



OESTERREICHISCHE NATIONALBANK  
EUROSYSTEM

# MONETARY POLICY & THE ECONOMY

Quarterly Review of Economic Policy

20 years of the euro in Austria

Stability and Security.

Q1–Q2/19

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

**Publisher and editor**

Oesterreichische Nationalbank  
Otto-Wagner-Platz 3, 1090 Vienna, Austria  
PO Box 61, 1011 Vienna, Austria  
www.oenb.at  
oenb.info@oenb.at  
Phone: (+43-1) 40420-6666  
Fax: (+43-1) 40420-046698

**Editorial board**

Ernest Gnan, Doris Ritzberger-Grünwald,  
Helene Schuberth, Martin Summer

**Managing editor**

Anita Roitner

**Editing**

Rita Glaser-Schwarz, Barbara Meinx, Anita Roitner, Ingeborg Schuch

**Translations**

Dagmar Dichtl, Ingrid Haussteiner, Barbara Meinx, Ingeborg Schuch, Susanne Steinacher

**Layout and typesetting**

Sylvia Dalcher

**Design**

Information Management and Services Division

**Printing and production**

Oesterreichische Nationalbank, 1090 Vienna

DVR 0031577

ISSN 2309–3323 (online)

© Oesterreichische Nationalbank, 2019. All rights reserved.

May be reproduced for noncommercial, educational and scientific purposes provided that the source is acknowledged.

Printed according to the Austrian Ecolabel guideline for printed matter.

Please collect used paper for recycling.

EU Ecolabel: AT/028/024



# Contents

Call for applications: Klaus Liebscher Economic Research Scholarship	4
Nontechnical summaries in English and German	5
Editorial	19
Analyses	
Inflation in Austria since the introduction of the euro <i>Friedrich Fritzer, Fabio Rumler</i>	24
Aggregate wage developments in Austria since the introduction of the euro <i>Gerhard Fenz, Christian Ragacs, Alfred Stiglbauer</i>	41
Financing conditions in Austria since the introduction of the euro <i>Ernest Gnan, Maria Teresa Valderrama, Walter Waschiczek</i>	57
(How) has EMU affected fiscal policy in Austria? <i>Walpurga Köhler-Töglhofer, Doris Prammer, Lukas Reiss</i>	71
Monetary policy of the Eurosystem and the OeNB's balance sheet <i>Clemens Jobst, Claudia Kwapil</i>	85
Approaching 20 years of euro cash in Austria: What has changed, and what's next? <i>Anton Schautzer, Helmut Stix</i>	99
The euro's effects for noncash retail payments <i>Christiane Dorfmeister</i>	113
The case for macroprudential policy as a stabilizing tool for the euro area <i>Michaela Posch, Stefan W. Schmitz, Katharina Steiner, Eva Ubl</i>	124
Economic growth slows in Austria as global economy weakens Economic outlook for Austria from 2019 to 2021 (June 2019) <i>Christian Ragacs, Klaus Vondra</i>	139

*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: Klaus Liebscher Economic Research Scholarship

The Oesterreichische Nationalbank (OeNB) has replaced the economic research awards previously conferred by its Economic Analysis and Research Department with the newly established “Klaus Liebscher Economic Research Scholarship.” This Scholarship gives outstanding researchers the opportunity to contribute to the broad range of research activities at the OeNB’s Economic Analysis and Research Department by providing consultancy services.

The Scholarship program targets Austrian and international experts with a proven research record in economics and finance and with postdoctoral research experience. Applicants need to be in active employment with a research institution in Austria or abroad and should be interested in broadening their research horizon and expanding their personal research networks in an environment of increasing international research mobility.

Applications should be e-mailed to [scholarship@oenb.at](mailto:scholarship@oenb.at) by October 1, 2019. For further details on the Scholarship, please see [www.oenb.at](http://www.oenb.at).

Nontechnical summaries  
in English and German

# Nontechnical summaries in English

## **Inflation in Austria since the introduction of the euro**

*Friedrich Fritzer, Fabio Rumler*

In a monetary union, inflation rates and price levels should converge in the long run due to greater transparency and the abolition of formal and informal trade barriers. This article provides a summary of inflation developments in Austria since the introduction of the euro by investigating the inflation-output trade-off, the degree of price flexibility as well as the development of inflation differences and price level convergence in the euro area in the last 20 years. In the first decade after the introduction of the euro, Austrian inflation was relatively low and stable. Since 2011, however, inflation rates in Austria have been above the euro area average, resulting from relatively higher price increases of services, in particular of catering and accommodation services. In addition to the prosperous tourism industry, which may have driven up prices of these services, a relatively stronger preference of Austrian consumers to dine and drink out has entailed a considerably higher weight of catering services in the Austrian Harmonized Index of Consumer Prices (HICP), which has additionally increased the contribution of catering services to overall inflation in Austria.

We also find that price levels of Economic and Monetary Union (EMU) member countries converged primarily in the years prior to EMU and, to some extent, in the first years after the introduction of the euro. After 2007, this process stagnated and even turned into a mild price level divergence after the accession of several low price level countries to EMU (Cyprus, Estonia, Latvia, Lithuania, Malta, Slovakia and Slovenia).

Furthermore, estimates of the Phillips curve – which describes the relationship between prices and measures of economic activity – do not point to changes in the relationship between inflation and economic slack in Austria over the past 20 years. However, there is weak evidence that the persistence of the inflation process may have increased since the introduction of the euro; yet, this evidence is not robust across all specifications of the Phillips curve.

At the micro level, the degree of flexibility of Austrian consumer prices appears to have increased considerably in the last 20 years, indicating that the macroeconomic frictions induced by price rigidity may have decreased in recent years.

## **Aggregate wage developments in Austria since the introduction of the euro**

*Gerhard Fenz, Christian Ragacs, Alfred Stiglbauer*

Since the introduction of the single European currency in Austria, real gross wages per worker have grown at a very slow rate, lagging behind the increase in hourly wages. Between 1999 and the outbreak of the global financial and economic crisis in 2008, the wage share of national income decreased continuously, and wage growth was below the traditional benchmark for a productivity-oriented wage policy. In the aftermath of the crisis, the wage share increased significantly, before levelling off in recent years. Ultimately, the wage share was only slightly lower in 2017 than the rate measured for 1999.

The institutional specifics of wage setting in Austria are unique for a developed country, given the institutionalized approach to seeking agreement between labor and business interests; the very high share of workers who are covered by collective bargaining agreements, even though they are not union members; and the highly coordinated wage-setting process. This system has remained virtually unchanged since the early 1980s despite declining union density. The euro did not serve as a trigger for changing the wage bargaining process either, because Austria was already part of the “hard currency bloc” in Europe before the currency conversion.

Our estimations regarding the relationships between wages, prices and economic activity suggest that nominal wage growth in the past twenty years has been mainly determined by labor productivity and past inflation but has reacted only weakly to the cyclical stance of the economy. With regard to the effects that structural changes in the labor market and the internationalization of the Austrian economy have had on wage developments, we find evidence that the increased openness of the Austrian economy and changes in participation rates have had a dampening effect on wage growth. In contrast, we find no significant effects for changes in the share of part-time and fixed-term workers, and in the share of foreign workers. The overall cumulative effect of euro area membership on wage growth in Austria appears to have been positive.

## Financing conditions in Austria since the introduction of the euro

*Ernest Gnan, Maria Teresa Valderrama, Walter Waschiczek*

How have financing conditions for Austrian firms and households evolved since the start of the euro? Have loans become more or less expensive with regard to both interest rate levels and other terms and conditions? How have bond yields and stock returns evolved? How have overall financial conditions in a broader sense developed? And has the level of interest rates, as determined by the Eurosystem's single monetary policy, been appropriate to safeguard price stability and help smooth the business cycle in Austria? These questions are addressed in this article; the following are the main findings:

1. We find that lending rates in Austria have fallen since the introduction of the euro, with inflation-adjusted interest rates being mostly lower in Austria compared to Germany and the euro area average. This was partly related to the high share of variable rate loans, especially for house purchase, whose interest rates tend to be lower than that of fixed rate loans. However, banks in Austria have, in part, compensated for lower lending rates by increasing non-interest price elements of loans. Banks have also applied higher collateral requirements and loan covenants since the crisis to protect themselves against risks and/or reduce the amount of equity needed to comply with tightened banking regulations.
2. The post-crisis expansionary monetary policy conducted by the Eurosystem has brought Austrian sovereign bond yields below 1% since end-2014, implying very cheap financing for both Austria's government and Austrian companies on the corporate bond market.
3. Earnings ratios of companies included in the Austrian ATX stock index were mostly below those in the German DAX stock index and the euro area-wide Euro STOXX50 index. This implies that Austrian stocks were more "expensive" than those in Germany or the euro area. Reflecting the higher risk of stocks compared to safe government bonds, Austrian stocks earned a premium over 10-year government bonds of 2% to 3% during most of the period under review, which rose substantially to around 9% in 2017/2018.
4. One way of summarizing different indicators to determine whether a country's financing conditions have become tighter or looser is to construct a Financial Conditions Index (FCI). By estimating an FCI for Austria, we show that the transmission of the Eurosystem's policy rate through lending rates was an important driver of the tightening of financial conditions before and during the financial crisis. In the same way, the transmission of expansionary monetary policy through lower lending rates and moderated credit risk has contributed to the loosening of financing conditions during the recovery after the crisis.
5. A common way to assess the adequacy of the monetary policy stance for a country's economic conditions is to compare actual market interest rates with a hypothetical interest rate given by a monetary policy rule. The rate obtained by this monetary policy rule indicates the interest rate that would bring consumer price inflation close to the central bank's price stability target and real economic output close to its potential growth rate. We estimate such a hypothetical monetary policy rule for Austria. By comparing it to the EONIA – the interest rate applied between banks for credits overnight – we find that monetary conditions in the euro area have been broadly adequate or slightly on the loose side in relation to economic conditions in Austria.

### **(How) has EMU affected fiscal policy in Austria?**

*Walpurga Köhler-Töglhofer, Doris Prammer, Lukas Reiss*

To be able to join European Economic and Monetary Union (EMU) – in other words, introduce the euro and become part of the euro area – at the very outset in 1999, Austria had to fulfill specific criteria in 1997. These so-called convergence criteria had been laid down by the European Union (EU) in the Treaty of Maastricht. Two criteria were of a fiscal nature. They required the Austrian government to ensure (1) that the public deficit amounted to no more than 3% GDP, and (2) that national debt was below 60% of GDP (or, if above 60%, diminishing and approaching this target at a satisfactory pace). These two criteria still form the core of the EU's Stability and Growth Pact, i.e. the set of fiscal rules to which all EU countries have to adhere. Meanwhile, the Stability and Growth Pact also requires EU countries to achieve broadly balanced structural deficits over the medium term.

Introducing the EU's fiscal rules in Austria involved more than formal adjustments to fiscal policymaking. Meeting the fiscal criteria for joining EMU first required major consolidation measures in 1996 and 1997, and ongoing compliance with the rules created new policy challenges later on. In 2009, Austria became subject to an excessive deficit procedure at the EU level, because Austria had started to miss the EU's fiscal benchmarks following a sharp drop in tax revenues resulting from an economic downturn. A new round of comprehensive consolidation measures led to closure of the excessive deficit procedure because Austria had corrected its deficit by 2013 as required. Yet extra consolidation measures became necessary in 2014 and 2015 to meet the requirement of broadly balanced structural fiscal positions. Austria's two major consolidation episodes (1996–1997 and 2011–2015) were procyclical reforms, as they had to be implemented during cyclical downturns, whereas interim consolidation measures undertaken in 2000 and 2001 coincided with a maturing boom period. Such strong fiscal tightening during periods of cyclical weakness or weakening was required not only because of the EU's fiscal rules but also because good economic times (1990–1991, 1998–1999 and 2006–2008) had not been used for building up adequate fiscal buffers.

The EU's fiscal rules have been designed to prevent fiscal policies – which remained a national responsibility – from jeopardizing the stability-oriented common monetary policy conducted by the Eurosystem (the ECB and the central banks of the euro area countries) and to building up fiscal buffers in good times to have fiscal space to counteract cyclical downswings and recessions in case of asymmetric shocks hitting euro area countries, i.e. for stabilizing the economy. The fiscal rules do not go so far as to prescribe a country's structure and size of public revenue and expenditure. As the latter continue to be a fully national responsibility, they reflect national social and economic policy preferences. In Austria, the structure of tax revenues has remained comparatively stable since the mid-1990s in the absence of major tax structure reforms. The structure of expenditure, however, has undergone significant shifts. The expenditure-to-GDP ratio has declined substantially since 1995; in other words, public spending has been growing at a visibly lower rate than economic output. Above all, this has been achieved by keeping a tight lid on public administration and security spending, reflected by disproportionately low increases. Furthermore, interest payments relative to GDP have dropped sharply, mainly on account of the Eurosystem's monetary policy. At the same time, spending on social benefits (in cash and in kind) has been rising broadly in sync with economic output.



## Monetary policy of the Eurosystem and the OeNB's balance sheet

*Clemens Jobst, Claudia Kwapil*

Monetary policy in the euro area is decided by the Governing Council of the European Central Bank (ECB) but implemented through the balance sheets of the 19 national central banks (NCBs) of the euro area and the ECB. While the consolidated financial statement of the Eurosystem – the sum of the balance sheets of all euro area NCBs and the ECB – is the primary source of information for monetary policy in the euro area, this article takes the Oesterreichische Nationalbank as an example and argues that a disaggregated view offers additional perspectives. During the financial crisis, the balance sheets of the NCBs reflected to what extent and through which channels national banking systems were affected by the crisis. At the same time, however, NCBs' balance sheets are driven by structural factors and contingencies completely unrelated to monetary policy.

This also becomes evident when looking at how the balance sheet of the Oesterreichische Nationalbank (OeNB) has evolved over the past 20 years. In the early days of Economic and Monetary Union (EMU), the Austrian banking system participated in long-term refinancing operations to a slightly larger extent than the OeNB's share in the ECB's capital key would have suggested. During the financial crisis, which started in 2007/2008, Austrian banks, which had large liabilities in Swiss francs and U.S. dollars, resorted to Swiss franc and U.S. dollar swap facilities offered jointly by the ECB, the Swiss National Bank and the Federal Reserve. During the sovereign debt crisis, which affected the Austrian banking system to a lesser extent, the share of Austrian banks in the Eurosystem's refinancing operations declined. Nowadays, the demand for main refinancing operations is exceptionally high in Austria.

Among the many structural factors that drive the OeNB's balance sheet we focus on the development of euro banknotes in circulation. Until recently, Austria had a special position in international banknote logistics and was a heavy importer of euro banknotes. From the introduction of euro cash in 2002 until 2017, more banknotes were returned to than issued by the OeNB, which meant that its balance sheet recorded negative net amounts of banknotes actually put into circulation by the OeNB. The equivalent amount of the banknotes returned was credited to accounts at the OeNB. As these transactions were often done on behalf of foreign banks, the credits were then transferred abroad, leading to large liabilities of the OeNB in TARGET2 – the Eurosystem's payment system.

Overall, we conclude that the NCBs' balance sheets contain valuable information on both the implementation of monetary policy as well as the operations of the financial and payment system more broadly; nevertheless, the NCBs' balance sheets must be read with due care.

## Approaching 20 years of euro cash in Austria: What has changed, and what's next?

*Anton Schautzer, Helmut Stix*

The article discusses almost 20 years of euro cash in Austria – from the user side and from the production side – and the changes that have occurred over this time period. The stylized facts presented in this short article are clear and unambiguous: Euro cash continues to remain an important medium of exchange and store of value. In fact, cash holdings have increased strongly since 2002, and in particular after the global economic and financial crisis, in the euro area as a whole as well as in Austria. Survey evidence confirms that Austria is one of the more cash-intensive euro area economies. As a case in point, we note that cash circulation within Austria increased from an estimated amount of EUR 1,500 per capita in 2002 to about EUR 3,500 per capita in 2018. According to a survey by the ECB, Austrian consumers use cash for about 80% of their purchases. In the context of a growing demand for cash, we discuss how technical progress in the production of euro banknotes and in euro cash logistics over the past two decades has contributed to cost-efficiency. As euro cash is the joint product of all Eurosystem national central banks, we also describe how this cooperation works in practice and the role of the OeNB in the supply of banknotes. Finally, we provide a brief discussion about the likely future of cash.

Overall, there are three main messages that can be drawn from our brief contribution. First, euro cash is here to stay, although it is likely that its demand will decline in the coming years, mainly due to innovations in payment technologies and increases in interest rates. Even though digitalization has the potential of making cash transactions superfluous, in principle, some consumers will nevertheless continue to prefer cash over other payment instruments because of the distinguishing attributes of cash. Second, cash is not outdated given the technical developments in cash production and dissemination, the continued use of cash by consumers and the costs of cash vis-à-vis other payment means that merchants face. Third, there is a need for more research in order to better understand the demand for cash, in particular referring to those aspects that are unrelated to short-run payment needs. The quantitatively more important demand component of hoarding is influenced by a multitude of factors and is difficult to predict.

## The euro's effects on noncash retail payments

*Christiane Dorfmeister*

The next milestone following the 2002 euro cash changeover was the harmonization of electronic payments in Europe: The aim was to enable citizens to make credit transfers and direct debits within Europe with the same ease and at the same conditions as when paying within their home country – in other words, to create the Single Euro Payments Area (SEPA). SEPA today covers all EU countries and also extends to Iceland, Liechtenstein, Norway, Switzerland, Monaco and San Marino. The basic idea of SEPA was to harmonize national infrastructures and to achieve interoperability between systems by applying international payments standards. The efficient pan-European payments market thereby created would entail more competition, thus benefiting consumers, businesses and banks. However, harmonizing cashless payments in euro came with a number of challenges: National technical formats and business rules had to be migrated to European standards, payment systems had to be adjusted and linked up, and a common European legal framework had to be created. Ultimately, as required by the corresponding EU regulation, SEPA migration was completed in the euro area countries on August 1, 2014, and in the participating non-euro area countries on October 31, 2016.

The most tangible change for end users were new bank identifier codes (BIC) and the replacement of existing bank account numbers by International Bank Account Numbers (IBAN). The OeNB (and the Eurosystem as a whole) contributed to the successful migration to SEPA credit transfer and direct debit solutions in its oversight capacity, in its policymaking function and through the operation of its own payment systems.

SEPA has indeed helped save time and money: Payment services fees have dropped and credit transfers and direct debits have become much faster. For instance, today electronic euro payments will be completed within no more than one business day. Furthermore, the statistics on payment infrastructures show a steady increase in the number of cross-border transactions, thus indicating progress in the development of the euro payments market. The cost of aligning payment infrastructures with SEPA standards were largely borne by payment service providers and businesses.

While the migration to harmonized credit transfer and direct debit solutions is complete, the SEPA project is ongoing, and further innovations are in the pipeline – such as the SEPA scheme for euro instant credit transfers, offering the electronic transfer of money in less than 10 seconds, at any time and on any day of the year. Apart from the European projects, smaller national or regional initiatives also play an important role in the development of new payments solutions. If they are successful, they may have the potential to be rolled out to the pan-European market.

## The case for macroprudential policy as a stabilizing tool for the euro area

*Michaela Posch, Stefan W. Schmitz, Katharina Steiner and Eva Ubl*

In the first decade of the euro, persistent macroeconomic imbalances accumulated within the euro area. Balanced external positions of the euro area as a whole masked the cross-country differences between member states. While northern countries like Germany ran substantial current account surpluses, southern countries like Greece, Italy, Portugal and Spain featured matching current account deficits. In particular in the periphery countries, increasing capital inflows led to the build-up of high external and domestic debt, which had a highly destabilizing impact on the economy in the course of the 2008 global financial crisis.

In this commentary, we argue that current account deficits in a currency union like the euro area are not destabilizing per se and that cross-border capital flows can contribute to economic convergence and private risk-sharing, provided they are adequately monitored and policy action is taken when risks emerge. We also claim that the current macroeconomic governance framework of the European Union has not properly addressed this issue yet. The macroeconomic imbalance procedure (MIP), which the EU introduced in 2011, aims at preventing the accumulation of macroeconomic imbalances by means of a system of surveillance comprising recommendations and possible sanctions. While this is an important policy tool, it is still not sufficient as it lacks credible implementation.

Macroprudential policy, which addresses risks to the stability of the financial system, could fill this gap. We draw on vast literature related to the impact of macroprudential policy on stabilizing financial sector developments. Our conclusion is that macroprudential policy instruments could allow countries with lower capital stocks to continue importing capital and to strengthen private risk-sharing in the euro area, while avoiding negative side effects, such as excessive credit growth and the risk of a balance of payment crisis. We make a case for broadening the MIP to include the assessment of the macroprudential policy stance, particularly with respect to the possible negative side effects of capital inflows. Such an integration could improve the activation of existing macroprudential policies and could speed up the introduction of any additional instrument that may be required to fend off catalysts of potential balance of payment crises in the euro area. Our argument is inspired by the effective application of macroprudential policy in Austria in the post-World War II era, when Austria featured a structural balance of payment deficit and liberalized both its capital account and its banking sector without a balance of payment crisis.

# Nontechnical summaries in German

## Inflationsentwicklung in Österreich seit der Einführung des Euro

*Friedrich Fritzer, Fabio Rumler*

Innerhalb einer Währungsunion sollte es aufgrund der größeren Preistransparenz und des Wegfalls tarifärer und nicht tarifärer Handelsschranken langfristig zu einer Annäherung der nationalen Inflationswerte und Preisniveaus kommen. Dieser Beitrag bietet einen Überblick über die Inflationsentwicklung in Österreich seit der Einführung des Euro. Analyse-schwerpunkt sind der Zusammenhang zwischen Inflation und Wachstum, das Ausmaß der Preisflexibilität sowie die Entwicklung der Inflationsunterschiede und der Preisniveauconvergenz im Euroraum in den letzten 20 Jahren.

In den ersten zehn Jahren nach der Einführung des Euro blieb die Inflation in Österreich relativ niedrig und stabil. Seit dem Jahr 2011 liegen die österreichischen Inflationswerte aber über dem Euroraum-Durchschnitt, was darauf zurückzuführen ist, dass die Preise für Dienstleistungen (insbesondere für Bewirtungs- und Beherbergungsdienstleistungen) in Österreich stärker als in anderen Euro-Ländern angezogen haben. Hier dürfte zum einen die florierende Tourismusbranche preistreibend gewirkt haben. Zum anderen fallen hierzulande die Bewirtungsdienstleistungen bei der Berechnung des harmonisierten Verbraucherpreisindex (HVPI) vergleichsweise stärker ins Gewicht, weil die Österreicherinnen und Österreicher mehr für Gastronomiedienstleistungen ausgeben, was sich wiederum in einem höheren Inflationsbeitrag der Bewirtungsdienstleistungen niederschlägt. Darüber hinaus ist festzustellen, dass eine Angleichung der nationalen Preisniveaus vor allem im Vorfeld bzw. teilweise in den ersten Jahren nach der Euro-Einführung stattgefunden hat. Ab 2007 stagnierte dieser Prozess, wobei es mit dem Beitritt einiger Niedrigpreisländer (Estland, Lettland, Litauen, Malta, Slowakei, Slowenien und Zypern) sogar wiederum zu einem leichten Auseinanderdriften der Preisniveaus kam.

In Schätzungen des Zusammenhangs zwischen Inflation und Wachstum (Phillips-Kurve) wurde festgestellt, dass sich das Verhältnis zwischen Inflation und Produktion in Österreich in den letzten 20 Jahren nicht verändert hat. Der Grad der Persistenz des Inflationsprozesses könnte sich hingegen seit der Einführung vergrößert haben. Eindeutig fallen dahingehende Schätzungen allerdings nicht aus.

Die Flexibilität der Verbraucherpreise dürfte in Österreich in den letzten 20 Jahren jedenfalls deutlich zugenommen haben, was bedeutet, dass negative makroökonomische Effekte aufgrund unflexibler Preise eine geringere Rolle als in der Vergangenheit spielen dürften.

## Gesamtentwicklung der Löhne in Österreich seit der Einführung des Euro

*Gerhard Fenz, Christian Ragacs, Alfred Stiglbauer*

Die Bruttolöhne je Arbeitnehmerin bzw. Arbeitnehmer sind in Österreich seit der Einführung des Euro kaufkraftbereinigt nur sehr moderat gestiegen, wobei der durchschnittliche Stundenlohn vergleichsweise stärker anstieg. Die Lohnquote, grob gesprochen der Anteil der Lohnsumme am gesamtwirtschaftlichen Einkommen, sank ab 1999 bis zum Ausbruch der Finanz- und Wirtschaftskrise im Jahr 2008. Das Lohnwachstum lag damit unter dem Richtwert, der sich ergeben hätte, wenn sich die Lohnerhöhungen an der Inflation und dem längerfristigen Produktivitätswachstum orientieren. Nach der Finanz- und Wirtschaftskrise ist die Lohnquote aber deutlich angestiegen und in den letzten Jahren relativ konstant geblieben; im Jahr 2017 lag sie nur unwesentlich unter dem Wert für das Jahr 1999.

Die Lohnabschlüsse werden in Österreich in einem für ein Industrieland recht speziellen Prozess ausgehandelt, wenn man an die zentrale Rolle der Sozialpartner, die fast flächendeckende Geltung der Kollektivvertragslöhne und die starke Koordination der Lohnverhandlungen denkt. Dieses System ist trotz des rückläufigen Anteils der Gewerkschaftsmitglieder an der Erwerbsbevölkerung seit den frühen 1980er-Jahren praktisch unverändert geblieben. Auch die Einführung des Euro bewirkte keinen Veränderungsdruck auf den Lohnbildungsprozess in Österreich, da Österreich schon vor der Währungsumstellung dem Hartwährungsblock in Europa angehört hatte.

Schätzungen zum Zusammenhang zwischen Lohn-, Preis- und Produktivitätsentwicklung zufolge haben die Löhne in den letzten 20 Jahren in erster Linie auf Veränderungen der Arbeitsproduktivität und der Inflationsrate des Vorjahres und nur wenig auf die Konjunktur reagiert. Ein weiterer Analyseschwerpunkt der vorliegenden Studie sind die Auswirkungen struktureller Veränderungen auf dem Arbeitsmarkt und der Internationalisierung der österreichischen Wirtschaft auf die Lohnentwicklung. Hier zeigt sich, dass sich die zunehmende Öffnung der österreichischen Wirtschaft und der Anstieg der Erwerbsbeteiligung dämpfend auf das Lohnwachstum ausgewirkt haben. Keinen signifikanten Einfluss auf das Lohnwachstum hatten hingegen die Entwicklung des Anteils von Teilzeitbeschäftigung, von befristeter Beschäftigung sowie von ausländischen Arbeitnehmerinnen und Arbeitnehmer an der Gesamtbeschäftigung in Österreich. In Summe dürfte die Euro-Einführung positive Effekte auf das Lohnwachstum der letzten 20 Jahre in Österreich bewirkt haben.

## Finanzierungsbedingungen in Österreich seit der Einführung des Euro

*Ernest Gnan, Maria Teresa Valderrama, Walter Waschiczek*

Wie haben sich die Finanzierungsbedingungen für österreichische Unternehmen und private Haushalte seit der Euro-Einführung entwickelt? Sind Kredite in Bezug auf die Zinssätze sowie auf andere Kreditkonditionen teurer oder günstiger geworden? Welchen Entwicklungen waren Anleihe- und Aktienrenditen unterworfen? Wie haben sich die allgemeinen finanziellen Rahmenbedingungen im weiteren Sinne entwickelt? Hat sich das durch die einheitliche Geldpolitik des Eurosystems gesteuerte Zinsniveau als angemessenes Instrument zur Gewährleistung von Preisstabilität und zur Glättung des Konjunkturzyklus speziell in Österreich erwiesen? Diese Fragen sollen im vorliegenden Artikel beleuchtet werden; die wichtigsten Erkenntnisse lauten wie folgt:

1. Seit der Einführung des Euro sind die Kreditzinsen in Österreich gesunken, wobei die inflationsbereinigten Zinsen in Österreich größtenteils niedriger ausfielen als in Deutschland und im Euroraumdurchschnitt. Dies hing zum Teil mit dem hohen Anteil an variabel verzinslichen Krediten, allen voran Wohnbaukrediten, zusammen, deren Zinssätze tendenziell unter jenen festverzinslicher Kredite lagen. Die niedrigeren Kreditzinsen wurden von den österreichischen Banken jedoch teilweise durch die Erhöhung der zinsunabhängigen, preislichen Kreditkonditionen ausgeglichen. Seit der Krise stellen die Banken zudem höhere Sicherheitenanforderungen und bestehen auf strengeren Zusatz- und Nebenvereinbarungen, um sich gegen Risiken abzusichern bzw. den zur Einhaltung der strengeren regulatorischen Vorschriften erforderlichen Eigenkapitalbedarf zu verringern.
2. Aufgrund des expansiven geldpolitischen Kurses, den das Eurosystem nach der Krise verfolgte, liegen die Renditen österreichischer Staatsanleihen seit Ende 2014 unter 1 %. Für den österreichischen Staat und für österreichische Unternehmen ergaben sich daraus äußerst günstige Finanzierungsbedingungen am Anleihemarkt.
3. Das Kurs-Gewinn-Verhältnis der im österreichischen Aktienindex ATX enthaltenen Unternehmensaktien fiel mehrheitlich geringer aus als jenes von Unternehmensaktien, die im deutschen DAX- und im euroraumweiten Euro-STOXX-50-Index enthalten waren. Österreichische Aktien wiesen somit eine geringere Rendite auf – und waren also „teurer“ – als Aktien aus Deutschland oder dem Euroraum. Das höhere Risiko von Aktien im Vergleich zu sicheren Staatsanleihen spiegelte sich über weite Strecken des Beobachtungszeitraums in einem Renditeaufschlag österreichischer Aktien gegenüber zehnjährigen Staatsanleihen von 2 % bis 3 % wider; in den Jahren 2017/2018 war ein deutlicher Anstieg auf rund 9 % zu beobachten.
4. Durch die Bündelung verschiedener Finanzindikatoren in einem Financial Conditions Index (FCI) lässt sich feststellen, ob sich die Finanzierungsbedingungen eines Landes verschärft oder gelockert haben. Anhand eines für Österreich erstellten FCI zeigt sich, dass die Weitergabe der Leitzinsänderungen des Eurosystems über die Kreditzinsen der Banken bei der Verschärfung der Finanzierungsbedingungen vor und während der Finanzkrise eine maßgebliche Rolle gespielt hat. Auf dieselbe Weise schlug sich der expansive geldpolitische Kurs in geringeren Kreditzinsen und moderaten Kreditrisiken nieder und trug so in der Erholungsphase nach der Krise zu einer Lockerung der finanziellen Rahmenbedingungen bei.
5. Eine gängige Methode, um die Angemessenheit des geldpolitischen Kurses für die wirtschaftliche Lage eines Landes zu beurteilen, besteht darin, die tatsächlichen Marktzinsen mit einem durch eine geldpolitische Regel definierten hypothetischen Zinssatz zu vergleichen. Letzterer ist dabei als jener Zinssatz definiert bei dem sich die Verbraucherpreis-inflation dem Preisstabilitätsziel der Zentralbank und die reale Wirtschaftsleistung dem Potenzialwachstum annähern würde. Im vorliegenden Artikel wird ein derartiger hypothetischer Zinssatz für Österreich geschätzt; der anschließende Vergleich mit dem EONIA – also jenem Zinssatz, zu dem Banken innerhalb des Euroraums unbesicherte Euro-Tagesgelder ausleihen – zeigt, dass der geldpolitische Kurs des Euroraums im Hinblick auf das wirtschaftliche Umfeld in Österreich weitgehend angemessen bzw. eher locker war.

## Die Europäische Währungsunion und ihr Einfluss auf die österreichische Fiskalpolitik

*Walpurga Köhler-Töglhofer, Doris Prammer, Lukas Reiss*

Um von Beginn an der Wirtschafts- und Währungsunion (WWU) angehören zu können, musste Österreich die im Vertrag von Maastricht festgeschriebenen Konvergenzkriterien im Jahr 1997 erfüllen. Fiskalpolitisch bedeutete dies, dass die gesamtstaatliche Defizitquote max. 3% des BIP betragen und die öffentliche Schuldenquote entweder unter 60% des BIP liegen oder sich zumindest hinreichend rasch rückläufig zu diesem Wert entwickeln musste. Diese beiden Kriterien bilden – gemeinsam mit dem mittelfristigen Ziel eines annähernd ausgeglichenen strukturellen Budgetsaldos – die Grundpfeiler des Stabilitäts- und Wachstumspakts (SWP).

Für die österreichische Fiskalpolitik bedeutete die Einbettung in den europäischen Fiskalrahmen nicht nur einen formalen Regimewechsel, sondern brachte auch politische Herausforderungen mit sich. So musste in den Jahren 1996 und 1997 stark konsolidiert werden, um die Fiskalvorgaben für einen Beitritt zur WWU zu erfüllen. Im Jahr 2009 führte der mit dem BIP-Rückgang einhergehende starke Einbruch der Steuereinnahmen zur Verletzung der Maastricht-Kriterien und zu einem Verfahren wegen eines übermäßigen Defizits. Infolge der Implementierung umfangreicher Konsolidierungsmaßnahmen wurde das Verfahren gegen Österreich innerhalb der bis zum Jahr 2013 gewährten Frist eingestellt. Allerdings mussten in den beiden darauffolgenden Jahren 2014 und 2015 weitere Konsolidierungsschritte gesetzt werden, um die Vorgabe eines strukturell annähernd ausgeglichenen Budgetsaldos zu erreichen.

Die beiden großen Konsolidierungsepisoden zur Erfüllung der Fiskalregeln (1996–1997 sowie 2011–2015) wirkten prozyklisch, da sie in konjunkturellen Abschwungphasen umgesetzt werden mussten. Die Konsolidierungsmaßnahmen der Jahre 2000 und 2001 wurden am Ende einer Hochkonjunkturphase wirksam. Diese stark restriktiv wirkende Fiskalpolitik in konjunkturell schwachen Perioden bzw. in einer sich bereits abschwächenden Konjunktur war nicht nur den europäischen Fiskalregeln geschuldet, sondern insbesondere dem Umstand, dass die wirtschaftlich guten Jahre (1990–1991, 1998–1999 und 2006–2008) nicht für den Aufbau von fiskalischen Puffern genutzt worden waren. Der europäische Fiskalrahmen soll sicherstellen, dass die stabilitätsorientierte gemeinsame Geldpolitik nicht durch die – grundsätzlich in nationaler Verantwortung der Mitgliedstaaten verbliebene – Fiskalpolitik gefährdet wird und dass hinreichend fiskalische Puffer in guten Zeiten aufgebaut werden, um im Fall von asymmetrischen Schocks in der WWU fiskalisch entsprechend gegensteuern zu können. Das Fiskalregelwerk beinhaltet keine Vorgaben zu Struktur und Höhe der öffentlichen Einnahmen und Ausgaben, die weiterhin in der alleinigen Verantwortung der Mitgliedstaaten liegen und damit nationale sozial- und wirtschaftspolitische Präferenzen zum Ausdruck bringen. Die Analyse zeigt, dass Österreich seit Mitte der 1990er-Jahre eine vergleichsweise stabile Struktur der Steuereinnahmen aufweist, da es keine großen Steuerstrukturreformen gab. Die Struktur der Ausgaben ist hingegen von beachtlichen Verschiebungen gekennzeichnet. Die Ausgabenquote verringerte sich seit 1995 beträchtlich, d. h. die Ausgaben sind deutlich schwächer als das BIP gewachsen. Dies wurde insbesondere durch eine unterdurchschnittliche Dynamik bei den Ausgaben für die öffentliche Verwaltung und Sicherheit erreicht. Auch die Zinsausgabenquote ist stark zurückgegangen – hauptsächlich bedingt durch die Geldpolitik des Eurosystems. Die öffentlichen Ausgaben für soziale Geld- und Sachleistungen stiegen hingegen in etwa gleich stark wie das BIP.



## Die Geldpolitik des Eurosystems und die Bilanz der OeNB

*Clemens Jobst, Claudia Kwapil*

Die Geldpolitik des Euroraums wird zentral vom EZB-Rat festgelegt; die Umsetzung der Geldpolitik hingegen erfolgt dezentral durch die 19 nationalen Zentralbanken (NZBen) des Euroraums und die Europäische Zentralbank (EZB) und spiegelt sich in deren Bilanzen wider. Während der konsolidierte Ausweis des Eurosystems – also die Summe der Bilanzen sämtlicher NZBen des Euroraums und der EZB – somit die primäre Informationsquelle über geldpolitische Entscheidungen im Euroraum darstellt, können durch die Analyse einzelner NZB-Bilanzen zusätzliche Einblicke gewonnen werden, wie im vorliegenden Artikel anhand der Bilanz der Oesterreichischen Nationalbank (OeNB) veranschaulicht wird. So spiegelte sich während der Finanzkrise in den Bilanzen der NZBen wider, in welchem Ausmaß und über welche Kanäle nationale Bankensysteme von der Krise betroffen waren. Neben geldpolitischen Entwicklungen finden in den Bilanzen der NZBen allerdings auch strukturelle Faktoren und Eventualitäten – die in keinem Zusammenhang zur Geldpolitik stehen – ihren Niederschlag.

