# MONETARY POLICY & THE ECONOMY

Quarterly Review of Economic Policy

ƏNB
**OESTERREICHISCHE NATIONALBANK**
EUROSYSTEM

Stability and Security.

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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 (EU or Swiss nationals) 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 postdoc) 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 2018 should be e-mailed to eva.gehringer-wasserbauer@oenb.at by May 1, 2018.

Applicants will be notified of the jury's decision by mid-June. The following round of applications will close on November 1, 2018.

# Analyses

# Austria's thriving economy is fueled by lively exports and strong domestic demand

## Economic outlook for Austria from 2017 to 2020 (December 2017)

Gerhard Fenz,
Martin Schneider[1]

## 1 Executive summary

The Austrian economy is on a roll: at 3.1%, real GDP growth is expected to reach levels in 2017 last seen in the two boom years of 2006 and 2007. The good performance of 2017 will be followed by another year of very robust growth in 2018 (+2.8%), before growth is forecast to lessen to 1.9% in 2019 and 1.6% in 2020.

These figures represent upward revisions of 0.9, 1.1 and 0.3 percentage points, respectively, versus the OeNB's June 2017 outlook for 2017, 2018 and 2019. The unemployment rate is forecast to decline continually from 6.0% in 2016 to 5.0% in 2020. The inflation rate is expected to rise from 1.0% in 2016 to 2.2% in 2017, with a slight decrease to 1.9% projected until 2020.

Having gained momentum in 2016, the global economy continued to strengthen in 2017. The advanced economies were instrumental in carrying growth, with all major regions (U.S.A., EU and Japan) reporting better economic performance. Economic conditions improved also in the emerging economies, but were somewhat more heterogeneous. Growth of world trade even outperformed global GDP growth in the year to date, essentially on account of the composition of global growth. Given its high import content, investment activity has been a key driver of the strong growth performance.

Against this backdrop, Austrian goods exports started to rebound toward end-2016 and continued to gain substantial momentum during 2017.

Exports of services, which had not echoed the temporary setback in goods exports, also grew markedly in the first half of 2017. The underlying assumptions about Austria's export markets show that growth in these markets peaked in mid-2017 and is set to level off slightly during the forecast horizon. The forecast of exports broadly mirrors this pattern. Following real growth of 5.6% in 2017, export growth rates are expected to gradually recede to 4.0% in 2020.

Domestic demand has remained strong, proving a key driver of growth. In this respect, investment has been playing a decisive role. The current cycle of investment in plant and equipment has been unusually long and strong. Driven first by replacement investment and then increasingly by investment in capacity expansion, investment in plant and equipment has been growing by more than 8% each in both 2016 and 2017. Residential construction investment accelerated markedly in the first half of 2017, before stagnating in the third quarter. This notwithstanding, real residential construction growth is forecast to reach 2.8% in 2017 as a whole. All in all, the OeNB expects the growth of gross fixed capital formation to decelerate from 5.1% in 2017 to 1.9% in 2020.

Private consumption will be another key driver of growth throughout the forecast horizon. In 2017 real private consumption is projected to augment by 1.5%, despite the weaker growth of real incomes as a result of rising inflation.

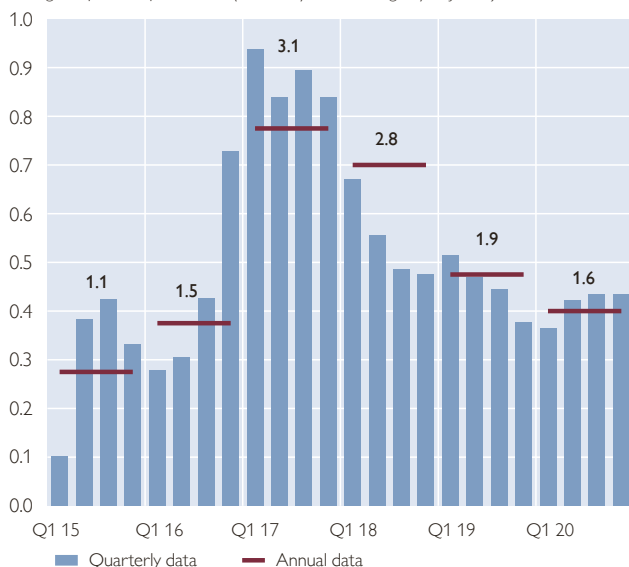[1] Oesterreichische Nationalbank, Economic Analysis Division, gerhard.fenz@oenb.at, martin.schneider@oenb.at. With contributions from Friedrich Fritzer, Ernest Gnan, Walpurga Köhler-Töglhofer, Doris Prammer, Doris Ritzberger-Grünwald and Alfred Stiglbauer.
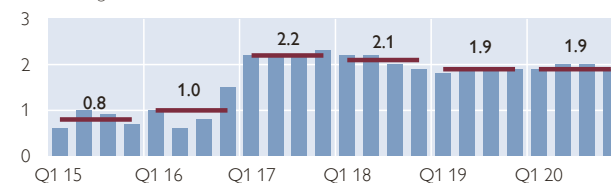
Chart 1

## Main results of the forecast

**Real GDP growth**

*Change on previous period in % (seasonally and working day-adjusted)*

**Harmonised Index of Consumer Prices**

*Annual change in %*

**Unemployment rate (Eurostat definition)**

%

*Source: WIFO, Statistics Austria, OeNB December 2017 outlook.*
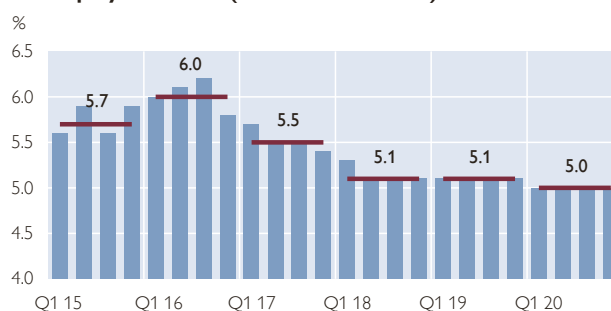
While private consumption has benefited from the 2016 tax reform in 2017, consumption growth will be mostly driven by the solid employment growth and more dynamic wage growth in 2018.

Labor market conditions have been improving markedly as a result of the thriving economy. Not only has the number of the jobs surged, but there has also been a substantial increase in full-time equivalent employment and in the number of hours worked. The boom of the Austrian economy will continue into the next year. Available leading labor market indicators, such as the number of registered vacancies or of leasing workers, do not signal a trend reversal in the months ahead. Growth of total employment is forecast to reach 1.7% in both 2017 and 2018, before leveling off to 1.0% in 2020 as the current business cycle runs its course. The unemployment rate as defined by Eurostat is expected to decline continually from 6.0% in 2016 to 5.0% in 2020.

HICP inflation will rise to 2.2% in 2017 and drop to 1.9% in 2020. The fact that inflation is set to remain comparatively stable over the forecast horizon can be attributed to two offsetting effects. The inflation rate of the HICP energy component will decline substantially, reflecting the expected drop in oil prices. Yet the commodity price-driven decline in inflation will be offset by determinants of domestic inflation, such as domestic demand or labor cost growth.

The general government budget balance is projected to improve in 2017, to –0.8% of GDP, following a temporary deterioration in 2016 (–1.6% of GDP). This improvement essentially reflects the highly favorable cyclical conditions and declining interest payments. At the same time, the reduction of the deficit will be slowed down by cuts in employer contributions to the family burden equalization fund, effective from January 1, 2017, the lagged effect of the

2016 tax relief measures as well as measures laid down in the government's action plan for 2017. The budget balance is expected to continue to improve substantially in the period from 2018 to 2020 given the favorable framework conditions. At the same time, the contraction of the budget deficit will be dampened, at least temporarily, by increased spending foreseen in the government's action plan for 2017 and a follow-up program adopted in the fall of 2017 (e.g. recruitment incentives to encourage new hiring and the creation of jobs for long-term unemployed, new investment subsidies, a one-off increase of small pensions and the decoupling of long-term jobless benefits from partners' incomes).

Government debt as a share of GDP started to go down again in 2016 and is expected to drop to some 70% of GDP by 2020. The decline reflects strong nominal growth and low interest rates as well as the progressive divestment of impaired assets by the government-run bad banks. This one-off effect explains above all the plunge by more than 5 percentage points in the debt ratio in 2017 in 2017, to 78.3% of GDP. The fact that the structural deficit will improve to no more than −0.8% of GDP in 2018 even in times of a substantial decline in interest payments is attributable to the spending measures mentioned above. Since some of those spending measures are set to be phased out in 2019 and 2020, Austria will be back on track to meet the medium-term budgetary objective (a structural balance of −0.5% of GDP) in 2019 without having to achieve additional savings.

## 2 Technical assumptions

This forecast for the Austrian economy is the OeNB's contribution to the December 2017 Eurosystem staff macroeconomic projections. The forecast hori-zon ranges from the fourth quarter of 2017 to the fourth quarter of 2020. The cutoff date for all assumptions on the performance of the global economy, interest rates, exchange rates and crude oil prices was November 28, 2017. To prepare these projections, the OeNB used its macroeconomic quarterly model and national accounts data, adjusted for seasonal and working-day effects (trend-cycle component), provided by the Austrian Institute of Economic Research (WIFO). These data differ from the quarterly series published by Eurostat since the changeover to the European System of Accounts (ESA 2010) in fall 2014 in that the latter are solely seasonally and working-day adjusted and therefore include irregular fluctuations that — in part — cannot be mapped to specific economic fundamentals. The values for 2016 also differ from the non-seasonally-adjusted data published by Statistics Austria. National accounts data were fully available up to the third quarter of 2017. The short-term interest rate used for the forecast horizon is based on market expectations for the three-month EURIBOR: −0.3% in 2017 and 2018, −0.1% in 2019 and +0.1% in 2020. Long-term interest rates, which are in tune with market expectations for government bonds with an agreed maturity of ten years, will rise from 0,6% in 2017 to 1.2% in 2020. The exchange rate of the euro vis-à-vis the U.S. dollar is assumed to remain at a constant USD/EUR 1.17 for the period from 2017 to 2020. The projected path of crude oil prices is based on futures prices, as a result of which the price of crude oil will rise from USD 54.3 USD per barrel Brent in 2017 to USD 61.6 in 2018, before receding during the remainder of the forecast horizon. The prices of commodities excluding energy are also based on futures prices over the forecast horizon.

Table 1

## OeNB December 2017 outlook for Austria – main results[1]

|  | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|
| **Economic activity** | *Annual change in % (real)* | | | | |
| Gross domestic product (GDP) | +1.5 | +3.1 | +2.8 | +1.9 | +1.6 |
| Private consumption | +1.5 | +1.5 | +1.6 | +1.4 | +1.2 |
| Government consumption | +2.0 | +1.4 | +2.0 | +1.1 | +0.8 |
| Gross fixed capital formation | +3.8 | +5.1 | +2.9 | +2.0 | +1.9 |
| Exports of goods and services | +2.4 | +5.6 | +5.0 | +4.2 | +4.0 |
| Imports of goods and services | +3.6 | +4.6 | +4.1 | +3.5 | +3.6 |
|  | *% of nominal GDP* | | | | |
| Current account balance | 2.1 | 1.9 | 2.1 | 2.6 | 3.1 |
| **Contribution to real GDP growth** | *Percentage points* | | | | |
| Private consumption | +0.8 | +0.8 | +0.8 | +0.7 | +0.6 |
| Government consumption | +0.4 | +0.3 | +0.4 | +0.2 | +0.1 |
| Gross fixed capital formation | +0.8 | +1.2 | +0.7 | +0.5 | +0.4 |
| Domestic demand (excluding changes in inventories) | +2.0 | +2.2 | +1.9 | +1.4 | +1.2 |
| Net exports | −0.5 | +0.7 | +0.7 | +0.5 | +0.4 |
| Changes in inventories (including statistical discrepancy) | +0.0 | +0.2 | +0.2 | +0.0 | +0.0 |
| **Prices** | *Annual change in %* | | | | |
| Harmonised Index of Consumer Prices (HICP) | +1.0 | +2.2 | +2.1 | +1.9 | +1.9 |
| Private consumption expenditure (PCE) deflator | +1.2 | +2.0 | +2.1 | +1.9 | +1.8 |
| GDP deflator | +1.1 | +1.5 | +1.9 | +1.9 | +1.8 |
| Unit labor costs (whole economy) | +2.1 | +0.1 | +1.7 | +1.8 | +1.5 |
| Compensation per employee (at current prices) | +2.3 | +1.5 | +2.8 | +2.5 | +2.2 |
| Compensation per hour worked (at current prices) | +1.7 | +1.3 | +2.8 | +2.6 | +2.4 |
| Import prices | −1.1 | +2.4 | +1.2 | +1.7 | +1.7 |
| Export prices | −0.6 | +2.0 | +1.2 | +1.8 | +1.8 |
| Terms of trade | +0.5 | −0.4 | +0.0 | +0.1 | +0.1 |
| **Annual change in %** | | | | | |
| Real disposable household income | +2.7 | +0.6 | +1.6 | +1.5 | +1.2 |
|  | *% of nominal disposable household income* | | | | |
| Saving ratio | 7.9 | 7.2 | 7.2 | 7.2 | 7.1 |
| **Labor market** | *Annual change in %* | | | | |
| Payroll employment | +1.4 | +1.8 | +1.9 | +1.3 | +1.1 |
| Hours worked (payroll employment) | +2.1 | +2.0 | +1.8 | +1.2 | +0.9 |
|  | *% of labor supply* | | | | |
| Unemployment rate (Eurostat definition) | 6.0 | 5.5 | 5.1 | 5.1 | 5.0 |
| **Public finances** | *% of nominal GDP* | | | | |
| Budget balance | −1.6 | −0.8 | −0.5 | −0.1 | +0.2 |
| Government debt | 83.6 | 78.3 | 74.9 | 72.1 | 69.3 |

*Source: 2016: WIFO, Eurostat, Statistics Austria; 2017 to 2020: OeNB December 2017 outlook.*

[1] *The outlook was drawn up on the basis of seasonally and working day-adjusted national accounts data (trend-cycle component: flash estimate for Q1 17). The data differ, in the method of seasonal adjustment, from the quarterly data published by Eurostat following the switch to the ESA 2010 framework in fall 2014 (the data published by Eurostat are much more volatile and do not facilitate detailed economic interpretation). The values for 2016 deviate also from the data released by Statistics Austria, which have not been seasonally adjusted.*

## 3 Strengthening global growth

Having gained momentum in 2016, the global economy continued to strengthen in 2017. The advanced economies were instrumental in boosting growth, with all major regions (the U.S.A., EU and Japan) reporting improved economic performance. Economic conditions improved also in the emerging economies, but were subject to a higher degree of

heterogeneity. Given that some risks had not materialized, these positive developments were driven by rising confidence. To begin with, fears of a sharp growth setback in China remained unfounded. The protectionist measures announced by the U.S. administration have not been adopted so far. In Europe, the economic impact of the *Brexit* vote in the U.K. has remained limited to weakened U.K. growth so far. Growth of world trade even outperformed global GDP growth in the year to date, essentially on account of the composition of global growth. Global output growth has been largely driven by investment demand, which relies heavily on imports. Monetary policy has remained highly accommodative in most regions of the world, thus supporting growth. Commodity-exporting countries finally, like Russia and Brazil, have been benefiting from a rise in commodity prices.

The economy of the *United States* regained strength in 2017. Buttressed by strong employment growth, households in particular were spending more confidently, as did businesses, which were investing more than they did in 2016. The swift adoption of protectionist measures proposed during the election campaign has yet to materialize.[2] In the medium run, U.S. growth is set to decline on account of ongoing demographic change and poor productivity growth.

The *Chinese economy* has been expanding at a robust pace and continues to become more consumption oriented. China's fiscal stance has been highly expansionary in recent years, thus supporting growth. In 2017, the budget deficit was not increased any further, and monetary policy rates were raised gradually. These measures stabilized the exchange rate of the Chinese renminbi

and contributed to mitigating the outflow of foreign exchange. The risks affecting the Chinese economy have abated somewhat more recently, but they remain elevated given the private sector's high and increasing level of indebtedness and the sharp increase in real estate prices. Growth rates are expected to continue to decrease gradually over the forecast horizon.

The *Japanese economy* continued its recovery. Private consumption has been expanding at a brisk pace due to the firming labor market. Investment activity has been on the increase both in the corporate and in the public sector. Growth rates are, however, set to slow down in the years to come in view of the gradual removal of fiscal stimulus and the reduction of the working-age population. In 2019, growth will be dented further by planned fiscal consolidation measures.

The *United Kingdom* experienced a marked growth setback in 2017 as a more lagged effect of the Brexit vote, which had initially left cyclical conditions broadly unchanged. Following the depreciation of the pound sterling, consumer prices went up noticeably, with real disposable household incomes and private consumption declining as a result. Exporters benefited from the weaker pound sterling and the strong international economy, which is why the growth downturn has remained moderate so far. Further developments over the forecast horizon very much depend on the turn the U.K.'s negotiations to leave the EU will take and are thus subject to a high degree of uncertainty.

Growth in *Central, Eastern and Southeastern European (CESEE) countries* accelerated visibly in the course of 2017. Apart from strengthening demand

[2] *The tax reform adopted by the Senate on December 2, 2017, might bring tax cuts in the amount of USD 1.5 trillion. The tax plan is, however, subject to controversy in light of anticipated distribution effects. The Senate vote came after the cutoff date for the forecast (November 28), which is why it did not enter the forecast exercise.*

Table 2

## Underlying global economic conditions

|  | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|
| **Gross domestic product** | *Annual change in % (real)* | | | | |
| World excluding the euro area | +3.2 | +3.7 | +3.9 | +3.8 | +3.7 |
| U.S.A. | +1.5 | +2.3 | +2.5 | +2.2 | +1.9 |
| Japan | +1.0 | +1.5 | +1.0 | +0.7 | +0.1 |
| Asia excluding Japan | +6.2 | +6.1 | +6.1 | +6.0 | +5.9 |
| Latin America | -0.9 | +1.4 | +2.2 | +2.7 | +2.8 |
| United Kingdom | +1.8 | +1.5 | +1.5 | +1.5 | +1.5 |
| CESEE EU Member States[1] | +3.1 | +4.7 | +3.5 | +3.2 | +3.2 |
| Switzerland | +1.4 | +0.8 | +1.8 | +1.8 | +2.1 |
| Euro area[2] | 1.8 | 2.4 | 2.3 | 1.9 | 1.7 |
| **World trade (imports of goods and services)** | | | | | |
| World | +2.0 | +5.5 | +4.5 | +4.2 | +3.8 |
| World excluding the euro area | +1.2 | +5.6 | +4.5 | +4.2 | +3.7 |
| Growth of euro area export markets (real) | +1.9 | +5.5 | +4.4 | +3.8 | +3.5 |
| Growth of Austrian export markets (real) | +3.3 | +5.6 | +5.0 | +4.4 | +4.0 |
| **Prices** | | | | | |
| Oil price in USD/barrel (Brent) | 44.0 | 54.3 | 61.6 | 58.9 | 57.3 |
| Three-month interest rate in % | −0.3 | −0.3 | −0.3 | −0.1 | 0.1 |
| Long-term interest rate in % | 0.4 | 0.6 | 0.7 | 0.9 | 1.2 |
| USD/EUR exchange rate | 1.11 | 1.13 | 1.17 | 1.17 | 1.17 |
| Nominal effective exchange rate of the euro (euro area index) | 109.7 | 112.1 | 115.3 | 115.3 | 115.3 |

*Source: Eurosystem.*

[1] Bulgaria, Croatia, Czech Republic, Hungary, Poland and Romania.
[2] 2016: Eurostat; 2017 to 2020: results of the Eurosystem's June 2017 projections.

for CESEE exports from the euro area, domestic demand has been fueled by strong employment figures and the increased uptake of EU structural funds, which had dropped in 2016. However, the current growth cycle is likely to peak in 2017. The outlook for the years ahead is characterized by a slight growth slowdown.

Growth in the *euro area* has been gaining momentum and become broad based. Performance in the year to date has been much better than anticipated even several months ago. Even the Greek economy, which had continued to shrink somewhat in 2016, reverted to positive growth this year. A number of factors are at the root of these positive developments. The ongoing recovery of the world economy has been instrumental, and monetary and fiscal policies have continued to support growth.

The structural reforms implemented by numerous countries as they emerged from the crisis are beginning to show results. Elections held in major EU Member States in 2017 were carried by pro-European parties, which caused political risks to become less pressing. Against this backdrop, private consumption has been the key growth driver, strongly supported by business investment and exports, though. In view of strong GDP growth and employment, wage developments have been subdued in most countries. This may be attributable to modest productivity growth, low inflation, changes in employment patterns as well as high – if decreasing – unemployment levels in a number of EU Member States. Unemployment is set to drop considerably over the forecast horizon, though, thus adding to wage pressures. A number of countries,

including Germany, the Netherlands, Belgium and Austria, have already started to show signs of labor shortages.

## 4 The Austrian economy has entered a boom period

### 4.1 Austrian exporters benefit from euro area recovery

Reflecting moderate global trade activity, Austrian export growth had remained weak in 2016. Goods exports suffered in particular, growing by just 1% in nominal terms. While exports to the euro area were relatively robust still, exports to non-euro area countries even contracted, largely because exports to the U.S.A., Russia and Asian countries decreased. In contrast, at +4.0%, growth of nominal services exports, as measured by balance of payments statistics, in 2016 even outperformed the increase recorded in 2015 (3.0%). This expansion was above all driven by buoyant growth of tourism exports.

Goods exports from Austria regained strength toward the end of 2016 and became considerably stronger in the course of 2017. A regional breakdown of goods exports made in the first eight months of 2017 shows that the expansion has been broadly based across regions. The biggest increases in exports were reported for France (39%) – driven by large shipments of pharmaceutical goods in January – and for Russia (24%). In the first half of 2017 services exports increased by 4.7%, with other business-related services expanding by as much as 10.1%. Export statistics were led by Germany.

The underlying assumptions about Austria's export markets show that the growth in these markets peaked in mid-2017 and is set to level off slightly during the forecast horizon. Export growth broadly mirrors this pattern. Following real growth of 5.6% in 2017, export growth rates are expected to gradually recede to 4.0% in 2020. Losses of market share are set to remain limited for Austrian exporters over the forecast horizon, and their price competitiveness will suffer only marginally despite the recent appreciation of the

Table 3

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

|  | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|
| **Exports** | *Annual change in %* | | | | |
| Competitor prices on Austria's export markets | −2.9 | +2.2 | +0.3 | +1.9 | +2.0 |
| Export deflator | −0.6 | +2.0 | +1.2 | +1.8 | +1.8 |
| Changes in price competitiveness | −2.3 | +0.2 | −0.9 | +0.1 | +0.2 |
| Import demand on Austria's export markets (real) | +3.3 | +5.6 | +5.0 | +4.4 | +4.0 |
| Austrian exports of goods and services (real) | +2.4 | +5.6 | +5.0 | +4.2 | +4.0 |
| Austrian market share | −1.0 | −0.1 | +0.0 | −0.3 | +0.0 |
| **Imports** | | | | | |
| International competitor prices on the Austrian market | −2.2 | +1.6 | +0.3 | +1.7 | +1.9 |
| Import deflator | −1.1 | +2.4 | +1.2 | +1.7 | +1.7 |
| Austrian imports of goods and services (real) | +3.6 | +4.6 | +4.1 | +3.5 | +3.6 |
| **Terms of Trade** | +0.5 | −0.4 | +0.0 | +0.1 | +0.1 |
| | *Percentage points of real GDP* | | | | |
| **Contribution of net exports to GDP growth** | −0.5 | +0.7 | +0.7 | +0.5 | +0.4 |
| | *% of nominal GDP* | | | | |
| Export share | 52.5 | 54.0 | 54.9 | 56.0 | 57.3 |
| Import share | 49.1 | 50.2 | 50.5 | 51.2 | 52.2 |

*Source: 2016: WIFO, Eurosystem; 2017 to 2020: OeNB December 2017 outlook.*

euro against the U.S. dollar. Projected to reach 4.6% in 2017 and 3.6% in 2020, import growth is trailing export growth somewhat. Hence, net exports will remain a key pillar of economic activity over the entire forecast horizon.

At 2.1% of GDP, Austria's current account balance in 2016 had improved slightly, by 0.2 percentage points against the previous year. With the trade balance worsening from 3.6% to 3.2%, the improvement was driven by the balance of primary income, which in turn basically reflected a marked improvement of direct investment income. Another contributing factor was the Eurosystem's expanded asset purchase program (APP), under which the OeNB has been buying above all Austrian government bonds from foreign investors on secondary markets. As a result of those purchases, inward portfolio investment and hence income outflows decreased. The slight deterioration of the current account in 2017, to 1.9% of GDP, is attributable to a deterioration of the services balance[3] in the first half of the year, and to increased commodity prices in the second half. In line with the positive growth contribution of net exports, the current account surplus is expected to keep rising over the entire forecast horizon, from 1.9% in 2017 to 3.1% in 2020.

## 4.2 Current cycle of investment in plant and equipment: exceptionally long and strong

Up to mid-2015, the post-crisis years were characterized not only by weak economic growth but also by corporate investment restraint. Uncertainty about future economic developments prompted businesses to postpone necessary replacement investment and to hold back investment projects. This led to an investment backlog. A new investment cycle did not start until the latter half of 2015 amid an improved outlook for growth. Initially, the new investment cycle was dominated by replacement investment. According to surveys by the European Commission for 2016, 46% of businesses – 9 percentage points more than two years earlier – indicated that their investment decisions were motivated by the need to replace existing capital stock. In 2016 investment in plant and equipment accelerated sharply, by more than 8%. As the economic recovery was gaining ground in 2017, investment in capacity expansion became increasingly important. As many as 22% of the businesses surveyed – 6 percentage points more than in the year earlier – saw the need to increase their production capacity. Investment in plant and equipment is thus expected to have grown by more than 8% in 2017.

Table 4

**Austria's current account**

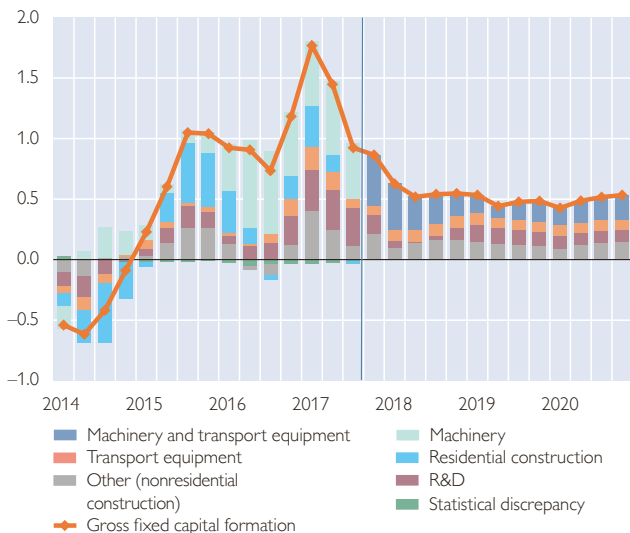|  | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|
|  | *% of nominal GDP* | | | | |
| Balance of trade | 3.2 | 3.1 | 3.3 | 3.9 | 4.4 |
| Balance of goods | 0.1 | 0.2 | 0.4 | 0.6 | 0.8 |
| Balance of services | 3.1 | 2.9 | 2.9 | 3.3 | 3.6 |
| Balance of primary income | −0.1 | −0.2 | −0.2 | −0.2 | −0.2 |
| Balance of secondary income | −1.0 | −1.0 | −1.0 | −1.0 | −1.1 |
| Current account balance | 2.1 | 1.9 | 2.1 | 2.6 | 3.1 |

*Source: 2016: OeNB; 2017 to 2020: OeNB December 2017 outlook.*

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[3] *Vigorous domestic demand fueled strong growth of imports of other business-related services (17.7%).*

Chart 2

## Gross fixed capital formation

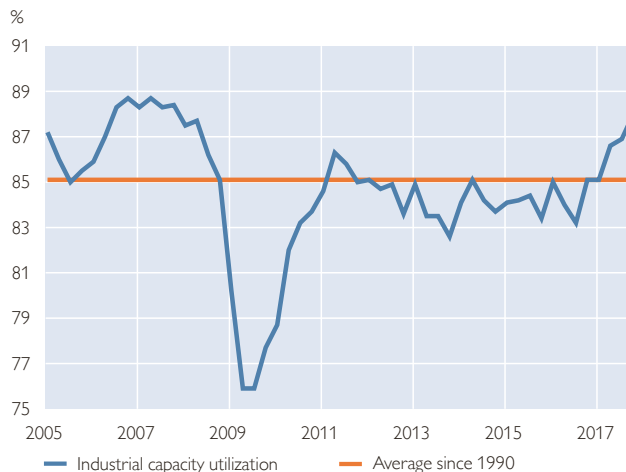**Quarterly investment growth**

*Quarterly change in %, contributions to growth in percentage points*

**Industrial capacity utilization**

%



Legend (left chart):
- Machinery and transport equipment
- Transport equipment
- Other (nonresidential construction)
- Gross fixed capital formation
- Machinery
- Residential construction
- R&D
- Statistical discrepancy

Legend (right chart):
- Industrial capacity utilization
- Average since 1990

*Source: Eurostat, OeNB.*

*Source: European Commission.*

Hence, the current investment cycle is already longer than average, and it has also been stronger than previous cycles. The cumulative three-year increase of investment in plant and equipment from 2015 to 2017 will be more than 20% in real terms. This compares with growth rates ranging from 10% to 15% for the past three investment cycles.

While the latest data for the third quarter of 2017 signal slightly weakening investment growth, the investment cycle is expected to level off only gradually, given the already very high degree of capacity utilization (88% in the fourth quarter of 2017, which is the highest measure since the boom period of 2006–2007). The outlook for the first half of 2018 is continued buoyant investment growth, if somewhat weaker than in 2016 and 2017. Looking ahead, the cyclical conditions, the historically favorable conditions for external financing and businesses' high self-financing capacity are set to remain the key pillars of corporate investment activity. For

investment in plant and equipment, a gradual return to long-term average growth rates will not happen before late 2018. Thus, this type of investment is forecast to increase by no less than 4.2% in 2018, and then drop to close to 2% in the following two years. The new investment subsidy adopted by the government for small and medium-sized businesses as well as its variant for large businesses are unlikely to generate substantial additional investment during the current boom.

Residential construction investment accelerated markedly in the first half of 2017, before virtually drying up in the third quarter. This notwithstanding, real residential construction growth is forecast to reach 2.8% in 2017 as a whole. Growth rates of more than 2% were seen only twice in the past 20 years, namely in 2007 and 2011. Even so, the favorable framework conditions — sharp increases in real estate prices, strong population growth and historically low interest rates — would

Table 5

## Investment activity in Austria

| | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|
| | *Annual change in %* | | | | |
| **Total gross fixed capital formation (real)** | +3.8 | +5.1 | +2.9 | +2.0 | +1.9 |
| *of which: investment in plant and equipment* | +8.3 | +8.3 | +4.2 | +1.8 | +1.8 |
| *residential construction investment* | +0.9 | +2.8 | +2.1 | +2.1 | +2.0 |
| *nonresidential construction investment and other investment* | +1.6 | +2.8 | +2.3 | +2.2 | +1.8 |
| *investment in research and development* | +2.5 | +5.3 | +2.3 | +2.1 | +2.1 |
| *public sector investment* | +2.9 | +2.4 | +2.0 | +2.0 | +2.1 |
| *private sector investment* | +3.9 | +5.5 | +3.1 | +2.1 | +1.9 |
| | *Contribution to the growth of real gross fixed capital formation in percentage points* | | | | |
| Investment in plant and equipment | +2.8 | +2.9 | +1.5 | +0.7 | +0.6 |
| Residential construction investment | +0.2 | +0.5 | +0.4 | +0.4 | +0.4 |
| Nonresidential construction investment and other investment | +0.4 | +0.8 | +0.6 | +0.6 | +0.5 |
| Investment in research and development | +0.5 | +1.1 | +0.5 | +0.4 | +0.4 |
| Public sector investment | +0.4 | +0.3 | +0.3 | +0.3 | +0.3 |
| Private sector investment | +3.4 | +4.8 | +2.7 | +1.8 | +1.6 |
| | *Contribution to real GDP growth in percentage points* | | | | |
| Total gross fixed capital formation | +0.8 | +1.2 | +0.7 | +0.5 | +0.4 |
| Changes in inventories | +0.1 | +0.0 | +0.2 | +0.0 | +0.0 |
| | *% of nominal GDP* | | | | |
| **Investment ratio** | 23.1 | 23.6 | 23.6 | 23.5 | 23.5 |

*Source: 2016: WIFO; 2017 to 2020: OeNB December 2017 outlook.*

have called for even stronger growth rates. The outlook for the years ahead is somewhat more than 2% on average. The growth pattern is expected to be similar for nonresidential construction investment. R&D investment, which also includes software purchases, is expected to expand along the lines of investment in plant and equipment. All in all, the OeNB expects the growth of gross fixed capital formation to decelerate from 5.1% in 2017 to 1.9% in 2020.

### 4.3 Private consumption to remain a major growth pillar over the forecast horizon

Having accelerated visibly in the latter half of 2016, the current economic recovery reached its erstwhile peak, at a growth rate of 0.9% against the previous quarter, in the first three months of 2017.

As employment and wages and hence household incomes tend to react with a lag to the ups and downs of the business cycle, private consumption typically peaks at later stages in the cycle. Yet one-off effects such as the tax reform effective from January 2016 and spending on asylum seekers caused growth of private consumption to peak already in mid-2016 and thus early in the current cycle. Following 0.5% growth in the second quarter of 2016, growth rates leveled off slightly in the following quarters. In the first three quarters of 2017, private consumption growth averaged 0.3% (quarter on quarter).

Weak productivity growth and low inflation in 2016 led to moderate wage settlements for 2017. The stronger-than-expected spike in inflation in 2017 entailed real income losses, causing gross

compensation of employees to grow by only slightly more than 1% despite dynamic employment growth. At the same time the data on property income that have become available for 2017 reflect a surprisingly weak performance, as a result of which real disposable household incomes are projected to grow by just 0.7%. Given this subdued income rise, at 1.5% in real terms, the pace of consumption growth projected for 2017 is in fact fairly high. The difference can be attributed to changes in the saving ratio, which will drop by 0.7 percentage points, to 7.2%, in 2017. Apart from weak real income growth, the contraction of the saving ratio can be pinpointed to two other effects. On the one hand, the lagged effects of the 2016 income tax reform have filtered down: additional income accruing to households is spent only with a time lag. Hence, an initial increase of the saving ratio is then followed by a decrease. On the other hand, the precautionary motive of saving has become less relevant, as

the good employment conditions add to consumer confidence.

The current strength of the economy – following the first peak of consumption growth in mid-2016 – will lead to a second peak in early 2018. The wage settlements that have been concluded so far would imply a marked acceleration of wage growth in early 2018. At the same time the leading indicators point to continued strong employment growth. In addition, other components of income, such as the mixed income of the self-employed and investment income, are going to grow more strongly on account of the business cycle. Real consumption growth is projected to accelerate again in early 2018, to 0.4% quarter on quarter, before gradually dropping to slightly below 0.3% during the remainder of the forecast horizon. On balance, real consumption stands to increase by 1.6% in 2018, followed by somewhat weaker growth rates of 1.4% in 2019 and 1.2% in 2020. The saving ratio is forecast to remain stable, following

Chart 3

**Private consumption**

**Disposable household income, private consumption and saving ratio**

*Annual change in %*  *% of disposable household income*
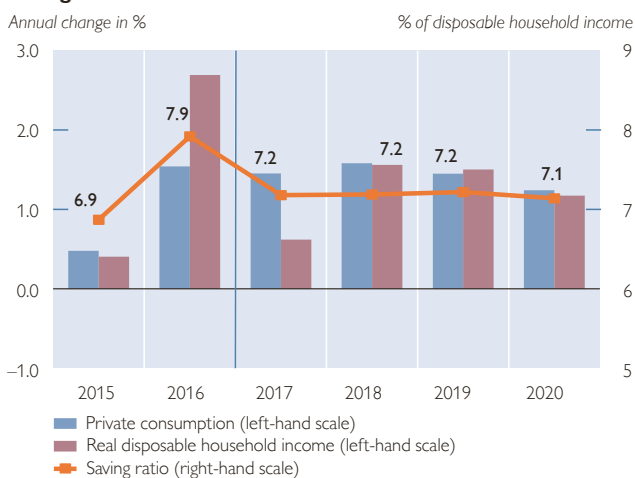
**Contributions to growth of real disposable net household income**

*Annual change in %, contributions to growth in percentage points*



Private consumption (left-hand scale)
Real disposable household income (left-hand scale)
Saving ratio (right-hand scale)

Income from self-employment and property (real, net)
Social security benefits (real, net)
Compensation of employees (real, net)
Real disposable household income
Other income

Source: WIFO, Statistics Austria, OeNB.

Source: WIFO, Statistics Austria, OeNB.

Table 6

**Determinants of nominal household income and private consumption growth in Austria**

| | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|
| *Annual change in %* | | | | | |
| Payroll employment | +1.4 | +1.8 | +1.9 | +1.3 | +1.1 |
| Wages and salaries per employee | +2.3 | +1.5 | +2.8 | +2.5 | +2.2 |
| Compensation of employees | +3.8 | +3.4 | +4.7 | +3.9 | +3.2 |
| Property income | −16.7 | +1.3 | +4.1 | +3.9 | +3.2 |
| Self-employment income and operating surpluses (net) | +5.9 | +5.1 | +4.3 | +3.4 | +3.1 |
| *Contribution to households' disposable income growth in percentage points* | | | | | |
| Compensation of employees | +3.2 | +2.8 | +4.0 | +3.3 | +2.8 |
| Property income | −2.2 | +0.1 | +0.4 | +0.4 | +0.3 |
| Self-employment income and operating surpluses (net) | +1.0 | +0.8 | +0.7 | +0.6 | +0.5 |
| Net transfers less direct taxes[1] | +2.0 | −1.2 | −1.4 | −0.9 | −0.7 |
| *Annual change in %* | | | | | |
| Disposable household income (nominal) | +3.9 | +2.6 | +3.7 | +3.4 | +3.0 |
| Consumption deflator | +1.2 | +2.0 | +2.1 | +1.9 | +1.8 |
| Disposable household income (real) | +2.7 | +0.6 | +1.6 | +1.5 | +1.2 |
| Private consumption (real) | +1.5 | +1.5 | +1.6 | +1.4 | +1.2 |
| *% of disposable income growth* | | | | | |
| Saving ratio | 7.9 | 7.2 | 7.2 | 7.2 | 7.1 |
| *% of nominal GDP* | | | | | |
| Consumption ratio | 52.7 | 52.1 | 51.6 | 51.4 | 51.1 |

*Source: 2016: WIFO, Statistics Austria; 2017 to 2020: OeNB December 2017 outlook.*

[1] *Negative values indicate an increase in (negative) net transfers less direct taxes; positive values indicate a decrease.*

the contraction in 2017, and hover slightly above 7.0% in the period from 2018 to 2020. Private consumption thus remains a major pillar of growth throughout the forecast horizon.

## 5 Unemployment rate to drop to as low as 5%

The period from 2012 to 2015 saw a solid rise in employment despite weak cyclical growth. As measured by the national accounts, the annual growth rate of payroll employment averaged 1.0%[4] in this period, thus even surpassing the 0.7% GDP growth rate. However, employment growth came mainly on the back of new part-time jobs in the services industry, where wages are typically lower. The number of hours worked stagnated.

This pattern has now changed with the current economic recovery. Since 2016, the number of new full-time jobs has been on a par with the number of new part-time jobs. Buoyant growth in the manufacturing industry caused the number of jobs to rise in this high-productivity sector, and the number of hours worked in payroll employment grew at a faster rate on balance than the number of jobs – as has typically been the case during boom periods of the Austrian economy. And these developments are ongoing. Following a 1.5% increase in 2016, in payroll employment is projected to rise by 1.8% in 2017.

[4] *In terms of employment growth, the national accounts refer to the number of jobs rather than the number of employed individuals.*

Table 7

**Labor market development in Austria**

| | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|
| | *Annual change in %* | | | | |
| Total employment (heads) | +1.2 | +1.7 | +1.7 | +1.3 | +1.0 |
| *Payroll employment* | *+1.4* | *+1.8* | *+1.9* | *+1.3* | *+1.1* |
| *of which: public sector employment* | *+0.9* | *+0.6* | *+2.4* | *−0.5* | *−1.2* |
| *Self-employment* | *−0.2* | *+0.9* | *+0.7* | *+0.7* | *+0.6* |
| Total hours worked | +1.9 | +1.8 | +1.6 | +1.1 | +0.8 |
| *of which: payroll employment* | *+2.1* | *+2.0* | *+1.8* | *+1.2* | *+0.9* |
| *self-employment* | *+0.8* | *+0.6* | *+0.7* | *+0.5* | *+0.4* |
| Labor supply | +1.5 | +1.2 | +1.3 | +1.2 | +1.0 |
| Registered unemployment | +7.2 | −7.7 | −5.6 | −0.4 | +0.4 |
| | *% of labor supply* | | | | |
| Unemployment rate (Eurostat definition) | 6.0 | 5.5 | 5.1 | 5.1 | 5.0 |

*Source: 2016: WIFO, Statstics Austria; 2017 to 2020: OeNB December 2017 outlook.*

Having grown by 2.1% in 2016, the total number of annual hours worked is forecast to increase by 2% in 2017, thus again outpacing employment growth.

The boom of the Austrian economy will continue into the year 2018. The available labor market leading indicators, such as the number of registered vacancies or of leasing workers, do not signal a trend reversal in the months ahead. The favorable development is thus likely to continue. In 2018, employment growth will be boosted further by recruitment incentives aimed at helping long-term unemployed persons back to work. These incentives are expected to create some extra 15,000 jobs. Growth in payroll employment is thus forecast to inch up to 1.9% despite the gradual slowdown of the economic recovery. The number of hours worked is projected to grow at a slightly slower pace of 1.8%.

In 2019 and 2020 the growth rates of the Austrian economy are expected to decelerate, thus gradually reverting to the long-term trend. Employment growth is thus set to decline, also in view of the phasing out of the employment initiative for the long-term jobless.