Dies lässt sich an der Entwicklung der OeNB-Bilanz während der letzten 20 Jahre ablesen: Zu Beginn der Wirtschafts- und Währungsunion (WWU) nahmen österreichische Banken in etwas größerem Umfang an den längerfristigen Refinanzierungsgeschäften des Eurosystems teil als dies der Anteil der OeNB am Kapitalschlüssel der EZB nahegelegt hätte. Während der in den Jahren 2007/2008 einsetzenden Finanzkrise griffen jene österreichischen Banken, die hohe Verbindlichkeiten in Schweizer Franken und US-Dollar aufwiesen, auf liquiditätszuführende Swap-Kreditlinien in diesen Währungen zurück, die den Banken von der EZB, der Schweizerischen Nationalbank und der Fed eingeräumt worden waren. Während der Staatsschuldenkrise, von der der österreichische Bankensektor weniger stark betroffen war, nahm sein Anteil an den Refinanzierungsgeschäften des Eurosystems ab. Derzeit ist die Nachfrage aus Österreich nach Liquidität aus den Hauptrefinanzierungsgeschäften besonders hoch.

Unter den zahlreichen strukturellen Faktoren, die die OeNB-Bilanz beeinflussen, verdient die Entwicklung des Banknotenumlaufs besondere Aufmerksamkeit. Bis vor Kurzem nahm Österreich in der internationalen Banknotenlogistik eine Sonderstellung ein und galt als einer der größten Nettoempfänger von Euro-Banknoten. Von der Einführung des Euro-Bargelds im Jahr 2002 bis zum Jahr 2017 verzeichnete die OeNB weitaus mehr Ein- als Auslieferungen von Euro-Banknoten, wodurch die Bilanz der OeNB in diesen Jahren bei der Ausgabe von Euro-Banknoten negative Nettobeträge aufwies. Der Gegenwert der rückgelieferten Banknoten wurde auf den entsprechenden, bei der OeNB geführten Konten gutgeschrieben. Solche Transaktionen wurden häufig für ausländische Banken getätigt, weswegen die jeweiligen Beträge anschließend ins Ausland überwiesen wurden, was sich für die OeNB in hohen negativen TARGET2-Salden niederschlug (TARGET2 ist das Großbetragszahlungssystem des Eurosystems).

Zusammenfassend lässt sich festhalten, dass die Bilanzen der NZBen wertvolle Informationen über die konkrete Umsetzung der gemeinsamen Geldpolitik sowie allgemein über Transaktionen im Finanz- und Zahlungssystem enthalten. Dabei gilt es zu beachten, dass die Bilanzen der NZBen mit Vorsicht interpretiert werden sollten.

## **Euro-Bargeld in Österreich – eine Bestandsaufnahme der Entwicklung seit 2002 und einige Überlegungen über die zukünftige Rolle von Bargeld**

*Anton Schautzer, Helmut Stix*

Der Artikel beschäftigt sich mit den Erfahrungen mit fast 20 Jahren Euro-Bargeld in Österreich – sowohl aus dem Blickwinkel der Verwendung als auch der Produktion von Bargeld. Die präsentierten Fakten sprechen eine eindeutige Sprache: Euro-Bargeld ist nach wie vor ein sehr wichtiges Zahlungs- und Wertaufbewahrungsmittel. Seit 2002 ist die umlaufende Bargeldmenge sowohl im gesamten Eurogebiet als auch in Österreich gestiegen – besonders deutlich war der Anstieg unmittelbar nach der globalen Wirtschafts- und Finanzkrise. Ergebnisse aus Umfragen bestätigen, dass Österreich innerhalb des Eurogebiets zu den Ländern mit hoher Bargeldnutzung bzw. hohem Bargeldumlauf zählt. Beispielhaft sei genannt, dass die innerhalb Österreichs umlaufende Bargeldmenge von geschätzten 1.500 EUR pro Einwohner im Jahr 2002 auf ca. 3.500 EUR pro Einwohner im Jahr 2018 gestiegen ist. Gemäß den Ergebnissen einer Umfragestudie der EZB verwenden österreichische Konsumentinnen und Konsumenten nach wie vor bei über 80 % ihrer Einkäufe Bargeld.

In Anbetracht der nach wie vor substantiellen Bedeutung von Bargeld spielen Kosteneffizienz und Qualität eine große Rolle, weshalb der Artikel auch auf den diesbezüglichen technischen Fortschritt in der Bargeldproduktion und -logistik eingeht. Da Euro-Bargeld das gemeinsame Produkt aller nationalen Notenbanken im Eurosystem ist, wird ferner beschrieben, wie die Kooperation in der Praxis vorstättengeht und welche Rolle die OeNB in der Banknotenproduktion- und -verteilung einnimmt. Abschließend wird kurz diskutiert, wie sich die Bargeldnachfrage voraussichtlich in Zukunft entwickeln wird.

Im Wesentlichen lassen sich aus dem vorliegenden Artikel drei Hauptaussagen ableiten. Erstens, obwohl die Bargeldnachfrage in den nächsten Jahren – hauptsächlich wegen neuer Zahlungstechnologien sowie eines zu erwartenden Zinsanstiegs – zurückgehen wird, wird Bargeld, zumindest in absehbarer Zeit, nicht verschwinden. Obwohl innovative Bank- und Bezahlleistungen das Bargeld zumindest theoretisch überflüssig machen könnten, werden etliche Konsumentinnen und Konsumenten weiterhin Bargeld präferieren, weil sie die Eigenschaften des Zahlungsmittels Bargeld schätzen. Zweitens ist Bargeld nicht "veraltet", gegeben die technischen Fortschritte in der Bargeldproduktion und -verteilung, die weiterhin hohe Nutzung durch Konsumentinnen und Konsumenten sowie die Kostenstruktur der Zahlungsmittel für den Handel. Drittens braucht es mehr Forschung, um die Nachfrage nach Bargeld besser zu verstehen, wobei dies insbesondere den quantitativ sehr wichtigen Bereich der Bargeldnachfrage betrifft, der nicht unmittelbar auf kurzfristige Transaktionsbedürfnisse zurückzuführen ist (z. B. Hortung). Die zukünftige Entwicklung dieser Komponente der Bargeldnachfrage hängt von einer Vielzahl an Faktoren ab und ist schwierig zu prognostizieren.



## Die Auswirkungen des Euro auf den unbaren Zahlungsverkehr in Europa

*Christiane Dorfmeister*

Nach der erfolgreichen Euro-Bargeldeinführung im Jahr 2002 sollte auch der bisher fragmentierte unbare Zahlungsverkehr in Europa vereinheitlicht werden, sodass alle europäischen Zahlungen wie inländische behandelt werden. Um dies zu erreichen, wurde der einheitliche Euro-Zahlungsverkehrsraum SEPA (Single Euro Payments Area) geschaffen. Dieser umfasst neben den EU-Mitgliedstaaten auch Island, Liechtenstein, Norwegen, die Schweiz, Monaco und San Marino. Die grundlegende Idee von SEPA war es, die Fragmentierung des Zahlungsraumes zu beseitigen und Interoperabilität zwischen den bestehenden Zahlungssystemen zu schaffen, indem internationale Zahlungsverkehrsstandards verwendet werden. Ein effizienter pan-europäischer Zahlungsverkehrsmarkt sollte geschaffen werden, der durch stärkeren Wettbewerb Konsumentinnen und Konsumenten, Unternehmen und Banken Vorteile bringt. Dafür waren folgende Herausforderungen zu bewältigen: Nationale technische Formate und Abwicklungsregeln wurden auf europäische umgestellt, Zahlungssysteme wurden adaptiert und zum Teil verbunden und es wurde ein gemeinsamer europäischer Rechtsrahmen geschaffen. Per EU-Verordnung wurde die SEPA-Migration in den Euro-Ländern mit dem 1. August 2014 abgeschlossen, Nicht-Euro-Länder hatten bis 31. Oktober 2016 Zeit.

Für den Endkunden wurde die SEPA-Migration mit dem Wechsel von Kontonummer und Bankleitzahl auf die internationalen Standards IBAN und BIC augenscheinlich. Das Eurosystem und die OeNB trugen in ihren Rollen als Aufseher, Policy Maker und Zahlungssystembetreiber ihren Teil zu einer erfolgreichen Migration von Überweisungen und Lastschriften auf das neue System bei.

Die durch SEPA anvisierte Effizienzsteigerung von europäischen Zahlungen spiegelt sich sowohl in den gesunkenen Gebühren für Zahlungsservices als auch den deutlich kürzeren Durchführungszeiten von Überweisungen und Lastschriften wider. Beispielsweise werden elektronische Euro-Überweisungen heute in maximal einem Bankgeschäftstag durchgeführt. Die Daten von Zahlungsverkehrsinfrastrukturen zeigen einen kontinuierlichen Anstieg der Anzahl der grenzüberschreitenden Transaktionen, was auf die Entwicklung eines europäischen Zahlungsverkehrsbinnenmarkts hindeutet. Die für die Schaffung von SEPA notwendigen Adaptierungen der Infrastrukturen verursachten auch Kosten, die zum Großteil von den Zahlungsverkehrsdienstleistern und den Unternehmen getragen wurden.

Das SEPA-Projekt ist nicht mit der Migration zur SEPA-Überweisung und -Lastschrift beendet, sondern es ist vielmehr ein lebendiger Prozess mit zahlreichen Innovationen. Beispielhaft erwähnt wird die derzeitige Entwicklung der sogenannten „SEPA instant Überweisung“. Mit ihr ist eine Transaktion innerhalb von zehn Sekunden rund um die Uhr möglich. Neben den europäischen Projekten spielen auch kleinere, nationale und regionale Initiativen eine wichtige Rolle bei der Entwicklung von neuen Zahlungsverkehrslösungen. Wenn diese auf nationaler Ebene erfolgreich sind, können sie das Potenzial zur Expansion in den gesamten europäischen Markt aufweisen.

## Was die makroprudenzielle Politik zur Stabilisierung der Euroraum-Wirtschaft beitragen könnte

*Michaela Posch, Stefan W. Schmitz, Katharina Steiner und Eva Ubl*

In den ersten zehn Jahren nach Einführung des Euro drifteten die Länder des Euroraums wirtschaftlich auseinander. Die länderweisen Unterschiede wurden aber durch die in Summe ausgeglichene außenwirtschaftliche Position des Euroraums überlagert. Konkret gab es ein Nord-Süd-Gefälle: Deutschland und andere Länder im Norden erwirtschafteten hohe Leistungsbilanzüberschüsse, während die südlichen Länder, wie Griechenland, Portugal und Spanien, in Summe im gleichen Ausmaß Leistungsbilanzdefizite verzeichneten. Die steigende Inlands- und Auslandsverschuldung dieser Länder aufgrund des anhaltenden Kapitalzuflusses führte sodann im Zuge der globalen Finanzkrise 2008 zu einer starken Destabilisierung der Wirtschaft.

Dieser Beitrag geht davon aus, dass Leistungsbilanzdefizite in einer Währungsunion wie dem Euroraum nicht per se destabilisierend wirken müssen, sondern dass der grenzüberschreitende Kapitalfluss das wirtschaftliche Zusammenwachsen und die Risikoteilung im Privatsektor unterstützen kann, sofern die Entwicklung unter Kontrolle bleibt und beim Aufbau von Risiken entsprechend gegengesteuert wird. In diesem Zusammenhang argumentieren die Autoren, dass das Instrumentarium der Europäischen Union zur wirtschaftspolitischen Steuerung diesbezüglich weiter verbessert werden sollte. Im Jahr 2011 hat die EU mit dem sogenannten Verfahren bei einem makroökonomischen Ungleichgewicht zwar schon zusätzliche Kontrollmechanismen (Empfehlungen mit Sanktionsmöglichkeiten) eingeführt, um künftig ein wirtschaftliches Auseinanderdriften zu verhindern, und diese neuen Mechanismen sind auch ein wichtiges Instrument – doch es mangelt an einer glaubwürdigen Umsetzung sowie zusätzlichen Instrumenten.

Entsprechende makroprudenzielle Maßnahmen – also Maßnahmen mit dem Ziel, die Stabilität des Finanzsystems zu überwachen und zu sichern – könnten diese Lücke füllen. Der vorliegende Beitrag stützt sich auf die umfangreiche Literatur zur stabilisierenden Wirkung der makroprudenziellen Politik im Finanzsektor. Die Analyse führt zu dem Schluss, dass bei einem entsprechenden Einsatz des makroprudenziellen Instrumentariums weniger kapitalstarke Länder weiter Kapital importieren könnten und die privatwirtschaftliche Risikoteilung im Euroraum weiter ausgebaut werden könnte, ohne im Gegenzug negative Nebeneffekte wie übermäßiges Kreditwachstum und etwaige Zahlungsbilanzkrisen zu riskieren. Konkret schlagen die Autoren vor, das Verfahren bei einem makroökonomischen Ungleichgewicht um eine Analyse der makroprudenziellen Ausrichtung zu erweitern, insbesondere im Hinblick auf etwaige negative Nebeneffekte aus Kapitalzuflüssen. Diese Erweiterung dürfte sich positiv auf die Aktivierung der bestehenden makroprudenziellen Instrumente auswirken, und es ist auch davon auszugehen, dass unter Nutzung dieser Mechanismen bereits präventiv auf eventuell aufkommende Zahlungsbilanzkrisen reagiert werden kann. Untermauert wird dieser Vorschlag mit dem Argument, dass sich der Einsatz makroprudenzieller Maßnahmen in Österreich in der Nachkriegszeit nachweislich bewährt hat. Österreich liberalisierte damals vor dem Hintergrund eines strukturellen Handelsbilanzdefizits sowohl den Kapitalverkehr als auch den Bankensektor, ohne dass es zu einer Handelsbilanzkrise gekommen wäre.

## Editorial

Twenty years ago, on January 1, 1999, the euro was born. Three years later, euro banknotes and coins were first put into circulation. Since then the euro has been “the most tangible representation of European integration for our citizens” (Draghi, January 2019). But the euro has become much more than the embodiment of European ideas – indeed, the European Economic and Monetary Union is the core pillar of policymaking with a view to achieving the objectives of the EU as laid down in the Lisbon treaty, notably sustainable economic development, a free single market and a social market economy.

Within the framework set by the EU treaties, the role of the ECB and the national central banks as independent institutions is to provide a stable environment by maintaining stable prices. While the global financial crisis and the ensuing sovereign debt crisis have revealed some vulnerabilities and structural deficiencies of EMU, which are at the core of an ongoing reform process of the European Union, it can be well argued that European monetary policy not only successfully maintained stable prices over the past 20 years but, by taking rapid and decisive action, also played a key role in overcoming the crisis. By lowering the key interest rates for the euro area to the effective lower bound and using a broad range of nonstandard measures, the Eurosystem successfully stabilized financial markets, counteracted fragmentation, restored bank lending to the real economy and safeguarded the monetary union. Two decades after the introduction of the euro, this special issue of *Monetary Policy & the Economy* has been compiled to take stock of the impact EMU has had on the Austrian economy and to review the tasks and responsibilities the OeNB has assumed as part of the Eurosystem and the European System of Central Banks (ESCB).

The Eurosystem’s common monetary policy is geared toward the euro area as a whole and the primary objective of maintaining price stability, defined as an inflation rate below, but close to, 2% over the medium term. Developments in individual countries can and do deviate from the euro area average for various reasons, both cyclical and structural. Yet if deviations persist, imbalances can build up in terms of competitiveness, labor markets and unemployment as well as excessive credit growth. A first set of articles in this special volume therefore reviews how inflation, financing conditions, wages and fiscal policy have developed in Austria since 1999.

Concerning inflation, *Fritzer and Rumler* show that inflation was relatively low and stable over the past 20 years, with average annual HICP inflation at 1.8% – close to average inflation in the euro area of 1.7% and thus very much in line with the Eurosystem’s definition of price stability. They argue that comparatively higher inflation rates of services have been the main reason for above-average inflation in Austria since 2011. Importantly, the flexibility of consumer prices appears to have increased in Austria in the past 20 years, suggesting that resulting macroeconomic frictions may have decreased in recent years.

With regard to wage flexibility, another important adjustment channel for coping with adverse shocks in a monetary union, *Fenz, Ragacs and Stiglbauer* argue that earlier adherence to the “hard currency bloc” had contributed to the flexibility of the wage bargaining processes in Austria. As outlined, real gross wages per employee grew only modestly over the past 20 years while hourly wages evolved more dynamically, also compared to the euro area average, and especially Germany and

Italy. The wage share decreased continuously between 1999 and the Great Recession but increased significantly in the aftermath of the crisis and has been fairly constant in recent years. Finally, wage growth has been a reflection of the increasing openness of the Austrian economy and changes in participation rates.

*Gnan, Valderrama and Waschiczek* examine whether the stance of monetary policy adopted for the euro area was also adequate for Austria. To do so, they calculate a financial conditions index for Austria and assess euro area policy rates against a simple hypothetical monetary policy rule for Austria. The outcome is that, in general, financing conditions over the last two decades were adequate, i.e. had a stabilizing impact on the economy, with bank lending rates being the key transmission channel.

While flexible product and factor markets help countries cope with asymmetric shocks in monetary union, fiscal policy remains a key instrument at the national level, even if within the limits set by the European fiscal framework. In their article, *Köhler-Töglhofer, Prammer and Reiss* show that EU fiscal rules on the 3% target and the medium-term structural balance have influenced Austria's budgetary policy to a significant extent, thereby limiting Austria's "discretionary fiscal policy space". At the same time, however, expenditure and revenue structures have remained under full national responsibility, thus continuing to exhibit the socioeconomic and political preferences of the Austrian voters.

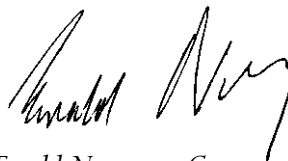
A second set of articles is devoted to the OeNB and its tasks in the Eurosystem/ESCB. According to the decentralized set-up of the Eurosystem, central decision powers reside with the Governing Council of the ECB in Frankfurt, but the implementation of the joint policies remains with the national central banks. *Jobst and Kwapil* review the implementation of monetary policy since 1999 through the lens of the OeNB's balance sheet. They show that during the crisis the balance sheets of the individual NCBs reflected the different extent but also the different channels through which national banking systems were affected. At the same time, however, NCBs' balance sheets have also been driven by structural factors and contingencies completely unrelated to monetary policy. They conclude that while the balance sheets of the euro area central banks contain valuable information, they have to be read with due care.

Regarding another central bank responsibility, cash logistics, *Schautzer and Stix* offer a view on euro cash holdings in Austria since 2002 – from the user as well as from the production and logistic side. They argue that while demand for cash for transaction purposes is bound to decline in the coming years, cash will retain an important role notably as a store of value. The high demand for cash is a manifestation of trust in the Eurosystem, building both on the stable purchasing power as well as on the "technical quality" of euro banknotes. But the national central banks are also key actors in noncash payments. Hence, *Dorfmeister* discusses recent developments in retail payment systems, notably the introduction of the Single Euro Payments Area (SEPA) in 2014, which significantly improved the efficiency of retail payments within EMU, reducing fees and increasing the speed and security of transactions.

The last contribution focuses on macroprudential policies – a shared responsibility of national authorities (in Austria the Financial Market Authority, the Ministry of Finance and the OeNB) and the ECB (European Systemic Risk Board). The global financial crisis had shown that it takes more than the supervision of individual institutions to ensure financial stability: a systemic perspective is needed

as well. Inspired by the effective application of macroprudential policy in Austria in the post-WW II era, *Posch, Schmitz, Steiner and Ubl* go one step further by arguing that the scope of macroprudential policy should be broadened beyond banking to include international capital flows in order to address negative side effects of structural and cyclical capital inflows into member states.

Understanding what happens in the member states of the euro area is crucial both for national policymakers striving to improve economic and social conditions there as well as for policymakers at the European level, as they continue to restructure and improve the institutional set-up of the Union, taking into account its interaction with the national and regional level. It is my hope that this special volume of *Monetary Policy & the Economy* will contribute to both these objectives.

A handwritten signature in black ink, appearing to read 'Ewald Nowotny', written in a cursive style.

*Ewald Nowotny, Governor*

# Analyses

# Inflation in Austria since the introduction of the euro

Friedrich Fritzer, Fabio Rumler<sup>1</sup>

Refereed by: Josef Baumgartner, Austrian Institute of Economic Research

Given that Austria had already pursued a fixed exchange rate regime with Germany prior to the establishment of European Economic and Monetary Union (EMU), it is unlikely that the inflation process in Austria has changed fundamentally due to the introduction of the euro. Nevertheless, according to the theory of monetary union, inflation rates and price levels should converge in a monetary union in the long run due to greater transparency and the abolition of (formal and informal) trade barriers. In this article, we investigate the inflation process in Austria in the last 20 years by analyzing the inflation-output trade-off, the degree of price flexibility as well as the development of inflation differences and price level convergence in the euro area since 1999. We find that comparatively higher inflation rates of services, in particular of catering services, have been the main reason for the above-average inflation rate in Austria since 2011. Furthermore, we find that the convergence of price levels within the euro area, as measured by the coefficient of variation between national price levels, primarily decreased in the years prior to EMU, but increased after 2007. The latter can be explained by the accession of a number of low price level countries to EMU in the years after its establishment. At the micro level, the degree of flexibility of consumer prices appears to have increased in Austria in the last 20 years, indicating that the macroeconomic frictions induced by price rigidity may have decreased in recent years.

JEL classification: E31, E52, F45

Keywords: inflation, inflation differences, price level convergence, Phillips curve, price rigidities, Austria

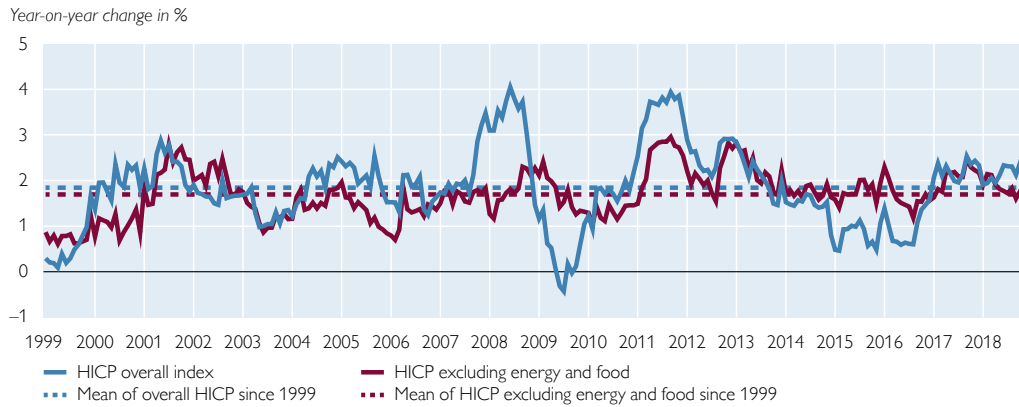
With the establishment of Economic and Monetary Union (EMU) in Europe, the exchange rate was given up as a policy instrument and as an adjustment mechanism in case of asymmetric shocks. A common monetary policy requires a common price stability target, implying, in turn, that equilibrium inflation rates should be equalized across member countries in the long run (see chapter 20 in Blanchard, 2017). In the short run, inflation rates can still differ substantially due to various reasons, including differences in taxation or asymmetric shocks. According to the theory of optimum currency areas (OCA), however, changes in the real exchange rate induced by differing inflation rates create a tendency for real economic and inflation developments to converge toward the long-run equilibrium (see De Grauwe, 2016). The elimination of imbalances occurs more rapidly and smoothly if prices and wages are more flexible and/or labor is more mobile within the union.

From a long-run perspective, average annual inflation, as measured by the Harmonized Index of Consumer Prices (HICP), has amounted to 1.8% in Austria since the establishment of EMU in 1999, which is indeed quite close to the average inflation rate of 1.7% in the whole euro area over the same period (see chart 1.1). Both values are also very much in line with the Eurosystem's definition of price stability of "below, but close to, 2%."

<sup>1</sup> Oesterreichische Nationalbank, Economic Analysis Division, [friedrich.fritzer@oenb.at](mailto:friedrich.fritzer@oenb.at) and [fabio.rumler@oenb.at](mailto:fabio.rumler@oenb.at). Opinions expressed by the authors of studies do not necessarily reflect the official viewpoint of the OeNB or the Eurosystem. The authors would like to thank the participants of an OeNB workshop, in particular Claudia Kwapil and Clemens Jobst, for their helpful comments and valuable suggestions.

Chart 1.1

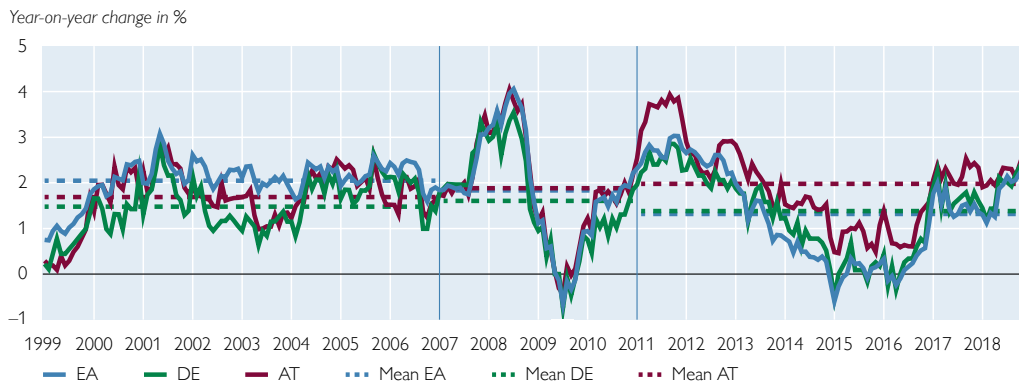
### HICP inflation and core inflation in Austria



Source: Statistics Austria.

Chart 1.2

### Inflation in Austria, Germany and the euro area



Source: Eurostat.

In order to identify the medium- to long-run movements of inflation, central banks usually calculate a measure that excludes the most volatile components of the HICP: energy, food, alcohol and tobacco. This measure, which is commonly called core inflation, amounted to 1.7% on average in Austria from January 1999 to December 2018 (chart 1.1). Large deviations of overall or headline inflation from core inflation reflect the fact that either food price inflation was particularly high, as in 2008 (or low), or energy price inflation was particularly high, as in 2011 (or low, as in 2009 and 2015/2016). In the long run, when transitory movements of the volatile components washed out, core inflation was very close to headline inflation, as can be seen in chart 1.1.

Even though inflation rates in Austria, the euro area and Austria's main trading partner, Germany<sup>2</sup>, were very close to each other in the long run, there were also

<sup>2</sup> After the cut-off date of this article, DESTATIS, the Federal Statistical Office of Germany, revised German inflation data as of 2015 due to a methodological change in the treatment of package holiday data in Germany. As a result, annual German HICP inflation for 2015 was revised upward from 0.1% to 0.7%. The revisions for the years after 2015 are negligible. For more information on this revision, see Deutsche Bundesbank (2019).



periods of more substantial deviations. In the early years of EMU, i.e. the period from 1999 to 2006, Austrian inflation was slightly below euro area inflation by an average 0.4 percentage points (yet by 0.2 percentage points higher than in Germany). In the period from 2007 to 2010, inflation in Austria was almost identical on average with euro area inflation, while in the latest period, i.e. from 2011 to 2018, it exceeded both euro area and German inflation considerably, namely by an average 0.6 percentage points and 0.5 percentage points, respectively (see chart 1.2).

Following this brief introduction, section 1 digs deeper into inflation differences and discusses the main reasons for the sustained above-average inflation rate in Austria since 2011. Section 2 analyzes the convergence of price levels both within and outside the euro area, which was to be expected as a result of the abolition of trade barriers after the introduction of the common currency. Based on estimations of the price Phillips curve, section 3 then addresses the trade-off between inflation and economic slack in Austria in the last 20 years. In section 4, we examine whether the degree of price rigidity present in HICP micro data has changed over time and, finally, section 5 concludes.

## 1 Inflation differences compared to other euro area countries

The persistent inflation differential between Austria and the euro area as well as between Austria and Germany since 2011 has almost exclusively been the result of considerably higher inflation in the Austrian service sector, while inflation rates in the goods sector have been almost identical in Austria, the euro area and Germany (see chart 2).<sup>3</sup>

Chart 2

### Inflation of goods and services

#### Goods



Source: Eurostat.

#### Services



<sup>3</sup> Even though the revision of German inflation data for 2015 was considerable, it is limited to package holidays and affects the inflation difference between Austria and Germany in 2015 only, so that the findings for the period from 2011 to 2018 discussed in this section should not be affected qualitatively by this revision.

Looking particularly at the differential between Austria and its main trading partner, Germany, we find that within the service sector, catering services<sup>4</sup> have accounted for almost half of the total inflation differential between the two countries since 2011 (see chart 3). Medical services and paramedical services, telephone and telefax services, recreational and sporting services as well as accommodation services follow as further important contributors to the inflation differential. However, their contribution is an order of magnitude smaller than that of catering services. Other service items, such as air tickets and social protection (more specifically, childcare services and nursing homes) have even had a small negative contribution to the inflation differential between Austria and Germany since 2011.<sup>5</sup>

The contribution of a particular service item to overall inflation is the product of its weight and its inflation rate. In chart 3, total differences between Austria and Germany in the inflation contributions of selected services (depicted by black frames) are decomposed into the contribution of differences in weights (blue bars) and the contribution of differences in inflation rates (dark red bars).<sup>6</sup> In the case of catering services, we find that the large contribution of catering services to the inflation differential rather results from a large difference in weights than from a difference in inflation rates. In fact, the weight of catering services in the Austrian HICP was 7 percentage points larger than that in the German HICP from 2011 to 2018, while its inflation rate was only about 1 percentage point larger. This implies that about 0.19 percentage points (or 70%) of the total 0.27 percentage points difference in the contribution of catering services to the Austrian-German inflation differential are due to differences in weights; the rest is due to differences in inflation rates.

Generally speaking, differences in weights of certain service items reflect the fact that households in one country spend a larger share of their income on these items than households in another country.<sup>7</sup> The larger weight of catering services in Austria is often explained by the importance of the tourism industry in Austria, which generates a lot of spending on catering and accommodation services and may also have exerted upward price pressures on these service items in recent years. However, this explanation can only be part of the story because prices of catering services are primarily collected in large cities rather than in rural touristic areas in Austria. Additionally, the weight difference between Austria and Germany for catering services is also substantial in the national Consumer Price Indices (CPIs), which do not include expenses of tourists.<sup>8</sup> Thus, the larger weight of catering

<sup>4</sup> *Catering services include restaurants, cafés, bars, discotheques, fast food outlets and canteens.*

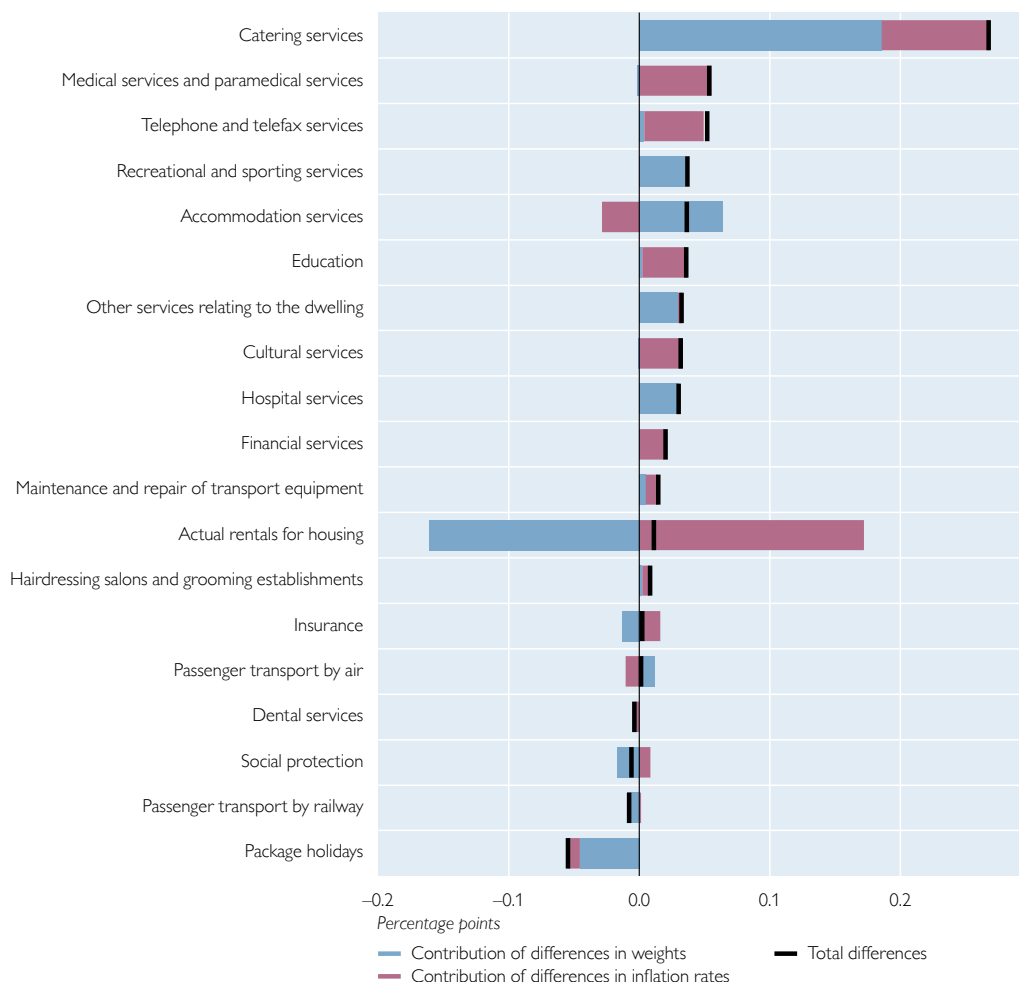
<sup>5</sup> *For a more detailed analysis of inflation differences between Austria, Germany and the euro area, see Roitner and Rumler (2017).*

<sup>6</sup> *The calculations are based on the so-called Shapley decomposition, which was first employed for the decomposition of income inequality. Shorrocks (2013) showed that it can be applied to any – not necessarily linear – function. Since, in our case, the decomposition is based on time-averaged weight and inflation data, the sum of the contributions of differences in weights and differences in inflation rates does not always exactly equal total differences, which are also time-averaged.*

<sup>7</sup> *Assuming that the underlying household consumption surveys are conducted in a similar way in both countries.*

<sup>8</sup> *Over the period from 2011 to 2018, the average weight of catering services in the Austrian HICP was roughly 11%, while it amounted to 4% in Germany. Within the euro area, the weight of catering services is lowest in Germany and highest in Ireland (16%), with Austria ranking fifth. In the national CPI, the weight of catering services was 9.5% in Austria in 2018, compared to 3.4% in Germany.*

### Differences between Austria and Germany in inflation contributions of selected services from 2011 to 2018



Source: Eurostat.

Note: Contribution of differences in weights and inflation rates are approximated using the Shapley decomposition.

services in Austria indeed reflects a stronger preference of Austrian households for dining and drinking out relative to German households.<sup>9</sup>

The weight of accommodation services (hotels, pensions, holiday homes, camping) in the Austrian HICP was also larger (by about 2 percentage points) than that in the German HICP, which is also partly due to the important role the tourism industry plays in Austria. However, inflation rates of accommodation services were slightly lower in Austria than in Germany from 2011 to 2018, which dampens the contribution of these services to the total inflation differential between the two countries. In contrast, in the cases of medical services and paramedical services as well as telephone and telefax services, the contribution to the inflation differential was mainly determined by higher inflation rates in Austria compared to Germany in the period from 2011 to 2018 (see chart 3). Moreover, interesting results can be

<sup>9</sup> For more details, see Roitner and Rumler (2017).

observed for actual rentals for housing in chart 3. Even though inflation of housing rents was 2.4 percentage points higher in Austria than in Germany over the period from 2011 to 2018, higher inflation developments were almost completely compensated by the substantially lower weight of rents in Austria (−6 percentage points), resulting in a negligible contribution of rents to the overall inflation differential. Comparing the weight of rents among euro area countries, we find that it is largest in the German HICP (10%) and lowest in Lithuania (0.6%), with Austria (4%) ranking somewhere in the middle.<sup>10</sup>

Apart from the service items shown in chart 3, the contribution of the public sector to overall inflation (through indirect taxes, public fees and administered prices) has been 0.2 percentage points higher in Austria than in Germany since 2011, which implies that the government also contributed a small amount to the inflation differential between the two countries.<sup>11</sup>

## 2 Price level convergence in the euro area and other country groups

During the past decades, policymakers have made continuous efforts to foster the economic and monetary integration of European markets, with one of the most important milestones being the introduction of a common currency in 1999. All of these efforts are likely to promote the convergence of price levels across euro area countries for the following reasons: (1) European economic integration goes hand in hand with the erosion of trade barriers (tariffs, non-tariff barriers, regulatory restrictions) and hence fosters price convergence for traded goods, in particular, simply by way of goods market arbitrage; (2) prices in less advanced countries (with usually lower price levels) increase faster simply because their productivity growth surpasses that of advanced economies (with higher price levels), which also leads to a catch-up in terms of price levels. The latter is due to the link between wages and productivity growth.