The unemployment rate (Eurostat definition) was rising until 2016, climbing to 6.0%, despite the high employment growth rate, because labor supply was expanding unusually fast. The boom year of 2017 will bring a trend reversal, with the unemployment rate dropping to 5.5% (annual average). Employment growth is set to remain strong in the following years, and the unemployment rate is forecast to drop to 5.0% in 2020. The stronger improvement of the job market will coincide with undented strong growth of the labor supply. On average, some 55,000 individuals will newly enter the Austrian job market per year in the period from 2018 to 2020.[5] Labor supply growth will be fueled by migration, the rising labor force participation rate of

[5] *The change in labor supply may be broken down into a population effect (change in population with unchanged participation rates) and a participation effect (change in participation rates with unchanged population figures). The population effect, in turn, may be decomposed into a change in population excluding immigration (based on population statistics underlying the Statistics Austria forecast excluding migrations) and a change in population including immigration (Statistics Austria — baseline forecast minus forecast excluding migration effects). As to immigration, a distinction may be made between "traditional" immigration and immigration motivated by a search for refuge.*

older workers and the procyclical response of the labor market supply (idle labor capacity). Net migration is forecast to stabilize at about 30,000 individuals per year in the period from 2018 to 2020. In addition, the labor supply stands to rise by another 15,000 older workers per year, reflecting the gradual increase of the retirement age adopted in the context of previous pension reforms. At the same time, in 2018, demographic change (change in population excluding immigration) is set to turn negative for the first time, thus pushing down labor supply by close to 20,000 individual in 2020. In sum, labor supply growth is set to go down from more than 60,000 in 2018 to slightly over 45,000 in 2020.
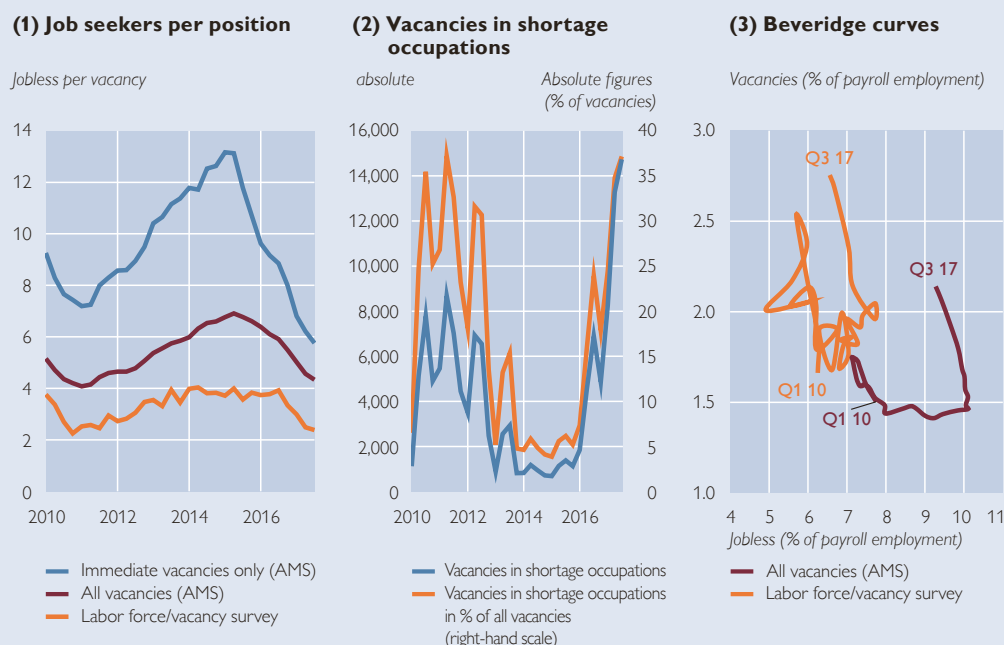
Box 1

## Has the economic boom led to labor shortages?[1]

*Any economy will be short of workers in a particular trade or industry from time to time. Even in times of weak economic growth some job vacancies may remain unfilled despite large numbers of jobless individuals, either because the latter lack the required skills or because they are not able or willing to take on advertised jobs on account of the geographical distance. When the economy is thriving, such problems are more widespread, as the number of job seekers per position declines.*

*In recent quarters, the number of job seekers per position has contracted sharply, to roughly the levels observed in early 2011 (see the left panel of chart 4). This pattern is more pronounced when we look at the data provided by the Austrian Public Employment Service (AMS) – in particular the data on immediate vacancies2 – than when we analyze the number*

Chart 4

### Job seekers per position, vacancies in shortage occupations and Beveridge curves



**(1) Job seekers per position**

*Jobless per vacancy*

- Immediate vacancies only (AMS)
- All vacancies (AMS)
- Labor force/vacancy survey

**(2) Vacancies in shortage occupations**

*absolute*     *Absolute figures (% of vacancies)*

- Vacancies in shortage occupations
- Vacancies in shortage occupations in % of all vacancies (right-hand scale)

**(3) Beveridge curves**

*Vacancies (% of payroll employment)*

- All vacancies (AMS)
- Labor force/vacancy survey

*Jobless (% of payroll employment)*

Source: Statistics Austria, Public Employment Service Austria (AMS), OeNB. Panels (1) and (3): seasonally adjusted data. Panel (2) is based on data for immediate job openings for which job seekers must have completed an apprenticeship or attained a higher training level.

[1] Author: Alfred Stiglbauer, Oesterreichische Nationalbank, Economic Analysis Division, alfred.stiglbauer@oenb.at.

[2] Note a bias in the data, given the fact that, in 2015, the AMS changed its conceptual framework to differentiate between immediate vacancies and jobs that will become available at a later stage. This change led to a shift toward the first category. For this reason, the number of immediate vacancies grew particularly strongly in the past few quarters, which in turn caused the number of job seekers per position to drop particularly sharply.

of job seekers per position based on the labor force survey (LFS) and the vacancy survey conducted by Statistics Austria. The number of vacancies evidenced by the vacancy survey is higher than the vacancies registered by the AMS, whereas the number of jobless individuals evidenced by the labor force survey is lower than the number registered by the AMS.[3]

The AMS regularly publishes a shortage occupation list based on the number of job seekers per position for individual trades and professions. A shortage occupation is defined as an occupation for which the number of job seekers per job is less than or equal to 1.5. In its latest shortage occupation list, published in fall 2017, the AMS reported a marked increase in the number of shortage occupations.[4] The middle panel of chart 4 summarizes the analysis of AMS data on job seekers per position for 518 occupations. An occupation will qualify for the for shortage occupation list if the number of job seekers per position is less than or equal to 1.5 and if at least 100 unemployed jobseekers have been registered for a particular trade or profession. Moreover, the list reflects only immediate vacancies and jobless workers who have completed at least an apprenticeship. The analysis shows that the number of vacancies in shortage occupations has been on a sharp rise since 2016, following very low figures between 2013 and 2015 (with the increase probably being too pronounced due the bias inherent in the AMS data). According to the above criteria[5] the most sought-after shortage occupations in quantitative terms are trades such as electrical engineers, plumbers, locksmiths, motor mechanics, turning machine operators and skilled woodworkers as well as jobs in the tourism industry.

The sharp increase in vacancies in shortage occupations is a result of the booming economy, but it may also reflect a decline in matching efficiency (the rate at which vacancies may be filled with jobless per period). Changes in matching success can be studied with the Beveridge curve, which plots unemployment on the horizontal axis and the vacancy rate on the vertical axis. The Beveridge curve is downward sloped as a rule. Tracking the business cycle, the chart plots movement from the lower right-hand corner (low GDP growth with few job openings and many jobless) to the upper left-hand corner (business cycle peak with a lot of job openings and few jobless). As the matching efficiency changes, the Beveridge curve may also shift as a whole. The right-hand panel of chart 4 shows two Beveridge curves, based on the different data sources mentioned above. A shift of the curve toward the right, as observed in the period from 2013 to 2015, implies a decline in matching efficiency. A right-hand shift is evident when we use AMS or labor force/vacancy survey data (with the shift being less pronounced for the latter). Since early 2016 there has been movement on a new Beveridge curve, placed further to the right, toward the upper left, reflecting the pattern that is typically observed during a business cycle. At the same time, filling vacancies has become more difficult, given the solid current cyclical situation and lower matching success. Today's very high rate of employment growth shows that potential labor shortages have not yet started to clearly limit economic growth. However, labor shortages might have a dampening effect on economic growth, should they increase in the years ahead. Wage development and inflation could receive a boost.

[3] The labor force survey does not classify as unemployed seasonal workers with a job offer as unemployed, whereas the AMS does. The vacancy survey lists job openings before they may have been registered with the AMS. Moreover, the vacancy survey is better a capturing job openings for workers with higher levels of educational attainment, whereas the AMS underreports such openings (Edelhofer, E. and K. Knittler. 2013. Offene-Stellen-Erhebung 2009 bis 2012. In: Statistische Nachrichten 11. 1033–1040).

[4] The definition of shortage occupations has been laid down in article 13 paragraph 1 of the Austrian foreign labor act (Ausländerbeschäftigungsgesetz). Based on the list of shortage occupations the minister for social affairs will issue skilled labor regulations on an annual basis, spelling out all occupations to which non-EU citizens holding an Austrian greencard may gain easier access.
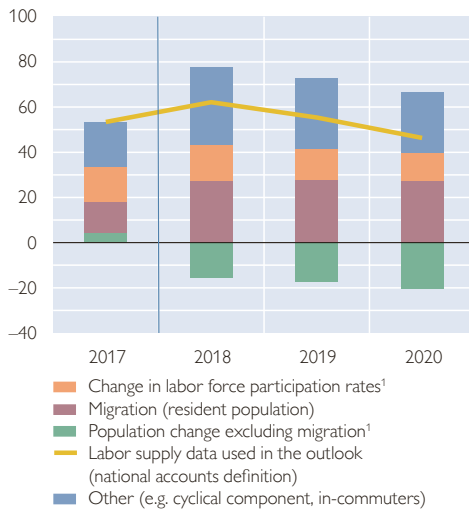
[5] A meaningful approach to determining actual skilled labor shortages would be to analyze changes in employment, labor turnover, hours worked and wages (see Fink, M., G. Titelbach, S. Vogtenhuber and H. Hofer. 2015. Gibt es in Österreich einen Fachkräftemangel? Institute for Advanced Studies).
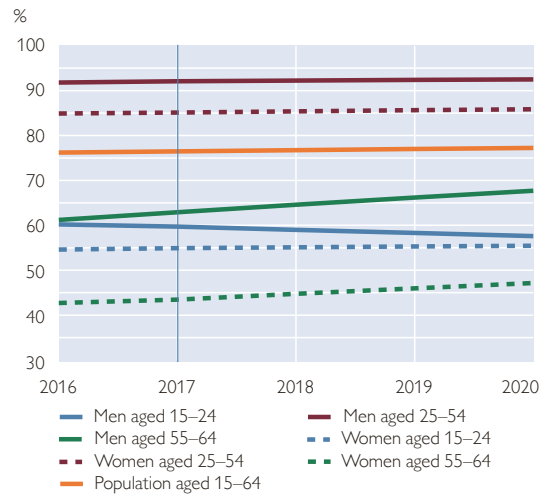
Chart 5

**Structure of labor supply**

**Contributions to the change in labor supply
(resident population)¹**

*Change in thousands*



Change in labor force participation rates¹
Migration (resident population)
Population change excluding migration¹
Labor supply data used in the outlook
(national accounts definition)
Other (e.g. cyclical component, in-commuters)

**Labor force participation (resident population)¹**

%



Men aged 15–24          Men aged 25–54
Men aged 55–64          Women aged 15–24
Women aged 25–54        Women aged 55–64
Population aged 15–64

*Source: Statistics Austria, OeNB.*

¹ *Resident population: Domestic households according to microcensus data; forecast extrapolated from projected labor force participation rates and the population forecast of Statistics Austria (baseline scenario, November 2017). The labor supply data used in the outlook (national accounts definition) may differ from the microcensus-based equivalent.*

## 6 Inflation to remain slightly above 2.0% in 2018

Domestic inflation was very stable in 2017, despite some volatility in several months. In each of the first three quarters, inflation as measured by the HICP equaled 2.2%; in October it reached 2.3%. At the same time, core inflation (HICP excluding energy) increased from 1.8% in the first quarter to 2.3% in the third quarter of 2017, to 2.4% in October. While the contribution of energy to inflation dropped in the first three quarters, the contributions of food and industrial goods excluding energy increased.

Starting from December 2017, HICP inflation is forecast to slow down moderately, thus resulting in a rate of 2.2% for 2017 as a whole. Thereafter, HICP inflation is expected to stabilize at slightly more than 2% until the fall of 2018. A decline to below 2% is not in store until the fourth quarter of 2018.

This pattern essentially reflects changes in energy prices and food prices. In fall 2018, the inflation rate of the energy component of the HICP will decline markedly, reflecting the anticipated drop in oil prices and the base effect related to the latest price increases. At the same time, domestic drivers of inflation, such as domestic demand or labor cost growth, should be offsetting the commodity price-driven decrease in inflation. In 2018 as a whole, inflation will run to 2.1%. Looking further ahead, inflation is expected to edge down, to amount to 1.9 % in 2019 as well as 2020.

At 2.1%, HICP inflation excluding energy is forecast to equal headline inflation in 2018. In 2019 and 2020 core inflation is expected to total 2.0%, thus exceeding headline inflation. Compared with the OeNB's economic outlook of June 2017, HICP inflation has been revised upward by 0.2 percentage points

Table 8

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

| | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|
| | Annual change in % | | | | |
| Harmonised Index of Consumer Prices (HICP) | +1.0 | +2.2 | +2.1 | +1.9 | +1.9 |
| HICP energy | −4.6 | +2.9 | +1.3 | +0.2 | +0.8 |
| HICP excluding energy | +1.5 | +2.2 | +2.1 | +2.0 | +2.0 |
| Private consumption expenditure (PCE) deflator | +1.2 | +2.0 | +2.1 | +1.9 | +1.8 |
| Investment deflator | +1.4 | +1.6 | +1.8 | +1.7 | +1.6 |
| Import deflator | −1.1 | +2.4 | +1.2 | +1.7 | +1.7 |
| Export deflator | −0.6 | +2.0 | +1.2 | +1.8 | +1.8 |
| Terms of trade | +0.5 | −0.4 | +0.0 | +0.1 | +0.1 |
| GDP deflator at factor cost | +1.1 | +1.5 | +2.0 | +1.9 | +1.8 |
| Collective wage and salary settlements | +1.6 | +1.5 | +2.6 | +2.5 | +2.2 |
| Compensation per employee | +2.3 | +1.5 | +2.8 | +2.5 | +2.2 |
| Hourly compensation per employee | +1.7 | +1.3 | +2.8 | +2.6 | +2.4 |
| Labor productivity per employee | +0.3 | +1.4 | +1.0 | +0.7 | +0.6 |
| Labor productivity per hour | −0.4 | +1.3 | +1.1 | +0.8 | +0.8 |
| Unit labor costs | +2.1 | +0.1 | +1.7 | +1.8 | +1.5 |
| Profit margins[1] | −1.0 | +1.3 | +0.2 | +0.0 | +0.3 |

Source: 2016: WIFO, Statistics Austria; 2017 to 2020: OeNB December 2017 outlook.

[1] GDP deflator divided by unit labor costs.

for 2017 and by 0.3 percentage points for 2018. On the supply side, the upward revisions are attributable to the marked rise in commodity prices, on the demand side to the strengthening of the economic recovery.

Austria's inflation differential has increased vis-à-vis both Germany and the euro area since early 2017, totaling 0.8 and 0.9 percentage points, respectively, in October. The services sector continues to account for the bulk of the inflation differential. Inflation has been higher in Austria above all in the tourism sector (e.g. hotels and restaurants) as well as with regard to administered prices. In the period from 2018 to 2020 labor shortages in Germany are going to considerably push up wage settlements, and wage pressures are set to increase also in many other euro area countries on account of the advanced stage of the business cycle. As a result, Germany's inflation differential to

Austria in the labor-intensive services sector should contract.

Collective wages are set to go up by 1.5% in 2017. Given a projected HICP inflation rate of 2.2%, this implies real wage losses. The wage settlements for 2018 that have been concluded so far point to higher wage growth looking ahead. Given higher inflation and productivity gains, the metal industry is going to see a 3.0% rise in collective wages, while an increase by 2.45% was agreed for retail workers, and an increase by 2.3% for public sector employees. On average, collective wages are expected to rise by 2.6% – i.e. by 0.4 percentage points above the projected HICP inflation rate. Real wage growth is set to remain positive also in 2019 and 2020. Against the backdrop of the strong economy and inflation rates of close to 2%, wages are forecast to grow by 2.5% (2019) and 2.2% (2020). Wage drift will be neutral over the entire

Table 9

## Compensation of employees

| | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|
| | *Annual change in %* | | | | |
| **Gross wages and salaries[1]** | | | | | |
| In nominal terms | +3.8 | +3.4 | +4.7 | +3.9 | +3.2 |
| Consumption deflator | +1.2 | +2.0 | +2.1 | +1.9 | +1.8 |
| In real terms | +2.6 | +1.4 | +2.5 | +2.0 | +1.5 |
| **Collectively agreed wages and salaries[1]** | +1.6 | +1.5 | +2.6 | +2.5 | +2.2 |
| Wage drift | +0.8 | +0.0 | +0.1 | +0.0 | +0.0 |
| **Per person employed (gross, nominal)** | | | | | |
| Per person employed (gross)[2] | +2.3 | +1.5 | +2.8 | +2.5 | +2.2 |
| Per person employed (real) | +1.1 | -0.5 | +0.6 | +0.7 | +0.4 |
| **Per person employed (gross, real)** | | | | | |
| Per hour (gross, nominal) | +1.7 | +1.3 | +2.8 | +2.6 | +2.4 |
| Per hour (gross, real) | +0.5 | -0.7 | +0.6 | +0.8 | +0.6 |
| | *% of nominal GDP* | | | | |
| **Wage share** | 48.1 | 47.5 | 47.5 | 47.5 | 47.4 |

*Source: 2016: WIFO, Statistics Austria; 2017 to 2020: OeNB December 2017 outlook.*

*[1] Overall economy.*
*[2] Including employers' social security contributions.*

forecast horizon. While the increase in the share of part-time jobs will have a dampening effect, overpayments are expected to rise in view of initial signs of labor shortages in individual industries. The wage share (gross compensation of employees as a share of GDP) is expected to remain stable at 47.5% over the forecast horizon.

## 7 Balance of forecast risks on the upside in the short run

The external risks to the growth forecast are balanced. The procyclical behavior of the elasticity between global trade growth and global GDP growth might be more pronounced than expected, thus leading to stronger demand on Austria's export markets. Given good

Chart 6

### Contributions to HICP inflation and core inflation

*Annual change in % (inflation) and percentage points (contributions to inflation)*       *Forecast: November 2017 to December 2018.*



HICP inflation: 2017: 2.2%
2018: 2.1%

Legend: Services, Nonenergy industrial goods, Food, Energy, HICP inflation, Core inflation (excluding energy and unprocessed food)
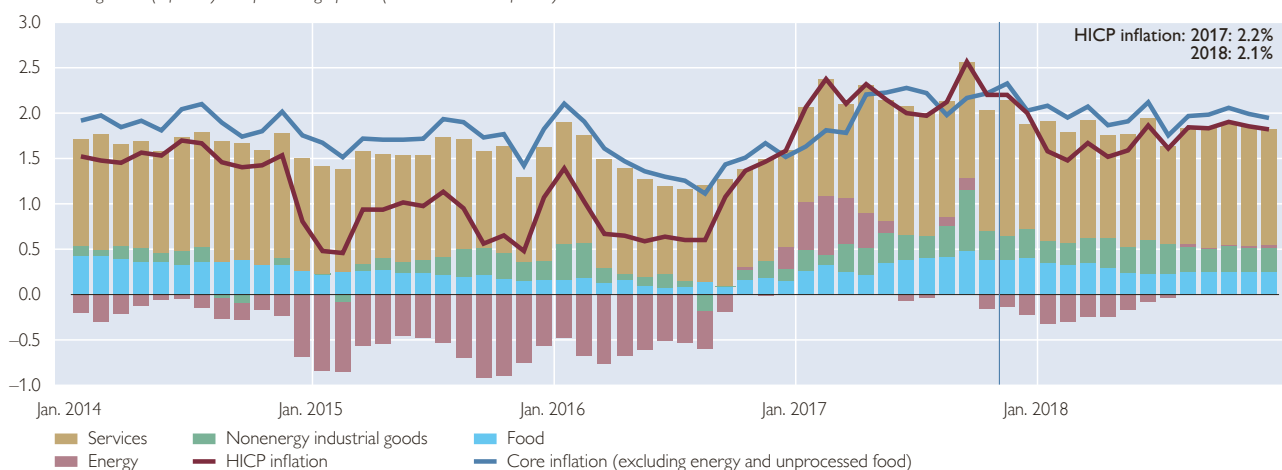
*Source: Statistics Austria, OeNB.*

leading indicators, the balance of risks is also on the upside for the short-term outlook for euro area growth. At the same time, political uncertainties continue to weigh on the outlook. These uncertainties include a number of geopolitical risks, such as the turn the North Korea conflict may take. In the United States, uncertainties prevail with regard to the planned tax reform and the evolution of trade policies. In Europe, uncertainties relate to the composition of the new government in Germany, to the forthcoming parliamentary elections in Italy as well as to the eventual outcome of the Brexit negotiations.

The balance of *domestic risks* is likewise on the upside, in particular with regard to short-term growth expectations. The available leading indicators for the domestic economy do not signal any reversal. On the contrary, numerous leading indicators are close to their historical peaks. Some indicators, such as the purchasing managers' index compiled by Bank Austria, which stagnated at high levels in the summer, surprisingly improved further after the cutoff date for the projections. Hence, growth might turn out to be even higher in the first quarters of the forecast than expected. Upside risks also prevail for the investment outlook. Businesses continue to report high demand for investment in capacity expansion and above-average capacity utilization. Therefore, the extended and pronounced investment cycle for machinery and transport equipment may well last until the second half of 2018. Finally, residential construction investment is also subject to upside risks, given the acute need for housing and continued favorable financing conditions. In contrast, downward risks to the outlook might emanate from labor shortages as evidenced by some indicators, should those shortages intensify.

The risks surrounding the outlook for *inflation* are also strongly tilted toward the upside. The path for oil prices implied by forward markets might turn out to have been underestimated, as has happened occasionally in the past. Further upside risks to inflation stem from the upside risks to the outlook for GDP growth, as well as from the labor shortages that is clearly on the horizon, in case these shortages should lead to heightened wage pressures.

## 8 Major upward revision of economic outlook

The external environment has significantly improved since the OeNB June 2017 outlook. The good outlook for the global economy in general and for Austria's key export markets (the euro area and CESEE countries) in particular have led to a marked revision of the growth outlook for Austria's export markets compared with the projections made in June. In contrast, the assumption of higher oil prices has an offsetting effect on the outlook for growth. Markets currently expect oil prices to rise to USD 61.6 per barrel Brent in 2018, 20% more than the level projected in June 2017. However, the appreciation of the euro against the U.S. dollar weakens this impact to 12%. The assumptions with regard to the euro area exchange rate against the U.S. dollar were revised upward by 7½% for the forecast horizon. Short-term and long-term interest rates were again revised downward slightly, thus supporting investment growth. In sum, the revised assumptions for 2018 and 2019 have led to upward revisions of both the outlook for GDP growth and for inflation.