Section 2.1 explores the convergence in consumer prices for groups of countries within the EU, using price level data drawn from the comparative price level indices developed jointly by Eurostat and the Organisation for Economic Co-operation and Development (OECD) together with national central statistical offices. Based on these price level indices, convergence is measured using the standard deviation and variation coefficient<sup>12</sup> calculated for several groups of countries. The 28 EU countries are grouped into nine clusters for the purpose of comparing euro area with non-euro area price level convergence. The clusters are as follows:

- The euro area in a “fixed composition:” The founding members of the euro area, that is Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain as of 1995.
- The euro area in a “flexible composition:” All countries listed under (1) as of 1995 as well as Greece as of 2001, Slovenia as of 2007, Malta and Cyprus as of 2008, Slovakia as of 2009, Estonia as of 2011, Latvia as of 2014 and Lithuania as of 2015.

<sup>10</sup> For a detailed analysis of the coverage of housing costs in the Austrian HICP, see Roitner et al. (2018).

<sup>11</sup> For a more detailed analysis of the contribution of the public sector and other factors to the inflation differential between Austria and Germany, see Roitner and Rumler (2017).

<sup>12</sup> For the variation coefficient, the standard deviation is divided by the mean of the variable. Countries are not weighted as the analysis of price convergence requires the measurement of actual price differences, and not weighted price differences.

- The current 19 euro area countries as of 1995. In addition, the 19 euro area countries were split (3a) into a high-income group (Austria, Belgium, Cyprus, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Spain) and (3b) into a low-income group (Estonia, Greece, Latvia, Lithuania, Malta, Portugal, Slovakia, Slovenia).<sup>13</sup>
- The current 28 EU countries excluding the euro area countries: Bulgaria, Croatia, the Czech Republic, Denmark, Hungary, Poland, Romania, Sweden, and the United Kingdom. Furthermore, this group was split (4a) into high-income countries (Denmark, Sweden, the United Kingdom) and (4b) into low-income countries (Bulgaria, Croatia, the Czech Republic, Hungary, Poland and Romania).
- All 28 EU countries.

## 2.1 General consumer price level and prices for goods and services: Country groups

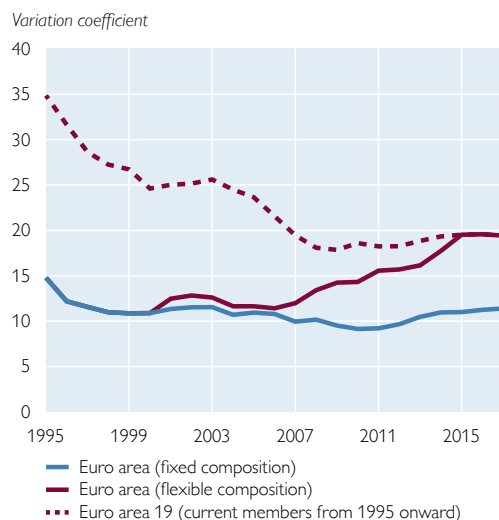
Chart 4 provides an overview of the changes in the variation coefficient for the aggregate consumer price level (household consumption expenditure) over time.

The variation coefficient<sup>14</sup> in chart 4 shows that price variation has been considerably lower in the euro area countries since 1995 than in other EU countries

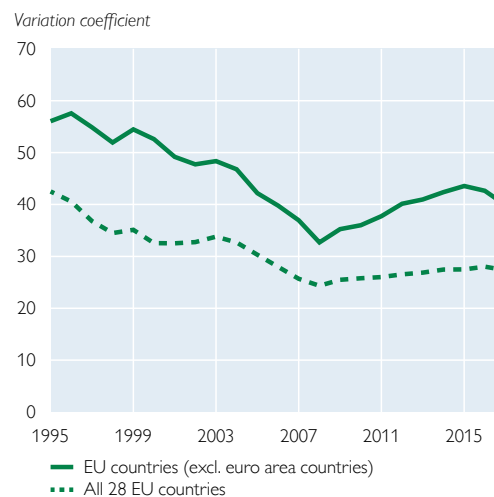
Chart 4

### General consumer price level: variation coefficient developments

#### Euro area



#### EU countries (excl. euro area countries) and EU countries



Source: Eurostat (price level indices from the European Comparison Programme), author's calculations.

Note: Euro area (fixed composition): founding members of Monetary Union as of 1995; euro area (flexible composition): founding members of Monetary Union as of 1995 as well as other euro area members as of their entry into the euro area; euro area 19: current members of Monetary Union lumped together as of 1995.

<sup>13</sup> The income groups are based on real per capita GDP. All 28 EU countries were ranked according to their income level and split into two groups comprising 14 countries each.

<sup>14</sup> The qualitative conclusions remain unchanged when the standard deviation is used as the measure of convergence. In the following pages, we will therefore only refer to the variation coefficient in our assessment of the level of price convergence.

excluding the euro area countries as well as the group of all 28 EU countries. In 2017 (the most recent year for which data are available), price level variation in the “fixed composition” euro area group, i.e. within the 11 founding members of the euro area, stood at 11.4% of the mean price level, while price level convergence within the “flexible composition” euro area group stood at 19.4%. However, in the group of the EU countries excluding the euro area countries, price level convergence reached almost four times the level of the “fixed composition” euro area group. In addition, we find an improvement in price level convergence for the “fixed composition” euro area countries until 2011, as opposed to a significant deterioration in price level convergence within the “flexible composition” euro area countries as of 2006. This can be attributed to the euro area accession of a number of countries with relatively low price levels during this period – i.e. of Greece (2001), Slovenia (2007), Cyprus and Malta (2008), Slovakia (2009), Estonia (2011), Latvia (2014) and Lithuania (2015). Lumping together all current euro area countries from 1995 onward shows a slightly different picture: Price convergence strongly improved from 1995 until 2008, and broadly stagnated from then onward. A closer look at the consumer price level reveals that, irrespective of the country group, services prices showed a higher variation compared to goods prices.

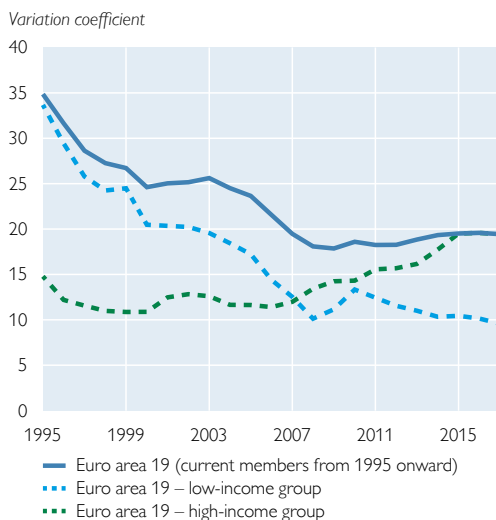
A further analysis of high-income as opposed to low-income countries indicates that price convergence progressed exclusively within the low-income country group. This is valid for both the group comprising the 19 euro area countries (see left panel of chart 5) and the group comprising the EU countries that are not members of the euro area (see right panel of chart 5). In addition, chart 5 shows that within the high-income euro area countries prices even diverged after 2007.

Even though – as described above – price convergence in the euro area countries is at a more advanced stage than in other EU countries, the question remains as to why convergence is not complete or why prices for some products even diverged.

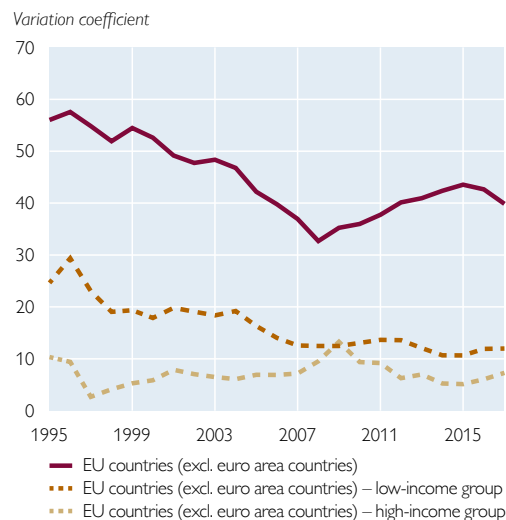
Chart 5

### General consumer price level in the EU according to income groups

#### Euro area countries according to income levels



#### EU countries (excl. euro area countries) according to income levels



Source: Eurostat (price level indices from the European Comparison Programme), author's calculations.

The effect of taxation on the price level may be one source of price divergence. Within the euro area, some countries have augmented their value-added tax (VAT) rates since 1995, including larger countries like Germany (from 16% to currently 19%), Spain (from 16% to currently 21%) and Italy (from 19% to currently 22%), but also smaller countries like Greece (from 18% to currently 24%) and Ireland (from 21% to currently 23%). Furthermore, economies with a relatively high level of prosperity (as measured by real per capita GDP) have been found to have higher price levels compared to countries with a lower level of real per capita GDP. The positive correlation between real GDP and price levels operates through both demand (e.g. higher consumer demand) and supply factors (higher productivity and thus higher wages). Therefore, the new Member States of the euro area – which are also countries with a considerably lower real per capita GDP level – may drive a long-lasting wedge between the price level of the euro area countries in “flexible composition” and that of the euro area founding members. However, also among the 11 founding members of the euro area, some divergence of the prosperity level could be observed after the financial and economic crisis in 2007/2008. The real per capita GDP level of Italy and Greece declined, while Spain’s level broadly stagnated. Other countries of the core euro area have recorded moderate increases in their real per capita GDP level since 2007/2008. Alongside these macroeconomic conditions, several structural factors may also have a causal effect on existing price differences. As a case in point, both retail profit margins and barriers to market entry for newly established firms may cause price level differences.

After having explored consumer price convergence for different country groups within the EU, section 2.2 examines price level convergence in Austria with respect to two of its most important trading partners – Germany and Italy.<sup>15</sup>

## **2.2 General consumer price level and prices for goods and services: Austria in comparison**

Based on the relative price level indices,<sup>16</sup> convergence in general consumer price levels has been recorded for Austria and its main trading partners over sub-periods since 1995. Against Germany, the period of convergence spans from 1995 to 2009, while it ranges from 1995 to 2002 against Italy (see left panel of chart 6).

In 1995, the price level in Austria was considerably above Italy’s, and slightly below Germany’s price level. One important factor contributing to consumer price convergence between Austria and Italy before 1999 was the appreciation of the Italian lira against the Austrian schilling. One interesting observation is that goods prices in Austria converged toward those of its main trading partners, while services prices did not. In fact, there have been no marked sustained differences in goods prices compared to Germany and Italy since about 2002. This is likely to be due to the higher tradability of goods compared to services. For services prices, however, Austrian prices have surpassed the German and Italian level since about 2007 (see right panel of chart 6). This might be the result of unit labor cost developments

<sup>15</sup> A previous analysis of price level convergence similar to the one in section 2 can be found in Fritzer (2012).

<sup>16</sup> The price level indices compiled under the Eurostat/OECD Purchasing Power Parities Programme are normalized to an EU average (here EU-15=100). In order to compare Austrian price levels directly with those in Germany, Italy and the euro area, the price level indices for Austria are divided by those of the other countries or regions, respectively, and then multiplied by 100. If the resulting relation is over (under) 100, Austria’s price level is above (below) that of the other countries or regions.

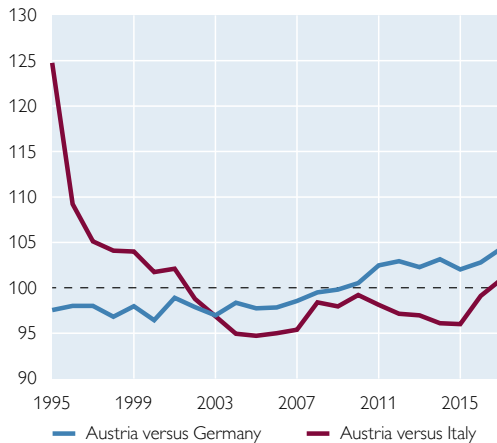


Chart 6

## Differences in price levels: Austria versus Germany and Italy

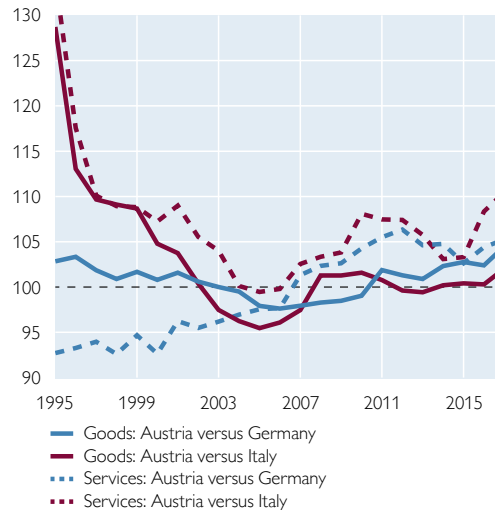
### Consumer price level

Relative price level for AT vis-à-vis DE, IT<sup>1</sup>



### Consumer goods and services

Relative price level for AT vis-à-vis DE, IT<sup>1</sup>



Source: Eurostat (price level indices from the European Comparison Programme), authors' calculations.

<sup>1</sup> Austria versus Germany (Italy) is defined as the price level index for Austria divided by that of Germany (Italy) and multiplied by 100. The Eurostat price level indices are normalized to EU-15=100.

for market services, which have developed more vigorously in Austria compared to Germany, in particular. Austrian unit labor costs (normalized to 1999=100) surpassed the German level in 2006, and remained above the latter until 2017.

### 3 The Austrian Phillips curve: inflation persistence and trade-off between inflation and economic slack

The Phillips curve is a long-standing framework to investigate the relation between inflation, inflation expectations, economic slack and imported inflation. We use empirically estimated Austrian Phillips curves to investigate two questions: First, has the trade-off between inflation and economic slack – the slope of the Phillips curve – changed during the last 20 years? Second, has inflation persistence, i.e. the dependence of inflation on its recent past, changed during the past two decades? Both questions are of high importance for policymakers: The trade-off between inflation and economic slack determines the output loss necessary to bring down inflation (the so-called sacrifice ratio) or, vice versa, the output growth necessary to lift inflation in case it is below levels deemed appropriate. Inflation persistence decreases the effectiveness of monetary policy as the impact of monetary policy measures passes through to inflation at a slower pace. For the euro area, there is evidence that both inflation persistence as well as the responsiveness of inflation to economic slack has increased during recent years (see Ciccarelli and Osbat, 2017). In our analysis, we deliver a full and updated account on these issues for Austria.



Our benchmark specification is

$$\pi_t = \mu + \rho\pi_{t-1} + \theta\pi_t^e + \beta x_t + \gamma imp_{t-1} + \varepsilon_t,$$

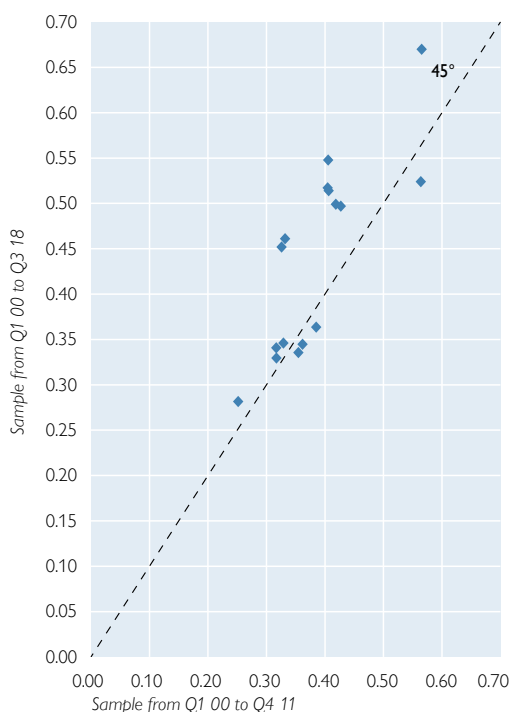
where  $\pi$  is the annual HICP inflation rate (seasonally adjusted),  $\pi^e$  are inflation expectations,  $x$  is the measure of economic slack and  $imp$  is the annual growth rate of oil prices in euro. In this specification,  $\rho$  is our indicator of inflation persistence, and  $\beta$  represents the trade-off between inflation and economic slack.

One of the critical issues in Phillips curve specifications of this kind is that neither economic slack nor inflation expectations are directly observable. Therefore, results may be sensitive to the measurement (errors) of these variables. We try to robustify the results by estimating the Phillips curve for a bundle of slack and inflation expectations measures. The following indicators of economic slack are incorporated into the estimation one at a time: GDP growth, the unemployment rate, the unemployment gap (unemployment rate minus an estimate of the non-accelerating inflation rate of unemployment), the unemployment recession gap<sup>17</sup> as well as estimates of the output gap from the OeNB, the OECD, the International Monetary Fund (IMF) and the European Commission. Furthermore, two estimates of inflation

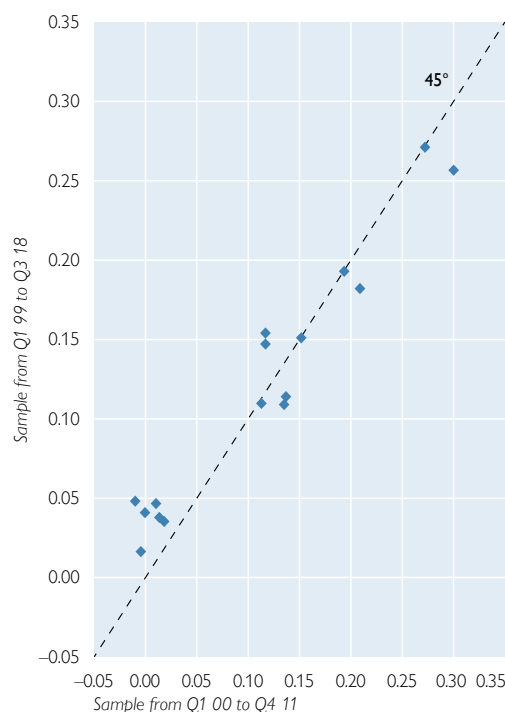
Chart 7

### Austrian Phillips curve

Inflation persistence in two samples



Slope in two samples



Source: Authors' calculations.

<sup>17</sup> The unemployment recession gap is the difference between the current unemployment rate and the minimum unemployment rate over the current and previous 11 quarters. Hence, the slack indicator is the unemployment rate recorded during downturns and zero otherwise. For more information, see Stock and Watson (2010).

expectations are incorporated one at a time: inflation forecasts for the current year and inflation forecasts for the next year, as provided by Consensus Economics<sup>18</sup>. Hence, in total there are 16 Phillips curve specifications, which we estimate over two different periods: from Q1 2000 to Q3 2018 and from Q1 2000 to Q4 2011. The second sample was restricted to end in Q4 2011 as inflation followed a markedly different path after this point in time. During the period up to Q4 2011, the stable development of inflation was interrupted by volatile developments during the economic and financial crisis in 2007/2008. As of Q1 2012, a long disinflation period was followed by a dynamic acceleration of inflation after 2016.<sup>19</sup>

The empirical estimates of inflation persistence and the slope of the Phillips curve are depicted in chart 7 where the vertical axis measures the estimates over the full sample (until Q3 2018) and the horizontal axis measures the estimates over the shorter sample (ending in Q4 2011). In case the estimates coincide with the 45-degree line, they are identical in the two samples. Estimates above (below) the 45-degree line signal higher (lower) parameter estimates over the full sample as compared to the sample restricted to the period up to Q4 2011.

The left panel of chart 7 represents inflation persistence (the estimate of  $\rho$  in the Phillips curve), i.e. the dependence of inflation on its past. Increases in inflation persistence indicate that monetary policy was working less efficiently as central bank actions took longer to pass through to inflation. Chart 7 shows that the majority of inflation persistence estimates are above the 45-degree line, with some of these

Table 1

### Chow test of parameter stability

Specification	Inflation persistence		Slope of the Phillips curve	
	Chow test statistic	P-value	Chow test statistic	P-value
HICP, GDP, OIL, Consensus_CY	0.94	0.34	0.87	0.35
HICP, GDP, OIL, Consensus_NY	0.49	0.49	0.85	0.36
HICP, UR, OIL, Consensus_CY	0.08	0.78	0.00	0.95
HICP, UR, OIL, Consensus_NY	0.00	0.97	0.04	0.84
HICP, Output Gap, OIL, Consensus_CY	0.29	0.59	0.29	0.59
HICP, Output Gap, OIL, Consensus_NY	0.22	0.64	0.41	0.52
HICP, Unemployment Gap, OIL, Consensus_CY	0.00	0.97	0.30	0.58
HICP, Unemployment Gap, OIL, Consensus_NY	0.01	0.92	0.24	0.62
HICP, Unemp. Recession Gap, OIL, Consensus_CY	0.19	0.66	0.00	1.00
HICP, Unemp. Recession Gap, OIL, Consensus_NY	0.02	0.88	0.00	0.97
HICP, OECD OG, OIL, Consensus_CY	0.62	0.44	2.00	0.16
HICP, OECD OG, OIL, Consensus_NY	0.33	0.57	2.02	0.16
HICP, WEO OG, OIL, Consensus_CY	0.49	0.49	1.14	0.29
HICP, WEO OG, OIL, Consensus_NY	0.61	0.44	1.87	0.18
HICP, EC OG, OIL, Consensus_CY	0.37	0.54	1.81	0.18
HICP, EC OG, OIL, Consensus_NY	0.12	0.73	1.76	0.19

Source: Authors' calculations.

Notes: The null hypothesis of the Chow test is that parameters are equal in the sub-samples. In the current application, the samples cover the periods from Q1 2000 to Q4 2011 and from Q1 2012 to Q3 2018.

<sup>18</sup> Consensus Economics collects forecasts of several professional forecasters and publishes an average thereof; available at <https://www.consensuseconomics.com/>.

<sup>19</sup> The separate estimation of the Phillips curves over the sample starting in Q1 2012 was not implemented as it contains only 27 quarterly observations. The lack of sufficient observations deteriorates the precision of the parameter estimates considerably.

estimates being pretty close to and fewer estimates being below the 45-degree line. Over the whole sample, all but one estimate of inflation persistence are significantly different from zero, while over the shorter sample (up to Q4 2011) only 9 out of the 16 estimates are statistically significant. Altogether, there seems to be more evidence for an increase in inflation persistence after Q4 2011.

Considering the link between inflation and real activity (see right panel of chart 7), the majority of estimates lies above the 45-degree line, with four estimates coinciding with the 45-degree line. It turns out that the significant parameter estimates are all close to or coincide with the 45-degree line. The results provide (very weak) evidence that the slope of the Phillips curve has not changed since 2000. No change in the Phillips curve slope suggests, in turn, that dampened economic growth occurring from 2012 to 2016 has not fundamentally changed wage bargaining or firms' price-setting behavior.

To shed more light on the statistical significance of the results, a structural break test according to Chow (see Chow, 1960) was conducted. Table 1 provides the results of the test examining the equality of the parameter estimates for inflation persistence and the Phillips curve slope during the two periods from Q1 2000 to Q4 2011 and from Q1 2012 to Q3 2018.<sup>20</sup>

In all of the specifications, the hypothesis of stable parameters in the two samples is rejected for both inflation persistence and the slope of the Phillips curve (the trade-off between inflation and economic activity). This is at odds, in particular, with the previous tentative assessments of a stable slope of the Phillips curve and, to a lesser extent, with an increase in inflation persistence during the last two decades. The test, however, assumes that the parameters are estimated separately during the two periods, which is likely to have affected the precision of the estimates. Furthermore, the Phillips curve estimates seem to be rather sensitive to sample changes. Overall, however, the previous assessment could not be confirmed by statistical evidence.

#### 4 Price rigidity over the last 20 years as derived from micro price data

Micro price data, i.e. individual data collected by Statistics Austria for HICP calculation, allow us to analyze how often and by how much retailers and service providers change their prices. From this, we can derive the degree of price rigidity present in the Austrian retail industry and further analyze whether it has changed over time.

To compute the inflation rate, Statistics Austria collects the prices of more than 700 goods and services in different outlets in 20 cities in Austria and (for some products) on the internet at monthly frequency. Based on this data, we calculate a number of descriptive statistics that characterize the price-setting behavior of Austrian retail firms, i.e. the average frequency of price changes, the average duration of constant prices (length of price spells) and the average size of price changes.<sup>21</sup>

<sup>20</sup> The acronyms HICP (HICP inflation), GDP (GDP growth), OIL (growth of oil prices in euro), Consensus\_CY and Consensus\_NY (inflation forecasts for the current year and the next year as provided by Consensus Economics), UR (unemployment rate), Output Gap (OeNB estimate of the output gap), OECD OG (OECD estimate of the output gap), WEO OG (IMF estimate of the output gap), EC OG (European Commission estimate of the output gap), Unemployment Gap (unemployment rate minus the non-accelerating rate of unemployment), and Unemployment Recession Gap (as defined in section 3) comprise the variables included in the Phillips curve specification.

<sup>21</sup> Our analysis is based on an updated version of the dataset used in Baumgartner et al. (2005). In the new dataset, the sample period spans from January 1996 to December 2017. For a more detailed description of the features of the data used and a detailed explanation of how the descriptive statistics were calculated and interpreted, see Baumgartner et al. (2005).

#### 4.1 Prices of energy and unprocessed food items are more flexible than prices of other products

Over the whole basket of goods and services and over the entire sample period from January 1996 to December 2017, 18.1% of all prices were changed each month. This implies that, on average, prices remained constant for about 12 months (median of 10 months).<sup>22</sup> Furthermore, more prices were changed upward (10.2%) than downward (7.3%),<sup>23</sup> but the average price increase (+10.5%) was smaller than the average price decrease (−14%). These average numbers for the whole basket hide a considerable degree of heterogeneity across products. Broken down by product type, we find that prices were changed much more frequently for energy and unprocessed food items than for processed food items, non-energy industrial goods and services.

#### 4.2 Price flexibility has increased over time, no inflationary effect of the euro cash changeover

The large number of monthly observations in our dataset allows us to calculate the descriptive statistics for every single month. Chart 8.1 plots the average frequency of price changes of all products over time. From the chart, we can clearly detect a seasonal pattern of price changes, with most price adjustments taking place in January of each year. This is particularly the case for many service items whose prices are typically changed in January. Apart from the seasonal pattern, we can also detect a clear upward movement of the frequency of price changes over time: Between the beginning and the end of our observation period, the average frequency of price changes has almost doubled. This indicates that the price-setting process has become more flexible in Austria over time and, consequently, macro-economic frictions induced by nominal rigidities are likely to have decreased in the recent past compared to before.

At first sight, the finding of higher price flexibility over time may seem to be at odds with the weak evidence of increased inflation persistence in the previous section. However, when consulting the most widely recognized theory of inflation determination, the hybrid New Keynesian Phillips Curve (NKPC), we realize that the frequency of price adjustments and inflation persistence are actually positively correlated. This is due to the fact that the NKPC assumes Calvo price setting<sup>24</sup> with partial indexation: Each firm is allowed to reset its prices in a given period with a constant probability (Calvo probability) and within this group, a fraction of firms does not set prices optimally but chooses to index its prices to past inflation. Thus, the more firms change their prices in any period, the larger the number (in absolute terms) of firms that set their prices in a backward-looking way and, as a result, the higher the persistence of the inflation process.

To examine whether the introduction of euro cash in January 2002 has had an effect on the price-setting behavior of Austrian retailers, we draw separate trend

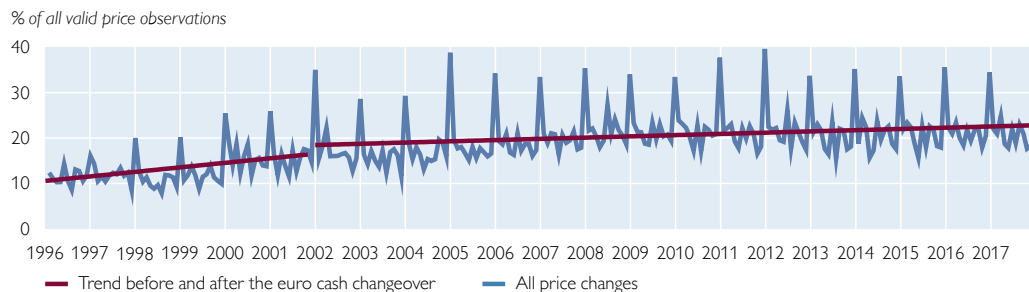
<sup>22</sup> The frequency of price changes  $F$  is converted to the price duration  $T$  by using the formula  $T = -1/\ln(1-F)$ . The calculations are done at the product level and then aggregated over the whole basket (using the HICP weights) to arrive at the mean and median price duration cited in the text.

<sup>23</sup> The frequencies of price increases and decreases do not exactly sum to the frequency of all price changes because of the weighting employed in the aggregation.

<sup>24</sup> For more information, see Calvo (1983).

Chart 8.1

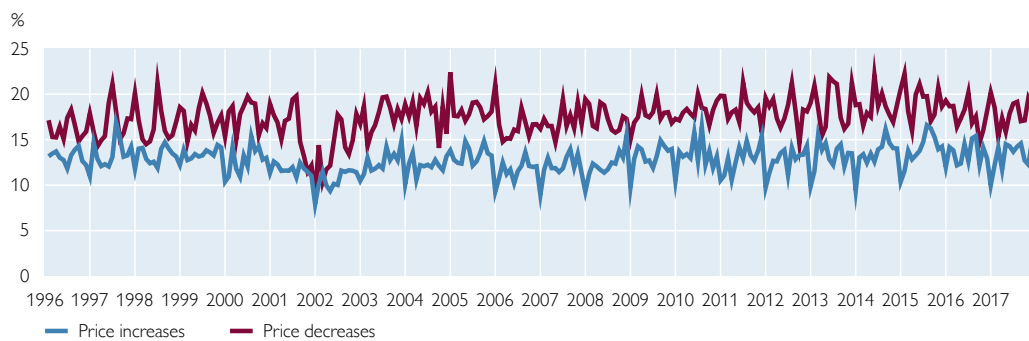
### Frequency of price changes



Source: Statistics Austria, authors' calculations.

Chart 8.2

### Size of price changes



Source: Statistics Austria, authors' calculations.

lines for the periods before and after the cash changeover and indeed find that a mean shift in the frequency of price changes occurred around the date of the cash changeover. This observation is supported by a Chow breakpoint test, which detects a significant break in both the mean and the trend of the frequency of price changes.

Turning to the time series of the average size of price increases and decreases shown in chart 8.2, we cannot detect any clear trend over time. Average price decreases are always larger than price increases, and they also appear to follow a seasonal pattern: Price decreases are largest in the summer months of July and August, while price increases are lowest in January. The former observation most likely results from summer sales in the clothing retail sector. However, since there are no fixed dates for sales periods throughout the year as they vary with demand conditions in retail markets, the seasonal pattern is not entirely stable over time.

Another striking feature in chart 8.2 is the sharp drop in the average size of both price increases and decreases in January 2002, the month of the cash changeover. Obviously, in this month (and, to a smaller extent, also in the three months preceding and following the cash changeover), more prices were adjusted than normally (as can be seen in chart 8.1); yet, they were adjusted by a smaller amount. Given that the upward and downward adjustments at the time of the cash changeover were about symmetrical both in terms of size and frequency, we cannot detect any inflationary effect of the cash changeover in our data.

## 5 Conclusions

In the period after the introduction of the euro 20 years ago, Austrian inflation was relatively low and stable. Since 2011, however, inflation rates in Austria have been above the euro area average, which is the result of relatively higher price increases of services, in particular of catering and accommodation services. The strong and prosperous tourism industry in Austria, which may have driven up prices of these services, is only part of the answer. There also seems to be a stronger preference of Austrian consumers to dine and drink out than in other countries, which is reflected by the considerably higher weight of catering services in the Austrian HICP.

Price level convergence among today's euro area countries improved, in particular, in the years prior to EMU and, to some extent, in the first years after the introduction of the common currency. Afterwards, this process stagnated or even worsened. The latter can be attributed to the accession of several low price level countries to EMU during the past 17 years. Austria's general consumer price level has surpassed the German price level from 2010 onward, while being broadly in line with Italy's consumer price level during the two most recent years. While services prices in Austria appear to have stayed above German and Italian services prices, Austrian goods prices have witnessed less (compared to Germany) or no (compared to Italy) divergence from the goods price level of its main trading partners. The development of Austria's unit labor costs with respect to Germany, in particular, may be one reason for the divergent services price development in Austria compared to Germany and Italy.

Concerning the persistence of the inflation process, we find that inflation persistence, as measured by Phillips curve estimations, may have increased during the past 20 years; however, no firm empirical evidence has been found to support this conclusion. Furthermore, estimates of the relation between inflation and economic slack do not provide clear evidence whether this link has remained unchanged or not.

In macroeconomic theory, the degree of price rigidity in an economy – together with other nominal and real frictions – is relevant for the size and timing of the real effects of monetary policy. We find that the degree of price rigidity, as measured by micro consumer prices, has gradually decreased in Austria over the last 20 years, which implies that the transmission of monetary policy may have changed over that period.

## References

- Baumgartner, J., E. Glatzer, F. Rumler and A. Stiglbauer. 2005.** How Frequently Do Consumer Prices Change in Austria? Evidence from Micro CPI Data. ECB Working Paper 523. September.
- Blanchard, O. 2017.** Macroeconomics. 7<sup>th</sup> Edition. Global Edition. Pearson Education Limited.
- Calvo, G. 1983.** Staggered prices in a utility-maximizing framework. In: *Journal of Monetary Economics* 12(3). 383–398.
- Chow, G. 1960.** Tests of Equality Between Sets of Coefficients in Two Linear Regressions. In: *Econometrica*, 28/3. 591–605.
- Ciccarelli, M. and C. Osbat (eds.). 2017.** Low inflation in the euro area: Causes and consequences. ECB Occasional Paper 181. January.
- De Grauwe, P. 2016.** Economics of Monetary Union. 11<sup>th</sup> Edition. Oxford: Oxford University Press.
- Deutsche Bundesbank. 2019.** The revision of the sub-index for package holidays and its impact on the HICP and core inflation. In: Deutsche Bundesbank. Monthly Report. March. 8–9.

- Fritzer, F. 2012.** Price Level Convergence Before and After the Advent of EMU. In: OeNB. Monetary Policy and the Economy Q1/12. 105–116.
- Rogers, J. H. 2007.** Monetary union, price level convergence, and inflation: How close is Europe to the USA? In: Journal of Monetary Economics 54(3). 785–796.
- Roitner, A. and F. Rumler. 2017.** Worauf lässt sich der persistente Inflationsabstand Österreichs zum Euroraum und zu Deutschland zurückführen? In: Inflation Aktuell – Die Inflationsanalyse der OeNB Q4/17. 10–16.
- Roitner, A., F. Rumler and K. Wagner. 2018.** Wie sehr reflektiert die HVPI-Inflationsrate die Wohnkosten der Österreicher? In: Inflation Aktuell – Die Inflationsanalyse der OeNB Q1/18. 10–14.
- Shorrocks, A. F. 2013.** Decomposition procedures for distributional analysis: a unified framework based on the Shapley value. In: The Journal of Economic Inequality 11(1). 99–126.
- Stock, J. and M. Watson. 2010.** Modeling inflation after the Crisis. In: Federal Reserve Bank of Kansas City. Proceedings – Economic Policy Symposium – Jackson Hole. 173–220.



# Aggregate wage developments in Austria since the introduction of the euro

Gerhard Fenz, Christian Ragacs, Alfred Stiglbauer<sup>1</sup>

Refereed by: Helmut Hofer, Institute for Advanced Studies

Real gross wages per worker have experienced a very subdued development since the introduction of the single currency in Austria. Average hourly wages, on the other hand, have evolved more dynamically. Between 1999 and the Great Recession, the wage share decreased continuously, and wage growth was less than suggested by the “Benya rule.” However, having increased significantly in the aftermath of the crisis, the wage share has been fairly constant in recent years. In 2017, the wage share was only slightly lower compared to that in 1999. The institutional specifics of Austrian wage setting are unique for a developed country (neo-corporatist system, almost complete union coverage and highly coordinated wage setting). Despite declining union density, the system has remained virtually unchanged since the early 1980s. Arguably, joining Economic and Monetary Union (EMU) did not lead to pressures to change the wage bargaining process as Austria had already been part of the “hard currency bloc” in Europe before the introduction of the euro. Phillips curve estimations suggest that nominal wage growth in the past twenty years has been mainly determined by labor productivity and past inflation but has reacted only weakly to the cyclical stance of the economy. In addition, we analyze the effects that structural changes in the labor market and the internationalization of the Austrian economy have had on wage developments. We find evidence that the increased openness of the Austrian economy and changes in participation rates have had a dampening effect on wage growth. In contrast, we find no significant effects for changes in the share of part-time and fixed-term contracts, and in the share of foreign workers. The overall cumulative effect of EMU on wage growth in Austria is estimated to be positive.

JEL classification: E25, J30, J51

Keywords: wage share, collective bargaining, Austria, monetary union

This article discusses the aggregate wage development in Austria since the establishment of Economic and Monetary Union (EMU) and its main determinants. According to general understanding, the main determinants of nominal wage growth are inflation and productivity growth. When bargaining over wages, both workers and firms have, on the one hand, real consumption and real product wages in mind. On the other hand, when real wages grow in line with productivity, the functional income distribution (i.e. the income shares of labor and capital) remains constant – and may thus be regarded as a “benchmark” with both labor and capital receiving the same gains from economic growth. In addition to inflation and productivity, many other factors can be expected to influence wage growth. These include the economic cycle and specific labor market shocks, such as changes in labor market participation rates or migration. Furthermore, structural factors may also be relevant: Among these are the institutional structure of collective bargaining, EU and EMU accession, growing internationalization as well as growth of both non-standard and part-time contracts in the labor market.

The article is structured as follows: Section 1 starts by presenting stylized facts on the development of wages and employment. Section 2 then presents key institutional

<sup>1</sup> Oesterreichische Nationalbank, Economic Analysis Division, [gerhard.fenz@oebn.at](mailto:gerhard.fenz@oebn.at), [alfred.stiglbauer@oebn.at](mailto:alfred.stiglbauer@oebn.at), [christian.ragacs@oebn.at](mailto:christian.ragacs@oebn.at) (corresponding author). The authors thank Doris Ritzberger-Grünwald, Walpurga Köhler-Töglhofer, Doris Prammer and Lukas Reiss (all OeNB) and the referee for helpful comments and valuable suggestions.



characteristics of collective bargaining in Austria. Seeking to provide some empirical insights, sections 3 and 4 aim to quantify the influence of inflation, productivity and other factors on wage growth. More precisely, section 3 shows wage Phillips curve estimation results for Austria and other EU countries, while section 4 refines the empirical specifications of wage equations for Austria by explicitly allowing for structural factors.

## 1 Stylized facts: changes in wages, employment and wage shares

At the outset, some clarifying remarks on the wage measures used are helpful.<sup>2</sup> The wage rate is defined as the wage bill divided by employment. For the wage bill, we use total compensation of employees according to national accounts data, which is roughly equivalent to total wage costs. The measure for employment is the number of hours worked by employees, and the resulting wage measure is average compensation per hour worked. We prefer this measure over compensation per employee as the latter is biased by the pronounced downward trend in working hours per employee (mainly due to the rising share of workers in part-time jobs). When interpreting the aggregate growth of hourly wages, we have to bear in mind that the observed changes might be due to changes in wages while the composition of the workforce remains stable and due to changes in the composition of the number of employees while holding wages constant. The wage share is defined as compensation of employees as a percentage of net national income minus other taxes less subsidies on production and thus considers potential changes in the depreciation rate and other factors.<sup>3</sup>

The left panel of chart 1 displays indices for nominal and real wages in Austria, respectively, including collectively agreed wages.<sup>4</sup> The difference between real and nominal wages is marked by inflation, as measured by the Harmonized Index of Consumer Prices (HICP), as consumer price inflation typically serves as the basis for wage negotiations in Austria (see the orange line).<sup>5</sup> The chart reveals that real hourly wages experienced an increase of about 13% between 1999 and 2018. Over the same period, real labor productivity per hour increased by about 20% (see right panel of chart 1). The number of hours worked has grown steadily since 1999 (by about 14%), except for a temporary sharp contraction during the Great Recession in 2008/2009. The number of employees has increased by 23% over the same period; yet, the contraction experienced during the crisis was much smaller due to labor hoarding. This implies that the growth in real compensation per worker was much weaker (+4.5%) than the growth in real wages per hour worked (+12.8%).

<sup>2</sup> Data on wages and employment are seasonally and working day-adjusted national accounts data if not indicated otherwise (until Q4 2018, trend-cycle component). The cut-off date for all data is March 1, 2019. Due to data limitations, the wage shares could only be calculated until 2017.

<sup>3</sup> For a detailed definition of the wage share, see annex.

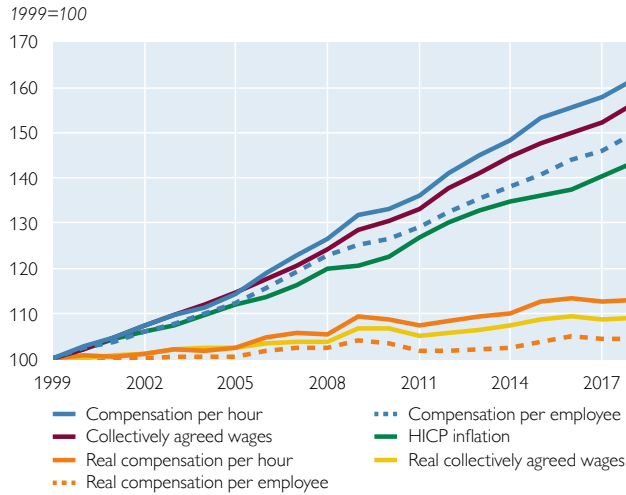
<sup>4</sup> As measured by the Tariflohnindex (TLI), an index measuring the evolution of collectively agreed minimum wages and salaries.

<sup>5</sup> Strictly speaking, the Consumer Price Index (CPI) – as opposed to the HICP – is regarded as the relevant inflation measure for Austrian wage negotiations. The difference in growth rates between the two indices was, however, very small, with the CPI increasing by 44.1% from 1999 to 2018, and the HICP by 43.3%. From the perspective of employers, the GDP deflator would be the appropriate inflation measure. In the remainder of the article, unless stated otherwise, we use the consumption deflator to calculate real wages and the GDP deflator to calculate real productivity. For further information on the effects the different inflation measures have on the wage share, see the annex. See also Marterbauer und Walterskirchen (2003).

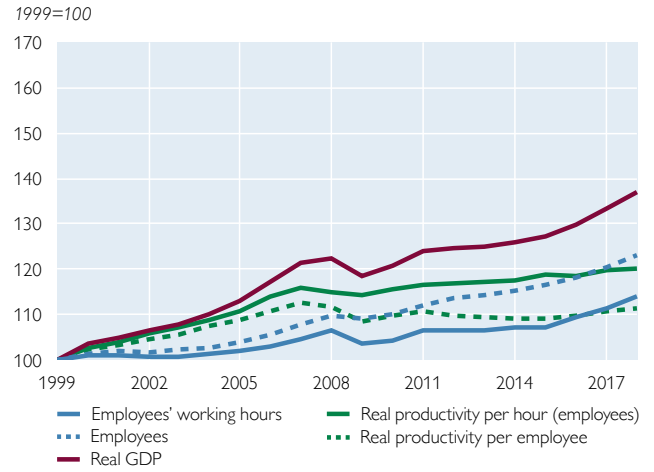
Chart 1

### Wages, employment and productivity in Austria from 1999 to 2018 (total economy)

#### Nominal and real wages and inflation



#### Employees, real GDP and productivity



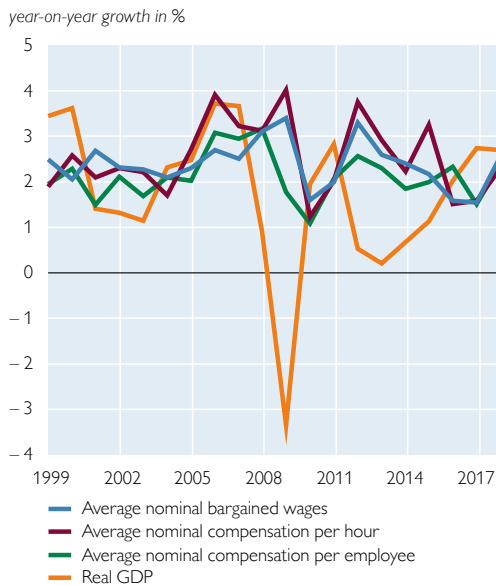
Source: Statistics Austria, OeNB, authors' calculations.

Note: Collectively agreed wages are based on the "Tariflohnindex" (TLI).

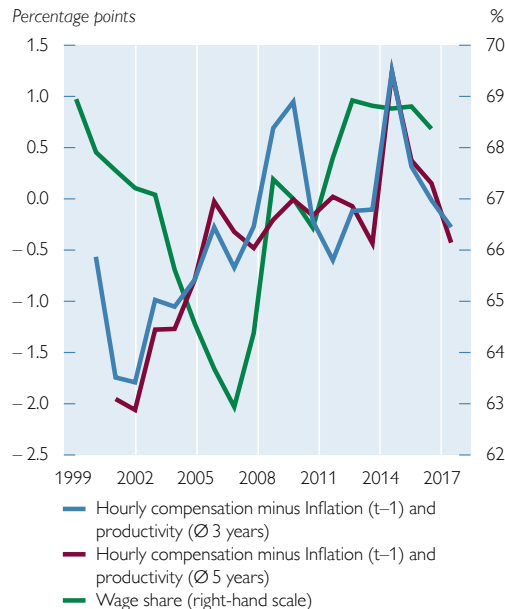
Chart 2

### Wages and the business cycle, the "Benya rule" and the wage share

#### Nominal wages and the business cycle



#### Hourly compensation less "Benya rule" and wage share



Source: Eurostat, Statistics Austria, OeNB, authors' calculations.

The left panel of chart 2 shows the annual growth rates of various measures of nominal wages, i.e. hourly wages, wages per employee and bargained wages (together with real GDP growth). As can be seen in the chart, the growth rates of the various wage measures are highly correlated and wage changes tend to lag the business cycle.

When nominal wages grow at the same pace as inflation and real productivity do each year, then the functional income distribution remains unaffected, and the wage share constant.<sup>6</sup> In fact, the right panel of chart 2 shows that the wage share is characterized by large movements in the period under investigation. Between 1999 and the Great Recession, the wage share declined steadily, before increasing significantly in the aftermath of the crisis and remaining fairly constant in recent years. In 2017, the wage share was only slightly lower compared to that in 1999.<sup>7</sup>

According to Mesch (2015), unions aim to maintain a constant wage share. This is exemplified by the so-called “Benya rule”,<sup>8</sup> according to which nominal wage increases should be equal to the sum of consumer price inflation in the past year and medium-run productivity growth, which roughly implies a constant wage share in the medium term. Did actual wage growth conform to this rule? The right panel of chart 2 depicts the difference between the actual increase of hourly wages and the hypothetical wage growth implied by the Benya rule.<sup>9</sup> Since “medium-run productivity growth” is not clearly defined, two different definitions are applied: productivity growth over the past three years and productivity growth over the past five years. Regardless of which definition is used, the chart reveals that, between 1999 and the Great Recession, actual wage growth was below the level suggested by the Benya rule. After the crisis, wage growth has been above the benchmark on average.

Box 1

### Real wages, employment and wage shares in selected euro area countries

*In the period from 1999 to 2017, the developments of real wages per hour, employment and wage shares were not synchronized across euro area countries. Over the whole period, growth of hourly wages in Austria was stronger than the euro area average (left panel of chart 3). A comparison with other euro area countries shows that wage growth was stronger in France, but weaker in Germany and, above all, in Italy.*

*Interesting differences can be observed over time. Before the Great Recession, wage developments were remarkably dynamic in all countries except Germany. In the years 2010/2011, real wages decreased in most countries as a result of the crisis, before increasing in all countries except Italy and the Netherlands after 2012.*

*Similar observations can be made for hours worked. The middle panel of chart 3 shows that employment growth was strongest in Austria. Employment in the euro area increased strongly before the crisis and plunged during the crisis. In 2017 (the latest year for which harmonized data are available), the number of hours worked in the euro area was still below its pre-crisis level.*

*Finally, there is also considerable heterogeneity in the levels and development of wage shares (right panel of chart 3). In 2017, the wage share of the total economy was about 76.2% in*

<sup>6</sup> Strictly speaking, this only holds if the depreciation rate, the tax rate on production less subsidies and the ratio of GDP to gross national product (GNP) remain constant and consumer price inflation equals inflation according to the GDP deflator. For further details, see annex. We do not calculate adjusted wage shares where a correction is made for changes in the ratio of hours worked by employees to total working hours (including those of the self-employed) as this figure is distorted by structural changes in the agricultural sector (i.e. a sharp reduction in the number of part-time farmers).

<sup>7</sup> For a discussion of the longer-term development of the wage share as well as of the development of personal income distribution in Austria, see Mayrhuber et al. (2018). For the historical development of the wage share between 1955 and 1995, see Chaloupek et al. (2008).

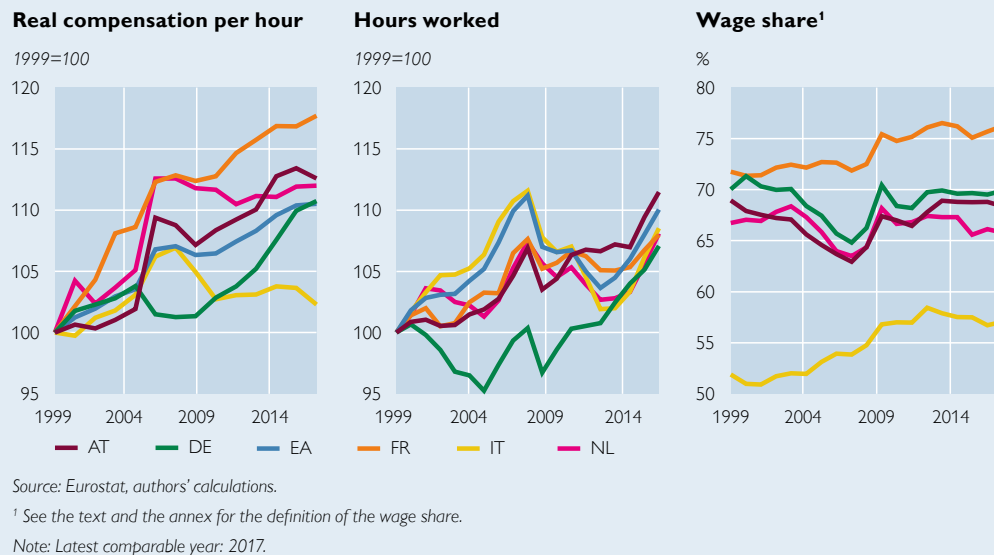
<sup>8</sup> Named after Anton Benya, a former president of the Austrian Trade Union Federation.

<sup>9</sup> Again, the HICP was used as the inflation measure.

France and close to 70% in Germany and Austria, while being considerably lower in the Netherlands (66%) and Italy (57%). When comparing 1999 and 2017, we see an increase in the wage share for Italy and France, respectively, and constant or slightly decreasing wage shares for Austria, Germany and the Netherlands.

Chart 3

### Wages, employment and wage shares in Austria and selected euro area countries



## 2 Changes in the institutional specifics of wage setting in Austria

The evolution of aggregate wages is, to a considerable extent, shaped by collective agreements.<sup>10</sup> How have wage-setting institutions evolved in the past 20 years? Following Visser (2016), we discuss several key dimensions of collective bargaining, one important aspect of which is membership to the contracting parties representing employers and workers, respectively. On the employers' side,<sup>11</sup> almost all private-sector collective agreements are negotiated by the Austrian Economic Chambers where membership is mandatory.<sup>12</sup> On the workers' side, bargaining is conducted by unions covering different sectors or occupations. However, union density, i.e. the share of union members as a percentage of total dependent employment, revealed a decreasing trend from 41.1%<sup>13</sup> in 1995 to 27.4% in 2013.<sup>14</sup> By international comparison, union membership in Austria ranks in the middle (left panel of chart 4).

<sup>10</sup> As already mentioned, changes in hourly wages and wages per worker are highly correlated with changes in collectively agreed wages (see chart 2). Although, strictly speaking, collective agreements are about increases of sector-, occupation- and tenure-specific minimum wages ("Mindestlohn-Abschlüsse"), many firms increase pay rates by the same percentage as specified in collective agreements, even though they pay higher wages and salaries. Moreover, several collective agreements include increases in both minimum wages and actual wages ("Istlohn-Abschlüsse").

<sup>11</sup> There is a lack of internationally comparable data on employer representation (Visser, 2016).

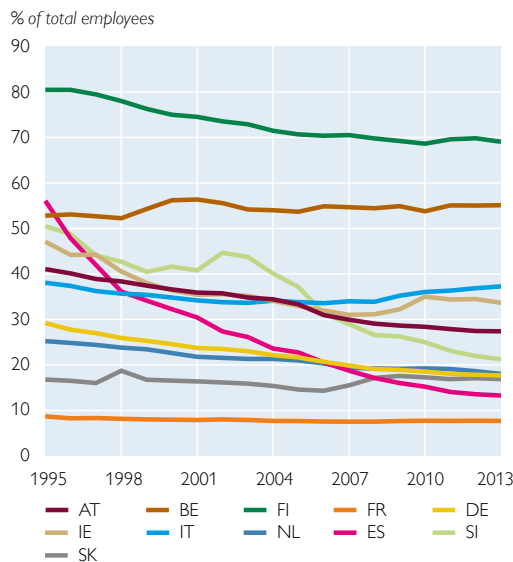
<sup>12</sup> For wage negotiations in the public sector, the contracting party on the employers' side is the state.

<sup>13</sup> Union density and bargaining coverage data were obtained from AIAS (2016). The most recent data refer to 2013 or 2014.

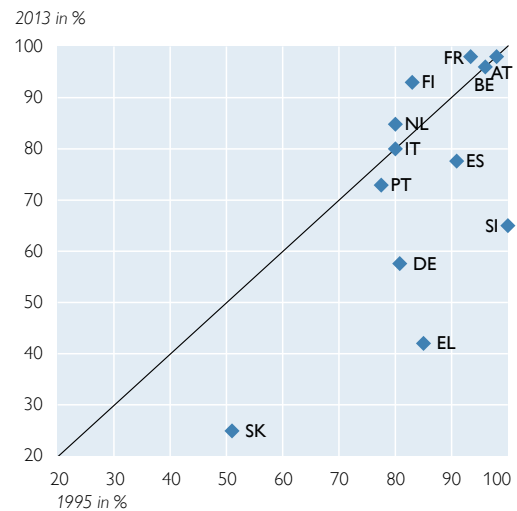
<sup>14</sup> As a matter of fact, unionization had already started to decline much earlier. In 1970, Austrian union density stood at 62.7%.

### Union density and collective bargaining coverage over time

#### Union density rates from 1995 to 2013



#### Bargaining coverage in 2013 vs. 1995



Source: AIAS (2016).

Note: The latest bargaining coverage data for Finland and Portugal refer to 2014, for France to 2012 and for Italy to 2010.

Unionization is not directly relevant for the wage setting process in Austria, because collective agreements are valid for all workers regardless of union membership. Hence, bargaining coverage, i.e. the share of all workers for which collective agreements are binding, is more crucial. Austria has almost complete<sup>15</sup> coverage and this has remained constant over time, while coverage rates for several other countries, such as Germany and Spain, dropped considerably from 1995 to 2013 (right panel of chart 4).

A further key characteristic is the level at which bargaining is conducted. Single-employer or firm-level bargaining is common in Anglo-Saxon economies and in many Central, Eastern and Southeastern (CESEE) countries. Multi-employer bargaining, which usually means that collective agreements are bargained at sectoral (and sometimes also regional) levels, prevails in Western Europe. In Austria, although firm-level agreements do occur, the dominant level at which bargaining takes place was and is the sectoral level (see table 3 in Visser, 2016), as is the case in France, Germany, Italy and the Netherlands.

Apart from the level at which bargaining takes place, horizontal coordination of wage bargaining is also important (Flanagan, 1999). Coordination means the integration or synchronization of pay policies of distinct bargaining units (Visser, 2016). In Austria, coordination is achieved through “wage leadership” of the export-oriented metal sector – a system that has been in place since the late 1970s (Knell and Stiglbauer, 2012). In an international comparison (see table 4 in Visser, 2016), Austria belongs to the countries with high bargaining coordination.

<sup>15</sup> According to AIAS (2016), about 98% of all workers are covered by a collective agreement. Bönisch (2008) reports a somewhat lower coverage (95%) for the total economy.

Furthermore, wage bargaining institutions have been very stable over time. They rely on strong involvement of both employer federations and unions not only in wage bargaining but also in economic and social policies in general. This system of “social partnership” has been characterized as “(neo-)corporatist.” Although there are signs of erosion (Pernicka and Hefler, 2015), Austria’s labor relations are still characterized by a high degree of trust between social partners, which tend to avoid labor conflicts (Addison, 2016).

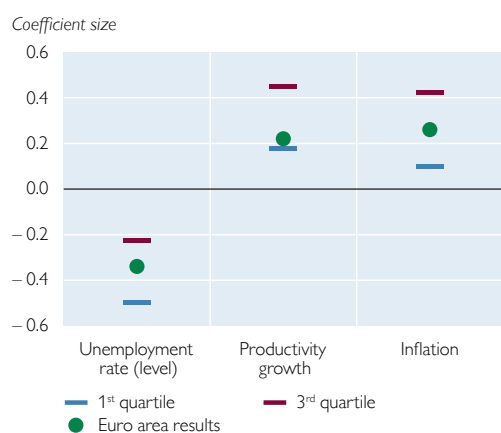
### 3 Wage Phillips curves for the euro area and other EU countries

What are the determinants of aggregate wage growth? For a start, we present the results of a recent empirical analysis at the level of the European System of Central Banks (ESCB), for which a wide range of wage Phillips curve specifications<sup>16</sup> was tested for the euro area as a whole and for 19 individual countries, including Austria.<sup>17</sup> The wage Phillips curve is a key macroeconomic relationship (Galí, 2011) that relates the observed nominal wage growth to the cyclical state of the economy (“slack”), inflation and labor productivity growth.

Chart 5

#### Wage Phillips curve estimation results based on a common specification

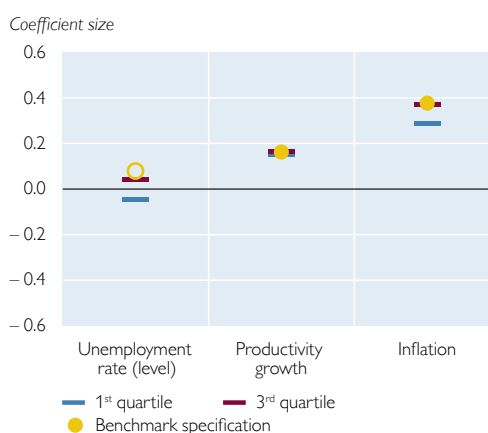
##### Results for 15 euro area countries and 5 other EU Member States



Source: ECB (forthcoming).

Note: The green dots represent the point estimates of a benchmark specification of the wage Phillips curve for the euro area as a whole, while the blue and red dashes mark the interquartile range of the individual country estimation results. The specification is as follows: The dependent variable is the growth rate of compensation per employee (annualized, quarter on quarter), the regressors are an autoregressive (AR(1)) term (the magnitude of which is 0.16; it is only marginally significant), the level of the unemployment rate (logged by one quarter), the contemporaneous growth rate of real productivity per worker and the average year-on-year HICP inflation rate over the previous four quarters. The coefficient of the autoregressive term implies that the long-term coefficients are 19% higher than their short-term counterparts.

##### Results for Austria



Source: Authors' estimates.

Note: The benchmark specification is the same as for the euro area (see left panel of this chart). The estimated autoregressive coefficient is 0.37. The coefficients for the AR(1) term, productivity growth and inflation are highly statistically significant, while the estimates for the unemployment rate are not significant. For the Austrian estimates, Newey-West corrected standard errors were used. The yellow dots represent the point estimates of the benchmark specification. The red and blue dashes mark the interquartile range of coefficient estimates of variations of the benchmark specification (see running text). The long-term coefficients are 58.7% higher than the short-term coefficients.

<sup>16</sup> For results of a similar exercise with price Phillips curves, see the contribution by Fritzer and Rumler in this volume.

<sup>17</sup> For more details, see the ECB's research report on wage growth in the euro area and European countries (forthcoming). The estimations comprise the results of 15 euro area countries (including France, Germany, Italy, the Netherlands and Spain) and four other EU Member States.

A “benchmark” specification for the growth rate of compensation per employee<sup>18</sup> was estimated for all EU countries, using the Eurostat unemployment rate, the growth of real productivity per worker and past inflation as explanatory variables.<sup>19</sup> The results are depicted in the left panel of chart 5, with the green dots representing the estimated coefficients for the euro area as a whole, and the blue and red dashes representing the interquartile range of the individual country results. There is considerable cross-country variation in the impact of unemployment, productivity and inflation on wage growth.

The right panel shows the results of Phillips curve estimations for Austria. The yellow dots mark the point estimates for the benchmark specification (and are thus directly comparable to the results in the left panel), whereby the coefficient of the unemployment rate is depicted merely as a circle as it is not statistically different from zero. The coefficients for productivity and inflation, on the other hand, are highly significant. The short-term elasticity of productivity is somewhat lower than that for the total euro area, while the elasticity of inflation is rather high. Taking the coefficients of the autoregressive terms into account shows that the long-term coefficients of both productivity growth and inflation are higher in Austria than in the euro area (see the notes in chart 5).

The blue and red dashes in the right panel indicate the range of the estimates when slightly changing the specification of the benchmark equation by using different measures for inflation<sup>20</sup> and economic slack<sup>21</sup>. The results indicate that the estimated coefficients of productivity and inflation do not change much and that the level of the unemployment rate remains insignificant on average. However, some of the slack measures (especially the output gap variables) are significant and have the expected sign.

To sum up, the wage Phillips curve estimations show a robust influence of productivity growth and (past) inflation on wage growth. To some extent, the economic cycle also plays a role. Wage Phillips curves are a rather simple way of “explaining” the variation of wage growth. In the next section, we will go back to hourly wages as our preferred wage measure and adopt richer specifications, enabling us to determine whether structural changes in the economy and the labor market affect wage growth as well.

#### 4 Wages and structural change

Apart from inflation, productivity growth and the economic cycle, wage growth is also likely to be affected by structural changes in the economy. In what follows, we will discuss several indicators for structural change, which will be used as additional regressors in refined estimations of wage equations for Austria. Among

<sup>18</sup> As argued before, it would be preferable to use hourly wage costs; for many countries, however, working time data are not particularly reliable.

<sup>19</sup> For more details on the “benchmark” specification, see the notes in chart 5.

<sup>20</sup> Nine different inflation measures were employed, including six backward-looking and three forward-looking inflation measures. It turns out that the measure for inflation over the last 4 quarters performs best in terms of statistical significance.

<sup>21</sup> Altogether, 19 slack measures were used. These included real GDP growth, the absolute change in the unemployment rate, measures for the output and unemployment gap from different institutions (Eurosystem, International Monetary Fund (IMF), Organisation for Economic Co-operation and Development (OECD), European Commission) and several underemployment measures as alternatives to the unemployment rate.



those indicators are the growing importance of part-time and fixed-term work and the rise in the participation rate, especially among elderly workers. Moreover, the increasing share of foreign workers and the ongoing internationalization of the Austrian economy may have had an effect on wages.

The Austrian economy became considerably more internationalized due to the fall of the Iron Curtain in 1989 and the accession to the European Union with its Single Market in 1995.<sup>22</sup> According to standard economic theory, the increased internationalization may have exerted a downward pressure on wage growth. The bargaining power of unions is negatively related to the (inverse) wage elasticity of labor demand (Boeri and van Ours, 2013). On the one hand, internationalization is likely to increase this elasticity because of import competition or the possibility of employers to relocate their production facilities abroad, thereby weakening the bargaining position of unions. On the other hand, internationalization can foster economic growth and increase labor demand and wages. The introduction of the euro 20 years ago is likely to have enhanced internationalization further. The right panel of chart 6 shows that the openness of the Austrian economy, as measured by the share of imports and exports in GDP, increased strongly until the Great Recession and has remained, after a post-crisis rebound in 2010/2011, roughly constant thereafter.

Joining EMU is also relevant with respect to its effects on economic growth (which affects productivity and thus also wage growth) and, possibly, also on wage bargaining. The growth effects are the result of the elimination of exchange rate risks and transaction costs as well as of enhanced competition due to greater price transparency. Moreover, foreign trade and cross-border investments are likely to have increased, resulting in a further acceleration of economic growth. Breuss (2016) analyzed the effects of EMU accession and found an average annual increase of GDP growth of 0.5 percentage points in the period between 1999 and 2015. He also found productivity gains of 0.3 percentage points per year for the Austrian economy due to EMU membership. Being a member of Monetary Union, however, also entails costs. The most important ones are the loss of independent monetary and exchange rate policies. The theory of optimum currency areas calls for increased wage flexibility and/or increased labor mobility in the event of asymmetric shocks to member countries (De Grauwe, 2018). Both effects reduce the bargaining power of national labor unions. In Austria's case, however, joining the single currency arguably had no such impact as Austria had already been a member of the "hard currency bloc" in Europe (Handler, 2016) which was a de-facto currency union even before the introduction of the euro.<sup>23</sup>

In addition, internationalization and, above all, the EU enlargement rounds in 2004 and 2007 have also spurred labor migration to Austria. Between the mid-1990s and 2018, the share of foreign workers in the labor force doubled (see the green line in the left panel of chart 6). This might have influenced the wages of incumbents; in any case, it has had a strong compositional effect on aggregate wages.<sup>24</sup>

<sup>22</sup> For an overview of the economic effects of Austria's EU and euro area membership, see Beer et al. (2017).

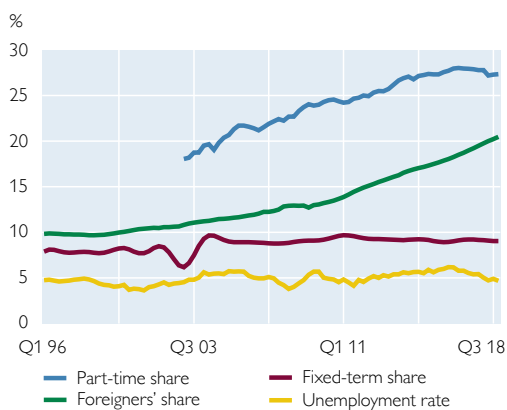
<sup>23</sup> To be able to retain a fixed exchange rate vis-à-vis Germany, Austria had to have flexible wages in order to achieve the desired real exchange rate target even before joining EMU.

<sup>24</sup> Hofer et al. (2017) show that immigrants are more likely to work in unskilled or low-skilled jobs. Moreover, the authors show that immigrants face wage discrimination, i.e. they receive considerably lower pay than natives, even after controlling for a large number of personal and job characteristics.

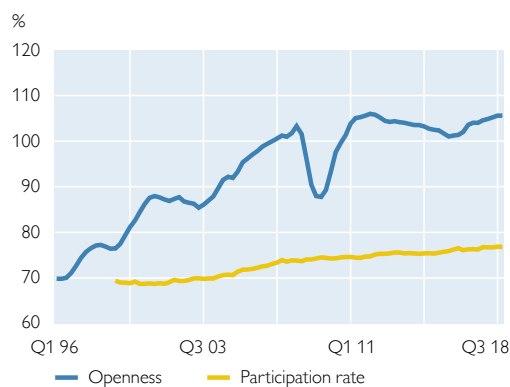


### Structural changes in the economy and the labor market

#### Selected labor market indicators



#### Openness and participation rate



Source: Eurostat, Statistics Austria, authors' calculations.

Note: For details on the data, see notes in table 1.

Further effects on wages may be the result of increases in the participation rate (right panel of chart 6) that are mainly due to rising participation rates of older workers and female workers and that are also likely to affect the composition of the workforce; however, it is unclear in which direction.<sup>25</sup> Average wages may also have been affected by “non-standard” forms of work. Part-time work increased significantly (see left panel of chart 6), which is mainly the result of increased participation by female workers, many of whom work part-time. Part-time work is likely to have a negative effect on average wages for various reasons.<sup>26</sup> Finally, another institutional indicator of structural change in the labor market is the share of workers in fixed-term contracts. This indicator is often used as a proxy for precarious labor contracts (Da Silva and Turrini, 2015). The left panel of chart 6 suggests that there has only been a slight increase of fixed-term work since the mid-1990s.<sup>27</sup>

In what follows, we will present the results for wage equations for the Austrian economy, which capture a long-run equilibrium relationship, short-run developments and indicators of structural change in a cointegration framework.<sup>28</sup> For the long run, we find a cointegrating relationship between the level of nominal hourly wages, the level of real hourly productivity and the price level. Moreover, the openness indicator (i.e. the share of exports and imports in GDP) enters the error correction term capturing the downward trend in the wage share until the Great Recession.

In the short run, like in the Phillips curve estimations in section 3, the growth rate of nominal hourly wages is driven by the growth rates of real labor productivity and inflation. Effects of the business cycle are captured by the change in the unemployment rate. Additionally, the indicators of structural change and internationalization,

<sup>25</sup> For example, the rising participation of female workers is likely to slow down the growth of average wages (see footnote 26). On the other hand, more older workers may increase average wages (due to rising age-earnings profiles).

<sup>26</sup> For example, part-time work may be regarded as a proxy for the gender pay gap (Böheim et al., 2013). Moreover, a genuine wage penalty (“part-time wage gap”) for working part-time has been observed empirically, even after controlling for several personal characteristics including gender (Manning and Petrongolo, 2008).

<sup>27</sup> The drop observed around 2003/2004 is due to a structural break in the time series.

<sup>28</sup> For a similar analysis, see the Deutsche Bundesbank (2018).

Table 1

<b>Wages and structural change in a small open economy</b>															
<b>Dependent variable: nominal hourly wages, quarter-on-quarter growth, total economy</b>															
	Constant	Productivity growth	Inflation	$\Delta$ Unemployment rate	EC	AR(1)	$\Delta$ Openness	$\Delta$ Part-time	$\Delta$ Fixed-term	$\Delta$ Foreign	$\Delta$ Participation rate	Dummy Q4 12	Adjusted R2	Adjusted sample	Observations
Coefficient:	<b>0.00</b>	<b>0.29</b> (t)	<b>0.32</b> (t-3)	<b>-0.15</b> (t-1)	<b>-0.03</b> (t-4)	<b>0.42</b>	<b>-0.07</b> (t)					<b>0.01</b>	0.79	Q1 98–Q4 18	84
p-value:	0.01	0.00	0.00	0.00	0.05	0.00	0.00					0.00			
Coefficient:	<b>0.00</b>	<b>0.39</b> (t)	<b>0.66</b> (t-3)	<b>-0.13</b> (t)	<b>-0.05</b> (t-4)	<b>0.33</b>	<b>-0.08</b> (t)	0.05 (t-1)	0.27 (t-1)	-0.12 (t)	<b>-0.20</b> (t-1)	<b>0.01</b>	0.89	Q1 05–Q4 18	56
p-value:	0.11	0.00	0.00	0.02	0.00	0.00	0.00	0.31	0.15	0.49	0.00	0.00			
Coefficient:	<b>0.00</b>	<b>0.25</b> (t)	<b>0.48</b> (t-3)	<b>-0.18</b> (t)	<b>-0.04</b> (t-4)	<b>0.34</b>	<b>-0.08</b> (t)				<b>-0.11</b> (t-1)	<b>0.01</b>	0.83	Q2 00–Q4 18	75
p-value:	0.00	0.00	0.05	0.00	0.00	0.00	0.00				0.05	0.00			

Source: Eurostat, Statistics Austria, social security data, OeNB.

Notes: OLS with Newey-West correction, quarterly seasonally adjusted data. Lags of variables in parentheses. For details on the estimated equations, see box 2. Productivity growth: real hourly labor productivity growth of employees (Eurostat). Inflation: growth of seasonally adjusted consumption deflator (Eurostat). Unemployment rate: Eurostat. EC: Error correction term. AR(1): Autoregressive term. Openness: ratio of exports and imports to GDP (Eurostat). Part-time: share of part-time employment (Eurostat, data available since Q1 03). Short-term: Share of short-term workers (Eurostat, splined quarterly data). Foreign: share of foreign employees in total employment (social security data). Participation rate: participation rate of the 15 to 64 age group (Eurostat). Dummy Q4 12: Dummy set for unexplained quarter-on-quarter growth of nominal wages in the fourth quarter of 2012.

as described above, enter the equations. For details on the estimated equations and the data used, see box 2 and the notes in table 1. Out of a large set of estimated equations, we show the results for three selected equations in table 1 that summarize our main findings.

Our basic equation includes a constant, an error correction term, productivity growth, the inflation rate, unemployment, an autoregressive term and the indicator for openness. All variables enter the equation significantly and with the expected sign. The results for productivity and inflation are comparable to our findings in section 3. Now, the change in the unemployment rate is used as regressor and we find significantly negative effects of the business cycle. Furthermore, the increased internationalization (openness) of the Austrian economy seems to have had a negative effect on wage growth. In further specifications, we add more indicators of structural change. We find evidence that increases in the participation rate have had a dampening effect on aggregate wage growth. In contrast, we find no significant effects for changes in the share of part-time and fixed-term contracts, and in the share of foreign workers.