Table 11 provides detailed reasons for revising the outlook. Apart from the impact of changed external assumptions, they are attributable to the impact of new data and a residual. The influ-

Table 10

**Change in external economic conditions since the June 2017 outlook**

| | December 2017 | | | | June 2017 | | | Difference | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2017 | 2018 | 2019 |
| *Annual change in %* | | | | | | | | | | |
| Growth of Austria's export markets | +5.6 | +5.0 | +4.4 | +4.0 | +4.4 | +4.2 | +4.1 | +1.2 | +0.8 | +0.3 |
| Competitor prices on Austria's export markets | +2.2 | +0.3 | +1.9 | +2.0 | +3.7 | +1.9 | +2.0 | −1.5 | −1.6 | −0.1 |
| Competitor prices on Austria's import markets | +1.6 | +0.3 | +1.7 | +1.9 | +2.7 | +1.7 | +1.8 | −1.1 | −1.4 | −0.1 |
| *USD per barrel (Brent)* | | | | | | | | | | |
| Oil price | 54.3 | 61.6 | 58.9 | 57.3 | 51.6 | 51.4 | 51.5 | +2.7 | +10.2 | +7.4 |
| *Annual change in %* | | | | | | | | | | |
| Nominal effective exchange rate (exports) | −0.5 | −1.4 | +0.0 | +0.0 | +0.7 | −0.2 | +0.0 | −1.2 | −1.2 | +0.0 |
| Nominal effective exchange rate (imports) | −0.6 | −0.9 | +0.0 | +0.0 | +0.2 | −0.1 | +0.0 | −0.8 | −0.8 | +0.0 |
| *%* | | | | | | | | | | |
| Three-month interest rate | −0.3 | −0.3 | −0.1 | 0.1 | −0.3 | −0.2 | 0.0 | +0.0 | −0.1 | −0.1 |
| Long-term interest rate | 0.6 | 0.7 | 0.9 | 1.2 | 0.7 | 0.9 | 1.2 | −0.1 | −0.2 | −0.3 |
| *Annual change in %* | | | | | | | | | | |
| U.S. GDP (real) | +2.3 | +2.5 | +2.2 | +1.9 | +2.2 | +2.5 | +2.3 | +0.1 | +0.0 | −0.1 |
| *USD/EUR* | | | | | | | | | | |
| USD/EUR exchange rate | 1.13 | 1.17 | 1.17 | 1.17 | 1.08 | 1.09 | 1.09 | +0.05 | +0.08 | +0.08 |

*Source: Eurosystem.*

ence of new data includes the effects of the revisions of both the historical data already available at the time of the OeNB's June 2017 economic outlook (i.e. data up to the first quarter of 2017) and the forecasting errors of the previous outlook for the periods now published for the first time (i.e. data for the second and third quarters of 2017). The residual includes new expert assessments regarding domestic variables, such as government consumption or wage settlements, as well as any changes to the model.

For 2017, GDP growth has been revised up by 0.9 percentage points. The bulk of this change (0.5 percentage points) is attributable to revisions of historical data. Moreover, the projections for GDP growth for the second and the third quarters of 2017 turned out to be too conservative, which explains 0.4 percentage points of the revision for 2017. A carry-over effect stemming from the higher growth rates in the second and third quarters of 2017 add another 0.2 percentage points to the upward revision of GDP growth by 1.1 percentage points for 2018. The improved external assumptions add another 0.6 percentage points to growth in 2018. Finally, today's thriving economy underpins a more positive outlook on the economy in general than warranted in June, which explains 0.3 percentage points of the upward revision for 2018 (table 11). Looking ahead to 2019, the forecast was revised upward by 0.2 percentage points.

Compared with the economic outlook, the revisions to inflation outlook have been only marginal The inflation outlook for 2018 has been revised upward by 0.3 percentage points, with the higher oil prices accounting for 0.2 percentage points and the cyclical momentum for 0.1 percentage points of the revision. The upward revision by 0.1 percentage points for 2019 is attributable to higher wage settlements.

Table 11

**Breakdown of revisions to the outlook**

| | GDP | | | HICP | | |
|---|---|---|---|---|---|---|
| | 2017 | 2018 | 2019 | 2017 | 2018 | 2019 |
| | *Annual change in %* | | | | | |
| **December 2017 outlook** | +3.1 | +2.8 | +1.9 | +2.2 | +2.1 | +1.9 |
| **June 2017 outlook** | +2.2 | +1.7 | +1.6 | +2.0 | +1.8 | +1.8 |
| **Difference** | +0.9 | +1.1 | +0.3 | +0.2 | +0.3 | +0.1 |
| **Caused by:** | *Percentage points* | | | | | |
| External assumptions | +0.0 | +0.6 | +0.1 | +0.1 | +0.3 | +0.0 |
| New data[1] | +0.9 | +0.2 | +0.0 | +0.1 | x | x |
| *of which:  revisions to historical data up to Q1 17* | *+0.5* | *x* | *x* | *+0.0* | *x* | *x* |
| *projection errors for Q2 and Q3 17* | *+0.4* | *+0.2* | *x* | *+0.1* | *+0.0* | *+0.0* |
| Other changes[2] | +0.0 | +0.3 | +0.2 | +0.0 | +0.0 | +0.1 |

*Source: OeNB December 2017 and June 2017 outlooks.*

*Note: Due to rounding, the sum of growth contributions subject to individual revisions may differ from the total revision.*

[1] *"New data" refer to data on GDP and/or inflation that have become available since the publication of the preceding OeNB outlook.*

[2] *Different assumptions about trends in domestic variables such as wages, government consumption, effects of tax measures, other changes in assessments and model changes.*

Table 12

## Comparison of the OeNB December 2017 outlook and the June 2017 outlook

| | Actual figures | December 2017 outlook | | | Revision since June 2017 outlook | | |
|---|---|---|---|---|---|---|---|
| | 2016 | 2017 | 2018 | 2019 | 2017 | 2018 | 2019 |
| **Economic activity** | *Annual change in % (real)* | | | | | | |
| Gross domestic product (GDP) | +1.5 | +3.1 | +2.8 | +1.9 | +0.9 | +1.1 | +0.3 |
| Private consumption | +1.5 | +1.5 | +1.6 | +1.4 | −0.1 | +0.4 | +0.2 |
| Government consumption | +2.0 | +1.4 | +2.0 | +1.1 | +0.5 | +0.2 | +0.3 |
| Gross fixed capital formation | +3.8 | +5.1 | +2.9 | +2.0 | +1.8 | +0.9 | +0.3 |
| Exports of goods and services | +2.4 | +5.6 | +5.0 | +4.2 | +1.4 | +1.0 | +0.3 |
| Imports of goods and services | +3.6 | +4.6 | +4.1 | +3.5 | +0.9 | +0.3 | +0.1 |
| | *% of nominal GDP* | | | | | | |
| Current account balance | +2.1 | +1.9 | +2.1 | +2.6 | −0.2 | −0.3 | −0.2 |
| **Contribution to real GDP growth** | *Percentage points* | | | | | | |
| Private consumption | +0.8 | +0.8 | +0.8 | +0.7 | +0.0 | +0.2 | +0.1 |
| Government consumption | +0.4 | +0.3 | +0.4 | +0.2 | +0.1 | +0.0 | +0.0 |
| Gross fixed capital formation | +0.8 | +1.2 | +0.7 | +0.5 | +0.4 | +0.2 | +0.1 |
| Domestic demand (excluding changes in inventories) | +2.0 | +2.2 | +1.9 | +1.4 | +0.4 | +0.5 | +0.2 |
| Net exports | −0.5 | +0.7 | +0.7 | +0.5 | +0.3 | +0.4 | +0.1 |
| Changes in inventories (including statistical discrepancy) | +0.0 | +0.2 | +0.2 | +0.0 | +0.2 | +0.2 | +0.0 |
| **Prices** | *Annual change in %* | | | | | | |
| Harmonised Index of Consumer Prices (HICP) | +1.0 | +2.2 | +2.1 | +1.9 | +0.2 | +0.3 | +0.1 |
| Private consumption expenditure (PCE) deflator | +1.2 | +2.0 | +2.1 | +1.9 | +0.1 | +0.4 | +0.2 |
| GDP deflator | +1.1 | +1.5 | +1.9 | +1.9 | −0.1 | +0.0 | +0.1 |
| Unit labor costs (whole economy) | +2.1 | +0.1 | +1.7 | +1.8 | −0.3 | −0.1 | +0.4 |
| Compensation per employee (at current prices) | +2.3 | +1.5 | +2.8 | +2.5 | +0.2 | +0.6 | +0.6 |
| Compensation per hour worked (at current prices) | +1.7 | +1.3 | +2.8 | +2.6 | −0.2 | +0.3 | +0.3 |
| Import prices | −1.1 | +2.4 | +1.2 | +1.7 | −0.2 | −0.7 | −0.1 |
| Export prices | −0.6 | +2.0 | +1.2 | +1.8 | −0.7 | −0.9 | −0.1 |
| Terms of trade | +0.5 | −0.4 | +0.0 | +0.1 | −0.5 | −0.2 | −0.1 |
| **Income and savings** | | | | | | | |
| Real disposable household income | +2.7 | +0.6 | +1.6 | +1.5 | −0.4 | +0.2 | +0.3 |
| | *% of nominal disposable household income* | | | | | | |
| Saving ratio | 7.9 | 7.2 | 7.2 | 7.2 | −0.7 | −0.7 | −0.7 |
| **Labor market** | *Annual change in %* | | | | | | |
| Payroll employment | +1.4 | +1.8 | +1.9 | +1.3 | +0.3 | +0.4 | +0.1 |
| Hours worked (payroll employment) | +2.1 | +2.0 | +1.8 | +1.2 | +0.7 | +0.7 | +0.4 |
| | *% of labor supply* | | | | | | |
| Unemployment rate (Eurostat definition) | 6.0 | 5.5 | 5.1 | 5.1 | −0.2 | −0.4 | −0.3 |
| **Public finances** | *% of nominal GDP* | | | | | | |
| Budget balance | −1.6 | −0.8 | −0.5 | −0.1 | +0.1 | +0.4 | +0.4 |
| Government debt | 83.6 | 78.3 | 74.9 | 72.1 | −1.9 | −3.1 | −3.7 |

*Source: 2016 (actual figures): WIFO, Statistics Austria, OeNB; OeNB December 2017 and June 2017 outlooks.*

## Annex: detailed result tables

Table 13

### Demand components (real)
Chained volume data (reference year = 2010)

| | 2016 | 2017 | 2018 | 2019 | 2020 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| | EUR million | | | | | Annual change in % | | | | |
| Private consumption | 164,960 | 167,357 | 170,003 | 172,468 | 174,608 | 1.5 | 1.5 | 1.6 | 1.4 | 1.2 |
| Government consumption | 63,805 | 64,702 | 65,977 | 66,700 | 67,209 | 2.0 | 1.4 | 2.0 | 1.1 | 0.8 |
| Gross fixed capital formation | 72,822 | 76,541 | 78,774 | 80,387 | 81,921 | 3.8 | 5.1 | 2.9 | 2.0 | 1.9 |
| of which: investment in plant and equipment | 25,184 | 27,264 | 28,402 | 28,924 | 29,442 | 8.3 | 8.3 | 4.2 | 1.8 | 1.8 |
| residential construction investment | 13,124 | 13,495 | 13,774 | 14,066 | 14,352 | 0.9 | 2.8 | 2.1 | 2.1 | 2.0 |
| nonresidential construction investment and other investment | 19,679 | 20,231 | 20,696 | 21,152 | 21,533 | 1.6 | 2.8 | 2.3 | 2.2 | 1.8 |
| Changes in inventories (including statistical discrepancy) | 4,959 | 5,562 | 6,064 | 5,984 | 5,992 | × | × | × | × | × |
| Domestic demand | 306,546 | 314,161 | 320,819 | 325,540 | 329,730 | 2.1 | 2.5 | 2.1 | 1.5 | 1.3 |
| Exports of goods and services | 178,268 | 188,189 | 197,686 | 205,925 | 214,195 | 2.4 | 5.6 | 5.0 | 4.2 | 4.0 |
| Imports of goods and services | 167,182 | 174,883 | 181,999 | 188,451 | 195,294 | 3.6 | 4.6 | 4.1 | 3.5 | 3.6 |
| Net exports | 11,085 | 13,306 | 15,688 | 17,474 | 18,901 | × | × | × | × | × |
| Gross domestic product | 317,631 | 327,467 | 336,506 | 343,014 | 348,631 | 1.5 | 3.1 | 2.8 | 1.9 | 1.6 |

Source: 2016: Eurostat; 2017 to 2020: OeNB December 2017 outlook.

Table 14

### Demand components (nominal)

| | 2016 | 2017 | 2018 | 2019 | 2020 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| | EUR million | | | | | Annual change in % | | | | |
| Private consumption | 186,289 | 192,715 | 199,961 | 206,631 | 212,877 | +2.8 | +3.4 | +3.8 | +3.3 | +3.0 |
| Government consumption | 70,534 | 72,259 | 75,130 | 77,522 | 79,725 | +3.1 | +2.4 | +4.0 | +3.2 | +2.8 |
| Gross fixed capital formation | 81,601 | 87,141 | 91,275 | 94,683 | 97,989 | +5.2 | +6.8 | +4.7 | +3.7 | +3.5 |
| Changes in inventories (including statistical discrepancy) | 3,137 | 3,815 | 4,251 | 4,192 | 4,212 | × | × | × | × | × |
| Domestic demand | 341,560 | 355,931 | 370,617 | 383,028 | 394,803 | +3.0 | +4.2 | +4.1 | +3.3 | +3.1 |
| Exports of goods and services | 185,612 | 199,906 | 212,522 | 225,355 | 238,638 | +1.8 | +7.7 | +6.3 | +6.0 | +5.9 |
| Imports of goods and services | 173,543 | 185,884 | 195,755 | 206,061 | 217,126 | +2.5 | +7.1 | +5.3 | +5.3 | +5.4 |
| Net exports | 12,069 | 14,023 | 16,767 | 19,294 | 21,511 | × | × | × | × | × |
| Gross domestic product | 353,629 | 369,954 | 387,384 | 402,322 | 416,314 | +2.6 | +4.6 | +4.7 | +3.9 | +3.5 |

Source: 2016: Eurostat; 2017 to 2020: OeNB December 2017 outlook.

Table 15

## Demand components (deflators)

| | 2016 | 2017 | 2018 | 2019 | 2020 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2010 = 100 | | | | | Annual change in % | | | | |
| Private consumption | 112.9 | 115.1 | 117.6 | 119.8 | 121.9 | +1.2 | +2.0 | +2.1 | +1.9 | +1.8 |
| Government consumption | 110.5 | 111.7 | 113.9 | 116.2 | 118.6 | +1.1 | +1.0 | +2.0 | +2.1 | +2.1 |
| Gross fixed capital formation | 112.1 | 113.8 | 115.9 | 117.8 | 119.6 | +1.4 | +1.6 | +1.8 | +1.7 | +1.6 |
| Domestic demand (excluding changes in inventories) | 112.2 | 114.1 | 116.4 | 118.6 | 120.7 | +1.2 | +1.7 | +2.0 | +1.9 | +1.8 |
| Exports of goods and services | 104.1 | 106.2 | 107.5 | 109.4 | 111.4 | −0.6 | +2.0 | +1.2 | +1.8 | +1.8 |
| Imports of goods and services | 103.8 | 106.3 | 107.6 | 109.3 | 111.2 | −1.1 | +2.4 | +1.2 | +1.7 | +1.7 |
| Terms of trade | 100.3 | 99.9 | 99.9 | 100.1 | 100.2 | +0.5 | −0.4 | +0.0 | +0.1 | +0.1 |
| **Gross domestic product** | 111.3 | 113.0 | 115.1 | 117.3 | 119.4 | +1.1 | +1.5 | +1.9 | +1.9 | +1.8 |

*Source: 2016: Eurostat; 2017 to 2020: OeNB December 2017 outlook.*

Table 16

## Labor market

| | 2016 | 2017 | 2018 | 2019 | 2020 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Thousands | | | | | Annual change in % | | | | |
| Total employment | 4,337.6 | 4,411.8 | 4,487.8 | 4,544.1 | 4,589.5 | +1.2 | +1.7 | +1.7 | +1.3 | +1.0 |
| *of which: private sector* | 3,604.3 | 3,674.0 | 3,732.5 | 3,792.8 | 3,847.2 | +1.3 | +1.9 | +1.6 | +1.6 | +1.4 |
| Payroll employment (national accounts definition) | 3,787.1 | 3,856.3 | 3,928.4 | 3,980.9 | 4,023.1 | +1.4 | +1.8 | +1.9 | +1.3 | +1.1 |
| | % of labor supply | | | | | | | | | |
| Unemployment rate (Eurostat definition) | 6.0 | 5.5 | 5.1 | 5.1 | 5.0 | × | × | × | × | × |
| | EUR per real unit of output x 100 | | | | | | | | | |
| Unit labor costs (whole economy)[1] | 61.3 | 61.4 | 62.5 | 63.6 | 64.6 | +2.1 | +0.1 | +1.7 | +1.8 | +1.5 |
| | EUR thousand per employee | | | | | | | | | |
| Labor productivity (whole economy)[2] | 73.2 | 74.2 | 75.0 | 75.5 | 76.0 | +0.3 | +1.4 | +1.0 | +0.7 | +0.6 |
| | EUR thousand | | | | | | | | | |
| Compensation per employee (real)[3] | 39.8 | 39.6 | 39.8 | 40.1 | 40.2 | +1.1 | -0.5 | +0.6 | +0.6 | +0.4 |
| | At current prices in EUR thousand | | | | | | | | | |
| Compensation per employee (gross) | 44.9 | 45.6 | 46.8 | 48.0 | 49.1 | +2.3 | +1.5 | +2.8 | +2.5 | +2.2 |
| | At current prices in EUR million | | | | | | | | | |
| Total gross compensation of employees | 170,051 | 175,759 | 183,987 | 191,141 | 197,335 | +3.8 | +3.4 | +4.7 | +3.9 | +3.2 |

*Source: 2016: Eurostat; 2017 to 2020: OeNB December 2017 outlook.*

[1] Gross wages and salaries divided by real GDP.
[2] Real GDP divided by total employment.
[3] Gross wages and salaries per employee divided by private consumption expenditure deflator.

Table 17

## Current account

|  | 2016 | 2017 | 2018 | 2019 | 2020 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
|  | EUR million | | | | | % of nominal GDP | | | | |
| Balance of trade | 11,350.0 | 11,564.5 | 12,840.0 | 15,594.8 | 18,199.5 | 3.2 | 3.1 | 3.3 | 3.9 | 4.4 |
| Balance of goods | 240.9 | 655.7 | 1,431.9 | 2,304.5 | 3,307.8 | 0.1 | 0.2 | 0.4 | 0.6 | 0.8 |
| Balance of services | 11,109.1 | 10,908.8 | 11,408.1 | 13,290.3 | 14,891.7 | 3.1 | 2.9 | 2.9 | 3.3 | 3.6 |
| Balance of primary income | −180.0 | −883.7 | −811.3 | −802.0 | −786.3 | −0.1 | −0.2 | −0.2 | −0.2 | −0.2 |
| Balance of secondary income | −3,687.0 | −3,619.2 | −3,902.0 | −4,170.3 | −4,428.4 | −1.0 | −1.0 | −1.0 | −1.0 | −1.1 |
| Balance on current account | 7,483.0 | 7,061.6 | 8,126.6 | 10,622.5 | 12,984.8 | 2.1 | 1.9 | 2.1 | 2.6 | 3.1 |

Source: 2016: Eurostat; 2017 to 2020: OeNB December 2017 outlook.

Table 18

## Quarterly outlook results

|  | 2017 | | | | 2018 | | | | 2019 | | | | 2020 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| **Prices, wages and costs** | Annual change in % | | | | | | | | | | | | | | | |
| HICP | +2.2 | +2.2 | +2.2 | +2.3 | +2.2 | +2.2 | +2.0 | +1.9 | +1.8 | +1.9 | +1.9 | +1.9 | +1.9 | +2.0 | +2.0 | +1.9 |
| HICP excluding energy | +1.8 | +2.2 | +2.3 | +2.4 | +2.3 | +2.2 | +2.0 | +2.1 | +2.0 | +2.1 | +2.1 | +2.0 | +2.1 | +2.1 | +2.1 | +2.0 |
| Private consumption expenditure deflator | +1.7 | +1.9 | +2.0 | +2.2 | +2.2 | +2.2 | +2.2 | +2.0 | +1.9 | +1.9 | +1.8 | +1.8 | +1.8 | +1.8 | +1.8 | +1.8 |
| Gross fixed capital formation deflator | +1.4 | +1.5 | +1.7 | +1.8 | +1.8 | +1.8 | +1.8 | +1.8 | +1.7 | +1.7 | +1.6 | +1.6 | +1.5 | +1.5 | +1.6 | +1.6 |
| GDP deflator | +1.1 | +1.4 | +1.7 | +1.6 | +1.8 | +1.9 | +2.0 | +2.0 | +1.8 | +1.8 | +1.9 | +2.0 | +2.0 | +1.9 | +1.8 | +1.6 |
| Unit labor costs | +0.9 | +0.2 | −0.3 | −0.3 | +0.5 | +1.4 | +2.2 | +2.7 | +2.3 | +1.9 | +1.6 | +1.5 | +1.8 | +1.7 | +1.5 | +1.1 |
| Nominal wages per employee | +1.6 | +1.4 | +1.4 | +1.6 | +2.0 | +2.6 | +3.1 | +3.3 | +2.9 | +2.6 | +2.3 | +2.3 | +2.4 | +2.3 | +2.1 | +1.7 |
| Productivity | +0.7 | +1.1 | +1.8 | +1.8 | +1.5 | +1.2 | +0.8 | +0.5 | +0.5 | +0.6 | +0.7 | +0.7 | +0.6 | +0.6 | +0.6 | +0.7 |
| Real wages per employee | −0.1 | −0.6 | −0.6 | −0.6 | −0.1 | +0.4 | +0.8 | +1.2 | +0.9 | +0.7 | +0.5 | +0.5 | +0.6 | +0.6 | +0.4 | +0.0 |
| Import deflator | +3.4 | +3.0 | +2.1 | +1.2 | +0.4 | +0.9 | +1.7 | +1.8 | +1.7 | +1.6 | +1.7 | +1.7 | +1.7 | +1.7 | +1.7 | +1.7 |
| Export deflator | +2.1 | +2.5 | +2.1 | +1.5 | +0.8 | +0.9 | +1.4 | +1.6 | +1.7 | +1.8 | +1.8 | +1.8 | +1.8 | +1.8 | +1.8 | +1.8 |
| Terms of trade | −1.2 | −0.6 | +0.0 | +0.3 | +0.5 | +0.0 | −0.3 | −0.2 | +0.1 | +0.2 | +0.2 | +0.1 | +0.1 | +0.1 | +0.1 | +0.1 |
| **Economic activity** | Annual and/or quarterly changes in % (real) | | | | | | | | | | | | | | | |
| GDP | +0.9 | +0.8 | +0.9 | +0.8 | +0.7 | +0.6 | +0.5 | +0.5 | +0.5 | +0.5 | +0.4 | +0.4 | +0.4 | +0.4 | +0.4 | +0.4 |
| Private consumption | +0.3 | +0.3 | +0.4 | +0.4 | +0.4 | +0.4 | +0.4 | +0.4 | +0.3 | +0.4 | +0.3 | +0.3 | +0.3 | +0.3 | +0.3 | +0.3 |
| Government consumption | +0.2 | +0.2 | +0.4 | +0.8 | +0.4 | +0.5 | +0.4 | +0.4 | +0.2 | +0.2 | +0.2 | +0.2 | +0.2 | +0.2 | +0.2 | +0.2 |
| Gross fixed capital formation | +1.8 | +1.4 | +0.9 | +0.9 | +0.6 | +0.5 | +0.5 | +0.5 | +0.5 | +0.4 | +0.5 | +0.5 | +0.4 | +0.5 | +0.5 | +0.5 |
| Exports | +2.1 | +1.5 | +0.9 | +1.4 | +1.4 | +1.2 | +1.1 | +1.0 | +1.0 | +1.0 | +1.0 | +1.0 | +1.0 | +1.0 | +1.0 | +0.9 |
| Imports | +1.7 | +1.4 | +0.8 | +0.8 | +1.1 | +1.1 | +1.0 | +0.9 | +0.7 | +0.8 | +0.9 | +0.9 | +1.0 | +0.9 | +0.8 | +0.8 |
|  | Contribution to real GDP growth in percentage points | | | | | | | | | | | | | | | |
| Domestic demand | +0.6 | +0.6 | +0.5 | +0.6 | +0.4 | +0.4 | +0.4 | +0.4 | +0.3 | +0.3 | +0.3 | +0.3 | +0.3 | +0.3 | +0.3 | +0.3 |
| Net exports | +0.3 | +0.1 | +0.1 | +0.4 | +0.2 | +0.1 | +0.1 | +0.1 | +0.2 | +0.2 | +0.1 | +0.1 | +0.1 | +0.1 | +0.1 | +0.1 |
| Changes in inventories | +0.0 | +0.2 | +0.3 | −0.1 | +0.0 | +0.0 | +0.0 | +0.0 | +0.0 | +0.0 | +0.0 | +0.0 | +0.0 | +0.0 | +0.0 | +0.0 |
| **Labor market** | % of labor supply | | | | | | | | | | | | | | | |
| Unemployment rate (Eurostat definition) | 5.7 | 5.5 | 5.5 | 5.4 | 5.3 | 5.1 | 5.1 | 5.1 | 5.1 | 5.1 | 5.1 | 5.1 | 5.0 | 5.0 | 5.0 | 5.0 |
|  | Annual and/or quarterly changes in % | | | | | | | | | | | | | | | |
| Total employment | +0.4 | +0.5 | +0.4 | +0.5 | +0.4 | +0.4 | +0.4 | +0.3 | +0.3 | +0.3 | +0.3 | +0.2 | +0.2 | +0.3 | +0.2 | +0.3 |
| of which: private sector | +0.5 | +0.4 | +0.3 | +0.4 | +0.4 | +0.4 | +0.5 | +0.4 | +0.4 | +0.4 | +0.4 | +0.4 | +0.4 | +0.4 | +0.4 | +0.4 |
| Payroll employment | +0.4 | +0.6 | +0.4 | +0.5 | +0.5 | +0.5 | +0.4 | +0.4 | +0.3 | +0.3 | +0.3 | +0.3 | +0.3 | +0.3 | +0.3 | +0.3 |
| **Additional variables** | Annual and/or quarterly changes in % (real) | | | | | | | | | | | | | | | |
| Disposable household income | −0.2 | +0.2 | −0.1 | −0.4 | +0.8 | +0.8 | +0.8 | +0.5 | +0.2 | +0.2 | +0.2 | +0.3 | +0.4 | +0.3 | +0.2 | +0.1 |
|  | % of real GDP | | | | | | | | | | | | | | | |
| Output gap | −0.6 | −0.3 | 0.1 | 0.5 | 0.6 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.6 | 0.5 | 0.5 | 0.5 | 0.4 |