Has the introduction of the euro had a positive or negative effect on overall wage growth in Austria? In our empirical estimations, openness and productivity are exogenous variables for wage growth. According to our results, openness turned out to have had a significantly negative impact on the development of wage growth, whereas productivity has had a positive impact. The rise of the openness indicator is the result of a combination of several factors: the general trend of globalization, the opening of the East, the accession of Austria to the EU and the introduction of the euro 20 years ago. According to our estimation results, increased internationalization had an overall dampening effect on wage growth of almost 5 percentage points in the period from 1999 to 2018. A precise breakdown among the above-mentioned factors is difficult, but given the fact that Austria had already been a member of a hard currency block before 1999, the introduction of the euro accounts, most probably, only for a minor part. Breuss (2016) estimates productivity gains of 6.5 percentage points for the Austrian economy due to EMU membership in the period from 1999 to 2015, whereby the positive effects were most evident in the first years after the introduction of the euro. Productivity gains generate – according to our long-term estimation results – increases in wages by the same amount. Thus, the positive effects of EMU membership on wages via increased productivity growth (6.5 percentage points) outweigh the dampening effects via increased internationalization (up to 5 percentage points). Depending on the extent to which EMU is responsible for increased internationalization (and its wage-dampening effects), the overall effect of EMU on wage growth in Austria is positive, ranging from 1.5 to 6.5 percentage points.

Box 2

#### Details on the estimation of the effects of structural changes

We use the two-step Engle Granger cointegration procedure to estimate the effects of structural changes on wage growth. For the long run, we find a cointegrating relationship given by  $\log(w_t) = \alpha_1 + \alpha_2 \cdot \log(\text{productivity}_t) + \log(\text{price}_t) + \alpha_3 \cdot \log(\text{openness}_t) + \varepsilon_{L,t}$ , where  $w_t$  denotes nominal hourly wages,  $\text{productivity}_t$  real labor productivity per working hour,  $\text{price}_t$  the consumer price deflator,  $\text{openness}_t$  the ratio of nominal exports plus imports to nominal GDP and  $\varepsilon_{L,t}$  the residual. The estimation results for the longest time horizon available are  $\alpha_1 = -0.440$ ,  $\alpha_2 = 0.969$  and  $\alpha_3 = -0.002$ .

The estimated dynamic (“short run”) equations follow the general form of

$$\begin{aligned} d\log(w_t) = & \beta_1 + \beta_2 \cdot d\log(\text{productivity}_t) + \beta_3 \cdot d\log(\text{price}_{t-3}) + \beta_4 \cdot \Delta(\text{unempl}_t) + \beta_5 \cdot EC_{t-4} + \\ & + \beta_6 \cdot d\log(w_{t-1}) + \beta_7 \cdot \Delta(\text{openness}_t) + \beta_8 \cdot \Delta(\text{parttime}_{t-1}) + \beta_9 \cdot \Delta(\text{fixedterm}_{t-1}) + \\ & + \beta_{10} \cdot \Delta(\text{foreign}_t) + \beta_{11} \cdot \Delta(\text{participation}_{t-1}) + \beta_{12} \cdot D2012Q4 + \varepsilon_t \end{aligned}$$

The residuals from the long-term equilibrium equation ( $\varepsilon_{L,t}$ ) enter the regression as error correction term ( $EC_{t-1}$ ). Additionally, the following variables are tested:  $\text{unempl}_t$ : unemployment rate,  $\text{parttime}_t$ : share of part-time workers,  $\text{fixedterm}_t$ : share of fixed-term workers,  $\text{foreign}_t$ : share of foreign workers and  $\text{participation}_t$ : participation rate of the 15–64 age group. For exact data definitions and sources, see the notes in table 1.

## 5 Conclusions

Since the introduction of the euro, average real hourly wages have risen by 13% in Austria, which is equivalent to an annual increase of 0.6%. Compared to other euro area countries, this is a rather large increase. Until the Great Recession, the Austrian wage share decreased significantly but has recovered thereafter. In 2017, the wage share was only slightly below its level in 1999. In Austria, collective agreements exert a significant influence on wage growth. Over the past 20 years, collective bargaining institutions have remained remarkably stable, as evidenced by a high bargaining coverage and a high degree of bargaining coordination. The empirical analysis reveals that nominal wage growth has mainly been determined by growth of consumer prices and labor productivity. In addition, wage growth also appears to have been affected by structural factors altering the bargaining position of workers or changing the composition of the workforce. The results indicate that the growing openness of the Austrian economy and the rise of participation rates have had a dampening effect on aggregate wages. The overall cumulative effect of EMU on wage growth in Austria is estimated to have been positive since 1999, ranging from +1.5 to +6.5 percentage points.

## References

- Addison, J. T. 2016.** Collective bargaining systems and macroeconomic and microeconomic flexibility: the quest for appropriate institutional forms in advanced economies. In: IZA Journal of Labor Policy 5(19), 1–53.
- Amsterdam Institute for Advanced Labour Studies (AIAS). 2016.** Database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (ICTWSS) in 51 countries between 1960 and 2014. Version 5.1. September 2016. <http://uva-aias.net/en/ictwss> (retrieved on January 10, 2019).
- Beer, C., C. Belabed, A. Breitenfellner, C. Ragacs and B. Weber. 2017.** Österreich und die europäische Integration. In: Monetary Policy & the Economy Q1/17, 86–125.
- Boeri, T. and J. van Ours. 2013.** The Economics of Imperfect Labor Markets. 2nd Edition. Princeton; Oxford: Princeton University Press.
- Böheim R., C. Zulehner, H. Mahringer and K. Himpele. 2013.** The gender wage gap in Austria: eppur si muove! In: Empirica 40(4), 585–606.
- Bönisch, M. 2008.** Kollektivvertragliche Abdeckung in Österreich. In: Statistische Nachrichten Nr. 3, 207–211.

- Breuss, F. 2016.** A Prototype Model of European Integration: The Case of Austria. In: Bednar-Friedl, F. and J. Kleinert (eds.). *Dynamic Approaches to Global Economic Challenges. Festschrift in Honor of Karl Farmer*. Heidelberg: Springer: 9–30.
- Chaloupek, G., R. Russinger and J. Zuckerstätter. 2008.** Strukturveränderungen und funktionale Einkommensverteilung in Österreich. In: *Wirtschaft und Gesellschaft 2008/1*. 33–56.
- Da Silva, A. D. and A. Turrini. 2015.** Precarious and less well-paid? Wage differences between permanent and fixed-term contracts across the EU countries. *European Economy. Economic Papers 544*. European Commission. DG ECFIN. February.
- De Grauwe, P. 2018.** *Economics of Monetary Union*. 12<sup>th</sup> edition. Oxford: Oxford University Press.
- Deutsche Bundesbank. 2018.** Wage growth in Germany: assessment and determinants of recent developments. In: *Monthly Report 70(4)*. April 2018. 13–27.
- ECB. Forthcoming.** Understanding low wage growth in the euro area and European countries. Report of the Expert Group on Wages of the Working Group on Forecasting. European Central Bank Occasional Paper Series.
- Flanagan, R. J. 1999.** Macroeconomic Performance and Collective Bargaining: An International Perspective. In: *Journal of Economic Literature*. Vol. XXXVII (September). 1150–1175.
- Gali, J. 2011.** The Return of the Wage Phillips Curve. In: *Journal of the European Economic Association 9(3)*. 436–461.
- Handler, H. 2016.** Two centuries of currency policy in Austria. In: *Monetary Policy & the Economy Q3–Q4/16*. 61–76.
- Hofer, H., G. Titelbach, R. Winter-Ebmer and A. Ahammer. 2017.** Wage Discrimination Against Immigrants in Austria? In: *Review of Labour Economics and Industrial Relations 31(2)*. 105–222.
- Knell, M. and A. Stiglbauer. 2012.** Reference norms, staggered wages, and wage leadership: theoretical implications and empirical evidence. In: *International Economic Review 53(2)*. 569–592.
- Manning, A. and B. Petrongolo. 2008.** The Part-Time Pay Penalty for Women in Britain. In: *The Economic Journal 118(1)*. F28–F51.
- Marterbauer, M. and E. Walterskirchen. 2003.** Bestimmungsgründe der Lohnquote und der realen Lohnstückkosten. *WIFO Monatsberichte Nr. 2*. 151–159.
- Mayrhuber C., M. Firgo, H. Pitlik, A. Guger and E. Walterskirchen. 2018.** Sozialstaat und Standortqualität. Endbericht. Studie des Österreichischen Instituts für Wirtschaftsforschung. 2018/040/A/WIFO-Projektnummer: 5417.
- Mesch, M. 2015.** Benya-Formel gleich produktivitätsorientierte Lohnpolitik. In: *Wirtschaft und Gesellschaft 41(4)*. 593–599.
- Pernicka, S. and G. Hefler. 2015.** Austrian Corporatism – erosion or resilience? In: *Austrian Journal of Political Science 44(3)*. 39–56.
- Visser, J. 2016.** What happened to collective bargaining during the great recession? In: *IZA Journal of Labor Policy 5(9)*. 1–35.

## Annex

### The determinants of changes in the wage share

In this annex, we discuss the definition of the unadjusted wage share and how it is related to real wage growth, labor productivity growth and other factors. Let us start with a simplified definition of the wage share, which is equal to the total wage bill (nominal compensation of employees) divided by nominal GDP at market prices

$$s_1 = \frac{h \cdot w}{Y \cdot P_Y}, \quad (1)$$

whereby  $s_1$  denotes the simplified wage share,  $h$  the number of hours worked,  $w$  the average hourly wage,  $Y$  real GDP and  $P_Y$  the GDP deflator. The change in the wage share in percentage points is given by the growth rate of real product wages minus the growth rate of labor productivity weighted by the wage share

$$\dot{s}_1 = s_1 \cdot [(\widehat{w} - \widehat{P}_Y) - (\widehat{Y} - \widehat{h})], \quad (2)$$

whereby a dot over a variable symbolizes first differences and a hat the time derivative of the log of this variable (which is equal to the percentage change over time for small changes). Note that labor productivity is measured as GDP divided by working hours of employees, ignoring working hours of self-employed, and that wages are deflated using the GDP deflator.

In contrast to the simple formula (1), the wage share in actual economic statistics ( $s_2$ ) is computed as the compensation of employees divided by the net national income (NNI) at market prices minus other taxes on production plus subsidies. Using NNI instead of GDP and expanding the numerator and the denominator by  $P_C$ , the wage share changes to

$$s_2 = \frac{h \cdot w \cdot P_C}{Y \cdot P_Y \cdot n \cdot d \cdot t \cdot P_C}, \quad (3)$$

where  $n$  is the ratio of gross national income (GNI), defined as NNI plus depreciation, to GDP,  $d$  equals 1 minus the depreciation rate in % of GNI ( $d = 1 - \delta$ ) and  $t$  equals 1 minus the tax rate (in % of NNI) on production less subsidies ( $t = 1 - \tau$ ). We extend the fraction by the consumption deflator  $P_C$  to calculate real wages based on consumer prices, which typically form the basis for wage negotiations in Austria.<sup>29</sup> Now, the change in the wage share is given by the growth rate of real wages (deflated by consumer prices) minus the growth rate of labor productivity and minus the changes in  $n$ ,  $d$  and  $t$  and  $P_Y/P_C$

$$\dot{s}_2 = s_2 \cdot [(\widehat{w} - \widehat{P}_C) - (\widehat{Y} - \widehat{h}) - \widehat{n} - \widehat{d} - \widehat{t} - (\widehat{P}_Y - \widehat{P}_C)]. \quad (4)$$

<sup>29</sup> In Austrian collective bargaining, the CPI – rather than the consumption deflator – is usually regarded as the relevant inflation measure.

Table Annex

### Decomposition of changes in the wage share

Wage share in 1999	70.5
Wage share in 2017	68.7
Difference	-1.8
Implicit change in the wage share due to differences in the growth of real wages and productivity from 1999 to 2017 ("Benya rule")	-5.0
thereof:	
change in actual wage share	-1.8
change in depreciation rate	-1.5
domestic vs. resident concept	0.7
changes in product tax rate	0.2
consumption vs. GDP deflator	-2.7
discrepancy	0.1

Source: Statistics Austria, WIFO, authors' computations.

The results in the table show that the difference between the growth rate of real wages and that of labor productivity suggests a much larger drop in the wage rate (-5.0 percentage points) than indicated by actual statistics (-1.8 percentage points). This is explained by an increase in the depreciation rate and higher inflation rates of consumer prices compared to product prices. Finally, changes in the relation between GDP and GNI (domestic versus resident concept in the table), on the one hand, and changes in the product tax rate, on the other hand, have small opposite effects.



# Financing conditions in Austria since the introduction of the euro

Ernest Gnan, Maria Teresa Valderrama, Walter Waschiczek<sup>1</sup>

Refereed by: Heinz Handler, Austrian Institute of Economic Research

*How have financing conditions for Austrian firms and households evolved since the start of the euro? To answer this question, we consider Austrian credit, bond and stock markets, estimate a financial conditions index and assess euro rates against a simple hypothetical monetary policy rule for Austria. We find that interest rates for bank loans have fallen since the introduction of the euro, with real interest rates being mostly lower in Austria than in Germany and the euro area average. This was partly related to the high share of variable rate loans, especially for house purchase. However, banks have compensated, at least in part, for lower interest rates by increasing non-interest price elements. Banks have also applied higher collateral requirements and loan covenants since the crisis. The post-crisis expansionary monetary policy conducted by the European Central Bank (ECB) has brought Austrian bond yields below 1% since end-2014. Earnings ratios of ATX companies were mostly below those in the DAX and Euro STOXX50. The stock earnings premium over 10-year government bonds was 2% to 3% in Austria during most of the period under review but rose substantially to around 9% in 2017/2018. A financial conditions index for Austria shows that the transmission of the policy rate through lending rates was an important driver of the tightening of financial conditions prior to and during the financial crisis. In the same way, the transmission of expansionary monetary policy through lending rates and credit risk has contributed to the loosening of financing conditions during the recovery. Judging from a hypothetical monetary policy rule for Austria, the monetary stance given by the euro area rate has been broadly adequate or slightly on the loose side in relation to economic conditions in Austria.*

JEL classification: E43, G21

Keywords: interest rates, credit conditions

Monetary policy affects financing conditions through multiple channels. Indeed, it is the purpose of monetary policy to manage aggregate demand by influencing the cost of financing and the return on savings. In this way, monetary policy strives to keep output close to potential and inflation close to target in the medium term.

In the three decades of “hard currency policy” prior to Economic and Monetary Union (EMU), Austria had already experienced a situation where monetary policy was not fine tuned to its business cycle and inflation developments since the exchange rate of the Austrian schilling was unilaterally pegged to the Deutsche mark. In this sense, participation in EMU, where monetary policy is geared to economic conditions in the euro area rather than to Austria, was not new.

Still, it is interesting and relevant to investigate how the monetary policy conducted by the European Central Bank (ECB) has affected financing conditions in Austria over the past two decades. This article addresses this question by examining how financing conditions have evolved in Austria since 1999.<sup>2</sup> This is done step by step,

<sup>1</sup> Oesterreichische Nationalbank, Economic Analysis Division, [ernest.gnan@oenb.at](mailto:ernest.gnan@oenb.at), [maria.valderrama@oenb.at](mailto:maria.valderrama@oenb.at), [walter.waschiczek@oenb.at](mailto:walter.waschiczek@oenb.at). Opinions expressed by the authors of studies do not necessarily reflect the official viewpoint of the OeNB or the Eurosystem. The authors would like to thank Ernst Glatzer, Gerald Hubmann and Beate Resch for excellent research assistance.

<sup>2</sup> Due to the lack of consistent time series for Austria, we were unable to cover a longer period including, ideally, two decades prior to the start of EMU, and thus were unable to compare pre-EMU with EMU periods. Lacking this comparison, our analysis nevertheless yields interesting findings.



i.e. by looking at various forms of financing, one by one, reflecting different channels of monetary transmission. Section 1 first discusses retail credit interest rates (interest rate channel) and conditions (credit channel), section 2 then progresses to long-term bond rates and section 3 examines the cost of equity financing in the Austrian stock market (interest rate expectations and portfolio rebalancing channels). For a broader view, we then construct a comprehensive financial conditions index for Austria in section 4. Finally, in section 5, we address the question of whether euro area monetary policy has been appropriate for Austrian economic conditions by comparing actual money market rates with a simple hypothetical monetary policy rule for Austria. Section 6 concludes.

## 1 Financing conditions for bank loans

Financing conditions include both price and non-price terms and conditions of a loan contract. The price consists of interest and other charges, such as fees and commissions. Non-price elements comprise covenants, the collateral or guarantees the borrower has to provide and the size and maturity of the loan.

While banks resident in the euro area regularly report interest rates for several types of loans in the monetary financial institution (MFI) interest rate statistics, the analysis of terms and conditions of loan contracts has to rely largely on surveys. However, these surveys do not cover the entire period since the inception of the euro. Starting in 2003, the Eurosystem's Bank Lending Survey (BLS) has monitored credit managers at leading euro area banks for their assessment of credit market developments. Since 2009, the Survey on the Access to Finance of Enterprises (SAFE) has asked enterprises about their assessment of financing conditions. While the SAFE covers firms of all sizes, data for Austria are only available for small and medium-sized enterprises (SMEs) due to the small size of the Austrian sample. Moreover, information derived from these surveys is only qualitative; they do not ask about the (perceived) level of credit conditions but about the change in credit conditions over time.

As regards interest rates for bank loans, it is obvious to distinguish between the pre-crisis and the post-crisis period (see chart 1). While annualized agreed interest rates on newly extended euro loans to nonfinancial corporations averaged 4.4% in nominal terms (and 2.6% per annum on an inflation-adjusted basis<sup>3</sup>) in the first decade of the euro, they fell to 1.9% in nominal terms and 0.1% in real terms in the period from 2009 to 2018.<sup>4</sup> Developments were similar for housing loans to private households,<sup>5</sup> with real interest rates declining from 3.1% before the crisis to 0.6% in the period thereafter. Interest rate reductions for consumer loans were

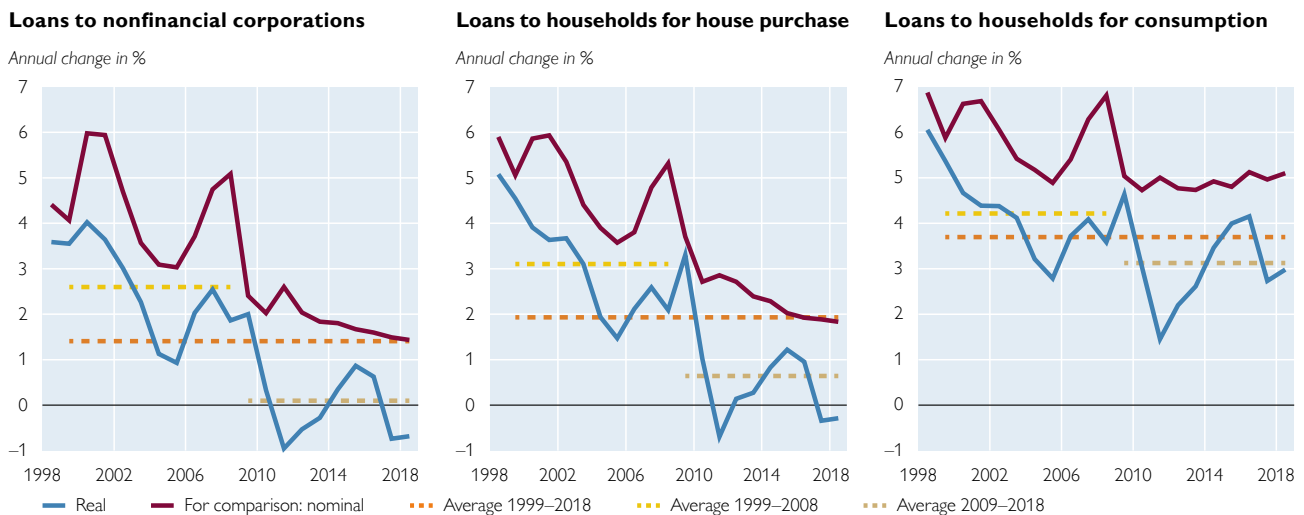
<sup>3</sup> We use the Harmonized Index of Consumer Prices (HICP) to track the general level of prices.

<sup>4</sup> The MFI interest rate statistics refer to euro loans granted to customers in the euro area. They do not cover foreign currency (FX) loans, which played an important role in bank financing in Austria for a large part of the period under review. Data on interest rates for FX loans in a number of foreign currencies to households and nonfinancial corporations collected by the Oesterreichische Nationalbank (OeNB) cannot be broken down by economic sector of the borrower or by loan purpose. Moreover, there are no comparable data for other countries. Hence, interest rates for FX loans are not analyzed in this article. While nominal rates for CHF- and JPY-denominated loans were usually lower than those for euro-denominated loans, there were a number of additional fees that were charged for these schemes (for which there are no data either). In addition, these loans carried additional risks.

<sup>5</sup> "Households" refer to households and non-profit institutions serving households.

Chart 1

## Real interest rates for MFI loans to nonfinancial corporations and households<sup>1</sup>



Source: ECB, Statistics Austria.

<sup>1</sup> For new euro-denominated loans to borrowers in the euro area. Annual averages. HICP-deflated.

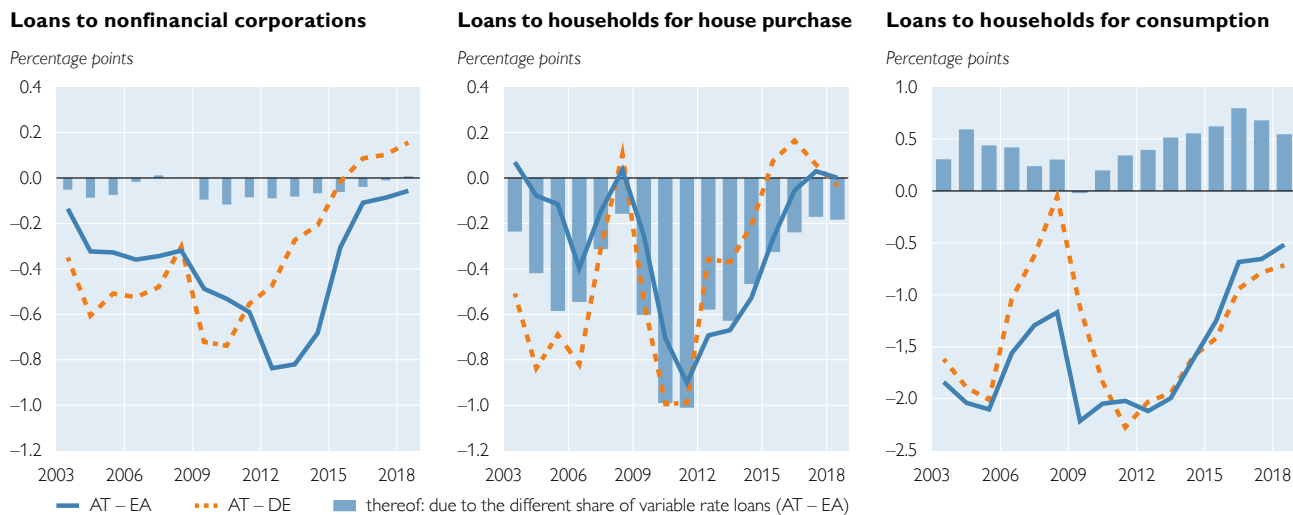
less pronounced, with differences between before (4.2% real) and after the onset of the crisis (3.1% real) being much smaller.<sup>6</sup>

For most of the period under review, both nominal and inflation-adjusted interest rates for bank loans were lower in Austria than in Germany and the euro area. As regards real interest rates, this reflects, to a large extent, higher inflation in Austria. Since 2008, Austrian HICP inflation has been above German and euro area inflation rates. However, since 2016, real interest rates for loans to nonfinancial corporations have been slightly higher than their German equivalents.<sup>7</sup>

The lower level of Austrian nominal interest rates (see chart 2) was, in part, related to the high – and for a long time increasing – share of variable rate loans, whose interest rate is typically lower than that of loans with longer interest fixation periods, if the yield curve is positively sloped. This held true for housing loans to households, in particular, for which aggregate interest rates would have been about half a percentage point higher in the past 20 years on average if the shares of interest fixation periods in Austria had been the same as in Germany or the euro area. In some years (e.g. in 2010/2011), the difference would have been more than one percentage point. Had the share of variable rate loans been the same as in Germany, nominal interest rates for housing loans in Austria would have been higher than in Germany on average. The opposite effect would have been registered in the case of consumer loans, for which the yield curve has been negative in Austria throughout the past

<sup>6</sup> However, the amount of loans for consumption is considerably smaller than that of loans for house purchase, amounting to about one sixth of housing loans. Moreover, credit risk is considerably higher in the case of loans for consumption. The nonperforming loan (NPL) ratio for this type of loan came to 6.1% in the third quarter of 2018, compared to 1.6% for mortgage loans (loans to households secured by residential real estate).

<sup>7</sup> Broken down by loan size, this has only concerned loans with a volume of more than EUR 1 million, while real interest rates for smaller loans have remained below German rates. Since 2016, credit standards for loans to larger enterprises have remained largely unchanged but have been tightened somewhat for loans to SMEs, according to the BLS. The main reasons behind this divergent development include, according to banks, risk factors, such as industry- or firm-specific situations and general economic activity, as well as competition in the banking market.

**Interest rate difference for MFI loans: Austria versus Germany and the euro area<sup>1</sup>**

Source: ECB, OeNB.

<sup>1</sup> For new euro-denominated loans to borrowers in the euro area. Annual averages.

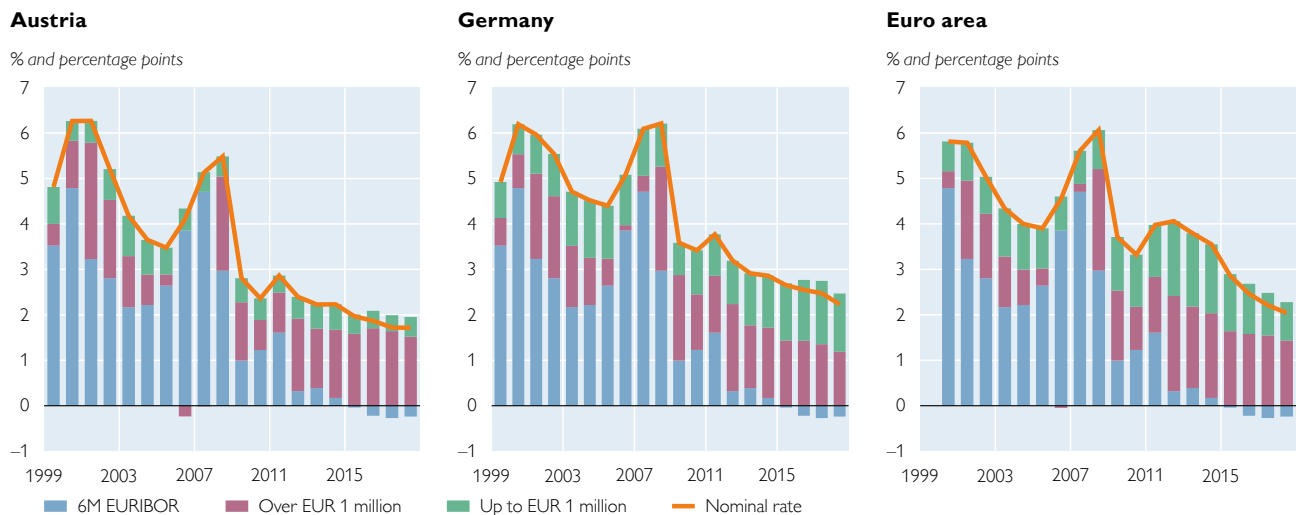
two decades.<sup>8</sup> For loans to nonfinancial corporations, the higher share of variable rate loans did not explain much of the interest rate difference vis-à-vis the euro area, but has accounted for about one third of the interest rate difference vis-à-vis Germany over the whole period under review, and for almost half of this difference since the onset of the crisis. As the share of variable rate loans has come down in the past few years, the interest cost advantage of Austrian borrowers has become smaller or has diminished altogether toward the end of the period under review.

While the steep decline in interest rates since the onset of the crisis can be attributed, to a large extent, to the Eurosystem's large-scale monetary policy response to the crisis, the pass-through to customer rates was far from complete, both in Austria and the euro area. As chart 3 shows, the lending spread, defined as the difference between customer and money market rates of comparable interest fixation periods or maturities, has widened since the onset of the crisis. For non-financial corporations, the spread between customer rates with an interest fixation period of up to one year and six-month money market rates – which had fallen from 2001 to 2007 – has widened since then, some fluctuations in 2008/2009 notwithstanding. Heightened credit risk considerations might have altered the interest rate pass-through, with banks requiring higher risk premiums, either because of more stringent regulatory requirements or, more generally, because of changed risk policies. Indeed, in the BLS, an increasing number of banks reported a widening of interest margins on riskier loans compared to average loans, suggesting increasing risk discrimination.<sup>9</sup> In the BLS, banks also stated that risk aspects

<sup>8</sup> Consumer loans with longer interest fixation periods were, for the most part, granted to consumers with good creditworthiness.

<sup>9</sup> The data do not allow to determine whether risk premiums were “too low” before the crisis and/or “too high” afterwards.

### Composition of interest rates for MFI loans to nonfinancial corporations<sup>1</sup>



Source: ECB.

<sup>1</sup> For new euro-denominated loans with an interest fixation period of up to 1 year. Annual averages.

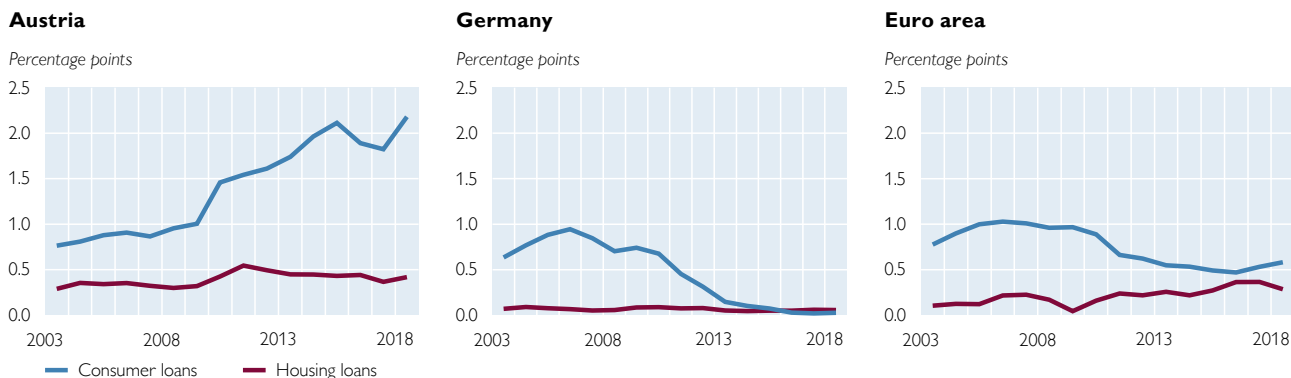
were an important factor for tightening credit standards.<sup>10</sup> Another factor affecting the interest rate pass-through may have been the zero lower bound on deposit rates, which put a floor under banks' funding costs.

Furthermore, chart 3 shows the spread between interest rates for smaller and larger loans which, given the lack of other data, is commonly used as an indicator of the relative cost of bank financing for SMEs and larger firms. During the past 20 years, this spread has been rather low in Austria. It even fell in the years before the crisis and has remained fairly stable since then – contrary to developments in Germany where this spread has risen almost continuously since 2010 and to developments in the euro area where it rose sharply in the first years after the crisis. Over the whole 20 years, it averaged 53 basis points in Austria – about half of the value in Germany and the euro area. To the extent that loan size and firm size go hand in hand, these divergences imply that bank lending rates for SMEs have developed favorably in Austria in relation to Germany and the euro area.

Regarding non-interest price elements, there is no hard evidence for loans to nonfinancial corporations. The BLS and SAFE surveys suggest that non-interest price elements have increased somewhat more strongly in Austria than in Germany and the euro area (although it is not possible to determine their actual level as these surveys ask about the change in non-interest price elements over the previous reporting period).<sup>11</sup> As far as loans to households are concerned (which the SAFE does not cover), banks said in the BLS that they increased non-interest rate charges

<sup>10</sup> However, more risk-aware lending policies need not result in higher aggregate interest rates in the MFI interest rate statistics as these include loans across all rating categories. If higher-risk borrowers (who would have to pay higher rates) are denied loans to a larger extent, this might lead to more low-risk borrowers being granted loans (who would have to pay lower rates).

<sup>11</sup> However, the results diverge somewhat on the question of whether non-interest price elements have still been increasing in recent years. While banks have reported no further increases since 2016, Austrian SMEs have seen ongoing increases (which have been perceived as being more pronounced than those in Germany but lower than those in the euro area).

**Spread between the annual percentage rate of charge and the agreed rate<sup>1</sup>**

Source: ECB.

<sup>1</sup> For new euro-denominated loans to borrowers in the euro area. Annual averages.

for both housing and consumer loans to households only modestly over the whole survey period. As regards loans to households, the MFI interest rate statistics provide data on the annual percentage rate of charge (APRC) that covers the total cost of loans, i.e. both interest rate and other cost elements, from 2003 onward. The difference to the annualized agreed rate can be seen as an indication of non-interest price elements. Strikingly, the difference increased for both housing and consumer loans in Austria in the period from 2003 to 2018 (see chart 4). Especially in the case of consumer loans, this contrasts with developments in Germany and the euro area where the APRC decreased more markedly than annualized agreed rates. Overall, these results suggest that banks in Austria made up, at least in part, for lower interest rates by increasing non-interest components so that total financing costs decreased less (or even increased) compared to what was suggested by interest rate developments.

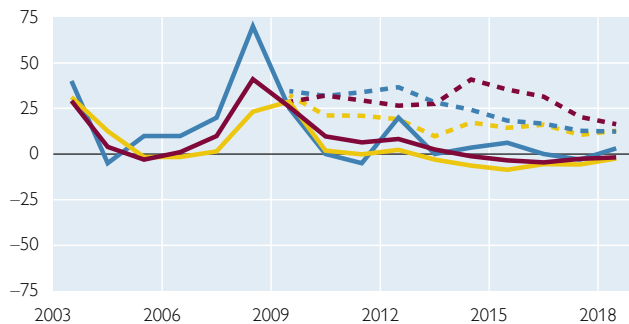
As mentioned at the beginning, the analysis of other credit conditions has to rely on survey data (see chart 5). According to the SAFE, credit-seeking SMEs in Austria have registered a significant tightening of non-price factors since the onset of the crisis, especially with respect to collateral requirements and loan covenants.<sup>12</sup> The view that tightening was most pronounced in these areas is also shared by banks when asked about terms and conditions in the BLS. Banks and firms disagree, however, on the degree of tightening – with enterprises seeing more severe tightening – and on whether and when this tightening ended. While banks said that they have no longer tightened credit conditions in recent years, enterprises felt that banks have still done so. Both sides agreed, however, that the effects on loan size and maturity have been limited. Yet, at least to some extent, price and non-price requirements might be interdependent. Compliance with covenants implies costs, which may be substantial in some cases. Conversely, higher collateral requirements and covenants might mitigate credit risks of loans, thus allowing for lower interest rates or the granting of loans.

<sup>12</sup> However, when trying to gauge the absolute level of financing conditions, it has to be borne in mind that the survey asks about the change in conditions. If conditions were less stringent at the start of the survey, then even higher increases do not necessarily mean higher absolute levels.

## Change in terms and conditions of loans to enterprises

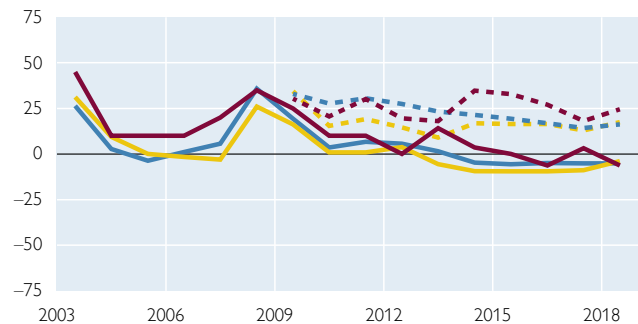
### Collateral requirements

Net percentage of responses, annual averages



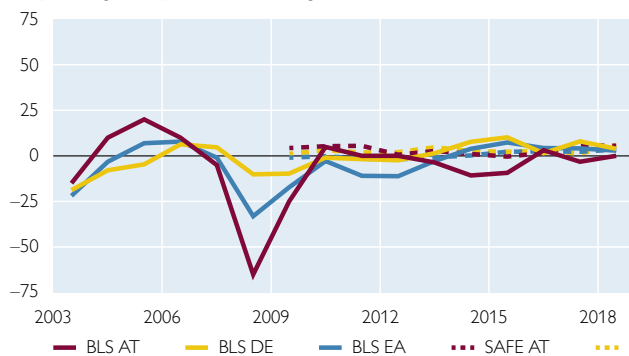
### Covenants/other

Net percentage of responses, annual averages



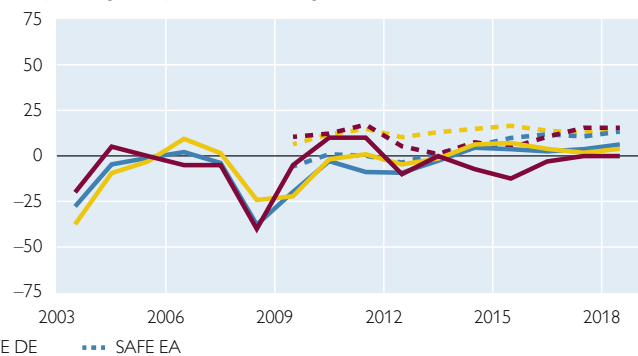
### Maturity

Net percentage of responses, annual averages



### Loan size

Net percentage of responses, annual averages



Source: ECB.