Source: OeNB December 2017 outlook. Quarterly values based on seasonally and working day-adjusted data.

Table 19

## Comparison of current economic forecasts for Austria

| | OeNB | | | | WIFO | | IHS | | OECD | | | IMF | | European Commission | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | December 2017 | | | | September 2017 | | September 2017 | | November 2017 | | | October 2017 | | November 2017 | | |
| | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2017 | 2018 | 2017 | 2018 | 2019 | 2016 | 2017 | 2017 | 2018 | 2019 |
| **Main results** | *Annual change in %* | | | | | | | | | | | | | | | |
| GDP (real) | +3.1 | +2.8 | +1.9 | +1.6 | +2.8 | +2.8 | +2.6 | +2.1 | +3.0 | +2.5 | +1.8 | +2.3 | +1.9 | +2.6 | +2.4 | +2.3 |
| Private consumption (real) | +1.5 | +1.6 | +1.4 | +1.2 | +1.5 | +1.7 | +1.5 | +1.2 | +1.3 | +1.7 | +1.2 | × | × | +1.4 | +1.5 | +1.3 |
| Government consumption (real) | +1.4 | +2.0 | +1.1 | +0.8 | +1.1 | +0.9 | +0.8 | +1.3 | +1.3 | +1.5 | +1.6 | × | × | +1.3 | +1.2 | +1.1 |
| Gross fixed capital formation (real) | +5.1 | +2.9 | +2.0 | +1.9 | +4.2 | +3.0 | +4.2 | +2.4 | +4.6 | +3.2 | +2.0 | × | × | +3.9 | +2.7 | +2.4 |
| Exports (real) | +5.6 | +5.0 | +4.2 | +4.0 | +5.5 | +4.8 | +5.4 | +4.0 | +6.1 | +5.3 | +4.4 | +4.6 | +3.6 | +5.3 | +4.5 | +4.3 |
| Imports (real) | +4.6 | +4.1 | +3.5 | +3.6 | +5.1 | +3.9 | +4.8 | +3.2 | +5.2 | +4.5 | +4.1 | +5.2 | +6.4 | +4.3 | +3.3 | +3.0 |
| GDP per employee[1] | +1.4 | +1.0 | +0.7 | +0.6 | +1.1 | +1.1 | +0.7 | +0.7 | +1.3 | +1.0 | +0.6 | × | × | +1.1 | +1.1 | +1.2 |
| GDP deflator | +1.5 | +1.9 | +1.9 | +1.8 | +1.9 | +2.0 | +1.6 | +1.7 | +1.6 | +2.0 | +2.2 | +1.6 | +1.7 | +1.8 | +1.6 | +1.7 |
| CPI | × | × | × | × | +1.9 | +1.8 | +2.0 | +2.1 | × | × | × | × | × | × | × | × |
| HICP | +2.2 | +2.1 | +1.9 | +1.9 | +2.0 | +1.9 | +2.1 | +2.1 | +2.1 | +2.1 | +2.3 | +1.6 | +1.8 | +2.0 | +1.6 | +1.7 |
| Unit labor costs | +0.1 | +1.7 | +1.8 | +1.5 | +0.9 | +1.7 | +0.8 | +1.8 | +0.6 | +2.2 | +2.5 | × | × | +1.2 | +1.2 | +1.1 |
| Payroll employment | +1.7 | +1.7 | +1.3 | +1.0 | +2.0 | +1.8 | +1.9 | +1.4 | +1.2 | +1.6 | +1.2 | +1.6 | +1.1 | +1.5 | +1.3 | +1.1 |
| | *% of labor supply* | | | | | | | | | | | | | | | |
| Unemployment rate (Eurostat definition) | 5.5 | 5.1 | 5.1 | 5.0 | 5.6 | 5.4 | 5.6 | 5.4 | 5.4 | 5.0 | 4.8 | 5.4 | 5.3 | 5.6 | 5.5 | 5.4 |
| | *% of nominal GDP* | | | | | | | | | | | | | | | |
| Current account balance | 1.9 | 2.1 | 2.6 | 3.1 | 2.7 | 2.9 | × | × | 2.3 | 3.0 | 3.0 | 2.1 | 2.2 | 2.2 | 2.9 | 3.7 |
| Budget balance (Maastricht definition) | −0.8 | −0.5 | −0.1 | 0.2 | −0.6 | −0.3 | −0.7 | −0.6 | −0.7 | −0.3 | 0.2 | −0.9 | −0.6 | −1.0 | −0.9 | −0.6 |
| **External assumptions** | | | | | | | | | | | | | | | | |
| Oil price in USD/barrel (Brent) | 54.3 | 61.6 | 58.9 | 57.3 | 53.0 | 53.0 | 52.8 | 54.0 | 52.6 | 55.0 | 55.0 | 50.3 | 50.2 | 53.6 | 55.7 | 54.7 |
| Short-term interest rate in % | −0.3 | −0.3 | −0.1 | 0.1 | −0.3 | −0.1 | −0.3 | −0.2 | −0.3 | −0.2 | −0.1 | −0.3 | −0.3 | −0.3 | −0.3 | −0.1 |
| USD/EUR exchange rate | 1.13 | 1.17 | 1.17 | 1.17 | 1.10 | 1.20 | 1.10 | 1.17 | 1.10 | 1.10 | 1.10 | 1.10 | 1.20 | 1.10 | 1.18 | 1.18 |
| | *Annual change in %* | | | | | | | | | | | | | | | |
| Euro area GDP (real) | +2.4 | +2.3 | +1.9 | +1.7 | +2.3 | +2.4 | +2.0 | +2.1 | +2.2 | +2.0 | +1.8 | +2.1 | +1.9 | +2.2 | +2.1 | +1.9 |
| U.S. GDP (real) | +2.3 | +2.5 | +2.2 | +1.9 | +2.2 | +2.1 | +2.2 | +2.3 | +2.1 | +2.4 | +2.1 | +2.2 | +2.3 | +2.2 | +2.3 | +2.1 |
| World GDP (real) | +3.6 | +3.6 | +3.6 | +3.5 | × | × | +3.6 | +3.7 | +3.5 | +3.7 | +3.6 | +3.6 | +3.7 | +3.5 | +3.7 | +3.7 |
| World trade | +5.5 | +4.5 | +4.2 | +3.8 | × | × | +4.2 | +4.0 | +5.0 | +4.1 | +4.1 | +4.2 | +4.0 | +4.3 | +4.1 | +4.0 |

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

[1] WIFO: GDP per hour worked.

# Three small essays on public investment: economic rationales, the EU fiscal framework and some statistical comparisons

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*Governments undertake public investments for a number of reasons. First, spending on public investment is a means to foster economic growth, in the short run by increasing aggregate demand and in the long run by (potentially) increasing growth potential. Second, public investments can be justified by the presence of market failures. And finally, they can be undertaken due to fairness objectives. Given the growth-enhancing impact of public investment expenditure, the EU has taken several initiatives to increase the low and, during the crisis, falling level of public investment in the EU. Most prominently, an investment clause was introduced into the Stability and Growth Pact (SGP), and the Investment Plan for Europe was launched. This can be considered an (albeit imperfect) substitute for the "golden rule" advocated by its proponents since the launch of the SGP. The ratio of government investment in Austria, at about 3% of GDP, is relatively far above that of Germany (around 2% of GDP), and has recently surpassed the euro area average. However, these figures are somewhat distorted by different sector classifications in the areas of transport, hospitals and municipal services.*

Since the onset of the crisis, public investment has been repeatedly brought up as a remedy to foster growth. In the short run, investment raises aggregate demand through the fiscal multiplier and can thus push economic growth. In the long run, a higher public capital stock generally increases the productive capacity of the economy, thus lifting potential growth. Nevertheless, public investment fell considerably during the crisis, and the countries that were hit hardest by the crisis (e.g. Greece, Spain and Portugal) reduced investment expenditure the most. Cutting back investment expenditure to consolidate the public budget might have lower short-term (political) costs than raising taxes or cutting social expenditure, subsidies or government employment. Given the growth-enhancing impact of investment expenditure, policymakers and academics alike have repeatedly called for special investment provisions in the EU fiscal framework. While some provisions have been introduced into the Stability and Growth Pact (SGP) recently, the often-advocated "golden rule" (that would exempt investment from deficit calculations) is not part of the SGP. This is at least partly due to difficulties with the definition and classification of public investment and the question which kind of public investment should benefit from the golden rule. Different legal and institutional settings might lead to the same type of investment being classified as private investment in one country while qualifying as public investment in another.

The rest of the paper is structured as follows: Section 1 provides a definition of public investment. In section 2, we discuss the economic rationales for public

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investment, focusing on its impact on short- and long-run growth. Section 3 highlights how the EU fiscal framework treats public investment and presents the latest EU initiative to promote investment (Investment Plan for Europe). Section 4 looks at the structure of public investment in Austria over time and in an international comparison, and section 5 concludes.

## 1 Definition of public investment

This paper focuses on investments in depreciable nonfinancial assets. Hence, in line with common practice, we disregard purchases of financial assets (e.g. bonds, stocks) and of non-depreciable assets (e.g. paintings) or non-produced assets (e.g. land). We follow mostly the national accounts definition of gross fixed capital formation, which is the net acquisition of fixed assets, where "fixed assets are produced assets used in production for more than one year" (Eurostat, 2013, p. 73f.). Furthermore, by public investment we typically refer to gross fixed capital formation undertaken by entities considered part of general government[2] in the national accounts. The definition of government entities in the European System of Accounts (ESA) focuses on government-controlled units primarily financed by taxes, thereby excluding public corporations primarily financed by market revenue (like road tolls or waste collection charges) and privately controlled entities mostly financed by taxes (e.g. church-run hospitals). In some cases, public-private partnerships are also not recorded on the government balance.

The scope of what constitutes a fixed asset and what is a government entity can be subject to debate and has changed over time in the national accounts (see also box 1 in section 4). For example, the size of the government sector has increased with the introduction of ESA 2010. Furthermore, while expenditure on research and development has recently been included in the definition of gross fixed capital formation, investment in human capital (e.g. education) is generally recorded as consumption expenditure. Given that investment in intangible assets (such as on-the-job education and training, market development, and organizational and management efficiency) is becoming increasingly important in modern economies, the discussion on how to incorporate them in the national accounts has gained momentum. Thum-Thysen et al. (2017) state that in most EU-15 countries the share of intangible assets not included in the national accounts is higher than that included.

In addition to these narrowly defined forms of public investment, governments provide investment grants to (partly) government-owned firms, which are not classified in the government sector in national accounts. Moreover, governments can also spur private investment by providing fiscal incentives, such as subsidies, or tax incentives to private institutions.

## 2 Economic rationale for public investment

There are a number of reasons why governments undertake public investments. First, spending on public investment is a means to foster economic growth, in the short run by increasing aggregate demand and in the long run by (potentially) raising growth potential.

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[2] General government "consists of institutional units which are non-market producers whose output is intended for individual and collective consumption, and are financed by compulsory payments made by units belonging to other sectors, and institutional units principally engaged in the redistribution of national income and wealth" (Eurostat, 2013, p. 44).

Second, public investments can help correct market failures, and finally, public investment can be undertaken due to fairness objectives. This section provides an overview of these arguments and briefly discusses some considerations regarding the optimal level of public investment expenditure.

## 2.1 Public investment and economic growth

Public investment has a positive impact on output in both the short and long run. In the short run, it raises aggregate demand through the fiscal multiplier. In episodes of low or even negative growth, a spending increase can push economic growth and thus contribute to macroeconomic stability. A large empirical literature has emerged to identify the size of the fiscal multiplier (for an overview, see IMF, 2014b). In general, fiscal multipliers are found to be larger during economic downturns (Auerbach and Gorodnichenko, 2012) and when monetary policy is at the zero lower bound (Christiano et al., 2011). Structural characteristics like trade openness (Ilzetzki et al., 2013), labor market rigidities (Gorodnichenko et al., 2012) and the magnitude of automatic stabilizers (Dolls et al., 2012) have an impact on the size of the fiscal multiplier, too. All these characteristics also apply to the fiscal multiplier of public funds spent on investment; it is typically found to be larger than for other types of spending and tends to have longer-lasting effects on output (IMF, 2015).

A supply-side effect of public investment arises because a higher public capital stock in principle increases the productive capacity of the economy. For example, many types of public infrastructure (e.g. transport or energy networks) are essential inputs in the private production process. Augmenting the productive public capital stock can therefore lead to higher efficiency in the private sector and contribute to long-run growth. Following the influential contribution by Aschauer (1989), a large empirical literature has emerged to estimate the output elasticity of public capital, which describes the percentage change in output for an increase in the public capital stock by 1%. Bom and Ligthart (2014) conducted a metaanalysis of the empirical literature and noted that earlier studies, like the one by Aschauer (1989), found rather large effects, while later studies arrive at substantially lower estimates.[3]

The large heterogeneity of results found in the literature, ranging from slightly negative to large and positive effects, can be explained by both methodological and economic factors. Methodological differences mostly stem from varying definitions of public investment or output(e.g. all public capital vs. infrastructure capital or private sector output vs. total GDP), from the different approaches employed[4] and from whether endogeneity and nonstationarity are addressed properly. The key economic factors that determine the long-run effect are related to the efficiency of government investment and to characteristics

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[3]  *The study by Aschauer (1989) and the meta-analysis by Bom and Ligthart (2014) follow the so-called production function approach, which includes the stock of public capital as an additional input in the production function. Aschauer (1989) found that a 1% increase in the public capital stock increased private output by 0.39%. Using a meta-regression analysis, Bom and Ligthart (2014) find an average output elasticity of public capital of 0.12% in the long run for all public capital provided by the national government. Their estimates increase if they consider only core public capital and public capital provided by local entities.*

[4]  *Besides the production function approach, several other approaches have been used to investigate the impact of public capital on (private) output: the cost-function approach (e.g. Cohen and Morrison Paul, 2004), VAR models (e.g. Kamps, 2005a) and cross-country growth regressions (e.g. Easterly and Rebelo, 1993). The IMF uses forecast errors to identify the macroeconomic effects of public investment (IMF, 2015).*

of the existing capital stock. Not all forms of public investment contribute to the productive public capital stock in the same manner; distortions in project choice and implementation might arise due to political economy reasons (e.g. lobbying, election cycle), illegal corruption or deficient institutional arrangements.[5] By comparing the value of public capital (input) with measures of infrastructure coverage and quality (output), the IMF estimates that on average around 30% of the potential gains from public investment are lost due to inefficiencies in the public investment process (IMF, 2015).[6] Regarding the characteristics of the public capital stock already in place, in particular size and quality seem to matter. The growth effects of public investment are likely to be nonlinear: If public capital is already close to its saturation level, further investments are likely to yield little to no effects. In advanced countries, this might be the case for core infrastructure stocks.

Public investment seems to have both a short- and long-term impact on output, so in principle it yields a so-called double dividend. However, in many cases, a trade-off might emerge between the short- and long-term dividends (European Commission, 2016). If the objective of an investment project is to stimulate aggregate demand, it has to be launched quickly and should mainly rest on locally available inputs. Such projects might not generate large long-term effects. Large infrastructure projects that potentially yield large returns in the long run typically involve long administrative procedures and for this reason might not be the go-to solution to stimulate growth in the short run.

## 2.2 Market failure and fairness aspects

Another reason for governments to undertake public investments is the desire to correct for market failures and achieve fairness objectives. In the presence of market failures, government intervention can lead to a more efficient allocation of resources in terms of social welfare, as private sector provision leads to inefficient outcomes or excess rents for private producers. One relevant reason for public investment is the supply of public goods, which, due to their characteristics (non-rivalrous, non-excludable), are likely to be undersupplied by the private sector. Typical examples are transport infrastructures[7], public recreation areas, noise barriers, avalanche barriers or clean water. While transport infrastructure is an important input in the private production process, this is not necessarily the case for the latter examples. Clean water or public recreation areas increase social welfare, but they have no direct impact on the production process and for this reason are likely to have no or only a small effect on long-run output.[8]

Another market failure that calls for public intervention is the presence of externalities. For example, the provision of public transport systems also serves the purpose of reducing pollution. Public investments related to education or research can be justified by positive externalities stemming from human

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[5] Dabla-Norris et al. (2012) construct a Public Investment Management Index and highlight the factors that determine public investment efficiency in greater detail.

[6] The sample consists of 134 countries; the estimates differ substantially between countries.

[7] Transport infrastructure (e.g. roads, railways) is not a pure public good, as excludability is in principle possible.

[8] In the short run, the typical fiscal multiplier applies. The effect on long-run output can go in both directions. On the one hand, these expenditures have to be financed by either expenditure cuts in other areas, distortive taxes or public debt, leading to lower output. On the other hand, a healthier or more content society might be more productive.

capital and knowledge spillovers (e.g. Moretti, 2004). Another category of market failure that justifies public provision or regulation is the presence of a natural monopoly due to economies of scales. This is mostly relevant for public utilities like water, electricity or public transit, where government intervention is required to prevent privately-controlled monopolies. Finally, due to imperfect capital markets (credit constraints), private firms might be unable to finance large and risky projects with a long time horizon, so the public sector is required to carry out such projects. In principle, government intervention through either direct provision or some form of regulation leads to more efficient resource allocation in all these cases. However, public intervention is typically accompanied by other forms of inefficiencies (government failure), which can lead to distortions.

From a welfare perspective, government intervention can also be justified by the government's fairness goals. That is, even in the absence of market failure or a growth objective, governments might undertake public investments to reach their redistributive goals. From a pure efficiency perspective, public investments motivated by redistributive objectives might often be unattractive as they imply a classical efficiency-equity tradeoff.

When discussing the redistributive impact of public investment, it makes sense to differentiate between redistribution across individuals and across regions. Redistribution across individuals is largely achieved through the tax and transfer system, but to some extent also through public investment, e.g. in public hospitals, schools or other forms of public infrastructure: These services, which are mostly tax-financed, can be used by the whole population at no or low cost. As the tax burden differs across individuals, this implies a redistribution of

resources. Further, if these services were provided privately, some people would probably be excluded by a pricing mechanism, leading to lower welfare for those affected.

In order to achieve redistribution across regions, most countries have some form of fiscal equalization mechanism in place that leads to financial transfers to disadvantaged regions, where the funds are spent (among other things) on local infrastructure. The share of public investment undertaken by local government is large in many countries. In addition, central governments also invest in public infrastructure in remote areas and in this way contribute to a redistribution across regions.

## 2.3 Optimal public investment spending

Given these arguments, how much should governments spend on public investment and to which types of projects should they direct these funds? Some papers (e.g. Aschauer, 2000; Kamps, 2005b) try to arrive at the optimal capital stock from a growth perspective. These studies make the plausible assumption that the growth effects induced by an increasing capital stock are nonlinear – the relationship between public capital and growth is positive up to a certain level but turns negative above the growth-maximizing point. Intuitively, when the public capital stock is low, inefficiencies might arise e.g. due to congested roads or poor Internet connections; on the other hand, when the public capital stock is already high, the economic cost of the tax burden required to finance and maintain public capital might be larger than the additional benefit. Aschauer (2000) finds that during the 1980s and 1990s, the level of public capital in most areas of the U.S.A. was below the levels that would have maximized the

rate of economic growth. For the EU, Kamps (2005b) finds that in the early 2000s, the level of public investment was roughly in line with the growth-maximizing level in most pre-enlargement EU Member States.

As these papers focus on the optimal aggregate level of public capital, they offer little guidance on the type of projects public investment expenditures should be directed to. There is some empirical evidence that investment in core infrastructure (e.g. roads, telecommunications) has a stronger impact on output compared to other investments in physical output (Bom and Ligthart, 2014). However, in advanced countries, the public capital stock for core infrastructure might already be close to its saturation level, suggesting lower growth effects. A number of other papers (e.g. Gemmell et al., 2016) investigate the relationship between government expenditure and growth by focusing on the functional breakdown of expenditure rather than distinguishing between capital and current spending. For a sample of OECD countries, Gemmell et al. (2016) find that reallocating spending towards infrastructure and education is positive for long-run output levels, whereas spending reallocated towards social transfers may be associated with negative effects on output in the long run.

The papers mentioned so far focus solely on the impact of public investment or public expenditure on long-run output, while other policy objectives, such as the correction of market failures or redistributive goals, are left aside. From a welfare point of view, the conclusions reached by these types of analysis might be misleading. For example, building better roads or a larger airport might be optimal from a growth perspective, whereas investing in other, more environmentally friendly means of transport might be preferable from a welfare perspective. Economic growth clearly is an important source of social welfare, as it increases (future) income opportunities and has positive employment effects, but considered in isolation, it might lead to misleading policy recommendations. From the perspective of social welfare, public investment expenditure should be increased as long as the social marginal benefit is larger than the social marginal cost. This is, of course, only a theoretical relationship that is hard to assess in practice. Nevertheless, it is a useful thought experiment to structure the arguments in favor of or against a specific public investment project; in addition, it is typically the theoretical basis for most forms of cost-benefit analysis.

To conclude, there is no straightforward optimality condition for the level of public investment, as the optimal level depends on the weighting of policy objectives (short- and long-run growth, allocation efficiency, redistribution). A number of tradeoffs are likely to emerge between the different objectives. In the end, it is a political decision: Which goals does the government want to reach through its public investment policy? Economist can try to assess which projects are best suited to reach these goals. A helpful tool in this context is cost-benefit analysis; however, a number of measurement problems makes it difficult to come to clear-cut conclusions. Other important parameters for policy advice are good empirical estimates on the growth effects of public investment (both short- and long-run effects).

## 3 Public investment and the EU fiscal framework

Since the very beginning, the EU fiscal framework has been criticized for possibly curbing public investment in EU Member States (Balassone and Franco, 2000). Given rigid budget constraints, cutting back on investment expenditure might be associated with lower short-term (political) costs than raising taxes or cutting social expenditure, subsidies or government employment. Blanchard and Giavazzi (2004) found that public investment in the twelve original euro area countries (EA-12) countries fell by 0.8 percentage points during the run-up to Economic and Monetary Union (1993–1997). In turn, lower public sector contribution to capital accumulation might put a strain on a country's short- and long-term growth prospects (see section 2).

Therefore, both policymakers and academics (Creel, 2003; Blanchard and Giavazzi, 2004; Barbiero and Darvas, 2014; Truger, 2015) have repeatedly advocated the incorporation of a "golden rule" in the EU fiscal framework. This golden rule would exclude some types of investment spending from the computation of the fiscal variables relevant in the EU fiscal framework. Balassone and Franco (2000) compare three different golden rules: Under the first one (proposed by Modigliani et al., 1998), net investment is excluded from the computation of deficit targets. Under the German golden rule, deficits are allowed up to gross investment expenditure, and under the UK golden rule, deficit targets may not exceed net investment expenditure over the cycle. Creel (2003) and Blanchard and Giavazzi (2004) suggest the introduction of a golden rule where, coupled with the creation of an investment agency, net public investment is excluded from the computation of the medium-term deficit target of the SGP. Later proponents of a golden rule modify the approach by suggesting a deduction of net public investment minus military expenditures plus investment grants for the private sector from the relevant fiscal variables (Truger, 2015) or an increase in the permitted structural deficit by the amount of net public investment whenever the negative output gap exceeds a certain threshold (Barbiero and Darvas, 2014). Aiginger (2014) proposes a "silver rule" where intangible investments (e.g. for education – which, however, does not qualify as an investment in ESA) are temporarily deductible, if they are qualitatively connected to structural reforms and supervised by an independent authority.[9]

In addition to promoting investment, the golden rule is appealing as it increases intergenerational equity. A higher public capital stock creates benefits for current and future generations in the form of higher productivity and higher per capita income. Hence, shifting part of the financing burden to future generations via debt service seems justified, as these generations profit from the deferred benefits (Truger, 2015). Otherwise, overburdening the current generation could lead to an underprovision of public investment, which might be particularly detrimental for countries with low capital stocks. In corporate accounting, too, the cost of an invest-

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[9]    *The Committee on Employment and Social Affairs referred repeatedly to a silver rule in the context of the European Pillar of Social Rights. In its 2016 draft report on a European Pillar of Social Rights it called "for a 'silver rule' on social investment to be applied when implementing the Stability and Growth Pact, namely to consider certain public social investments having a clear positive impact on economic growth (e.g. childcare or education and training) as being eligible for favourable treatment when assessing government deficits and compliance with the 1/20 debt rule." (European Parliament, 2016, p. 9/14). However, this call is not included in the final report.*

ment is distributed over several years. This principle could be replicated by an appropriate golden rule.

Despite its merits, the golden rule has not been included in the EU fiscal framework. Arguments against the application of a golden rule that focuses on gross investment comprise the possible high and sustained deficits and public debt levels. High debt levels increase interest expenditure, which restricts other – possibly more productive – uses of public funds. Moreover, a golden rule entails the preferential treatment of physical capital over investment in other forms of capital (e.g. education), which may have economically unwarranted consequences (Balassone and Franco, 2000; Barbiero and Darvas, 2014). Even though some of these issues have been tackled by the adjusted golden or silver rules suggested, important shortcomings remain. First, the issue of data definition and classification remains: Which expenditure categories should be granted special budgetary treatment and to what extent – overall expenditure, or just additional expenditure? Second, already strong incentives for creative accounting (recording all expenditure as eligible investment expenditure) would be strengthened.

Still, investment expenditure is not completely disregarded in the European fiscal framework. The corrective arm, based on the Maastricht criteria, has always included a provision on investment expenditure. Article 126(3)[10] of the Treaty on the Functioning of the European Union (TFEU) states that the report about the existence of an excessive deficit "shall take into account whether the government deficit exceeds government investment expenditure." However, this provision has never really played a role in the decision about the existence of an excessive deficit.

In 2013, the preventive arm, which calls for sound fiscal positions (Medium Term Objective – MTO and the expenditure benchmark), was also equipped with a temporary investment provision. In a letter to the EU finance ministers, then Vice-President of the European Commission, Olli Rehn, explained how the European Commission would incorporate an investment clause into the preventive arm of the Stability and Growth Pact (Rehn, 2013). This investment clause allowed for a temporary deviation from the adjustment path and the MTO, given that (i) the Member State and the euro area or the EU as a whole are in a recession, (ii) budget deficits stay below the 3% thresholds and the debt rule is respected, and (iii) the deviation is linked to the national co-funding of EU projects under the Structural and Cohesion policy, Trans-European Networks and the Connecting Europe Facility. In 2013 and 2014, Bulgaria, Romania and Slovakia benefited from these provisions, while Italy was not allowed to use the clause. With its Communication of January 2015, the European Commission clarified the margin of interpretation it had with regard to the treatment of public investments within the existing framework of the Stability and Growth Pact. Compared with the previous guidance, the investment clause now only focuses on the economic condition of an individual Member State, irrespective of the conditions in the euro area or the EU as a whole. Moreover, the scope of eligible projects has been extended to include projects co-financed by the European Fund for Strategic Investments – EFSI (see box 2). However, the

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[10] *Formerly Article 104(3) of the Treaty establishing the European Community (TEC).*

investment clause can only be invoked if investment levels are effectively increased as a result. Up until September 2017, only Finland and Italy benefited from the new investment clause. Given its numerous restrictions, it is unlikely that the clause will encourage public investment significantly. However, it aims to proactively counteract the well-established (political) practice of cutting public investment in times of economic and financial distress.

In addition to these explicit provisions on investment expenditure in the preventive arm, another, more indirect, provision is specified in the expenditure benchmark. The expenditure benchmark generally allows annual

### Investment Plan for Europe and European Fund for Strategic Investments[1]

*The Investment Plan for Europe (Juncker plan), announced in November 2014, intends to encourage investment and thereby stimulate economic growth in Europe. In addition to providing services for investment projects in the form of e.g. advisory hubs, it aims at removing regulatory barriers to investment and at mobilizing private and public financial resources. The centerpiece of this initiative is the European Fund for Strategic Investments (EFSI). The EFSI comprises a EUR 16 billion guarantee from the EU budget and a EUR 5 billion allocation of capital from the European Investment Bank (EIB). These EUR 21 billion are intended to trigger investments of EUR 351 billion between 2015 and 2018 in Europe. The EFSI allows the EIB Group to finance investment projects that would otherwise not receive EIB funding due to their risk profile. The investment projects focus on infrastructure, education and R&D, renewable energy and resource efficiency as well as support to SMEs. In principle, the EFSI considers projects on their individual merits without a sector or country quota. Given the EFSI's proven success, it was reinforced and extended to 2020 in September 2017 (EFSI 2.0). For the period until 2020, the EFSI has been equipped with funds of EUR 33.5 billion (+EUR 10 billion from the EU budget, +EUR 2.5 billion from the EIB). Hence, the overall expectations of investment to be unlocked have been revised to at least half a trillion euro by 2020. Furthermore, equity injections to the EFSI by contributing Member States are not considered in the EU fiscal framework, according to an explicit statement by the European Commission.[2]*

*For the period until end-November 2017, the European Commission (2017b) reports that total investment related to EFSI approvals came to EUR 252 billion or 80% of the amount targeted until 2018. EFSI-triggered investment (in % of GDP) was highest in Estonia, Bulgaria and Greece. Austria reached only rank 22, just slightly better than Germany. As of November 2017, total EFSI financing in Austria stood at EUR 930 million set to unlock EUR 2.8 billion in additional investment. So far, financing agreements have been signed for six projects, three of them in the energy sector (including Energiepark Bruck). The largest project is in the transport sector, namely the renewal of regional passenger trains amounting to EUR 500 million, set to trigger total investment in the amount of EUR 1,700 million. Three more projects have been approved but no agreements have been signed yet. Two of them are again classified as projects in the energy sector. Three more projects have received pre-approval, among them two for the construction and refurbishment of hospitals and Viennese schools, both planned as public-private partnerships. An evaluation of whether the EFSI goal of enabling risky investment to support economic growth has been achieved is still outstanding given that the Austrian projects are quite recent. In addition to assessing target achievement, the evaluation should also quantify the additional investment triggered ex post as well as possible windfall effects.*

*[1] The information presented in this box is based on information provided by the European Commission (2017b) and EIB (2017)*

*[2] "National contributions to the EFSI will not be taken into account by the Commission when defining the fiscal adjustment under either the preventive or the corrective arm of the Pact." (European Commission, 2015, p. 8).*

expenditure to grow in line with annual potential GDP growth. To calculate annual expenditure growth, nationally financed public investment is averaged over four years (years t-3 to t). This serves to take into account the variability of public investment, and in particular to refrain from discouraging large investment projects, which might have a huge impact on the budget in a given year. With this provision, the European fiscal framework aims to ensure that it does not curb public investment. Provisions to explicitly encourage public investment are not included, though.

## 4 Public investment in Austria

### 4.1 Government investment in Austria is dominated by transport and research

Chart 1 shows government investment in Austria for the period 1995–2015.[11] It highlights the strong impact of sector classification issues, which are the main drivers of the two breaks clearly visible in the series: The most important reason for the decline in 1997 was the reclassification of municipal corporations (in the areas of waste and waste water management, water supply and housing) as entities outside the government sector. In 2005, parts of the Austrian Federal Railways, ÖBB, were classified as government entities after a reorganization. Since the most recent break in 2005, government investment has been typically around 3% of potential GDP.[12]

The highest investment ratios were reached in 2008 (import of Eurofighter jets) and in 2009 (peak in transport-related investment). When adjusting for the impact of military investments, the ratio of government investment to potential GDP in 2015 was approximately at pre-crisis (i.e. pre-2009) levels (chart 2). High non-military investment in 2009

Chart 1

**Development in government investment in Austria**



*% of potential GDP*

Legend: Transport, Hospital services, Research, Education, Municipal services, Defence, General services, Other
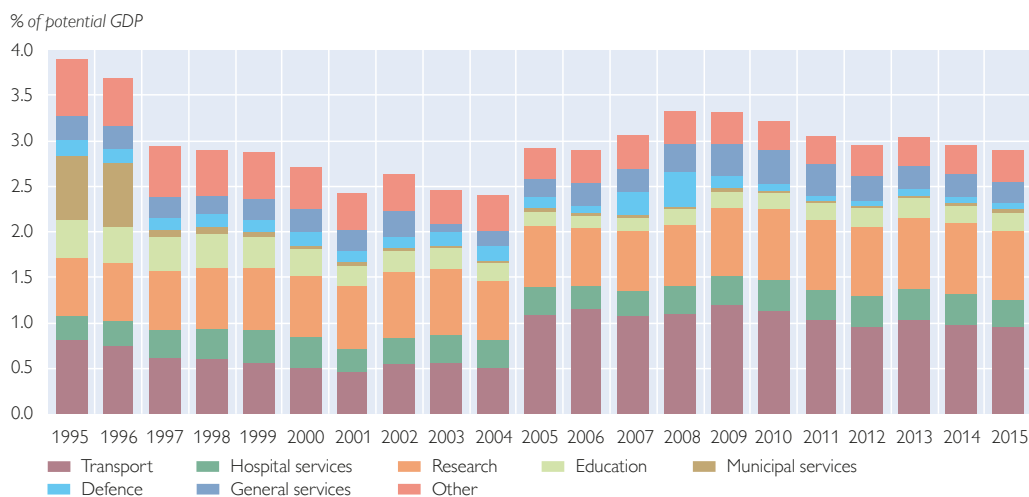
*Source: Eurostat, European Commission.*

[11] This chart is based on Eurostat data on "General government expenditure by function (COFOG)", where government expenditure is decomposed along both economic (e.g. compensation of employees, subsidies) and functional (e.g. education, health) categories. Due to publication lags for this decomposition, this paper's charts are based on data from the autumn 2016 notification.

[12] To avoid business cycle-driven spikes in the investment ratio, we divided investment by potential GDP instead of actual GDP.

and 2010 also indicates that government investment contributed significantly to the fiscal stimulus[13] in Austria.

The main areas of government investment are transport, research and hospital services. Transport-related investment typically makes up around 1% of (potential) GDP and consists primarily of investments undertaken by ÖBB and Wiener Linien (Vienna's public transport operator) as well as investments made by provinces and municipalities into their roads. Investment into R&D[14] makes up around ¾% of GDP and mostly consists of self-produced investments, i.e. the national statistical institute imputes a share of consumption expenditure by universities as investment (compensation of employees, intermediate consumption etc.).[15] In contrast to transport and R&D, investments in "hospital services" are made primarily by provinces and municipalities, as they run most public hospitals.

Investments in the areas of education[16] and public order and safety are seemingly low, because most buildings used by the federal government are rented from Bundesimmobiliengesellschaft (BIG), a publicly owned real estate company. Therefore, investments in a federal school building are typically recorded under "general services" and not under "secondary education"; the same is true for most police stations, courts of law and prisons. This somewhat distorts the Classification of the Functions of Government (COFOG) data published by Eurostat and leads to oddities like that most public investment in public order and safety is made in the subcategory "fire protection services."

Public investment expenditure in the areas of research and defence is made mostly to correct for market failures, as these services would likely be underprovided by private entities. This is also true for investments in railroad networks, which make up a large part of transport-related investments. Meanwhile, investments in hospitals and education have a large distributional component. While these services could also be provided by nongovernment entities — who would charge (much higher) fees, though — such investments are mostly financed by taxes and social contributions in Austria.

More than half of government investment is currently undertaken by the federal government (e.g. Ederer et al., 2016). However, only a small share of that (typically below 0.2% of GDP) is recorded in the federal budget, as the bulk of federal investment expenditure is made by the autonomous universities and the public corporations ÖBB and BIG.

## 4.2 Public investment outside the government balance sheet is also significant

Even though many investment-intensive public corporations have been classified as government entities during the switch to ESA 2010 (see box 2), the volume of

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[13] In light of the import of Eurofighter jets, adjusting for military investments makes the public investment figures more meaningful in terms of their economic impact on the private sector in Austria.
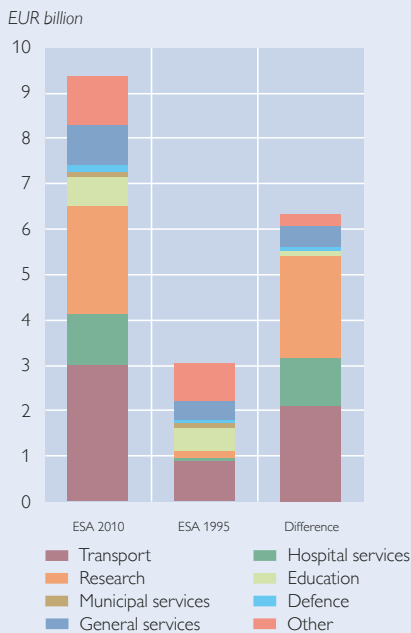
[14] "Research" is the sum of COFOG groups 01.04, 01.05, 02.04, 03.05, 04.08, 05.05, 06.05, 07.05, 08.05, 09.07 and 10.08. "Municipal services" is the sum of COFOG divisions 05 and 06 (excluding 05.05 and 06.05).

[15] Hence, part of the expenditure made by universities is recorded twice in the national accounts — under current expenditure (e.g. compensation of employees) and investment. To ensures that there is no impact on the budget balance, this investment is also recorded as government revenue in the subcategory "output for own final use."

[16] As explained in section 1, education expenditure as such is not considered part of (public) investment, and therefore the capital stock in the area of education mainly encompasses school buildings. Austria's public consumption expenditure in the area of education was around 4½% of potential GDP in 2015.

Box 2

## Changeover to ESA 2010 and government investment

**Upward revision in Austrian government investment in 2012 due to ESA 2010**

*EUR billion*



Source: Eurostat.

*From 2005 to 2013, public investment in Austria was typically at just above 1% of GDP according to ESA 1995 numbers, while it was at around 3% of GDP according to current releases in those years. The following chart compares the last available release of COFOG data in ESA 1995 (2012) with the most recent COFOG data for that year. It shows that most of the difference comes from the areas research, transport and hospital services.*

*The increase in the latter two categories was due to a wider scope of the government sector in ESA 2010 owing to a broader definition of costs and a narrower definition of market revenue (see Stübler et al., 2015). This led to a reclassification of ÖBB Infrastruktur and Personenverkehr (the Federal Railways' infrastructure and passenger transport unit), of Wiener Linien (Vienna's public transport operator), of public hospitals owned by provinces and municipalities as well as of property management companies into the government sector. Furthermore, ESA 2010 broadened the scope of what kind of expenditure actually constitutes investment. While the definition of military weapon systems as investment had a limited impact on Austrian government investment, the inclusion of R&D in investment had a sizeable impact.*

public investment (in a broad sense) conducted by public corporations outside general government is still substantial. However, public-private partnerships off the government balance sheet play only a minor role in Austria: According to Eurostat data, their combined adjusted capital value was below 0.1% of GDP in 2015.

Many entities conducting public investment in a broad sense receive investment grants. In 2015, overall investment grants paid by government to nongovernment units were at around 0.6% of GDP. This amount is not solely attributable to public investment in a broad sense (for example, there are also significant investment grants in the area of agriculture),

but includes substantial transfers to corporations conducting municipal services, especially in the area of waste water management. In addition, these investment grants also encompass transfers to private (mostly church-run) nonprofit schools and hospitals, which also provide public services.

### 4.3 Austria's government investment is above the euro area average

Since 1995, the ratio of government investment to GDP in Austria has consistently been higher than in Germany, and in recent years, it has surpassed the euro area average (chart 2). While government investment has grown roughly in line with potential GDP in Germany

Chart 2

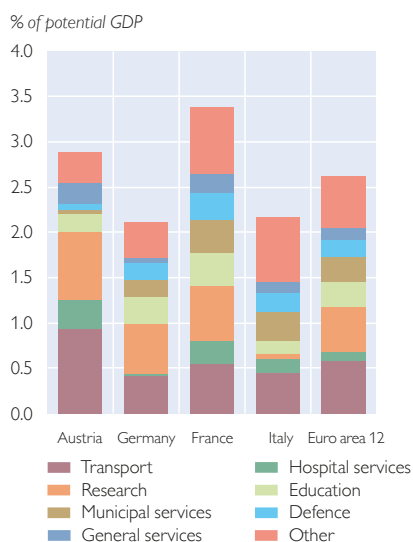**Government investment (without defence) since 2005**
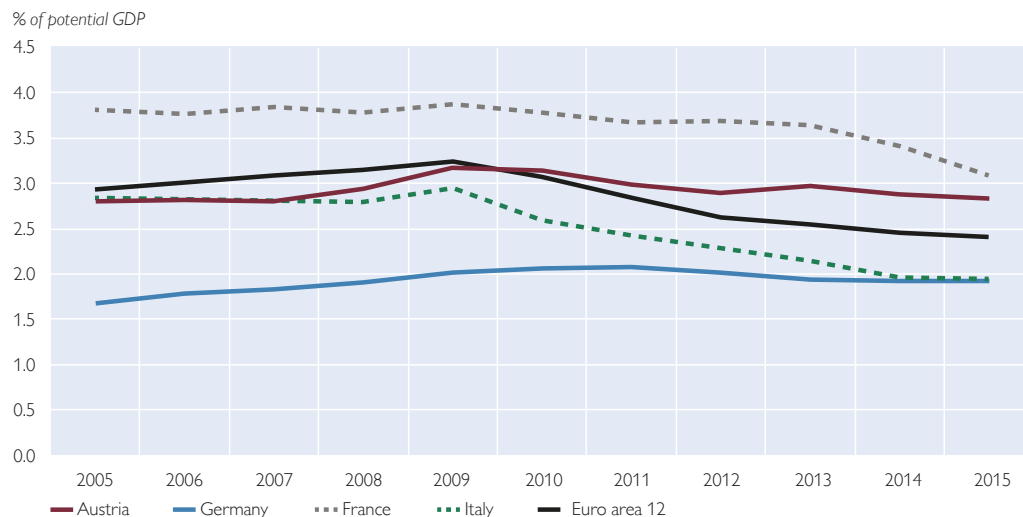
*% of potential GDP*



Source: Eurostat, European Commission.