Note: BLS: Net percentage of banks' easing minus tightening. SAFE: Weighted percentage of enterprises. 2018 refers to Q1–Q4 (BLS) and H1 (SAFE).

## 2 Bond market financing conditions

For lack of data on corporate bond yields in Austria, this section focuses on government bond yields, which serve as a benchmark for private market interest rates in many cases. Already in anticipation of the introduction of the euro, sovereign bond yields had receded markedly in participating countries. This reflected the expectation that the Eurosystem's monetary policy would bring lasting price stability. The yield decline was particularly pronounced in countries with comparatively higher pre-EMU inflation rates since risk premiums were more strongly depressed in these countries in anticipation of the euro.

In Austria, nominal government bond yields almost halved from 7.74% to 4.14% between Austria's accession to the EU on January 1, 1995 and the start of the third stage of EMU in 1999. Following a temporary increase to 5.75% by the second quarter of 2000, yields gradually declined to a low of 3.1% by fall 2005, hovering around 4% thereafter until the onset of the financial crisis in 2007/2008. Nominal sovereign bond yields declined to 2.5% in Austria in reaction to the Lehman crisis in September 2009 and the resulting adjustment of global growth expectations and inflation prospects as well as the slashing of official interest rates and the step-by-step adoption and extension of unconventional monetary policies

by central banks. The monetary policy measures taken in response to the euro area sovereign debt crisis pushed Austrian 10-year sovereign yields below 1% toward the end of 2014, with a low of 0.14% being reached in September and October 2016. Since then, 10-year sovereign yields have remained below 1% (see left panel of chart 6).

Austrian yield spreads over German bunds had already fallen to just a few basis points (which reflected the lower liquidity of the smaller market for Austrian as compared to German bunds) toward the late 1980s, and remained at these low levels until the onset of the crisis. Thus, the irrevocable fixing of conversion rates as at January 1, 1999 was apparently not regarded as a significant regime change by financial markets compared to Austria's hard currency policy that had been pursued over the two preceding decades. The yield spread temporarily increased to 1% and above between 2009 and mid-2012 in the context of the financial and sovereign debt crisis when Austrian banks' exposure in Central, Eastern and Southeastern European (CESEE) markets raised concerns about the stability of Austria's banks and the potential consequences for Austria's public finances. However, the de-escalation of the sovereign debt crisis by the ECB's announcements in July 2012 also caused Austrian yield spreads to almost return to their pre-crisis level, i.e. to one of the lowest levels of euro area countries (see middle panel of chart 6).

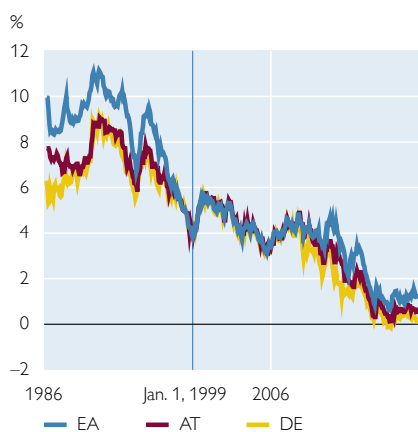
While Austria exhibited much lower nominal government bond yields than most of the other euro area countries (except Germany and a few "core" countries), this "yield advantage" disappeared in the run-up to EMU. It resurfaced, though, during the financial crisis as Austria was less affected than several other euro area countries, and has not fully vanished to date (see middle panel of chart 6).

The slope of Austria's sovereign yield curve, as approximated in the right panel of chart 6 by the 10-year minus 2-year yield difference, has undergone strong changes over the past two decades. After a marked flattening until the summer of 2000 following the Asian crisis, the yield curve steepened strongly until end-2003, reflecting marked cuts in key ECB rates, which depressed short-term yields. The yield curve turned virtually flat ahead and during the early phases of the financial crisis, reflecting the ECB's tightening of key interest rates in response to increasing

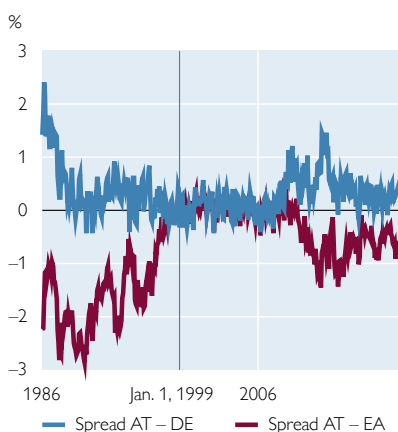
Chart 6

## Bond market financing conditions

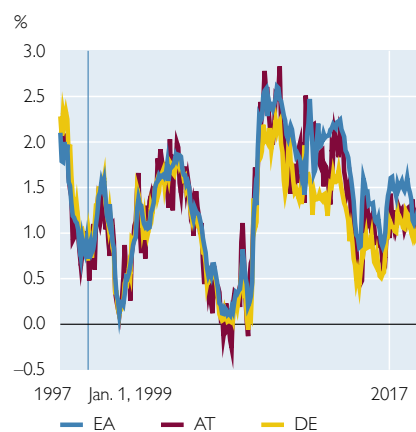
### 10Y sovereign yield



### 10Y spread AT versus DE/EA



### 10Y-2Y yield spread



Source: Macrobond.



HICP inflation during this period. Expectations of lower growth and inflation and resulting expectations of low future policy rates as well as expected and actual outright purchases in bond markets flattened the Austrian sovereign yield curve until 2015. Since then, with short-term rates around or slightly below zero and 10-year yields between zero and 1%, the Austrian sovereign yield spread has remained fairly stable with a moderately positive slope.

### 3 Stock market financing conditions

Overall, Austria's stock market, as measured by the ATX index since the start of EMU, has performed much better than both the DAX (price index) and the Euro STOXX50. Initially, Austrian stocks participated neither in the boom nor in the ensuing bust recorded in German and European stocks in the first five years of EMU. The following boom between mid-2003 and mid-2007 was far more pronounced in Austria than in Germany and Europe at large. During these four years, Austrian stock prices quadrupled. In turn, the price drop during the financial crisis until early 2009 was also much sharper in Austria. Ups and downs in stock prices thereafter basically reflected patterns in other stock markets.

Earnings ratios of listed companies as approximated by the inverse of the price-to-earnings ratio trended up from around 5% to 7% during the first EMU years up to the financial crisis. A short episode of extremely high values exceeding 20% reflected abrupt price corrections in the last quarter of 2008. The decline in listed companies' earnings ratios until 2014/2015 mirrored overall weak economic growth during this period, while the strong rise in earnings ratios until the third quarter of 2018 resulted from improved corporate earnings, which were not fully accompanied by stock valuations. Finally, the stock price corrections in the last quarter of 2018 further boosted earnings ratios to almost 10% by end-2018 (see middle panel of chart 7).

A common measure to gauge the premium that stock owners demand as compensation for the risk they assume compared to risk-free assets is the equity premium, which is estimated based on future expected earnings. For lack of data, we consider a much simpler, backward-looking measure of a "stock earnings premium," which is computed as the difference between the earnings ratio described

Chart 7

#### Stock market financing conditions



Source: Macrobond.



above minus a low-risk long-term asset, namely the premium over Austrian 10-year sovereign yields. Naturally, the time profile of these premiums closely reflects the development of the earnings ratio. Measured this way, Austrian stock earnings showed a premium of around 2 to 3 percentage points over the long term. Leaving aside the very start of EMU and the price collapse during the financial crisis, the steady and strong increase in the stock earnings premium to 9 percentage points in the course of 2017/2018 seems quite exceptional (see right panel of chart 7).

## 4 Financial Conditions Index

A common way of summarizing the information contained in several of the above indicators is to construct a Financial Conditions Index (FCI). The idea behind an FCI is that one can aggregate several financial variables in one number by using a weighted average of these variables. The index does not describe the change of individual variables but rather captures the overall trend in financial markets (see Fransson and Tysklind, 2017). FCIs are widely used by financial market analysts and, despite being atheoretical, have been found to be good predictors of GDP growth and financial market tensions (see Hatzius et al., 2010; Brave and Kelley, 2017).

### 4.1 Data and methodology

The data used to construct the FCI are chosen based on availability, their correlation with GDP,<sup>13</sup> and whether they represent different channels of the transmission mechanism of monetary policy. Our FCI is based on 16 variables, which have a common sample starting in January 2000. These include (1) price variables (EONIA, EURIBOR, 10-year government bond yields, lending rates for house purchase, nonfinancial corporations and consumers, the Vienna stock exchange index and the nominal effective exchange rate (NEER)); (2) quantity variables, such as growth of total credit to households and nonfinancial corporations as well as liquidity supplied by the Eurosystem;<sup>14</sup> and finally (3) risk variables, such as the spread between Austrian and German 10-year sovereign bond yields (country risk), the spread between the 10-year Austrian bund and EURIBOR (slope of the yield curve) as well as the spreads between lending rates to households, nonfinancial corporations and consumers and the EONIA (sectoral credit risk).

There are many methodologies used in the literature to estimate FCIs.<sup>15</sup> We have opted to extract the weights of each variable on the FCI by factor analysis. The principal components extracted with factor analysis capture the common variation of all the financial variables included in the index. As done in the literature, we normalize the data and transform the variables in such a way that an increase in the FCI reflects a loosening of financial conditions, while a decrease reflects a tightening. The index is constructed using the first five factors that explain 87% of the variance.<sup>16</sup>

<sup>13</sup> *F-tests of each variable correlated with GDP are available from the authors upon request.*

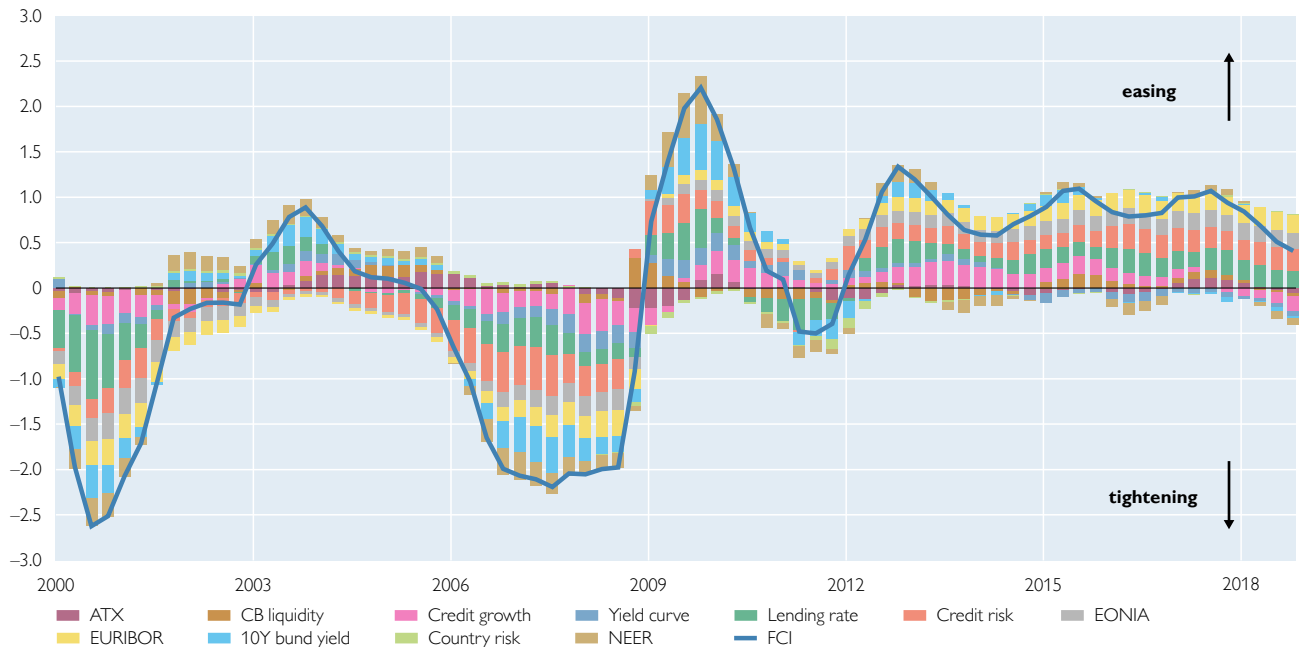
<sup>14</sup> *Excluding the Securities Markets Programme (SMP).*

<sup>15</sup> *For excellent reviews, see for example Davis et al. (2016) and Moccero et al. (2014).*

<sup>16</sup> *The first factor already explains 47% of the variance. Increasing or decreasing the number of factors and the percentage of variance explained does not alter the FCI significantly.*

Chart 8

### Contributions to the Financial Conditions Index



Source: Authors' calculations, ECB, Eurostat.

## 4.2 Results

Chart 8 shows the estimated financial conditions index and the contribution of each variable (or group of variables) to the FCI. Throughout the entire period under review, short- and long-term interest rates were important drivers of financial conditions in Austria, even though the long-term rate has contributed much less to overall financial conditions since 2015. While other variables that are usually associated with financing conditions, such as the stock market, the NEER or liquidity from the central bank, have smaller weights in this index, lending rates and sectoral credit risk turned out to be important contributors to financing conditions. Although the tightening that occurred between 2006 and 2009 was mostly driven by rising interest rates, other variables, such as lending to households, the stock market and the NEER, were also tightening during this period. After the crisis, lending rates and credit risk responded positively to the different policy measures implemented by the Eurosystem and have, for the most part, contributed to the easing of financial conditions. While lending rates followed the general tightening observed during the sovereign debt crisis in 2011, credit risk was still low and dampened the tightening observed in the sovereign bond market. In fact, the main drivers of the brief tightening period around the sovereign bond crisis in 2011 were, besides lending rates, the 10-year bund yield and country risk. This is surprising since Austria was considered a safe-haven market and yields of Austrian sovereign bonds therefore increased relatively less than those in several other countries. Finally, since 2011, almost all variables except central bank liquidity and the slope of the yield curve have contributed to more accommodative financing conditions.

## 5 Monetary stance

In order to gauge the monetary stance, it is common to compare the policy rate to a monetary policy rule, which should approximate the appropriate level of the policy rate as a function of national economic conditions. Since the OeNB does not set the interest rate for Austria, we can only measure whether euro area nominal interest rates were adequate for the economic conditions in Austria, as seen through the lens of a hypothetical monetary policy rule calibrated for Austria. The most popular monetary policy rule used to gauge the monetary stance is the Taylor rule but this rule has the disadvantage that it requires an estimation of the natural rate of interest (see Hartmann and Smets, 2018). This is problematic because the natural rate of interest is not observable, and its estimation is very imprecise. In fact, although there are good reasons to believe that the current natural interest rate in Austria is lower than at the beginning of the currency union, the uncertainty surrounding estimates of the natural interest rate is so large that it may well be that the natural interest rate has not changed.<sup>17</sup>

Thus, we rely on a so-called first-difference rule to gauge the monetary stance in Austria.<sup>18</sup> The advantage of this type of rule is that it only considers the inflation rate in Austria and the output gap or GDP growth but does not rely on estimates of the natural interest rate (see Hartmann and Smets, 2018). Orphanides and coauthors have shown in several studies that under uncertainty, a first-difference rule, where the policy rate has a very high degree of inertia, is the most robust rule a central bank can follow.<sup>19</sup> This is because this type of rule implies a smoother reaction of policy-makers to shocks in the economy, which reduces mistakes in case of mismeasurements of the relevant variables (see Williams, 1999).<sup>20</sup>

The first-difference rule used here is given by

$$R_t^{FD} = R_{t-1} + \theta(\pi_t - \pi^*) + \theta(y_t - y_{t-4})$$

where  $R_{t-1}$  is the EONIA rate in the last quarter,  $\pi_t$  is the inflation rate in Austria in quarter  $t$ ,  $\pi^*$  is the target inflation rate, which we set at 2%, and  $(y_t - y_{t-4})$  is the annual growth rate of GDP, which can eventually be replaced with the output gap as in Orphanides' original rule (see Orphanides, 2003).<sup>21</sup>

In chart 9 we show the deviation of two different specifications of a hypothetical monetary policy rule for Austria from the EONIA. The two policy rules are, first, Orphanides' original specification using a weight of  $\theta = 0.5$  and the output gap; the second rule uses  $\theta = 0.1$  and the annual growth of GDP as implemented by the Fed.<sup>22</sup> If the deviation is positive, i.e. if the EONIA is higher than the prescribed hypothetical monetary policy rule, the euro area rate was too tight for Austrian economic conditions.

<sup>17</sup> For estimates of the natural rate for Austria, see Belke and Klose (2017).

<sup>18</sup> The rule is also known as the Orphanides rule. For more details, see Orphanides (2003).

<sup>19</sup> Uncertainty not only about the level of the natural rate of interest but also about the structure of the economy, the phase in the business cycle, etc., which can lead to mismeasurements of the relevant variables. For more details, see Orphanides and Williams (2002) and Orphanides and Wieland (2012).

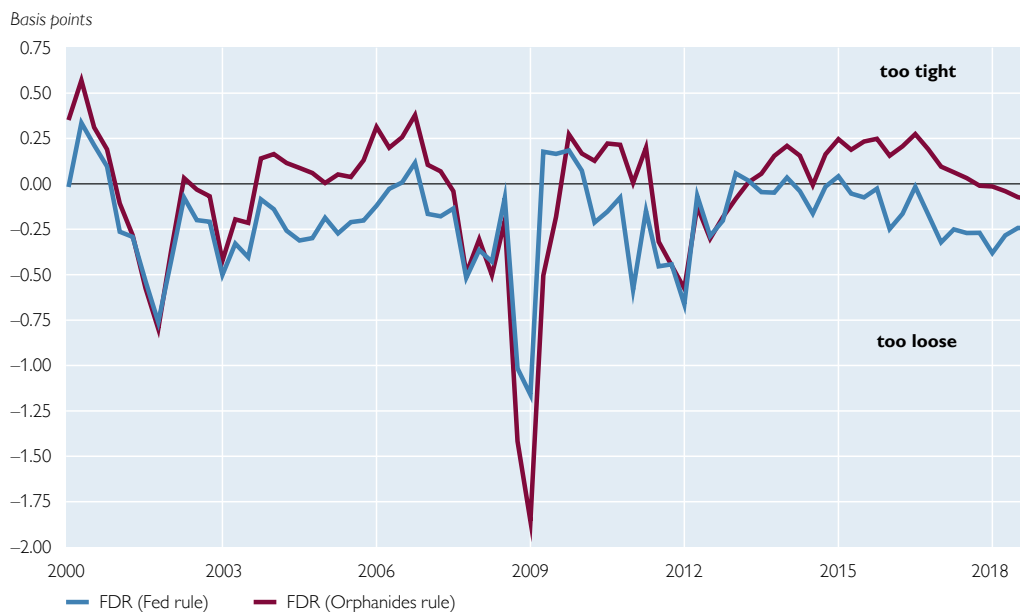
<sup>20</sup> It is understood that if the natural rate of interest was known, it would be more efficient to have a rule including it.

<sup>21</sup> The interpretation is that the output gap captures the deviation of current GDP growth from potential growth.

<sup>22</sup> For more information, see "Monetary Policy Principles and Practice" available at <https://www.federalreserve.gov/monetarypolicy/policy-rules-and-how-policy-makers-use-them.htm>.

Chart 9

### Deviations of an Austrian “policy rule” from the EONIA



Source: Authors' calculations, ECB, Eurostat.

As can be seen in chart 9, there are no large differences across both specifications. According to the original Orphanides rule (which implies a larger reaction of monetary policy to deviations of inflation from its target and to the output gap), the deviations from the EONIA were slightly larger during the peak of the crisis. On the other hand, under this rule the EONIA was too tight more often than under the Fed rule but the deviations from the EONIA were under 25 basis points most of the time. On the contrary, using the Fed rule (which has a much smaller reaction coefficient) the EONIA was almost always too loose for Austrian economic conditions and the deviations from the EONIA were often larger than 25 basis points. Only in the last year, given sustained economic growth and higher inflation in Austria compared to the euro area average, we observe that, according to both hypothetical rules, the EONIA was too low for Austrian economic conditions.

## 6 Conclusions

The various indicators used in this article show that Austria has withered the crisis well in terms of consequences for financing conditions, and Austria's public finances and the real economy have benefited from lower financing costs compared to the euro area average for most of the last 20 years.

Interest rates for bank loans have fallen since the introduction of the euro, with real interest rates being lower in Austria than in Germany and the euro area most of the time. This was, in part, related to the high share of variable rate loans, especially in the case of housing loans. Since the crisis, lending spreads between customer rates and money market rates (credit risk) have widened, while non-interest price elements of loans have increased. Banks have made up, at least in part, for lower interest rates by applying higher collateral requirements and loan covenants.

The Austrian 10-year nominal sovereign yield continued its pre-EMU decline also after the start of the euro; the expansionary monetary policy stance pursued by the ECB in response to the crisis has brought it below 1% since end-2014. Austria's pre-EMU "bond yield advantage" over non-core euro area countries, which had largely vanished in the first 10 years of EMU, resurfaced during the crisis.

The ATX index has risen by far more than the DAX and Euro STOXX50 indices over the past 20 years. However, earnings ratios of ATX companies have mostly been below those in the DAX and Euro STOXX50. In Austria, the stock earnings premium over 10-year government bonds was 2% to 3% for most of the period under review but rose to around 9% in 2017/2018.

A financial conditions index for Austria shows that together with interest rates, lending rates and credit risk were important contributors to the tightening of financial conditions during the financial crisis and have contributed to the loosening of financing conditions during the recovery.

Approximated by two different specifications of a simple hypothetical monetary policy rule, the monetary stance given by the euro area rate has been broadly adequate or slightly on the loose side in relation to economic conditions in Austria.

## References

- Angelopoulou, E., Balfoussia, H. and H. D. Gibson. 2014.** Building a financial conditions index for the euro area and selected euro area countries: what does it tell us about the crisis? *Economic Modelling* 38. 392–403.
- Belke, A. and J. Klose. 2017.** Equilibrium Real Interest Rates and Secular Stagnation: An Empirical Analysis for Euro Area Member Countries. *JCMS: Journal of Common Market Studies* 55(6). 1221–1238.
- Brave, S. A. and D. L. Kelley. 2017.** Introducing the Chicago Fed's new adjusted National Financial Conditions Index. *Chicago Fed Letter* 386/2017.
- Davis, E. P., Kirby, S. and J. Warren, J., 2016.** The Estimation of Financial Conditions Indices for the Major OECD Countries. OECD Economics Department Working Paper 1335. Paris: OECD Publishing.
- Fransson, L. and O. Tysklind. 2017.** An index for financial conditions in Sweden. *Sveriges Riksbank Economic Review* 1/2017.6–27.
- Hatzius, J., Hooper, P., Mishkin, F. S., Schoenholtz, K. L. and M. W. Watson. 2010.** Financial Conditions Indexes: A Fresh Look after the Financial Crisis. NBER Working Paper 16150. 1–56.
- Hartmann, P. and F. Smets. 2018.** The first twenty years of the European Central Bank: monetary policy. *ECB Working Paper Series* 2219. December.
- Moccero, D. N., Pariès, M. D. and L. Maurin. 2014.** Financial Conditions Index and Identification of Credit Supply Shocks for the Euro Area. *International Finance* 17(3). 297–321.
- Orphanides, A. 2003.** Historical monetary policy analysis and the Taylor rule. *Journal of Monetary Economics* 50(5). 983–1022.
- Orphanides, A. and V. Wieland. 2012.** Complexity and Monetary Policy. *International Journal of Central Banking* 9(1). 167–204.
- Orphanides, A. and J. C. Williams. 2002.** Robust Monetary Policy Rules with Unknown Natural Rates. *Brookings Papers on Economic Activity* 2. 63–118.
- Williams, J. 1999.** Simple Rules for Monetary Policy. Federal Reserve Board FEDS Paper No. 12/1999.

# (How) has EMU affected fiscal policy in Austria?

Walpurga Köhler-Töglhofer, Doris Prammer, Lukas Reiss<sup>1</sup>

Refereed by: Kristina Fuchs, Austrian Ministry of Finance

Since Austria joined the euro area, national budgetary policy has been influenced by EU fiscal rules to a significant extent. Above all, EU fiscal targets were key drivers behind the major consolidation episodes: consolidations either aimed at bringing the headline deficit ratio below 3% of GDP or at moving the structural budget balance closer to the medium-term objective. At the same time, the structure of expenditure and revenue continues to be under full national responsibility. While the revenue structure remained relatively stable over the last 20 years, we observe relatively strong shifts in the expenditure structure towards social transfers in kind.

JEL classification: E62, H2, H5

Keywords: fiscal rules, fiscal policy, tax and expenditure structure

With Austria having joined the European Union (EU) in 1995 and having been a first-round member of European Economic and Monetary Union (EMU), since 1999, Austria's fiscal policy has become firmly embedded in the evolving European fiscal framework. This has meant a substantial regime shift for fiscal policymakers.

In the decades preceding EU accession, Austria's budget policymaking had already undergone several regime changes. In the 1960s, Austria's budget policy, precisely the federal government's budget policy, used to be aimed at maintaining a balanced budget. The primary role of government at that time was that of allocating resources to secure the provision of services of general economic interest and to make sure that the essential needs of society would be met. In the 1970s, the advent of the welfare state was accompanied by expansionary budget policies (the so-called Austro-Keynesian model). Ultimately, the development of the welfare state and the stabilization function that fiscal policy assumed on top of its allocation function went hand in hand with permanent budget deficits. The cumulative deficits caused the public debt ratio to soar in the second half of the 1970s, with interest payments spiraling in tandem. This triggered a debate about the necessity of upper limits for budget deficits, based on the Seidl formula.<sup>2</sup> While successive governments indeed adopted consolidation packages whenever the budget deficit exceeded the Seidl threshold by a certain margin, primary surpluses remained out of reach. Another regime shift in the mid-1980s, finally, implied the de facto departure from the Austro-Keynesian course and a partial move to supply-side economics (see Bartel, 1995).<sup>3</sup>

<sup>1</sup> Oesterreichische Nationalbank, Economic Analysis Division, walpurga.koehler-toeglhofer@oenb.at, doris.prammer@oenb.at, lukas.reiss@oenb.at. The views expressed in this paper are exclusively those of the authors and do not necessarily reflect those of the OeNB or the Eurosystem. The authors would like to thank Christian Ragacs and Alfred Stiglbauer for helpful comments and valuable suggestions.

<sup>2</sup> According to the so-called Seidl formula – based on the theoretical model of Domar (1944) – Austria would have to target a federal government deficit of 2½% of GDP on average to stabilize the debt ratio at 33.3% of GDP given annual nominal GDP growth rates of 7% (see Katterl and Köhler-Töglhofer, 2005).

<sup>3</sup> Income as well as corporate taxation were reformed with the aim of strengthening the allocative function and departing from strictly distributional objectives. Among other things, the government reduced the marginal income tax rate from 62% to 50% with the aim of creating stronger incentives to work. The corporate taxation reform introduced a comparatively low proportional tax rate for corporations while expanding the tax base as well as a proportional tax on residential taxpayers' capital income that is withheld at source and treated as a final tax. This comprehensive tax reform was a response to the opening up of the economy and the free movement of capital and labor as well as to the growing locational competition.



The regime shift related to EU/EMU membership ensued from the requirement to comply with the convergence criteria defined by the Maastricht Treaty by 1997. Among the five criteria for nominal convergence there were two fiscal criteria, which requested first and foremost a general government budget deficit that must not exceed 3% of GDP, and second a debt-to-GDP ratio of below 60% of GDP, or – if above 60% of GDP – a debt ratio diminishing and approaching the debt limit at a satisfactory pace. These criteria still form the core of the Stability and Growth Pact (SGP), which was adopted in 1997 in anticipation of the need to help sustain sound fiscal policies beyond the date of accession to the euro area. The SGP defines fiscal rules for all EU countries and can lead to sanctions for euro area member states like Austria. Over time, these criteria have been specified and augmented by country-specific medium-term objectives, requiring balanced budget positions (in structural terms).

Box 1

#### European fiscal rules in a nutshell

*The current set of EU fiscal rules has three pillars indicating whether there are consolidation needs: (i) the 3% of GDP upper limit for the headline deficit, (ii) the requirement of the debt ratio being either below 60% of GDP or sufficiently diminishing, and (iii) the country-specific medium-term targets (MTO) for the structural balance (cyclically adjusted balanced budgets, net of one-off and temporary measures), which currently stands at –0.5% of GDP for Austria. The first two anchors form the corrective arm of the SGP, while the latter is at the core of the preventive arm. If a country does not achieve all these targets, it has to adopt adequate fiscal adjustment measures. The indicators used to assess the adequacy of the consolidation are (a) the change in the structural balance and (b) expenditure growth adjusted for the impact of discretionary revenue measures (for details, see Prammer and Reiss, 2016, 2018). Both consolidation requirements and sanctions tend to be stricter in the corrective arm of the SGP. At the same time, the corrective arm is also much more procyclical, i.e. tends to ask for higher consolidation in economically bad times.*

One of the main functions of budgetary and tax policy – in addition to allocation and distribution – is to stabilize the business cycle. In the euro area, monetary policy is expected to be the core instrument of aggregate stabilization policies, at least as long as countercyclical monetary policy is consistent with the ECB's main objective to achieve price stability. At the same time, national fiscal policies are responsible for smoothing country-specific business cycles, through automatic stabilizers and discretionary countercyclical policies.

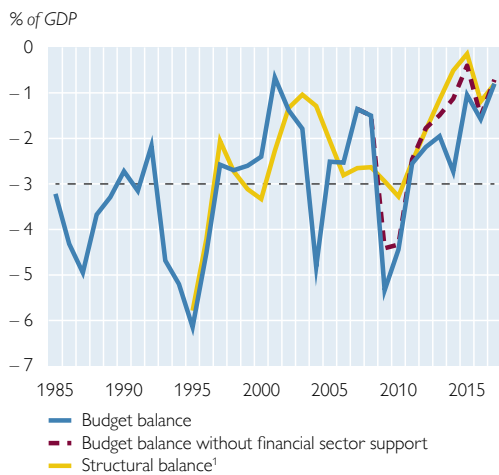
Two decades after the introduction of the euro, the question arises as to whether or to what extent the commitment to respect this European framework has limited Austria's "discretionary fiscal policy space." Put differently: Has fiscal policy in Austria become more or less procyclical or countercyclical since EU/EMU accession? Have the rules hampered policymakers in pursuing distributional and/or allocative goals?

Accordingly, the first section of this article focuses on the impact the European fiscal framework had on the concrete fiscal outcomes in the last two decades and, in particular, on the question whether the fiscal stance has been appropriate over the last 2½ decades. As the SGP does not contain any requirements for the size, structure or composition of national public revenues or expenditures, the second

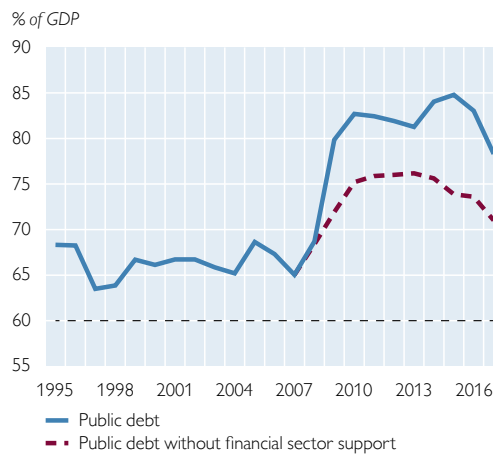
Chart 1

## Developments of budget balance and public debt

### Budget balance



### Public debt



Source: Eurostat, European Commission, OeNB.

<sup>1</sup> Cyclically adjusted balance according to the European Commission minus one-offs according to authors' estimates (see footnote 5).

section is devoted to the development of the revenue and expenditure structure of the general government sector. Section 3 concludes.

## 1 Austria's fiscal stance and compliance with EMU fiscal rules<sup>4</sup>

According to the most recent data, the general government's deficit ratio has occasionally been above the 3% threshold, while the debt ratio has always been above 60% of GDP (chart 1).

Chart 2 plots the evolution of Austria's fiscal stance (proxied by the change in the structural primary balance<sup>5</sup>) in relation to its position in the economic cycle (proxied by the output gap). The change in the structural primary balance can be considered as an indicator of whether discretionary fiscal policy is contractionary (expansionary) – related to the output gap.<sup>6</sup> It signals whether the fiscal stance in a certain year/period is appropriate for the current position in the business cycle, i.e. whether discretionary fiscal policy is smoothing economic activity or even amplifying shocks. Ideally, fiscal policy should be restrictive when both output level and growth are above trend, it should be expansionary when both output level and growth are below trend, and it should be passive otherwise. Chart 2 shows that in Austria episodes of active fiscal policymaking (changes in the structural primary

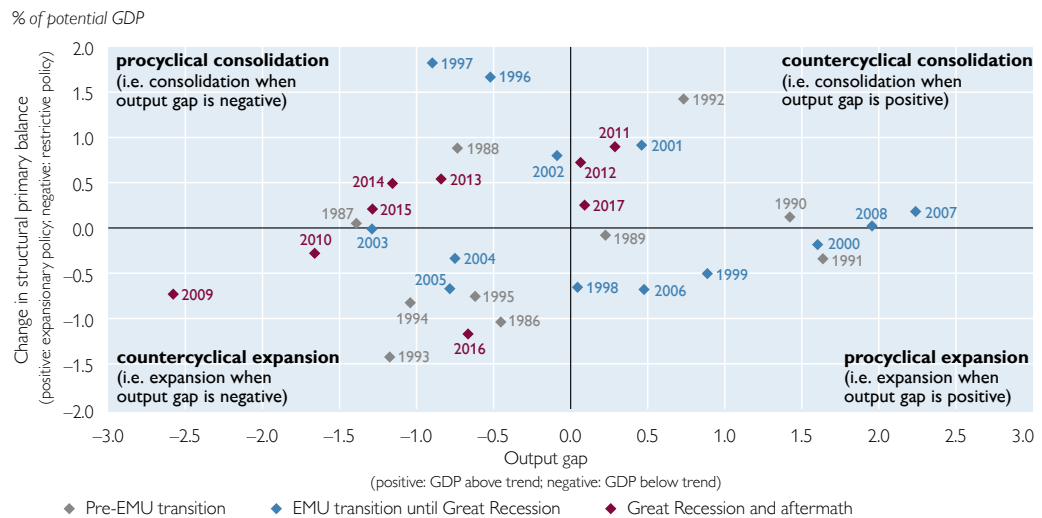
<sup>4</sup> Please note that the analysis is based on most recent fiscal data and might differ from first ex post released data. Differences are explained in box 2.

<sup>5</sup> For the calculation of the structural primary balance, we used output gaps by the European Commission (autumn 2018 data) and a constant budgetary semi-elasticity with respect to the output gap of 0.49 for the whole period. This value corresponds to the one used by the European Commission for the calculation of structural budget balances in the projection rounds of 2013–2014. The semi-elasticity of 0.58 that is currently used by the European Commission would lead to misleading results for the years before and after 2009. Furthermore, the following one-offs have been accounted for: capital transfers in the context of financial sector support from 2009 to 2017 and the reorganization of ÖBB in 2004, small one-off taxes collected in 2012–2014 (tax agreements ...) as well as policy-induced collection peaks in profit-related taxes in 2001 and 2015.

<sup>6</sup> The output gap measures the deviation of actual output from its trend.



### Austria's fiscal stance since 1986



Source: OeNB, European Commission.

balance larger than 0.5 percentage points in absolute terms) primarily coincided with economically bad times. Economically bad times, in turn, have seen both episodes of sizeable consolidations (e.g. in 1996–1997 and 2013–2015) and episodes of large fiscal stimuli (e.g. in 2009–2010).