Note: Euro area 12 stands for the 12 initial euro area members.

Chart 3

**Structure of government investment in 2015**

*% of potential GDP*



Source: Eurostat, European Commission.

Note: Euro area 12 stands for the 12 initial euro area members.

and Austria since 2007, it has increased significantly less in the rest of the euro area (including France and Italy).

However, as chart 3 indicates, sector classification issues seriously hamper the comparison of both the level and structure of government investment. For example, the setup of BIG depresses the level of education investments[17] and inflates investment in general services. The level of health investments is distorted by the fact that hospitals are (mostly) classified inside government in Austria, but outside the government sector in Germany and a few other euro area countries. Furthermore, the German Deutsche Bahn Netze is not part of government while ÖBB Infrastruktur is, which contributes to transport investment being much higher in Austria than in Germany (e.g. Heimberger, 2017). At the same time, government investment related to municipal services is higher in Germany, France and Italy than it is in Austria (where these services are mostly conducted via municipal non-government units). The persistent differences in government investment between

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[17] The fact that federal schools and universities, too, mostly rent their buildings from BIG is the reason why construction investment in the NACE category "education (P)" is far below the EU average.

Austria and Germany also translate into the estimates of the public capital stock, which (according to Eurostat numbers) stood at 59% of potential GDP in Austria and only 44% in Germany in 2015.

## 5 Conclusions

There seems to be general agreement that (public) investment has a positive impact on output in both the short and long run, albeit at different degrees depending on the capital stock of the economy and its cyclical position. A relevant reason for public (as opposed to private) investment is the supply of public goods, which, due to their characteristics (non-rivalrous, non-excludable), are likely to be undersupplied by the private sector. Despite these merits, government investment as a ratio to GDP in the euro area fell considerably during the crisis, declining by about 1 percentage point from 2009 to 2015, which has also been attributed to the restrictive nature of the European fiscal framework.

Given the growth-enhancing impact of investment expenditure, policymakers and academics alike have repeatedly called for special public investment provisions in the EU fiscal framework.

Even though the often-advocated golden rule is not part of the Stability and Growth Pact (SGP), other provisions have made their way into the SGP. Most prominently, the "investment clause" allows for deviations from the MTO that correspond to the size of additional investments during economically difficult times. However, the clause is quite restrictive in that only a few categories of investment qualify. This is at least partly due to difficulties with the definition and classification of public investment. Different legal and institutional settings might lead to the same type of investment being classified as private investment in one country while qualifying as public investment in another.

Adjusted for military investments, Austrian government investment peaked in 2009 and 2010 at more than 3% of GDP, thereby providing a stimulus during the Great Recession. Since then, it has roughly returned to pre-2009 levels of roughly 3% of GDP and has surpassed the euro area average. It has always been higher than in Germany (typically around 2% of GDP), but these figures have to be handled with caution due to different sector classifications in the areas of transport, hospitals and municipal services.

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# Households' housing expenditure in Austria, Germany and Italy

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*For many households, housing-related expenditures make up a substantial share of total consumption. This article aims to shed some light on households' current housing expenses in Austria, Germany and Italy. To this end, we use national data from the 2014 Household Finance and Consumption Survey (HFCS) to calculate the current housing expenditure (the ratio of current housing expenses to household net income). Comparing these three countries we see that the housing expenditure is lowest in Italy, with an average (mean) of 22% (median: 17%), and highest in Germany (mean: 37%, median: 31%). The average housing expenditure in Austria is 29% (median: 26%). In all three countries, the housing expenditure decreases as income and/or wealth increases. The current housing expenditure of tenants is higher than that of homeowners. On average, homeowners' housing expenditure amounts to 21% in Austria, 31% in Germany and 19% in Italy, whereas the average housing expenditure of tenants is 39% in Austria, 44% in Germany and 36% in Italy. In particular, homeowners without outstanding housing loans have a relatively low current housing expenditure. The difference between the median current housing expenditure of indebted owners and that of owners without debt is 10% in Austria, 17% in Germany and 19% in Italy. Differences across surveys still make international comparisons of housing expenses difficult. However, the availability of HFCS data has improved the situation considerably.*

Housing is a basic need. Individuals depend on housing more than they depend on many other consumption goods. For most households, housing accounts for the biggest share of total monthly expenditures. Tenants need to pay rent. Homeowners are often indebted, having had to make a high initial payment, and must repay their outstanding loans plus accrued interest. To determine just how much of household budgets goes toward housing in Austria, Germany and Italy, we have used national data from the Eurosystem Household Finance and Consumption Survey 2014 (Albacete et al., 2016; Banca d'Italia, 2015; ECB, 2016; PHF Survey Team, 2017) to calculate households' housing expenditure (the ratio of housing expenses to household net income).[2]

This paper is structured as follows: Section 1 provides an overview of our data sources and a definition of the term "housing expenditure" as used in this study. In section 2 we discuss some features of the national housing markets. We present the results of our analyses in section 3 and a summary and conclusions in section 4.

## 1 Data sources and definition of housing expenditure

The housing expenditure is defined as the share of housing-related expenditures as a percentage of household net income. Thus we are applying an expenditure approach. This approach is often used because of its simplicity and low computational requirements and because the results can be easily understood and interpreted. Drawbacks of this approach are the fact that it uses only a single measure and that it is highly sensitive to the definition and measurement of housing

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[2] A similar exercise was done for Austria in past years (Beer and Wagner, 2012; Wagner, 2011).

expenses and household income. An alternative to the expenditure approach is the residual income approach (Stone et al., 2011). The residual income approach requires commonly agreed reference budgets or poverty indicators for housing and non-housing expenditures. As a third option, the expenditure of owner-occupied housing services can be measured by the user cost of housing, which depends on house prices, the preferential tax treatment of home ownership, credit availability, current and expected transaction costs, and the role that ownership plays as insurance against rental price risk (Diaz and Luengo-Prado, 2011). However, the user cost concept seeks to provide a measure of the real cost of owning a home and emphasizes the investment component of home ownership, which is not the aim of this study.

We take into account only those expenditures that are related to the primary residence. We apply a broad definition of housing expenses that includes not only rent and loan-related expenditures (principal repayment and loan interest payments) but also expenditures for mandatory services and charges, maintenance, repairs, taxes and utilities. However, we do not take into account some items that represent costs. For example, we do not include owners'[3] foregone interest income (i.e. the income that owners could have earned from investment/saving alternatives if they had not used their capital to acquire the primary residence). At the same time, we do include repayment of the loan principal in our measure of the housing expenditure expenditure even though it represents savings rather than costs or expenditures. As a consequence, institutional differences in mortgage financ-

ing could affect our results. We do not take owner-occupiers' gains or losses from changes in property valuation into account in our calculations. Similarly, we do not count imputed rent as part of household income. We made these choices because our aim is not to calculate housing costs but rather to calculate the expenditures of households for housing purposes. For this reason we use the term "housing expenditure" instead of "housing cost."

Furthermore, we only take into account households' current housing expenditures. Owners have several expenditures when buying a property (e.g. for lawyers, notaries, taxes, obtaining a loan). Thus, owners who had initially taken out a loan to acquire their primary residence but who have since paid back the loan may have had relatively high housing expenditures in the past but their current housing expenditures are relatively low. While owner-occupiers often incur relatively high expenditures at the beginning of their ownership and lower expenditures later, tenants' housing expenditures are more constant. Thus a study of housing expenditures over the life cycle could potentially lead to different conclusions about the relative housing expenditure of owners and tenants compared to the conclusions about the current housing expenditure presented in this article.

This study uses national data from Austria, Germany and Italy from the second wave of the HFCS. Therefore, our analysis reflects the situation in the year 2014. The rationale for selecting these three countries is that data are available on both household net income and current housing expenditures, including operating expenses. Comparing monthly housing expenditures to

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[3] Unless otherwise noted, the term "owner" refers to ownership of the primary residence and not to ownership of other property.

monthly household net income (that is, disposable income), is more meaningful than comparing them to gross income. In addition, we see some similarities such as the rates of home ownership in Austria and Germany and attitudes about financing a home with a mortgage. It also seems interesting to consider Italy since the country was more deeply affected by the financial crisis in many respects than the other two countries.

For tenants, monthly rent is the main component of housing expenditures. Owners with outstanding loans taken out to acquire the primary residence have regular loan-related payments (principal and interest). For both tenants and homeowners, operating expenses are factored in as housing expenditures. Operating costs might include, among other things, expenditures for water and sewage, garbage collection, pest control, chimney sweep, premiums for building insurance, taxes and other public charges. In addition, tenants and owners who live in a multi-unit structure might pay for clearing of unclaimed property, electricity for lighting common areas, management fees, house cleaning, and ongoing operating costs of community facilities. However, operating costs are not strictly defined and the definition may vary across surveys. Households might also consider different items when asked about operating costs.[4] That limits the comparability of operating costs and the housing expenditure across countries. Nevertheless, our results do provide insights

about housing expenditures because operating expenses make up only a relatively small part of total housing expenditures. Finally, our data on housing expenditures include not only energy but also telecommunication expenditures, for the simple reason that the HFCS question on operating costs subsumes telecommunication expenditures under operating expenditures in general rather than asking respondents to provide a detailed breakdown of their expenses.[5]

Owners also face maintenance costs. Various international organizations recommend taking maintenance costs into account when calculating housing expenditures (International Labour Organization, 2004; Canberra Group, 2011; Organisation for Economic Cooperation and Development, 2013). Expenses for maintenance occur both regularly and, for larger maintenance items, at irregular intervals. The timing of households' payments for maintenance expenses and the maintenance expenses themselves is not necessarily the same. For example, co-owners may make regular payments for potential future maintenance expenses. Under our approach, these regular payments are regarded as housing expenses. Since the surveys do not include questions on comprehensive maintenance costs, we estimate maintenance expenditures by assuming a cost of EUR 1 per square meter per month. This choice is of course disputable but can be justified on the basis of data on extraordinary maintenance expenses in the Italian Survey on

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[4] *Data from the 2010 HFCS for Austria show that, among tenants, 8% of households included furniture as operating costs, 11% other inventory such as a washing machine or refrigerator, and 37% garage or parking lot fees. Although these items are housing expenditures, they are not part of operating costs. In addition, 90% of tenant households included water and sewage costs, 61% included heating and 26% included electricity. And though these items are necessities, their inclusion by some households but not others is problematic because it indicates a clear inconsistency in how the question was answered. Respondents' decision whether to include heating costs as operating costs probably depends on the heating system.*

[5] *A core question in the 2014 HFCS questionnaire asks: "About how much does your household spend on utilities (electricity, water, gas, telephone, internet and television) in a typical month?" See annex for country-specific survey details.*

Household Income and Wealth (SHIW). Using SHIW data, D'Ambrosio and Gigliarano (2007) calculate maintenance expenses of EUR 0.88 per square meter per month by dividing the annual amount of extraordinary expenses reported by all owners by the total number of square meters of all owners. For the 2014 data, the corresponding figure is EUR 0.92. However, we should note that "extraordinary maintenance" in the Italian survey includes extensions but not regular maintenance expenses.[6]

## 2 Comparison of tenure status and features of the national housing markets

Whether households own their primary residence, rent it or are able to use it free of charge has a major impact on current housing expenditures. As a result, the share of owners and tenants has a significant impact on average housing expenditures in a country. In this section we therefore discuss ownership and tenancy rates in Austria, Germany and Italy and describe some features of their housing markets that might explain the differences across countries.

Italy has the highest ownership ratio (68%). Ownership rates in Austria (48%) and Germany (45%) are markedly lower (see table 1).[7] Free use is much more widespread in Italy than in Austria or Germany. In all three countries, the share of homeowners increases in line with income. Conversely, free use declines as net income increases. This might be explained by the fact that free use housing is often provided by family and friends to young or retired relatives or – in Italy in particular – by public sector entities as social housing.[8]

Since Italy has the highest share of homeowners and the lowest share of indebted owners, one may conclude that Italian households are less affected by interest rate changes and rental market developments. In addition, the high share of free use should translate to lower housing expenses.[9]

There are also differences across countries with regard to the average size of the primary residence. The median surface area is 90 square meters in both Austria and Italy and 83 square meters in Germany. Regarding the surface area per earner, Austria and Germany show lower results (median: 65 square meters) than Italy (median: 70 square meters). However, the average number of household members is higher in Italy than in Austria and Germany. Additionally, the mean equivalised[10] household size is highest in Italy (1.7 compared to 1.5, both in Austria and Germany). This fits to the fact, that the median home size per household member is smaller in

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[6] A different approach would be to figure maintenance expenditure based on property value. A major drawback of this approach is that maintenance expenses would change as property prices change. Also, maintenance expenses usually increase as buildings age. Although we have information on the year of construction, we do not have information on major refurbishments or renovations, which is important for assessing the effective age of a building.

[7] Data from Eurostat show the following ownership rates: 55% in Austria (2016), 52% in Germany (2016) and 73% in Italy (2015). For Austria, households living in homes owned by relatives are also regarded as owners. Without these households, the share of owners is 51%. For Germany, the ratio relates to the share of individual persons living in an owner-occupied home. Translated to reflect the share of households, the figure is 43%.

[8] According to HFCS data "free use" housing is mostly provided by family members in Austria and by family and friends in Germany (the German survey does not differentiate). Although provision of free use accommodation by relatives is also common in Italy (with 30% of all accommodation being for free use), provision by private individuals that are not relatives is even more common (45%). In contrast to Austria and Germany, a significant share of free use accommodation in Italy is provided by public sector entities (18%).

[9] Free use does not imply that these households do not pay operating costs. Furthermore, the part of housing expenses that is not borne by the inhabitants of a free use accommodation must eventually be paid by other households.

[10] The equivalised household size is the number of consumption units in the OECD modified scale (1 + 0.5 * number of 14 and older + 0.3 * number of children below 1).

Table 1

## Tenure status

| | Austria | | Germany | | Italy | |
|---|---|---|---|---|---|---|
| | % | | | | | |
| Owners | 47.7 | (0.5) | 44.6 | (0.2) | 68.2 | (0.7) |
| *of which with outstanding loans* | *27.6* | *(0.4)* | *30.4* | *(1.5)* | *12.2* | *(0.6)* |
| Tenants | 45.4 | (0.0) | 50.9 | (0.5) | 20.7 | (0.6) |
| Free use | 7.0 | (0.5) | 4.5 | (0.5) | 11.1 | (0.5) |
| **Income quartiles** | | | | | | |
| Ownership ratio by income quartile | % | | | | | |
| 1 | 22.9 | (0.6) | 21.3 | (1.7) | 38.2 | (1.4) |
| 2 | 44.2 | (1.5) | 38.4 | (2.0) | 64.0 | (1.6) |
| 3 | 53.0 | (1.0) | 52.6 | (1.8) | 79.4 | (1.3) |
| 4 | 71.2 | (0.5) | 68.7 | (1.5) | 91.5 | (0.8) |
| Tenancy ratio by income quartile | % | | | | | |
| 1 | 64.5 | (0.6) | 70.2 | (2.1) | 46.5 | (1.4) |
| 2 | 48.9 | (1.1) | 56.7 | (2.0) | 20.8 | (1.4) |
| 3 | 41.8 | (1.1) | 45.0 | (1.9) | 12.5 | (1.1) |
| 4 | 25.7 | (0.8) | 29.6 | (1.5) | 2.9 | (0.4) |
| Free use ratio by income quartile | % | | | | | |
| 1 | 12.6 | (0.1) | 8.5 | (1.4) | 15.4 | (1.1) |
| 2 | 6.9 | (0.5) | 4.9 | (0.9) | 15.2 | (1.2) |
| 3 | 5.2 | (0.3) | 2.5 | (0.5) | 8.1 | (0.9) |
| 4 | 3.2 | (1.3) | 1.7 | (0.5) | 5.6 | (0.7) |
| **Networth quartiles** | | | | | | |
| Ownership ratio by net worth quartile | % | | | | | |
| 1 | 1.2 | (0.3) | 8.0 | (1.0) | 2.7 | (0.5) |
| 2 | 12.9 | (1.3) | 18.2 | (1.9) | 75.4 | (1.2) |
| 3 | 82.7 | (1.3) | 64.8 | (2.0) | 96.7 | (0.5) |
| 4 | 93.9 | (0.5) | 88.5 | (1.3) | 98.3 | (0.3) |
| Tenancy ratio by net worth quartile | % | | | | | |
| 1 | 88.1 | (1.5) | 86.4 | (1.6) | 67.4 | (1.4) |
| 2 | 74.3 | (1.7) | 75.2 | (2.0) | 13.0 | (1.0) |
| 3 | 14.6 | (1.3) | 30.7 | (2.0) | 1.5 | (0.4) |
| 4 | 4.4 | (1.7) | 10.5 | (2.0) | 0.6 | (1.0) |
| Free use ratio by net worth quartile | % | | | | | |
| 1 | 10.7 | (0.8) | 5.6 | (1.2) | 29.8 | (0.2) |
| 2 | 12.8 | (1.3) | 6.6 | (1.3) | 11.6 | (1.4) |
| 3 | 2.7 | (2.6) | 4.5 | (1.2) | 1.8 | (1.0) |
| 4 | 1.7 | (0.2) | 1.1 | (0.8) | 1.1 | (0.4) |

*Source: Authors' calculations based on HFCS, PHF, SHIW.*

*Note: Standard errors in parentheses.*

Italy (43 square meters) than in Austria and Germany (50 square meters in both countries). Concerning the number of employed or self-employed persons within the household, the Italian number is lower than the Austrian and German number (mean 1.75 in Austria and 1.57 in Germany compared to Italy 1.53). This is not astonishing regarding the fact that the Italian women's employment rate is second lowest in Europe[11] (48%, compared to Austria 68% and 71% in Germany, according to Eurostat data for 2016).

Some features of the national housing markets might help to explain the differences in home ownership ratios. One factor driving the preference for home ownership in Italy may be housing policy. The 1970s saw a burst of regulatory activity that included the passage of the Fair Rent Act in 1978. By contrast, these efforts were neglected in the 1980s and some features of the laws and norms that had been enacted in the previous years were repealed, thus changing the laws' corrective impact (Caruso, 2017). In that decade home ownership was promoted through the adoption of new provisions (Caruso, 2017). As a result, the rental market shrank steadily while the owner-occupied market grew. After the financial crisis, credit institutions tightened lending rules, which fueled demand for rental housing. Because social housing is not widespread (Bianchi, 2014, and chart 1), affordability is especially limited for low-income households. The situation is especially problematic in metropolitan areas (Pittini et al., 2015). Aassve et al. (2002) have shown that in southern Europe, more than elsewhere, leaving the parental home depends on employment and income. Often the original family has to take an exclusive role in supporting young people in this transition (Mencarini and Tanturri, 2006). According to the Italian survey data for 2014, 28.2% of households had inherited their primary residence or received a substantial gift (in 1989 the percentage was 26%). The respective

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[11] *Women's employment rate shows a big difference between northern and southern regions in Italy.*

ratio is 27.3% in Germany and 28.1% in Austria. Using data from the 2004 IDEA survey, Mencarini and Tanturri (2006) show that about 65% of young people living outside the parental home in Italy received funds from their parents to purchase or rent a home. German PHF data show that about 13% of households in Germany received support from persons outside the household when acquiring their primary residence. Data on support for tenants is not available for German households. In Italy, house prices have increased dramatically over the past two decades and Italy's labor market and pension system have both undergone various reforms. Together, these changes have worsened the economic conditions of young Italians (Berloffa and Villa 2010). Modena and Rondinelli (2011) point out that young people in Italy leave home relatively late compared with other countries, citing the rather small Italian rental market (around 20% of total housing), weak housing policies that offer little in the way of social rented housing for young people, high transaction costs on the housing market, and the difficulty of obtaining a mortgage without providing guarantees (Mencarini and Tanturri, 2006). According to Mencarini et al. (2010), young Italians emancipate five years later than their French counterparts.[12] Modena and Rondinelli (2011) find that in Italy the probability of leaving home decreases by about one half of a percentage point for a one standard deviation increase in house prices and show that the youngest cohort was heavily impacted by the evolution of real estate prices in the last decade.

In Austria, the rental market is highly regulated and comparatively large. Austrian housing policy targeted and still targets low- and middle-income households to provide them with adequate living space. Austria's housing policy rests on several pillars. First, a housing subsidy program provides subsidized loans to individuals, cooperatives and corporations. The second is the nation's legal framework, which consists of private law, building regulations and property development regulations. Besides the Tenancy Law, which targets the private rental market, there is another law that applies to non-profit housing developers, the Limited-Profit-Housing Act. Under this act, limited-profit housing associations are allowed to charge a rent that just covers costs. They must also reinvest any profits in Austrian housing projects. A further pillar is the subsidy given to building and loan associations and mortgage banks. Social housing plays an important role in the Austrian housing market, with 23% of the total housing stock used for social rental housing. To sum it up, in Austria there are quite a lot of instruments subsidizing households (subsidized mortgage loans, tax deductibility of housing expenses[13], subsidy scheme for tenants etc.) which are not accounted for in our results of housing expenditures (as we do not have data on these items within the HFCS).