#### 1.1 Large consolidation necessary for EMU accession

In the decade before EMU accession, Austria's budget balance was on average well above 3% of GDP, peaking in 1995 with a general government balance of –6.1% of GDP (see chart 1). The massive fiscal loosening undertaken in the 1993–1995 period amid slowing growth (chart 1 and countercyclical expansion in chart 2) had been observed with concern by academics (Van der Bellen, 1997) and Austrian policymakers alike as it endangered Austria's EMU accession. Hence, the Austrian government prepared the then largest consolidation package since the end of WW II, including an explicit strategy to bring down the debt ratio (for details see Katterl and Köhler-Töglhofer, 2005). Measures comprised a broadening of the tax base for direct taxes, staff cuts in the public sector, the restructuring of government enterprises to facilitate their reclassification to the private sector, and a package to curb expenditure on pensions.<sup>7</sup> Moreover, in 1996 the federal government also negotiated a precursor of the today's Austrian Stability Pact with the provinces and the municipalities. Widespread concerns that this procyclical fiscal tightening by almost 4 percentage points might cause an even stronger cyclical bust did not materialize. Real GDP growth and the output gap worsened only slightly compared to the preceding countercyclical expansionary episode in Austria (as shown in chart 2, the output gap deteriorated only slightly in 1997 compared to 1995). Austria even managed to keep GDP growth above the EA-12 average, as the majority of EU Member States willing to participate in EMU had to consolidate as well (Diebalek et al., 2002). The subdued effect of fiscal tightening on the economy might have

<sup>7</sup> Spending cuts were designed to account for two-thirds of the consolidation success and revenue increases for one-third.

been due to the expectation of positive effects from EMU accession. Another very important reason was that consolidation was, among other things, achieved by massive outsourcing and privatization activities as well as by one-off measures, which did not have an immediate impact on aggregate demand (Prammer, 2009). According to Stübler (2003), outsourcing activities in 1997 – as well as in 2001 – had a quite substantial deficit- and debt-reducing impact in real time, with the outsourcing of the highway authority ASFINAG alone reducing the public debt-to-GDP ratio by about 3 percentage points in 1997 (Prammer, 2009). However, some of these outsourcing activities improved the debt ratio only temporarily (see box 2). While it was widely acknowledged that consolidation was ultimately unavoidable, the timing (cyclical downswing) and size (large) of the consolidation was definitely a response to the fiscal precondition for EMU accession, as being among the initial members of the euro area was considered to be of paramount political importance for Austria (compare Pfaffermayr, 2003; Breuss, 1995; and Breuss et al., 1997).

## 1.2 Relatively strong variation in fiscal stance before the Great Recession

The years following compliance with the convergence criteria in 1997 and hence EMU accession in 1999 were characterized by euro area-wide fiscal fatigue: In Austria, no new consolidation measures were taken, but temporary consolidation measures were allowed to fade out.<sup>8</sup> The overall budget deficit remained rather stable despite buoyant economic activity, implying a substantial worsening of the structural balance in 1998 and 1999 (charts 1 and 2). Following the electoral cycle rather than the business cycle, a procyclical tax reform was scheduled for 2000, pushing up the projected deficit ratio even further. However, the resulting path of the deficit would have been at odds with the requirements to achieve a balanced budget in cyclically adjusted terms.<sup>9</sup> This caused massive criticism from the European Commission (see Katterl and Koehler-Töglhofer, 2005). In response to the criticism and the international request to respect the European fiscal rules, respectively, the government reformulated its fiscal policy strategy and announced its intention to achieve a balanced budget by all means in 2002. Like the 1997–1998 consolidation measures, consolidation again unfolded against the background of a starting slowdown of the economy, caused by the 2000 bust of the “dotcom bubble.” Nevertheless, given the high growth rates in the preceding years, chart 2 displays a countercyclical fiscal consolidation, with a positive but shrinking output gap. The balanced budget target was already met in 2001 according to real-time data (left panel of chart 3 in box 2), albeit with the help of one-off measures (very large revenue derived from income taxes on profits due to changes in tax collection) and further outsourcing measures (whose statistical treatment has since been changed, see box 2). The permanent consolidation measures (such as the increases in excise duty rates and the broadening of the income tax base) helped to keep structural budget deficits broadly stable until 2004.<sup>10</sup> However, consolidation against continued low growth implied fiscal procyclicality in 2002 (chart 2), while fiscal policy was broadly neutral in 2003.

<sup>8</sup> The consolidations in the previous years were partly based on one-off measures and temporary measures, expiring in 1998, such as the temporary abolition of the loss carryover.

<sup>9</sup> This was later on specified to be achieved in 2002 by all Member States and would have required a yearly adjustment of at least 0.5% of GDP towards the target (see Diebalek et al., 2006).

<sup>10</sup> Moreover, a sweeping pension reform – the biggest in the EU in terms of volume – was announced and implemented in 2003–2004.

The first leg of the 2004–2005 tax reform brought about a slight fiscal expansion amid rebounding growth rates. The general government deficit ratio of more than 4% of GDP in 2004, as displayed in chart 1 according to most recent data, did not give rise to concerns at that time, as it was only 1.5% of GDP according to the first ex post releases (box 2). However, the request for annual structural improvement in the preventive arm of the SGP of at least 0.5% of GDP was not executed.

The lack of enforceability of the SGP, in particular the failure to enforce the corrective arm in the case of Germany and France, ultimately led to its revision in 2005 (see Diebalek et al., 2006). Since then, the preventive arm of the SGP has included explicit country-specific targets for structural budget balances. In general, the adjustment path towards structural balanced budget positions should be aligned with cyclical conditions: while improvements of the structural balance by 0.5% of GDP should be the rule, member states should strive to do more in good times but would be allowed to do less in bad times. In addition, the corrective arm of the SGP specified circumstances allowing for a temporary overrun of deficit targets.

While the first leg of the 2004–2005 tax reform was counter-financed, the second leg of the tax reform – reducing personal income taxes and, above all, corporate income tax rates from 34% to 25% – was clearly at odds with the preventive arm of the SGP. Lack of full counter-financing caused the structural balances to worsen by more than 1/2 percentage point. The fiscal loosening took place against the background of GDP growth above trend, but a still negative output gap. The lagged effects of the tax reform caused the structural budget balance to worsen further in 2006 amid buoyant GDP development, indicated as a procyclical expansion in chart 2. The failure to improve structural fiscal positions during the boom years 2006 and 2007 was more than compensated by high GDP growth, which helped to bring down the overall headline budget deficits to around ½% of GDP in real time (meanwhile revised to about 1½% of GDP). The fact that other euro area countries failed to undertake the necessary structural adjustments during good times as well showed that ownership and enforceability of the preventive arm of the SGP was still weak. In the same way the preventive arm of the SGP had failed to lead to improvements of the structural balance once a nominal balanced budget had been achieved in 2001, the debt rule was sidelined. In fact, public debt in 2005 was higher than in 1995, while it was supposed to be “sufficiently diminishing” according to the Maastricht Treaty.

### **1.3 Mid-sized stimulus at the beginning of the Great Recession was followed by a long phase of gradual consolidation**

The failure to “repair the roof when the sun was shining” took its toll when the economic and financial crisis unfolded from 2008 onward. The government was initially willing to accept deficit ratios above 3% of GDP and implemented a relatively large fiscal stimulus package, comprising an income tax cut, increases to social benefits<sup>11</sup> (pensions, family, long-term care) and increases to public investment. While this countercyclical fiscal expansion in 2009 and 2010 (chart 2) seemed justified in light of traditional Keynesian demand policies and also in light of the extraordinarily strong recession, it drove the fiscal deficit well above 3% of GDP in 2009 and 2010.<sup>12</sup>

<sup>11</sup> Most of the increases to social benefits were initially deemed to be a response to the high inflation in 2008.

<sup>12</sup> Please note that the first ex post data for 2009 recorded a deficit ratio of only about 3½%, which was later revised upward due to support to the financial sector and reclassifications (each amounting to about 1% of GDP).

Based on its projections for 2009, the European Commission opened an excessive deficit procedure (EDP) against Austria, which was in good company though: all euro area countries except Estonia faced an excessive deficit procedure during/in the aftermath of the economic and financial crisis. Member states essentially got a waiver as regards their fiscal policy in 2009, and euro area countries with medium to good fiscal positions before the crisis (like Austria) were requested to consolidate only from 2011 onward. Austria's first post-crisis consolidation package came into effect in 2011, and involved increases in excise duties, the introduction of a bank levy and capital gains taxation on financial assets as well as cuts to social benefits (including measures curbing early retirement).<sup>13</sup> This package was successful insofar as it decreased the deficit ratio to below 3% of GDP already in 2011, supported by the comparatively strong cyclical upswing in 2010–2011. Nevertheless, the excessive deficit procedure was not abrogated until 2014, with the European Commission reasoning that it could only be abrogated if compliance with the corrective arm was expected to hold over the forecast horizon. At that time, there was, however, uncertainty about the deficit effects of support to the financial sector (see Prammer and Reiss, 2016). The second post-crisis consolidation package was implemented in early 2012, which was a time when the real economy was cooling down significantly and financial markets were in turmoil. It contained further tax increases as well as a public wage freeze and increases of public pensions far below past inflation. Thus, even though Austria remained subject to an excessive deficit procedure for some years, it managed to fulfil the required fiscal adjustments within the original deadline for correction – unlike several other member states, which were granted extensions, mostly on account of bad economic conditions. Indeed, the consolidations required by the European fiscal framework in this period were heavily criticized and caused intensive political debates among academics and policymakers, going hand in hand with proposals for euro area reforms.<sup>14</sup>

Before the reform of the EU governance framework in 2011, the fiscal rules had been criticized for having failed to enforce fiscal buffers in good times. To provide a better safety margin to the 3% deficit limit, the preventive arm of the SGP was strengthened by introducing the possibility of sanctions for disrespecting the (adjustment path to) the MTO.

While Austria's 2011–2013 consolidation was induced by the EDP and the corrective arm of the SGP (and to some extent by financial market pressures), the increased importance of the preventive arm of the SGP contributed to a smaller third post-crisis consolidation package in early 2014. These efforts took place against a negative output gap and a euro area-wide bust period (double-dip recession). In 2012, Austria reinforced compliance with the EU rules by adopting an internal Stability Pact with fiscal rules and targets for the different layers of government (federal level, states, municipalities) with the ultimate aim of respecting a national structural balance target of  $-0.45\%$  of GDP from 2017 onward (for details see Austrian Fiscal Council, 2014). The European Commission, however, asked Austria to intensify its fiscal adjustment to achieve the MTO already in 2015. This continued consolidation process was to a

<sup>13</sup> Moreover, the comprehensive budget reform that involved the introduction of a medium-term expenditure framework in 2009 as well as changes to the budgeting processes in 2013 (Steger, 2010) might have contributed to the sustained consolidation efforts.

<sup>14</sup> See for instance Truger (2013, 2014), Corsetti et al. (2015), De Grauwe et al. (2013), Bénassy-Quéré et al. (2017), Fatas (2018) and Orphanides (2018).

significant extent based on revenue-side measures such as an increase of excise duties and base-broadening adjustments in the income taxation and taxation of corporations in 2014–2015. After five years of consolidation, the structural budget balance stood relatively close to zero in 2015 – clearly respecting the preventive arm of the SGP. In other words, the breach of the 3% of GDP limit in 2009 had been followed by a comparatively long-lasting consolidation period, whereas the first consolidation episode in 1996–1997 had stopped once the minimum requirements for the headline deficits had been achieved in 1997. Thus, we can conclude that Austrian fiscal policy-makers have indeed responded to the strengthening of the preventive arm of the SGP.

However, once the MTO was achieved, the 2016 income tax reform – considerably decreasing the marginal tax rates for low- and middle-income earners – implied another fiscal loosening in a period when the output gap was still negative but a cyclical upswing emerging. For 2017, chart 2 depicts a broadly neutral fiscal stance against improving cyclical conditions.

Box 2

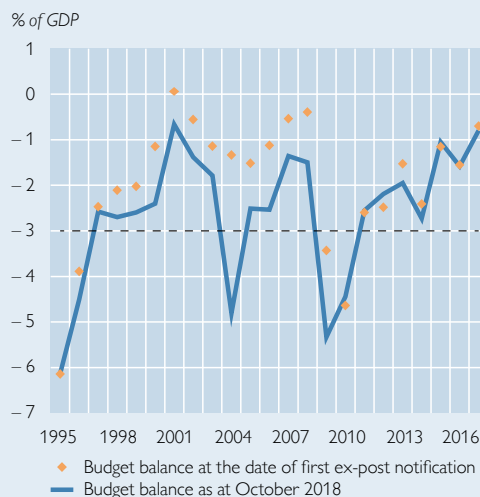
### Ex post revisions of budget balance and public debt data

Charts 1 and 2 above are based on the most recent fiscal data available. However, these data have been subject to relatively large revisions. Chart 3 shows that when comparing the first ex post release (currently end of March T+1) to the most recent one (October 2018), deficit ratios from 1998 to 2009 have typically been revised upward by around 1 percentage point. The main revisions were implemented in spring 2011 (implementation of the new Manual on Government Deficit and Debt, see for example p. 12f in Ragacs and Vondra, 2011) and in fall 2014 (switch to the European System of National Accounts 2010, see for example Stübler et al., 2015). They were largely due to rerouted transactions and subsequent reclassifications of state hospitals and ÖBB Infrastruktur. The large upward revision of the 2004 deficit ratio was due to the change in recording of a debt relief and a capital injection to ÖBB before its reorganization. Reclassifications of entities to the government sector (ÖBB Infrastruktur, ÖBB Personenverkehr, KA Finanz, state hospitals, property management vehicles, ...) have also contributed to the large upward revisions in the ratio of government debt to GDP (even though nominal GDP has also been revised upward substantially).

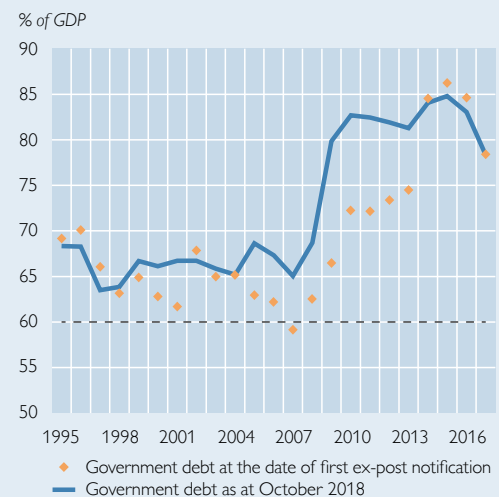
Chart 3

### Revisions to fiscal indications

#### Budget balance



#### Government debt



Source: Eurostat, Statistics Austria.

## 2 Shifts in expenditure and (tax) revenue structure since EMU accession

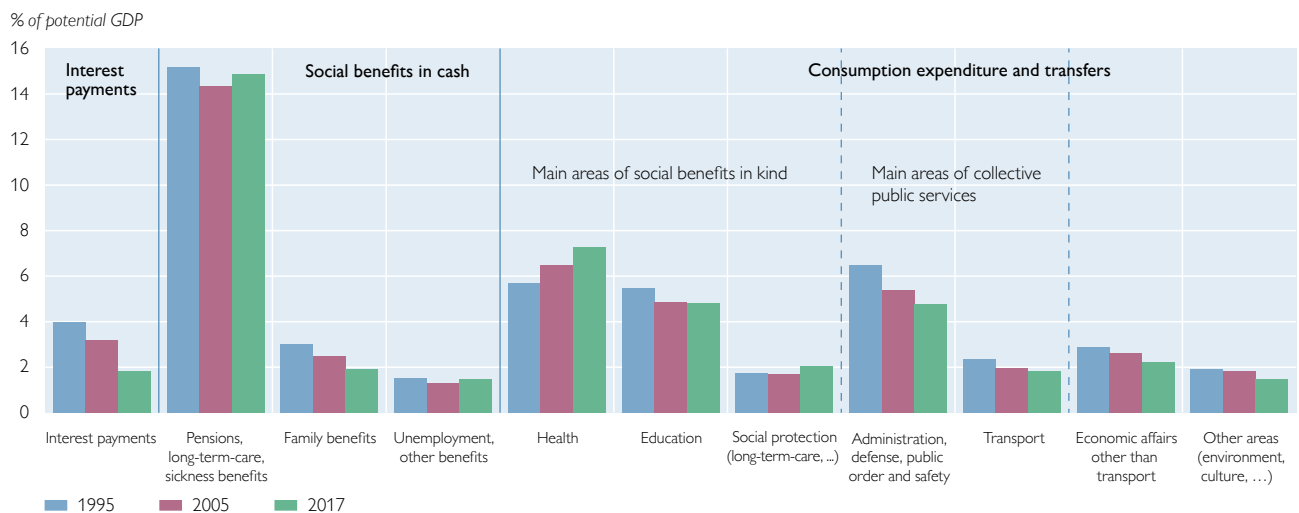
While European fiscal rules bind governments concerning the size of their budget balance and their financial debt, governments are relatively free to choose the size of the government sector and the structure of revenue and expenditure. Distributional goals pursued by the “design” of the tax structure such as the degree of progressivity of personal income tax or the tax treatment of capital etc. are still in the hands of national policymakers. This holds also for allocative goals such as environmental taxation. On the basis of the so-called European Semester, the European Commission and the Council may make (structural policy-induced) recommendations on revenue or expenditure structure in their country-specific recommendations (e.g. to shift taxation from labor income to immovable property), but there are no sanctions in case countries do not follow them (in contrast to recommendations covered by the fiscal rules laid out in the SGP). Thus, the public expenditure and revenue path over the years mirror the political programs of the governments in Austria as well as demographics and economic conditions.

### 2.1 Expenditure shifted from collective consumption goods to social benefits in kind

Chart 4 shows that there have been sizeable shifts within the structure of total government expenditure:<sup>15</sup>

Chart 4

#### Development of public expenditure since 1995



Source: OeNB, European Commission.

Note: Unemployment benefits have been cyclically adjusted.

<sup>15</sup> Instead of showing expenditure other than interest and social benefits in cash, we show the sum of government consumption and of other transfer payments (subsidies, other current transfers, capital transfers). This means that we replace expenditure on investment by the depreciation of the capital stock (similar to profit and loss accounts by enterprises). Furthermore, this essentially implies that we deduct payments for output sold by government entities (tickets for trains or museums, rental payments to property management vehicles ...). The latter adjustment also removes structural breaks induced by the reclassification of municipal quasi-corporations out of the government sector (in 1997; led to decrease in expenditure and in proceeds from output sold) and of ÖBB Infrastruktur and ÖBB Personenverkehr into the government sector (in 2005; led to increase in expenditure and in proceeds from output sold).



- Due to a strong decline in interest rates, spending on interest payments as a ratio of potential GDP more than halved compared to 1995 (even though the debt ratio has increased substantially). The marked decline in public interest expenditure over the last decade was, however, primarily caused by the Eurosystem's monetary policy after 2008 (especially the reduction of short-term interest rates below zero and the wide range of nonstandard measures).
- Expenditure on social benefits in cash to households have overall increased slightly less than potential GDP. This is mostly due to a falling population share of children, i.e. of potential recipients of family benefits, while cuts to benefits during the consolidations of 1996–1997 and 2011 have been roughly compensated by extraordinarily strong increases in 1999–2000 and 2008–2009. Expenditure increases in the area of pensions have been dampened by increases in the effective retirement age (abolishment and phasing out of early retirement schemes, reform of disability pensions), by various episodes of pension indexation below inflation (especially during the consolidation episodes), and by the cuts of replacement rates induced by the pension reforms of 2003–2005. Pension reforms of the last two decades were dominated by the political intention to ensure the long-term sustainability of the public pay-as-you go system by taking into account actual as well as expected demographic changes in the future.
- Expenditure on social benefits in kind (i.e. government-sponsored services to individual persons) has increased much stronger than potential GDP. This was mainly due to health and social protection (long-term care, youth welfare, and more recently in-kind benefits to refugees ...). Education expenditure increased somewhat less than GDP, which was especially due to primary and secondary schools, while expenditure related to pre-primary education and to universities has increased at a relatively stronger rate.
- Expenditure on collective services has increased at a much slower rate than potential GDP. This is true for administration and security<sup>16</sup> as well as for transportation.
- Other expenditure has also increased much less than potential GDP, even though some specific subitems like subsidies to promote private R&D have increased substantially over the last two decades.

The stronger upward pressure in the area of social benefits in kind as opposed to collective government services is a typical pattern in developed economies. It is not only due to the ageing of society (which puts upward pressure on benefits related to health care and long-term care), but also due to the relatively low technological progress in the area of personal services (also termed “Baumol’s cost disease”).

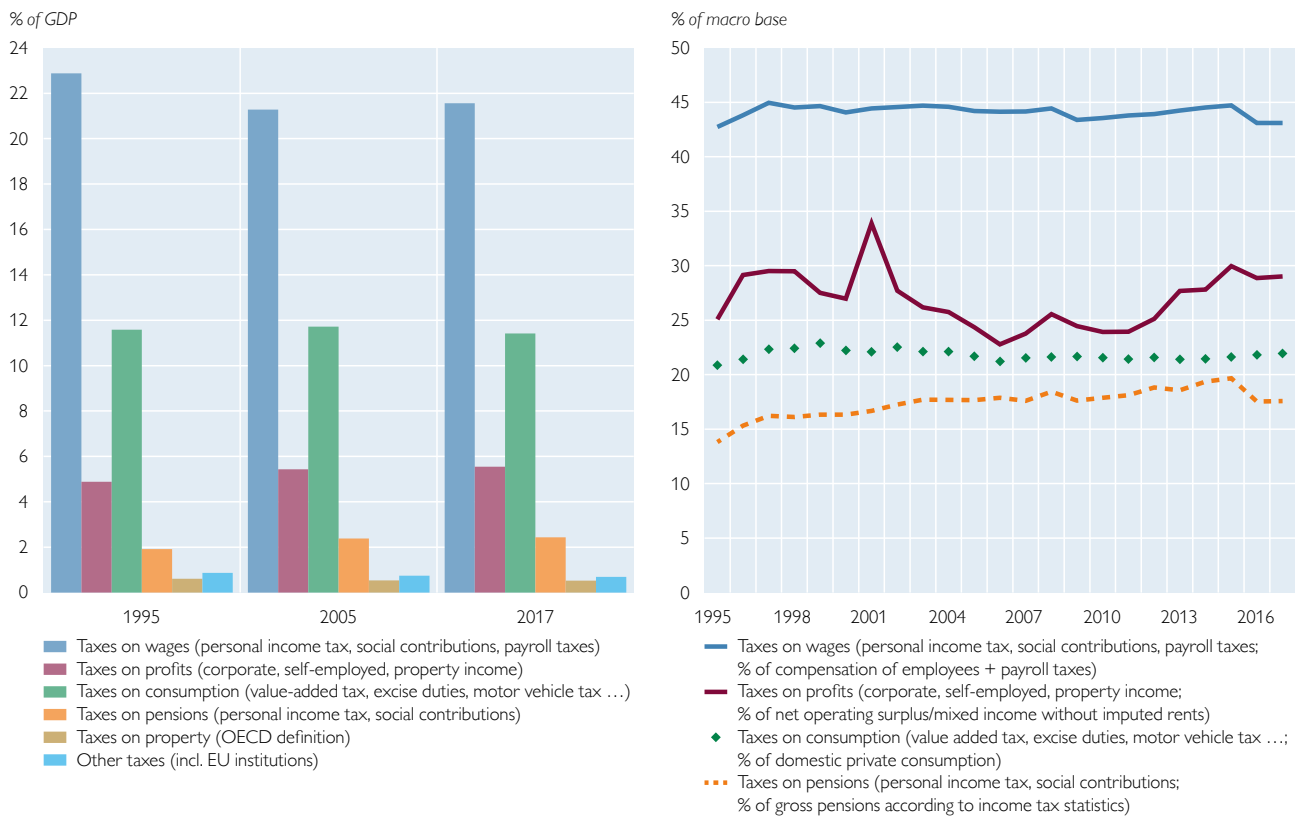
Expenditure growth in both individual and collective government services has been significantly dampened by low increases in agreed wages for government employees in the three major consolidation episodes, with the difference to private sector wage agreements being particularly large in 1996–1997 and in 2011–2013.<sup>17</sup>

<sup>16</sup> These developments are especially due to military spending, which has increased much less than the expenditure on police, law courts and prisons.

<sup>17</sup> The focus of this section is more on the structure of expenditure than on its overall size. The slowdown of potential GDP growth (nominal potential GDP growth from 2005 to 2017 has been on average by about ½ percentage points lower than from 1995 to 2005) has contributed substantially to the observed increases in social benefits between 2005 and 2017.

Chart 5

### Development of tax revenue since 1995



Source: Eurostat, Statistics Austria, OeNB.

## 2.2 Tax burden on wages has remained stable, while other implicit tax rates have increased

On the revenue side, the left panel of chart 5 shows that income from employed labor is by far the most important source of tax revenue, followed by consumption, profit income and pension income, while taxes on property (according to the OECD definition) make up for rather little revenue.<sup>18</sup> The right panel of chart 5 shows that the implicit tax rate<sup>19</sup> on wages has remained broadly stable since 1995, while the implicit tax rates on profits, consumption and pensions have all increased somewhat:

- Taxes on wages have remained stable, but they are still very high by international standards (see also European Commission, 2018). After the consolidation package of 1996–1997, episodes of non-indexation of tax brackets have been followed by

<sup>18</sup> Other taxes in the left panel of chart 5 only shows the main components of tax revenue. It leaves out some minor tax items summing up to about 1% to 1½% of GDP (depending on the year) which are only shown in the left panel of chart 5, namely taxes on property according to the OECD definition, import levies, and various taxes paid by enterprises irrespective of their payroll or profits (e.g. bank levy). Furthermore, note that we do not show the developments of non-tax revenue in chart 5. The main non-tax revenue items (proceeds from market and nonmarket output, output for own final use) are implicitly included in chart 4, while the other items (property income, other current and capital transfers received) are relatively small (currently around 1½% of GDP).

<sup>19</sup> As total economy wages have increased less than GDP since 1995 (so taxes on wages have increased less than GDP even though the implicit tax rate staid the same), we divided the major tax revenue categories by the macroeconomic main aggregate closest to the true tax base.



income tax cuts (in 2000, 2004–2005, 2009, 2016), while social contribution and payroll tax rates have remained broadly stable over that time span (see also Reiss and Schuster, 2019).

- Taxes on profits increased at a stronger rate than net operating surplus adjusted for imputed rents (which is a rather crude tax base) as the major corporate income tax cut of 2005 was more than offset by substantial base-broadening measures in the three major consolidation episodes described in section 1 (1996–1997, 2000–2002 and 2011–2015); 2001 and 2015 also saw policy-induced peaks in tax collection.
- Taxes on consumption increased somewhat during the 1996–1997 consolidation and remained stable afterwards. The standard VAT rate remained fixed at 20% throughout the observed time period, while the nominally fixed rates of excise duties (such as energy taxes and the tobacco tax) and the motor vehicle tax have been adjusted upward occasionally (above all during the 2000–2002 and the 2011–2015 consolidation episodes).
- Taxes on pensions increased at a stronger rate than overall pensions due to increases in health insurance contributions (esp. in 2004–2005), relatively large fiscal drag (induced by high growth in average pensions) and cuts to tax credits (largely targeted at pensioners (as part of the consolidation packages of 2000–2002 and 2011–2015).

Overall, the respective composition of implemented fiscal stimulus as well as consolidation packages has contributed to a slight shift in taxation away from employed labor.

### 3 Conclusions

This essay highlights that, first, the European fiscal framework has had quite a substantial influence on fiscal policymaking in Austria. Second, it shows that Austrian fiscal policymakers have been adhering broadly to the rules-based fiscal policy scheme. Third, it indicates that fiscal policy had to be restrictive in periods when it may have been economically adequate to provide a more expansionary response, implying that the stabilization function in these periods was impaired. In other words, fiscal policy was intensifying rather than smoothing output and employment cycles. Partly this was due to the fact that good times were not used to build up fiscal buffers in order to have more room for fiscal maneuver. Finally, in comparison with the decades before EU/EMU accession, fiscal sustainability considerations have gained greater importance, given the increased importance of debt developments.

As the SGP does not contain any requirements for the level or composition of public revenue or expenditure of EU Member States, fiscal policymakers are still free in pursuing their political priorities. We show that over the last two decades, there were no substantial shifts in the structure of tax revenue, while on the expenditure side there has been a shift from collective services (like administration, security) to social benefits in kind (health, long-term care).

## References

- Austrian Fiscal Council. 2014.** Bericht über die Einhaltung der Fiskalregeln 2013–2018.
- Bartel, R. 1995.** Budgetpolitik (Hintergründe, Fragen, Alternativen). In: Das öffentliche Haushaltswesen 3–4. 186–205.
- Bénassy-Quéré, A., M. Brunnermeier, H. Enderlein, E. Farhi, M. Fratzscher, C. Fuest, P.-O. Gourinchas, P. Martin, J. Pisani-Ferry, H. Rey, I. Schnabel, N. Veron, B. Weder di Mauro and J. Zettelmeyer. 2018.** Reconciling risk sharing with market discipline: A constructive approach to euro area reform. CEPR Policy Insight 91.
- Breuss, F. 1995.** Fiskalpolitische Disziplinierung durch den Stabilitäts- und Wachstumspakt: Österreich auf dem Weg zum Nulldefizit – Eine Modellanalyse. In: Neck, R., R. Holzmann and F. Schneider (eds.). Staatsschulden am Ende? Ursachen, Wirkungen und Zukunftsperspektiven. Vienna: Manz. 139–168.
- Breuss, F. and E. Walterskirchen. 1997.** Die Auswirkungen der WWU-Teilnahme auf Österreich. Vienna.
- Corsetti, G. 2015.** Austerity: Too Much of a Good Thing? A VoxEU.org eCollection of views by leading economists. [http://hassler-j.iies.su.se/courses/macroi/papers/austerity\\_ecollection.pdf#page=21](http://hassler-j.iies.su.se/courses/macroi/papers/austerity_ecollection.pdf#page=21)
- De Grauwe, P. and Y. Ji. 2013.** The Legacy of Austerity in the Eurozone. CEPS Commentary. Centre for European Policy Studies.
- Diebalek, L., W. Köhler-Töglhofer, H. Nekvasil and D. Prammer. 2001.** Maßnahmen und Strategien der Budgetkonsolidierung in den Mitgliedsländern der EU. Berichte und Studien 2/2001. OeNB. 122–156.
- Diebalek, L., W. Köhler-Töglhofer and D. Prammer. 2006.** Reform of the Stability and Growth Pact. In: OeNB. Monetary Policy & the Economy Q1/05. 78–109.
- Domar, E. D. 1944.** The Burden of Debt and the National Income. In: American Economic Review 34. Reprinted in Readings in Fiscal Policy. London. 1955.
- European Commission. 2015.** Making best use of the flexibility within the existing rules of the Stability and Growth Pact.
- European Commission. 2018.** Taxation Trends in the European Union, 2018 edition. Luxembourg.
- Fatas, A. 2018.** Self-fulfilling pessimism: The fiscal policy doom loop. <https://voxeu.org/article/europes-fiscal-policy-doom-loop>
- Katterl, A. and W. Köhler-Töglhofer. 2005.** The Impact of EU Accession on Austria's Budget Policy. In: OeNB. Monetary Policy & the Economy Q2/05. 101–116.
- Pfaffermayr, M. 2003.** Austria's Performance within an Integrating European Economy. In: Gehler, M., Pelinka, A. and G. Bischof. (eds.). 2003. Österreich in der Europäischen Union. Böhlau Verlag. 201–218.
- Orphanides, A. 2018.** Monetary policy and fiscal discipline: How the ECB planted the seeds of the euro crisis. <https://voxeu.org/article/how-ecb-planted-seeds-euro-area-crisis>.
- Prammer, D. 2009.** Public Sector Outsourcing: Creative Accounting or a Sustainable Improvement? – A Case Study for Austria. In: OeNB. Monetary Policy & the Economy Q1/2009. 118–125.
- Prammer, D. and L. Reiss. 2016.** The Stability and Growth Pact since 2011: More complex – but also stricter and less procyclical? In: OeNB. Monetary Policy & the Economy Q1/16. 33–53.
- Prammer, D. and L. Reiss. 2018.** How to increase fiscal stabilization at the euro area level? In: OeNB. Monetary Policy & the Economy Q2/18. 111–131.
- Ragacs, C. and K. Vondra. 2011.** Austria's Economy Moves beyond the Crisis: Powerful Economic Growth Provides a Tailwind to Reduce Budget Deficits – Economic Outlook for Austria from 2011 to 2013 (June 2011). In: OeNB. Monetary Policy & the Economy 2/2011. 6–30.
- Steger, G. 2010.** Austria's Budget Reform: How to Create Consensus for a Decisive Change of Fiscal Rules. OECD Journal on Budgeting 2010/1. 1–14.

- Stübler, W. 2003.** Auswirkungen von Ausgliederungen auf den Schuldenstand und das Defizit gemäß den Maastricht-Kriterien. In: Gröhs et al. (eds.), Privatwirtschaftliche Aktivitäten der öffentlichen Hand. Vienna: Linde Verlag.
- Stübler, W. and Team. 2015.** Öffentliche Finanzen 1995–2013. In: Statistische Nachrichten 1/2015. 46–66.
- Truger, A. 2013.** Austerity in the Euro area: The sad state of economic policy in Germany and the EU. Working Paper. Institute for International Policy Economy Berlin.
- Truger, A. 2014:** Austerity, cyclical adjustment and the remaining leeway for expansionary fiscal policies in the Euro area. Working Paper 140. Institut für Makroökonomie und Konjunkturforschung. November.

# Monetary policy of the Eurosystem and the OeNB's balance sheet

*Clemens Jobst, Claudia Kwapil<sup>1</sup>, Refereed by: Uwe Schollmeyer,  
University of Applied Sciences of the Deutsche Bundesbank*

*Monetary policy in the euro area is decided by the Governing Council of the European Central Bank (ECB) but implemented through the balance sheets of the 19 national central banks (NCBs) of the Eurosystem. While the consolidated financial statement of the Eurosystem is the primary source of information for monetary policy in the euro area, this article takes the Oesterreichische Nationalbank as an example and argues that a disaggregated view offers additional perspectives. During the financial crisis, the balance sheets of the NCBs reflected to what extent and through which channels national banking systems were affected by the crisis. At the same time, however, NCBs' balance sheets are driven by structural factors and contingencies completely unrelated to monetary policy. In Austria's case, for example, the country's special position in international banknote logistics is the key driving force behind the OeNB's large liabilities in TARGET2. Overall, we conclude that the NCBs' balance sheets contain valuable information on both the implementation of monetary policy as well as the operations of the financial and payment system more broadly; nevertheless, the NCBs' balance sheets must be read with due care.*

*JEL classification: E42, E52, E58*

*Keywords: central bank balance sheet, national central banks in the Eurosystem, monetary policy implementation, TARGET2*

On January 1, 1999 the power to decide on monetary policy was transferred from the national level – in the case of Austria from the General Council (Generalrat) of the Oesterreichische Nationalbank (OeNB) – to the Governing Council of the European Central Bank (ECB). While monetary policy decisions have been taken in Frankfurt since, it is the national central banks (NCBs) of the Eurosystem that continue to implement these decisions. Through their operations, the NCBs ensure that market interest rates align with the policy rate decided by the ECB Governing Council and, more generally, make sure that market conditions reflect the desired policy stance.

Monetary policy operations therefore show up in the balance sheets of the (currently 19) NCBs of the Eurosystem. It is also the NCBs that issue banknotes and administer the current accounts held by commercial banks. In this article, we trace how the OeNB's balance sheet has evolved and has reflected monetary policy over the past 20 years. Moreover, we show that the composition of a single NCB's balance sheet can deviate quite substantially from the consolidated balance sheet of the Eurosystem. Alongside the Federal Reserve System of the United States, the Eurosystem is the only decentralized central bank system currently in existence, and effectively the only monetary union organized in a decentralized system (see Schollmeyer, 2019). We argue that a proper understanding of the decentralized set-up is crucial for the interpretation of monetary policy implementation in the

<sup>1</sup> *Oesterreichische Nationalbank, Economic Analysis Division, clemens.jobst@oenb.at and claudia.kwapil@oenb.at. Opinions expressed by the authors of studies do not necessarily reflect the official viewpoint of the OeNB or the Eurosystem. The authors would like to thank Ernest Gnan, Martin Handig, Lenka Krsnakova and Walter Waschiczek (all OeNB) as well as Uwe Schollmeyer (University of Applied Sciences of the Deutsche Bundesbank) for their helpful comments and valuable suggestions.*

euro area, as has been shown by the drawn-out and often confused debate on the significance of intra-Eurosystem claims and liabilities relating to TARGET2 (for a recent summary of the debate in Germany, see e.g. Hellwig, 2018).

The article is structured as follows: Section 1 gives a brief overview over the most important components of central banks' balance sheets and their relation to monetary policy. Section 2 discusses the specificities of the decentralized set-up of the Eurosystem and shows how they are reflected in the balance sheets of the NCBs. Sections 3 and 4 describe the main determinants of the OeNB's balance sheet before and after Austria adopted the euro. Section 5 concludes.

## 1 A brief introduction to a central bank's balance sheet

Central banks issue central bank money either physically in the form of banknotes or electronically in the form of current account holdings by commercial banks. Commercial banks need current account holdings – often referred to as central bank liquidity or central bank reserves – to make payments in the financial system and obtain banknotes for their customers. Therefore, the interest rate banks pay to obtain deposits at the central bank is a key interest rate in the financial system. Very often, central banks implement monetary policy by adjusting the demand and supply of central bank liquidity in such a way that its price – the short-term interest rate – reflects the desired stance of monetary policy (see Bindseil, 2004).