Germany's homeownership rate is 52% and therefore comparable to Austria's rate. An important difference compared to Austria is that the social rental market is much smaller (around 5%). Germany's Limited-Profit-Housing Act was phased out on December 31, 1989,

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[12] *The HFCS data also show that Austrian and German households bought their primary residence when the survey reference person was 33 years old while in Italy the reference person was 36 years old.*

[13] *The tax deductibility of housing expenses (e.g. loans for renovation purposes) has been cancelled most recently. For existing loans concluded prior to 1 January 2016 the old rules are still valid for five years till 2020.*

Chart 1

**Social housing share 2012**

*% of total housing stock*
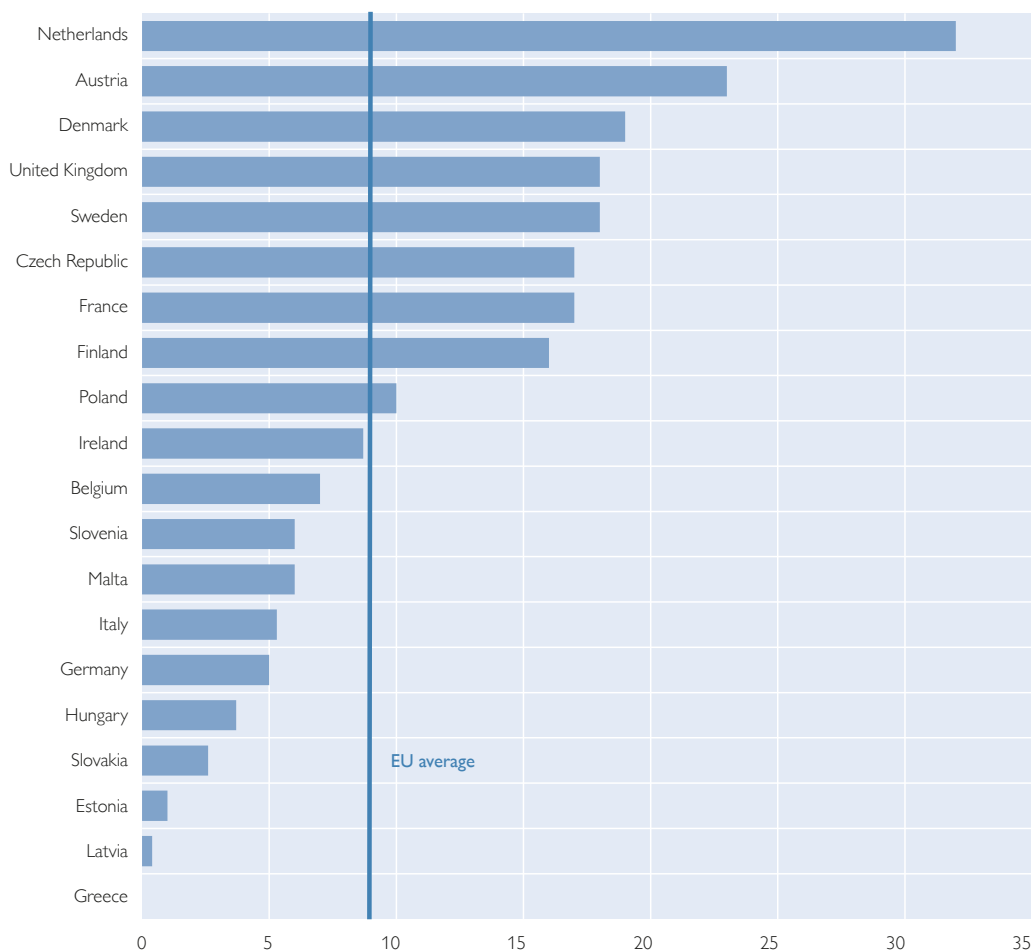


*Source: CECODHAS Housing Europe.*

and many dwellings that had been regulated until then were released from tenancy regulations.

Austria has a system of regulated rents that allows for surcharges or discounts depending on factors such as the rental property's location for contracts concluded after March 1, 1994, for houses built before May 8, 1945. In contrast, Germany has a very loose principle of comparable properties, with an regular survey on rents in a number of German cities serving as a reference framework.[14] In Austria, the above-mentioned tenancy agreements stipulate that rent increases are indexed by the consumer price index and rent increases after refurbishments are handled quite restrictively. In Germany, rents may be increased if owners incurred renovation costs or

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[14] *In Germany, two measures impose limits on rent increases: the cap which stipulates that rents may be increased by no more than 20% (in some cities 15%) within 3 years, and the survey-based reference framework of comparable rents, which constitute upper limits for rent increases.*

Table 2

## Housing expenditure

| | Austria | | | | Germany | | | | Italy | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mean | | median | | mean | | median | | mean | | median | |
| All | 28.6 | (0.1) | 25.6 | (0.1) | 36.6 | (0.6) | 30.8 | (0.5) | 21.6 | (0.3) | 16.6 | (0.2) |
| Owners | 20.7 | (0.2) | 17.6 | n.a. | 30.8 | (1.1) | 25.1 | (0.6) | 19.0 | (0.3) | 15.2 | (0.2) |
| Owners without loan | 17.3 | (0.2) | 15.6 | (0.2) | 24.4 | (0.5) | 20.6 | (0.4) | 16.4 | (0.2) | 13.9 | (0.2) |
| Owners with loan | 29.4 | (0.4) | 26.0 | n.a. | 45.4 | (3.1) | 37.2 | (1.1) | 37.5 | (1.3) | 33.1 | (1.1) |
| *share of loan-related payments (average)* | 44.6 | (0.5) | x | x | 57.2 | (1.1) | x | x | 62.6 | (0.9) | x | x |
| Tenants | 39.2 | (0.1) | 37.0 | (0.2) | 43.7 | (0.9) | 36.8 | (0.8) | 36.4 | (1.1) | 31.0 | (1.0) |
| *share of rent payments (average)* | 58.2 | (1.0) | x | x | 63.2 | (0.4) | x | x | 70.8 | (0.6) | x | x |
| Free use | 14.1 | (0.2) | 11.7 | (0.3) | 19.6 | (1.5) | 17.0 | (1.3) | 10.1 | (0.5) | 8.5 | (0.4) |
| Income quartile  1 | 41.3 | (0.2) | 39.9 | n.a. | 60.3 | (2.4) | 49.9 | (1.2) | 33.7 | (1.2) | 26.5 | (0.7) |
| 2 | 30.2 | (0.1) | 28.7 | (0.4) | 34.7 | (0.6) | 32.6 | (0.4) | 23.6 | (0.5) | 20.8 | (0.4) |
| 3 | 24.8 | (0.3) | 22.6 | (0.8) | 28.6 | (0.6) | 26.8 | (0.6) | 17.9 | (0.3) | 14.9 | (0.3) |
| 4 | 18.1 | (0.2) | 15.7 | (0.3) | 23.1 | (0.6) | 20.5 | (0.5) | 12.8 | (0.2) | 10.4 | (0.2) |
| Net worth quartile  1 | 40.6 | (0.4) | 39.8 | n.a. | 50.8 | (1.7) | 43.1 | (1.4) | 30.3 | (1.1) | 25.0 | (0.8) |
| 2 | 31.4 | (0.5) | 29.9 | (0.5) | 36.1 | (1.0) | 32.7 | (0.5) | 22.6 | (0.5) | 19.0 | (0.6) |
| 3 | 23.3 | (0.6) | 20.1 | (0.5) | 32.1 | (1.0) | 28.3 | (0.8) | 18.0 | (0.4) | 14.9 | (0.3) |
| 4 | 19.2 | (0.4) | 16.4 | (0.2) | 28.0 | (1.8) | 21.3 | (0.6) | 16.1 | (0.4) | 13.1 | (0.3) |

*Source: Authors' calculations based on HFCS, PHF, SHIW.*

*Note: Standard errors in parentheses.*

if comparable rents are higher.[15] However, in Austria no such restrictions exist for buildings constructed after 1945. That means Austrian rents in such buildings (17% of the entire Austrian housing market) are less regulated in Austria than in Germany.

Effective June 1, 2015, new rent-control legislation was introduced in various German districts. The new regime stipulates that rents for new contracts must not exceed the local average rent by more than 10%. The effects of the new regime have been hotly debated. Many experts see distortions in the real estate market as rents have increased quite sharply in many cities since the summer of 2015 (e.g. Kholodilin et al., 2016). Tenants may be avoiding moving out, preferring instead to extend their leases because

sitting tenants' rents are much lower than new rentals. In September 2017, Berlin's district court declared such provisions unconstitutional, finding them to discriminate against some landlords.

## 3 Current housing expenditure

Comparing the current housing expenditure in the three countries (table 2), we see that the housing expenditure is lowest in Italy (mean: 22%, median: 17%) and highest in Germany (mean: 37%, median: 31%). The mean Austrian housing expenditure is 29% (median: 26%).[16] On average, tenants have a higher current housing expenditure than owners. The difference between the average current housing expenditure of tenants and the average current housing expenditure of owners is about 19 percentage points in both Austria and Italy

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[15] *Austrian law also requires that a 25% discount be applied to rents payable on regulated flats if the contract term is limited. The minimum duration of a limited-term lease is 3 years.*

[16] *One could argue that household income should be adjusted by an equivalence scale that accounts for the number of household members. We chose not to do that because our interests focus on actual expenditure ratios. An analysis centered on households' needs should apply equivalence scales. Calculations show that – at least with respect to averages and medians – the use of equivalence scales would not affect the order of the results presented in table 2.*

but only 13 percentage points in Germany. The difference between tenants and owners with an outstanding loan is less distinct, particularly in Germany and Italy. In all three countries, the housing expenditure decreases as income increases. The drop in the housing expenditure from the first to the fourth net income quartile is most pronounced in Germany, where the difference in the mean housing expenditure is 37 percentage points. The trend is the same when the housing expenditure is broken down by net worth quartile. It should be borne in mind that the share of homeowners is relatively small in the first net worth quartile but relatively large in the highest net worth quartile. For many households in the fourth net worth quartile, a debt-free primary residence constitutes a large part of their net worth.

Chart 2 shows the distribution of the current housing expenditure between the 5th and the 95th percentiles. The spread between the three lines is smallest at the lower end of the distribution and grows as they move into the higher percentiles. The shape of the distribution curve is quite similar in Austria and in Germany although the curve for Germany lies consistently above that for Austria. The Italian distribution has a somewhat different shape. In particular, it is flatter at the lower percentiles and steeper at higher percentiles. The relatively flat part of the Italian distribution up to about the 65th percentile indicates a more equal distribution and reflects the large proportion of owners without outstanding loan debt who have a relatively low expenditure. The proportion of owners with outstanding debt to service on their primary residence is much lower in Italy (12%) than in Austria (28%) and Germany (30%).[17] The steeper slope after the 65th percentile reflects the higher expenditure of the relatively small group of Italian owners with outstanding loans and tenants.

Chart 2

**Distribution of housing expenditure**

*% of household net income*



*percentile of housing expenditure*

— DE    — AT    — IT
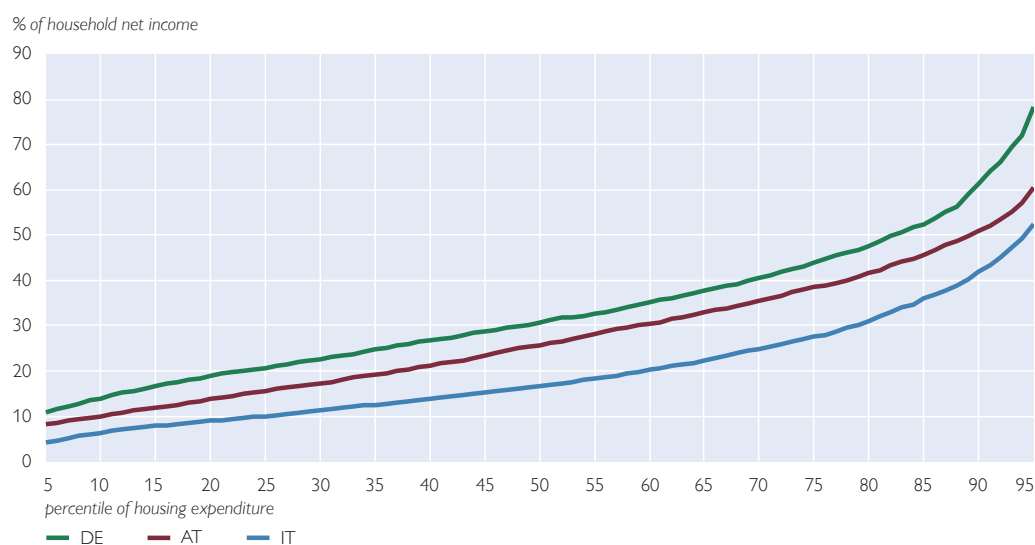
*Source: HFCS 2014 Austria, SHIW, PHF, OeNB.*

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[17] *Thus, even though the proportion of owners is higher in Italy than in Germany and Austria, the proportion of households that have an outstanding loan to finance the primary residence is lower in Italy (8%) than in Austria and Germany (both around 13%).*

In all countries but especially in Germany, high values for the housing expenditure can be observed for the higher percentiles. The slope of the distribution also increases markedly. Data suggest that mostly low-income households exhibit such a high expenditure. However, it must be borne in mind that the number of households observed to have an extremely high housing expenditure is relatively small. Therefore, the estimates have to be taken with caution. This also holds for the distribution of the housing expenditure of owners and tenants (discussed below).

Next we compare the housing expenditure of owners with the housing expenditure of tenants. A major determinant for the current housing expenditure of owners is whether they have an outstanding loan (see chart 3, upper panel). The difference between the current housing expenditure of owners with and without loan debt is more pronounced in Germany and Italy than in Austria. The difference between the median current housing expenditure of indebted owners and that of owners without debt is 10% in Austria, 17% in Germany and 19% in Italy. Loan repayments of indebted Austrian owners account on average for only 45% of the housing expenditure. This number is considerably higher in Germany (57%) and Italy (63%, table 2). Differences in the outstanding loan amounts are one factor causing the disparity in the housing expenditure among owners with an outstanding loan. On average, indebted Austrian households have about EUR 90,000 in outstanding loans to finance their primary residence (median EUR 64,000). This number is somewhat higher in Germany (mean: EUR 99,000; median: EUR 80,000). Outstanding loans among owners are distributed differently in Italy than in Austria or Germany. Outstanding loans of indebted Italian owners
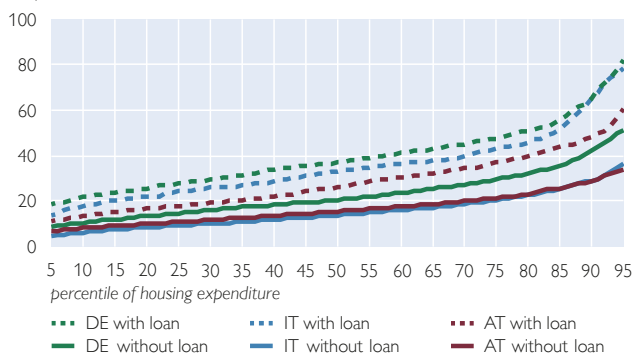
amount to EUR 77,000 on average, with a median of EUR 70,000. Differences in interest rates, mortgage characteristics (duration, initial period of fixation, etc.) also play a role. For example, the average original duration is 26 years in Austria and 23 years in Italy but only 13 years in Germany. That implies that German households have to pay back their loans in a shorter time period. Regulatory differences concerning the division of housing expenditures between tenants and landlords and other topics are also partly responsible for the differences in the levels of housing expenditure across the countries studied. The quality of housing may play a role when analyzing the amount of housing expenditure. There is no information in the HFCS on the building age of the main residence. Looking on the breakdown by the duration of living in the main residence we see a higher expenditure in the first twenty years, later on the amounts are lower (up to 10 percentage points). Therefore, it is not possible to analyze more thoroughly the effect of building standards and resulting country differences. Nevertheless, building characteristics and regulation standards my play a role on the amount a household has to pay as housing expenses.

Regarding the distribution of tenants' current housing expenditure the lower panel of chart 3 shows that the housing expenditure of Italian tenants is about 6 percentage points lower than the expenditure of German tenants across most of the distribution. Up to about the 60th percentile, the distribution of the current housing expenditure in Austria and Germany is almost identical. Above the 60th percentile the slope of the distribution increases in Germany whereas the Austrian distribution approaches the Italian one. The flatter slope of the Austrian distribution

Chart 3
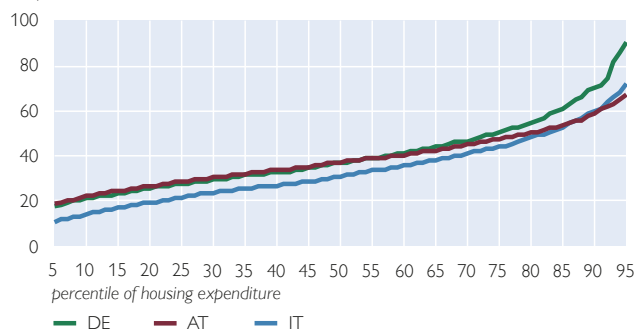
**Distribution of housing expenditure**

**Owners**

*% of household net income*



*percentile of housing expenditure*

······ DE with loan    ······ IT with loan    ······ AT with loan
—— DE without loan    —— IT without loan    —— AT without loan

**Tenants**

*% of household net income*



*percentile of housing expenditure*

—— DE    —— AT    —— IT

*Source: HFCS 2014 Austria, SHIW, PHF, OeNB.*

reflects somewhat more equality in the housing expenditure of tenants in Austria. Tenants with a high housing expenditure are mostly low-income households.

Overall, the size of the share of ownership and tenancy in a country accounts for a large part of the differences in the housing expenditure across countries. The relatively low current housing expenditure in Italy can be largely explained by the high ownership ratio and the low incidence of outstanding loans that were taken out to finance the primary residence among owners. However, that does not mean that financing housing is particularly easy for Italian households. On the contrary, as discussed above, it is relatively difficult for young people to establish their own first households because of the relatively small supply of cheap rental apartments and relatively high property prices. Italian households are larger than Austrian and German households. Thus housing expenses are distributed among more people.

In addition to the housing expense, we discuss the vulnerability of owners in the following paragraph. Vulnerability can be defined in several ways (see e.g. Albacete et al., 2013). We take advantage of the fact that data on net income

are available and calculate the total debt service ratio of owners. For this purpose, we do not only take into account debt services for loans taken out in order to purchase the primary residence (as above) but also the debt service for loans for the purchases of other real estate as well as consumer loans. As vulnerability is particularly important from a financial stability point of view we restrict our attention to owners with outstanding debt. The analysis shows that the median debt service ratio of these households is 12% in Austria, 19% in Italy and 20% in Germany. In Austria, about 95% of these households have a debt service ratio below 40% (and 80% spend less than a quarter of their net income on debt services). The corresponding numbers for Italy and Germany are 83% (63%) and 88% (65%) respectively. Indebted households are most likely not able to reduce their housing expenses easily if the get in trouble with servicing their debt. Hence, we also calculated the ratio of housing expenses (as defined in the previous sections) plus debt service for loans that were taken out for other purposes than financing the main residence to household net income. For this indicator the median values are 27% in Austria,

31% in Italy and 39% in Germany. In Austria about 80% of indebted owners spend less than 40% on housing expenses plus total debt service (and about 44% less than 25%). In Italy, 68% spend less than 40% (33% less than 25%) of their net income on housing expenditures plus total debt services. In Germany this is only the case for 51% (16%) of indebted owners. Comparing these results with the results on housing expenditures suggests that in Italy loans for other purposes than the primary residence play an important role and increase debt service payments of indebted owners.

## 4 Summary and conclusions

Housing expenditures usually make up the largest share of household consumption. In this article, we calculated the current housing expenditure of households in Austria, Germany and Italy using 2014 data from the second wave of the HFCS.

Disregarding households that can use their primary residence for free, we find that in all three countries owners without outstanding loans for the purchase of the primary residence have the lowest current housing expenditure. The high share of this group in Italy explains the low Italian current housing expenditure. However, despite this low current housing expenditure, structural features of the Italian property market make it difficult – especially for young people – to establish a household. Our study analyzes the current housing expenditure and not housing expenditures over the life-cycle. An analysis of housing expenditures over the life-cycle that also takes into account earlier expenses on loans that have already been repaid might yield a different picture with regard to both the differences between owners and tenants within a country and the housing expenditure across countries.

This article aims to give in initial impression of the differences in the housing expenditure across the selected countries. A next step would be to more thoroughly analyze the reasons for these differences while also extending the country sample. Although the HFCS data considerably improve comparisons of the housing expenditure across European countries, differences still exist between the national survey questions. For example, the operating expenses reported might differ across the countries surveyed, thus affecting the comparability of total housing expenses. Availability of net income data for all countries in the HFCS would be another welcomed improvement as it would allow for many important international analyses.

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## Annex

In this annex we discuss particular details of the surveys used.

### Austria

*Survey*: We used national data from the second wave of the HFCS (see Albacete et al., 2016).

*Operating costs:* Respondents are asked "How much does your household spend on ancillary housing costs (electricity, gas, water, sewage, phone, internet, television) in a typical month?" Interviewer guidance indicates that energy costs (e.g. heating, electricity) should be taken into account and that loan repayments do not fall into the category of ancillary housing costs. Owners are asked to record operating costs. Tenants are requested to state their rent both including and excluding operating costs.

*Housing cooperatives:* Tenants in flats provided by housing cooperatives often have to contribute to building costs. We include loan repayments (principal and interest) for loans taken out to finance this redeemable funding contribution. The contribution to building costs is reimbursed upon termination of tenancy, less depreciation. Because we apply an expenditure approach, we do not take this depreciation into account in the calculation of housing expenditures.

*Bullet loans:* Owners are asked whether they have an outstanding bullet loan for the acquisition of the main residence. We calculated expenses arising from these loans using information on current interest rates and loan amounts.

### Germany

*Survey:* We used the PHF Scientific Use File Wave 2 Version 1.0 data set (see PHF Survey Team, 2017).

*Operating costs:* Households are asked to state the ancillary costs including utility costs (heating, electricity). In a separate question, households are requested to give the expenditures on landline phones, mobile phones and internet access.

### Italy

*Survey:* We used national data from the 2014 Survey on Household Income and Wealth (SHIW) from Banca d'Italia (Banca d'Italia, 2015).

*Operating costs:* Households are asked for expenses relating to the main dwelling for condominium costs including any heating costs, electricity, water and gas (if not included in the condominium costs) and landline telephone, including any internet connection costs.

*Household income:* To improve comparability with net income information from the other surveys, we added interest rates paid and transfers paid to and subtracted imputed rent from the net income variable provided in the survey (called y in the data set). Of the households surveyed, 42 have an income of zero. For these households it is not possible to calculate the expense ratio. Also, some households have a very low monthly income (sometimes even below EUR 1). Because such a low income results in an unrealistically high expense ratio (up to more than 2000), we set the expense ratio for households with an income below EUR 150 to missing.