The analysis of a central bank's balance sheet usefully distinguishes between items actively managed by central banks (monetary policy operations), items that central banks take as a given (autonomous factors), and lastly the current accounts held by commercial banks. Figure 1 highlights in different shades of blue the three different classes of assets/liabilities. The most important autonomous factor is the demand for banknotes. Normally, central banks meet the demand for banknotes in full and consequently their amount is beyond the central bank's control. Other liquidity-absorbing autonomous factors include capital and reserves as well as e.g. government deposits. Gold, foreign exchange assets and financial assets purchased

Figure 1

### Simplified central bank's balance sheet

Assets	Liabilities
Gold and foreign exchange assets	Banknotes
Other liquidity-providing autonomous factors	Capital and reserves
Liquidity-providing monetary policy operations	Other liquidity-absorbing autonomous factors
	Current accounts (incl. minimum reserves)
	Liquidity-absorbing monetary policy operations

} Structural liquidity deficit

Source: Authors' compilation.

for generating income or for covering pension liabilities are prominent examples for liquidity-providing autonomous factors.

From a monetary policy perspective, a key characteristic of the balance sheet is the structural liquidity position of the banking system. When autonomous factors provide less liquidity than they absorb, we speak of a structural liquidity deficit. In figure 1, the banking system faces a structural liquidity deficit, because more liquidity is absorbed by the demand for banknotes, capital, reserves and other liquidity-absorbing autonomous factors than is provided through gold, foreign exchange assets and all other liquidity-providing autonomous factors. This was the situation in the

euro area after 1999. Conversely, we speak of a structural liquidity surplus when all non-monetary policy items provide more liquidity than they absorb. This was the situation in Austria before 1999.

When implementing monetary policy, central banks take the net demand for central bank liquidity provided by the autonomous factors as a given and adjust the supply and price of liquidity in their monetary policy operations in such a way that commercial banks hold their desired amount of current account balances. Depending on the amount of reserves demanded by the commercial banks and the structural liquidity position of the banking system, monetary policy operations have to either provide or absorb liquidity. To create liquidity, central banks purchase assets or grant collateralized loans to commercial banks. To absorb liquidity, central banks sell assets or borrow from banks. They can also require banks to hold more reserves by imposing minimum reserve requirements. Bindseil (2016) argues that before 2007 the consensus view was that market interest rates could be steered most effectively through liquidity-providing operations and thus in a liquidity deficit situation. Whether this still holds true after the crisis is subject to debate (see Gagnon and Sack, 2014).

## 2 The hybrid nature of NCBs' balance sheets within the Eurosystem

In the case of the Eurosystem, the relevant information on the creation and absorption of liquidity is given by the consolidated balance sheet – i.e. the sum of the balance sheets of all NCBs and the ECB<sup>2</sup> – which is published weekly on the ECB's website. NCBs' balance sheets reflect the NCBs' contributions to the common monetary policy of the Eurosystem, but for three reasons these contributions can differ significantly from one NCB to another:<sup>3</sup>

First, autonomous factors might be higher or lower than on average, e.g. because of higher or lower gold and foreign exchange holdings (which had been built up before the introduction of the euro in most cases), capital and reserves, or high and volatile government deposits for those central banks that act as cashiers for their national governments. Second, liquidity creation in refinancing operations depends on the demand of individual banks, which is why claims from monetary policy operations might be higher or lower in some jurisdictions than in others. Third, central bank money flows freely within the monetary union. This is true of both cash and electronic central bank money.

As far as banknotes are concerned, the Eurosystem's accounting rules state that NCBs shall not report the amount of banknotes put into circulation minus the amount of banknotes withdrawn from circulation (as has been the case before 2002), but shall distribute the total amount of banknotes in circulation among NCBs and the ECB according to an allocation key.<sup>4</sup> The OeNB, for example,

<sup>2</sup> The consolidated balance sheet of the Eurosystem is the sum of all NCBs' balance sheets with intra-Eurosystem claims and liabilities canceling each other out.

<sup>3</sup> Compared to NCBs, the ECB's balance sheet itself plays a limited role in the implementation of monetary policy. Exceptions from this rule include private and public asset purchase programs that have been introduced since 2009. Within the framework of these programs, both the NCBs and the ECB have bought shares of assets and hold them on their balance sheets.

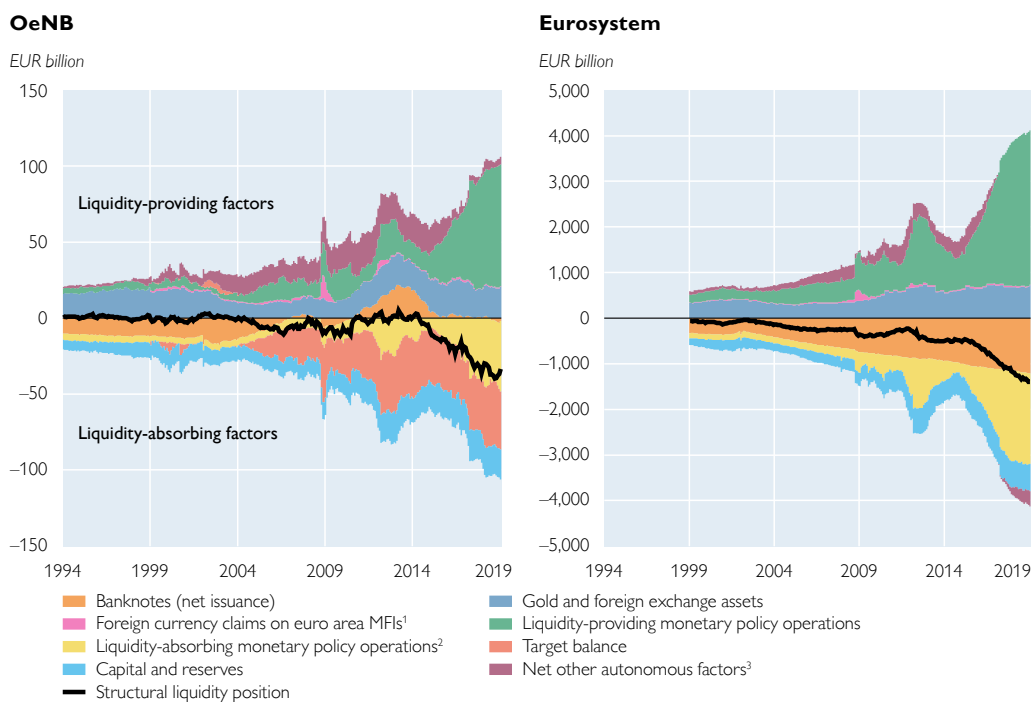
<sup>4</sup> The banknote allocation key is based on the share of each NCB in the capital of the ECB. The ECB is attributed 8% of the total value of euro banknotes in circulation; the remaining 92% of the value of euro banknotes in circulation are allocated to the NCBs of the Eurosystem in proportion to the respective NCB's share in the subscribed capital key (see Krsnakova and Oberleithner, 2012).

currently reports 2.7% of all euro banknotes in circulation in its balance sheet, regardless of how many banknotes it has actually issued itself or how many banknotes are circulating within the territory of Austria. However, this raises the issue of how NCBs' balance sheets handle the case when an NCB issues more (or less) banknotes, which is – as argued before – outside the control of the NCB. The difference between the banknotes in circulation allocated to the NCB in accordance with the banknote allocation key and the banknotes actually put into circulation by the NCB are recorded in its balance sheet either as an intra-Eurosystem liability or claim, depending on whether actual issuance is above or below the allocation key (see Krsnakova and Oberleithner, 2012). Thus, if we are interested in the net amount of banknotes actually put into circulation by an NCB, we have to add the item “banknotes in circulation” to the (positive or negative) item “net liabilities/net claims related to the allocation of euro banknotes within the Eurosystem.” The result can be referred to as net issuance of banknotes.

International movements of electronic central bank money, i.e. transfers between current accounts at different NCBs, are executed via the payment system TARGET2. If e.g. an Austrian commercial bank (holding its current account with the OeNB) buys a financial asset from a German commercial bank (holding its current account with the Deutsche Bundesbank), it can pay via a TARGET2 transfer. In the course of the transaction, its account at the OeNB is debited, while the account of the German commercial bank at the Deutsche Bundesbank is credited. To balance the

Chart 1

### A net view on the main categories of the OeNB's and the Eurosystem's balance sheets



Source: OeNB, ECB.

<sup>1</sup> Includes monetary policy operations in foreign currencies (USD, CHF).

<sup>2</sup> Includes current accounts.

<sup>3</sup> Includes, among others, securities held for investment purposes and other financial assets, provisions and government deposits.



transfer, the Bundesbank obtains a claim, while the OeNB builds up a liability in TARGET2.<sup>5</sup> The flows accumulate over time. As a result, the TARGET2 position of every NCB indicates the total net inflows and outflows of its country since the inception of the euro in 1999.

When the balance sheets of all NCBs and the ECB are aggregated, the claims and liabilities arising from both net claims or net liabilities related to the allocation of euro banknotes as well as net claims or net liabilities related to TARGET2 cancel each other out. Consequently, the consolidated balance sheet of the Eurosystem does not contain any intra-system positions and can be described similar to that in figure 1.

### 3 The balance sheet of the OeNB before 1999

Before 1999, Austria pegged its schilling to the Deutsche mark (see Jobst and Kernbauer, 2016) and kept high foreign exchange reserves accordingly.<sup>6</sup> With the transition to the euro in 1999, the OeNB became part of the Eurosystem with a price stability target, in which foreign reserves are of secondary importance only.

In the three years before the introduction of the euro, the balance sheet total of the OeNB amounted to EUR 26.4 billion on average.<sup>7</sup> The asset side was clearly dominated by gold and foreign exchange assets valued at EUR 18.7 billion.<sup>8</sup> Foreign exchange assets were thus significantly larger than banknotes in circulation (EUR 11.7 billion), enhancing the credibility of the schilling's peg to the Deutsche mark. The counterpart of the “excess coverage of banknotes by foreign exchange assets” was capital and reserves, amounting to EUR 8.5 billion. Thus, in total, slightly more liquidity was provided through gold, foreign exchange assets and all other non-monetary policy assets (autonomous factors) than what was absorbed by banknotes, capital, reserves and all other non-monetary liabilities.<sup>9</sup> Austria was therefore characterized by a structural liquidity surplus.

<sup>5</sup> According to the conventions of the Eurosystem (see ECB, 2012), the claims and liabilities are not recorded on a bilateral basis but transferred to the ECB and netted out. At the end of each day, therefore, all NCBs only hold claims or liabilities against the ECB. For more details on the balance sheet implications of cross-border transactions in TARGET2, see e.g. Jobst et al. (2012b).

<sup>6</sup> Historically, the reporting format of the OeNB's balance sheet was based on the legally defined concept of reliable coverage (“Deckung”). Assets were classified according to whether they qualified for the coverage of banknotes in circulation and sight liabilities. The balance sheet was published in Austria's official gazette (“Wiener Zeitung”) on a weekly basis to create trust for currency users. On December 31, 1998, coverage of total banknotes in circulation (“Deckung des Gesamtumlaufs”) according to Article 62 Federal Act on the Oesterreichische Nationalbank 1984 as amended in 1998 was 147.3%, of which 133.4% consisted of foreign exchange assets.

<sup>7</sup> All numbers given in this section are three-year averages (1996–1998). Originally, the unit of account was Austrian schilling (ATS). However, to ease comparisons with the post-1999 period we converted schillings into euro, using the official conversion rate of ATS 13.7603.

<sup>8</sup> Note that gold was valued at a fixed balance sheet valuation price of ATS 60,000 per kg of fine gold (around EUR 4,360 per kg of fine gold). This was considerably below the market value of ATS 108,993.67 per kg of fine gold as on December 31, 1998. The fixing of the valuation price rule has been applied as a prudence principle to avoid valuation volatility effects in profits and losses since the 1970s (see OeNB, 1999).

<sup>9</sup> Other net assets contributed EUR 1.8 billion of liquidity.



Figure 2

**The structure of the OeNB's balance sheet from 1996 to 1998  
(averages of weekly statements, converted into euro)**

	Assets	Liabilities
	Gold and foreign exchange assets (EUR 18.7 billion)	Banknotes (EUR 11.7 billion)
		Capital and reserves (EUR 8.5 billion)
Structural liquidity surplus {	Other liquidity-providing autonomous factors (EUR 3.8 billion)	Other liquidity-absorbing autonomous factors (EUR 1.8 billion)
	Liquidity-providing monetary policy operations (EUR 3.9 billion)	Current accounts (incl. minimum reserves) (EUR 4.2 billion)

Source: OeNB, financial statements, authors' calculations.

In order to create a liquidity deficit, the OeNB imposed minimum reserve requirements (see Pfeiffer and Quehenberger, 1996) that absorbed EUR 4.2 billion on average between 1996 and 1998.<sup>10</sup> The resulting liquidity deficit created the necessary demand in the liquidity-providing operations (EUR 3.9 billion) and allowed the OeNB to steer market interest rates. Traditionally, the OeNB used standing facilities to provide its banking system with central bank liquidity. It was only in 1996 and in preparation for the future framework of the Eurosystem that a weekly open market operation was introduced (see OeNB, 1996; Pfeiffer und Quehenberger, 1996).

#### 4 Key trends in the OeNB's balance sheet from 1999 to 2018

The Eurosystem took over responsibility for monetary policy operations on January 1, 1999. The establishment of the Eurosystem together with the introduction of the euro had several significant consequences for the balance sheet of the OeNB.

#### 4.1 New reporting rules and formats from 1999 onward

As a prerequisite for drawing up a consolidated balance sheet for the Eurosystem, financial reporting and balance sheet valuation rules had to be harmonized based on Article 15.2 of the ESCB/ECB Statute (reporting commitments), which required a weekly “consolidated financial statement” to be published from January 1, 1999 onward. According to Article 26.4 of the ESCB/ECB Statute (financial accounts), rules for standardizing the accounting and reporting of the NCBs’ operations were set up and new items entered the NCBs’ balance sheets reflecting the framework that the Eurosystem used to steer interest rates. Due to the shift from domestic to Eurosystem accounting and reporting rules, the OeNB’s balance sheet from December 31, 1998 and that from January 1, 1999 are not directly comparable. Most importantly, all assets and liabilities were revalued and recorded at market prices. The resulting unrealized gains of EUR 3.7 billion were transferred to revaluation accounts, included in “capital and reserves” in chart 1 (see OeNB, 2000).

<sup>10</sup> Unlike after 1999, minimum required reserves were not remunerated and imposed a tax on the Austrian banking system. To support the banks’ international competitiveness, reserve requirements were significantly lowered in 1995, but kept at a level that ensured a liquidity deficit (see Hanisch, 1995). At times, the OeNB also issued liquidity-absorbing debt certificates, whose amounts, however, were relatively small. Between 1996 and 1998, debt certificates, which are subsumed under “current accounts” in figure 2, amounted to EUR 80 million on average.

## 4.2 Monetary policy operations in the first years of EMU

Unlike Austria and some other countries joining European Economic and Monetary Union (EMU), the Eurosystem as a whole faced a structural liquidity deficit, and monetary policy operations were organized accordingly (see Galvenius and Mercier, 2011). Initially, the liquidity deficit amounted to around EUR 70 billion and was further increased by imposing a minimum reserve requirement of 2% of the reserve base, in particular deposits and debt securities with a maturity of up to two years, or roughly EUR 115 billion (annual average for 1999).

Starting on January 7, 1999, liquidity in the euro area was provided in weekly main refinancing operations (MROs)<sup>11</sup> and monthly longer-term refinancing operations (LTROs) with a maturity of three months (see ECB, 1999). The volumes in these open market operations were set by the Eurosystem according to estimates of the autonomous factors and the likely size of the liquidity deficit. The liquidity was allocated competitively based on interest rate bids by participating banks (see ECB, 2011).<sup>12</sup>

While the total volume allocated in MROs and LTROs was set by the Eurosystem, the allocation among the NCBs was determined by the interest rates that participating commercial banks had bid in the different jurisdictions. As a result, allocations at the national level were not necessarily proportional to the size of the national banking systems and also fluctuated between operations. Chart 2 shows the absolute amount of central bank liquidity allocated by the OeNB (left panel) as well as the OeNB's share in total central bank liquidity allocated by the Eurosystem (right panel). Except for short periods in 2001 and 2003, the amounts tendered by the OeNB in MROs and LTROs increased until 2007, broadly in line with the rising banknote circulation and liquidity deficit at the euro area level. Most of the time, Austrian banks accounted for a lower share of total tender operations than the OeNB's share in the ECB's capital as well as their share in minimum reserves.

## 4.3 Monetary policy operations during the Great Financial Crisis

First signs of the financial crisis in Europe appeared in August 2007.<sup>13</sup> Interbank-market functioning suffered and banks started to hoard central bank liquidity. The ECB reacted by shifting tender volumes from the weekly MROs to the three-month LTROs. At the OeNB, volumes in the LTROs came to exceed volumes in the MROs, even though the shift was less pronounced in Austria than at the euro area level. After the failure of Lehman Brothers in October 2008, the ECB further eased access to central bank liquidity by fully allotting all bids at the policy rate in both MROs and LTROs, effectively guaranteeing commercial banks access to central bank money, on condition that counterparties provided enough eligible collateral.<sup>14</sup> The procedure – called fixed-rate full allotment – has remained in

<sup>11</sup> Originally, the MROs had a maturity of two weeks. In March 2004, however, the maturity was shortened to one week (see ECB, 2003).

<sup>12</sup> Initially, the MROs were tendered in a fixed-rate procedure. On June 8, 2000 the ECB announced that, starting from the operation to be settled on June 28, 2000, the MROs would be conducted as variable rate tenders (see ECB, 2000; Papadia and Välimäki, 2011).

<sup>13</sup> For the following chronology of monetary policy at the euro area level, see Hartmann and Smets (2018), in particular.

<sup>14</sup> In October 2009, the list of assets eligible as collateral in Eurosystem operations was expanded. Thereafter, it was adjusted time and again. The expanded and adapted collateral list is still in place.

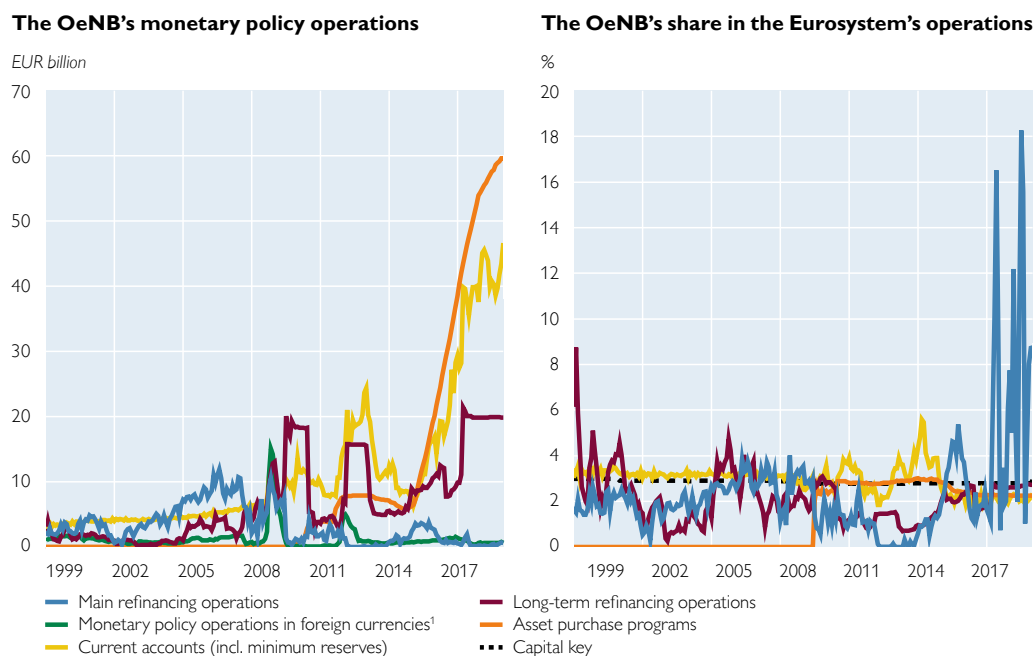
place ever since. To provide banks with sufficient liquidity also at longer maturities, the Eurosystem added LTROs with a maturity of the length of one maintenance period and with a maturity of six months to its toolbox and offered a series of one-year operations starting in June 2009. Moreover, the Eurosystem started to purchase euro-denominated covered bonds to ease funding conditions for banks, encouraging them to maintain and expand their lending to customers (see ECB, 2009).

Last but not least, the ECB and the central banks of Switzerland and the U.S.A. introduced swap facilities to help European banks refinance their liabilities in Swiss francs and U.S. dollars (see chart 1, Allen and Moessner, 2010).<sup>15</sup> Austrian banks, which had a large portfolio of loans denominated in Swiss francs in Austria and Central, Eastern and Southeastern European (CESEE) countries, either had intensive recourse to these facilities or profited indirectly (see Pann et al., 2010).

From late 2009 onward, the financial crisis spilled over to the markets for government debt. In May 2010, the Eurosystem introduced the Securities Markets Programme (SMP) and started to buy Greek, Irish, Italian, Portuguese and Spanish sovereign bonds. When the sovereign debt crisis intensified in 2011, a second purchase program for covered bonds followed. Moreover, in December 2011 and March 2012, the Eurosystem offered two three-year LTROs, allotting in total more than EUR 1 trillion. Ultimately, the crisis abated only after ECB President

Chart 2

### The OeNB participates in the Eurosystem's monetary policy operations



Source: OeNB, ECB.

<sup>1</sup> Includes also other foreign currency claims. The OeNB's share in the Eurosystem total can therefore not be interpreted as a share in policy operations and is not displayed in the right panel.

<sup>15</sup> USD and CHF reverse operations were booked under the item A3.1 "claims on euro area financial sector counterparties denominated in foreign currency". As A3.1 contains other items as well, no time series can be drawn for USD and CHF operations. End-of-year values can, however, be obtained from the comments in the end-of-year financial statements of the OeNB.

Mario Draghi assured markets on July 26, 2012, that “[w]ithin our mandate, the ECB is ready to do whatever it takes to preserve the euro” (see Draghi, 2012) and the ECB Governing Council announced the Outright Monetary Transactions (OMT) program in September 2012. The OMT led to a decline in tensions on the financial markets, without a single purchase taking place.

During this phase, financial tensions concentrated in the peripheral members of the euro area. While demand by Austrian banks in the LTROs was high in absolute terms, the share of the OeNB in Eurosystem operations declined after 2009, falling to a low of 1% in 2014. The decline was further accentuated by Austrian banks using the possibility to repay early some of the funds borrowed in the three-year LTROs. In the asset purchase programs, on the other hand, volumes were typically parcelled out among NCBs according to the capital key set by the ECB, meaning that the OeNB's share hovered around 2.9% from 2009 to 2014 (see chart 2).

Toward the end of 2013, the focus of policymakers shifted to sluggish economic growth, low inflation and a perceived risk of deflation. In addition to a further lowering of key policy rates, the ECB Governing Council reacted by offering a new series of refinancing operations with a built-in incentive for banks to increase their lending to the private sector. These targeted longer-term refinancing operations (TLTROs) started in June 2014 and were equipped with a maturity of four years. In these operations, Austrian banks participated roughly in line with the capital key. In the meantime, the weekly main refinancing operation (MRO) had lost all of its importance, declining from more than EUR 300 billion before the crisis to about EUR 5 billion in early 2019.<sup>16</sup>

The TLTROs were complemented by a series of securities purchase programs that culminated in the announcement of the Expanded Asset Purchase Programme (APP) in January 2015. Between March 2015 and December 2018, the Eurosystem bought public and private assets amounting to EUR 2.6 trillion. Unlike in earlier operations, the ECB participated in these purchases alongside the NCBs. Moreover, the implementation of some programs was delegated to specialized groups of NCBs operating on behalf of the entire Eurosystem. As a result, the share of the OeNB in all asset purchase programs declined somewhat after 2015 and has stabilized thereafter at around 2.3%. At the end of 2018, the OeNB's contribution to liquidity-providing monetary policy operations amounted to roughly EUR 80 billion. Of this amount, the TLTROs accounted for EUR 19.8 billion, the MROs for EUR 1.3 billion, the SMP for EUR 1.9 billion, the two remaining Covered Bonds Purchase Programmes (CBPP 2+3) for EUR 7.2 billion and the Public Sector Purchase Programme (PSPP) for EUR 50.3 billion (see OeNB, 2019).

By lending to banks and purchasing assets, the Eurosystem created more central bank liquidity<sup>17</sup> than the banking sector needed to cover the structural liquidity deficit and to fulfil the minimum reserve requirement. In addition, the Eurosystem lowered the minimum reserve requirement from 2% to 1% from January 18, 2012.

<sup>16</sup> The low total volume also explains the high and volatile share of the OeNB visible in chart 2.

<sup>17</sup> The only exception was the SMP. Initially and to signal that the SMP was not designed to alter the stance of monetary policy, purchases under the SMP were sterilized through fixed-term deposits. Sterilization was discontinued in June 2014 to ensure a sufficiently large amount of excess liquidity to stabilize short-term money market rates close to the rate on the deposit facility (see ECB, 2014).

Chart 2 tracks the changes in banks' current accounts (including minimum reserves and the deposit facility) at the OeNB. Until 2015, current account holdings were mainly determined by the banking sector's demand for lending programs. With the start of the APP, the Eurosystem actively drove up the amount of central bank liquidity holdings. Despite these many factors, the share of Austrian banks in total reserves remained relatively stable at 2% to 3% both before and after 2008.

#### 4.4 Austria as a net banknote-importing country

Banknotes are the most important autonomous factor and driver of demand for central bank liquidity. Traditionally, Austrians are heavy users of cash (see Jobst and Stix, 2016; Ritzberger-Grünwald and Stix, 2018), which is why the OeNB entered the euro with a high circulation of banknotes compared to the euro area average. From 1999 until the introduction of euro banknotes and coins in January 2002, the OeNB continued to report in its balance sheet the actual amount of schilling notes in circulation. From January 2002 onward, however (as explained in section 2 above), euro banknotes in circulation were distributed among NCBs according to the banknote allocation key. As a result, banknotes in circulation, as reported by the OeNB in its balance sheet, fell from a peak of EUR 12.7 billion (ATS converted into euro, average over 2000 and 2001) to EUR 7.6 billion in 2002 (see chart 3). In the following years, the total circulation of euro banknotes increased gradually to EUR 1.2 trillion, of which roughly EUR 30 billion were reported in the balance sheet of the OeNB in 2018.<sup>18</sup>

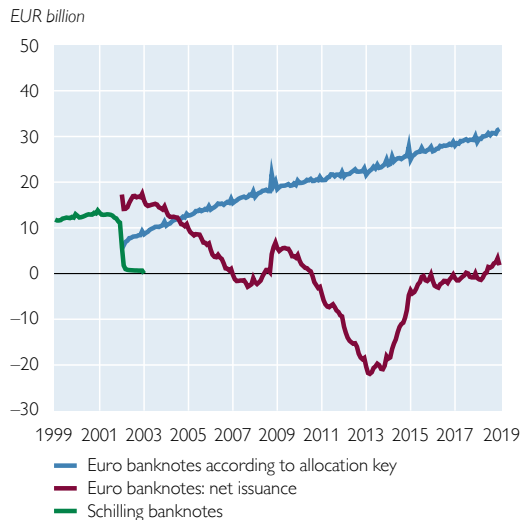
Initially in 2002, the volume of banknotes actually put into circulation by the OeNB (net issuance) was much higher, as is well visible in the difference between the purple and the blue line in chart 3. In the following years however, the pattern reverted, and net issuance of banknotes fell below the share of the OeNB according to the banknote allocation key. Since Austria is a small country within EMU, developments in cash circulation are less influenced by domestic demand than by in- and outflows from abroad. An example would be foreign tourists who withdraw money in their home country, spend their cash in Austria where it is deposited by Austrian hotels and merchants at Austrian banks and where the surplus banknotes ultimately flow to the OeNB (see Jobst et al., 2012a). Another, and at times more important, source of banknote inflows is related to the widespread use of euro cash in CESEE (see Ritzberger-Grünwald and Scheiber, 2012). Most of this cash is shipped out through the Deutsche Bundesbank and Frankfurt airport. However, some of the return flows – cash is shipped both in and out of the euro area and gross flows are much larger than net flows – pass through Austrian banks and end up at the OeNB. As a result, starting right after the introduction of the euro, the OeNB received more banknotes than it put into circulation (see Jobst et al., 2012a) and in 2007 net issuance even became negative. This trend continued until 2013 with a brief interruption in 2008 when, in the wake of the financial crisis, the demand for euro cash in Central and Eastern Europe soared and large amounts of banknotes were shipped there (see ECB, 2009), partly through the intermediation of the OeNB. A similar period of large outflows can be observed at the height of the political crisis in Ukraine in 2014 (see ECB, 2015). Between October 2013 and December 2014, net issuance of the OeNB increased by more than EUR 16 billion.

<sup>18</sup> Under liability item L1 "banknotes in circulation."

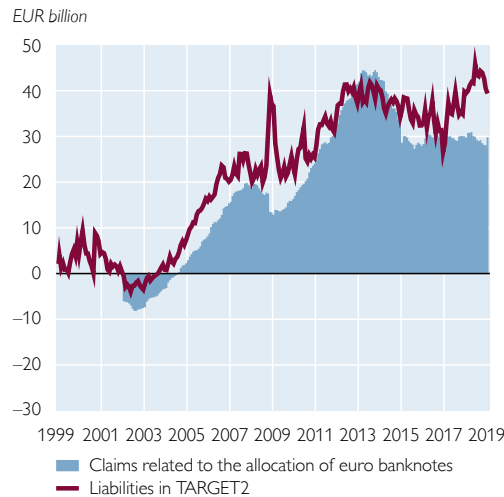
Chart 3

### Banknotes and TARGET2 balances in the OeNB balance sheet

#### Austrian schilling and euro banknotes



#### Banknotes drive the OeNB's TARGET2 balance



Source: OeNB, ECB.

After the Ukrainian crisis, however, the OeNB did not return to the previous pattern of large net inflows of cash. This is most likely due to the changing role of Austrian banks in international banknote logistics, with incoming and outgoing shipments roughly balancing out today. As a result, net issuance has been roughly stable since 2015.

#### 4.5 Claims and liabilities in TARGET2 as balancing item<sup>19</sup>

The continuing net inflow of banknotes had significant ramifications for the structure of the OeNB's balance sheet. By 2013, the OeNB had accumulated claims worth close to EUR 44 billion on the Eurosystem resulting from banknotes that had been issued elsewhere in the euro area but had been redeemed at the OeNB (see right panel of chart 3). In 2013, these EUR 44 billion amounted to 43% of total assets of the OeNB. The inflows of banknotes, in turn, became an important determinant of the OeNB's balance in TARGET2. Austrian banks delivering banknotes to the OeNB saw their current accounts credited by the same amount. According to the interpretation in Jobst et al. (2012a), these banknotes were paid in on behalf of (mostly) foreign banks using the services of Austrian banks. The amounts credited to the accounts at the OeNB were therefore swiftly transferred via TARGET2 to other countries within the euro area. Until 2004, the liabilities, then claims, of the OeNB in TARGET2 were relatively modest. After 2004, however, and until 2013, continuous outflows via TARGET2 caused the OeNB's liabilities to increase to about EUR 40 billion in 2013.<sup>20</sup> As can be seen in chart 3, the increase in TARGET2

<sup>19</sup> The euro payment system TARGET was first launched as a fully decentralized framework in 1999 and subsequently replaced by TARGET2 in 2008. For reasons of simplicity, we use the term "TARGET2" throughout the article.

<sup>20</sup> The spike in 2008/2009 is due to the CHF and USD operations mentioned above. In these operations, the OeNB lent CHF and USD to Austrian banks (see foreign currency claims in chart 1), which it had itself swapped against euro with the ECB. The euro leg of these operations showed up as TARGET2 liability to the ECB.



liabilities broadly matched the inflow of banknotes between 2002 and 2013. When, as noted above, banknote flows became more balanced after 2013, the liability position in TARGET2 stabilized as well. In late 2016, TARGET2 liabilities of the OeNB started to increase again, which was probably related to asset purchases within the framework of the APP. A significant share of the securities bought by the OeNB under the APP came from foreign counterparties that may have transferred the newly created liquidity abroad, again through TARGET2. This phenomenon is well documented for the euro area as a whole (see ECB, 2016 and ECB, 2017) and applies to Austria as well.

#### **4.6 Items not directly related to monetary policy**

Last but not least, the balance sheet of the OeNB comprises a number of elements that are not directly related to monetary policy or the flow of cash and non-cash central bank money within the euro area. A key asset traditionally held by central banks is gold. During the 1950s and 1960s, the OeNB built up a total stock of about 650 tons of gold, which it kept – with slight fluctuations – constant until the early 1990s. The important role of gold is not fully visible in the OeNB's balance sheet as gold was valued at a constant price, typically far below market prices. Following an international trend in central bank reserve management that had started in the 1970s and had led to the reallocation of reserves toward assets perceived to offer more attractive risk-adjusted returns (see Wooldridge 2006), the OeNB started to decrease its gold holdings in 1992. By 2007, the OeNB had sold more than half of its gold, most of which was used for the production of gold bullion coins – the Vienna Philharmonics – produced by the Austrian Mint. Since 2007, gold reserves have been held constant at 280 tons.

Regarding claims in foreign currency and securities held for investment purposes, developments are more difficult to track due to regular reclassifications of these assets. Between 2002 and 2004, a significant portion of securities denominated in foreign currency was shifted to “other financial assets.” As can be seen in chart 1, the decline in “gold and foreign reserve assets” in these years roughly matches the increase in “net other autonomous factors.” After 2009, “gold and foreign reserve assets” increased again, mainly driven by valuation gains due to the rising gold price, a sharp increase in claims on the International Monetary Fund (IMF) in 2009 and renewed investments in foreign securities between 2010 and 2014.

Finally, “net other autonomous factors,” which had increased due to the transfer of foreign currency securities from 2002 to 2004 and renewed purchases in 2009, fell sharply after 2015 as deposits from the Austrian government and deposits related to the resolution of bad banks, which are liabilities for the OeNB, increased.

## **5 Conclusion**

Monetary policy in the euro area is decided by the ECB Governing Council but implemented mostly through the balance sheets of the 19 NCBs of the participating countries. The primary source of information on monetary policy operations in the euro area is the consolidated financial statement of the Eurosystem. Using the OeNB as an example, this article argues that a disaggregated view affords an additional perspective on both the implementation of monetary policy as well as the operations of the financial and payment system. During the financial crisis, the NCBs' balance sheets reflected not only the different extent to which, but also the different channels

through which, national banking systems had been affected. In Austria's case, CHF and USD swap facilities operated by the Eurosystem played an important stabilizing role. What is more, the specific composition of the OeNB's balance sheet also reflects idiosyncratic factors, notably the role of Austria in international banknote logistics, at least until 2013. Taken together, these factors show that the balance sheets of NCBs are driven by both local shocks related to, and contingencies completely unrelated to, monetary policy. The high TARGET2 liabilities of the OeNB, for example, are neither related to problems in the banking sector nor to capital flight, as has been the case in other euro area member countries; rather, the OeNB's TARGET2 liabilities essentially constitute the counterpart of international euro banknote flows. To conclude, NCBs' balance sheets contain valuable information; yet, they have to be read with due care.

## References

- Allen, W. and R. Moessner. 2010.** Central bank co-operation and international liquidity in the financial crisis of 2008-9. BIS Working Paper 310. June.
- Bindseil, U. 2004.** Monetary Policy Implementation. Theory – Past – Present. New York: Oxford University Press.
- Bindseil, U. 2016.** Evaluating monetary policy operational frameworks. Jackson Hole Economic Policy Symposium, Federal Reserve Bank of Kansas City. August.
- Draghi, M. 2012.** Verbatim of the remarks made by Mario Draghi at the Global Investment Conference. London. July 26.
- ECB. 1999.** Euro area statistics. ECB Monthly Bulletin. January to December 1999. Frankfurt am Main.
- ECB. 2000.** The switch to variable rate tenders in the main refinancing operations. In: ECB Monthly Bulletin. July. 37–42.
- ECB. 2003.** Changes to the Eurosystem's operational framework for monetary policy. In: ECB Monthly Bulletin. August. 41–54.
- ECB. 2009.** The international role of the euro. July. Frankfurt am Main.
- ECB. 2009.** The implementation of monetary policy since August 2007. In: ECB Monthly Bulletin. July. 75–89.
- ECB. 2010.** The ECB's response to the financial crisis. In: ECB Monthly Bulletin. October. 59–74.
- ECB. 2011.** The monetary policy of the ECB. Frankfurt am Main.
- ECB. 2012.** Guideline of the European Central Bank of 5 December 2012 on a Trans-European Automated Real-time Gross settlement Express Transfer system (TARGET2). ECB/2012/27.
- ECB. 2014.** Introductory statement to the press conference (with Q&A). Mario Draghi. June 5. Frankfurt am Main.
- ECB. 2015.** The international role of the euro. July. Frankfurt am Main.
- ECB. 2016.** TARGET balances and the asset purchase programme. In: ECB Economic Bulletin 7/2016. 20–23.
- ECB. 2017.** The ECB's asset purchase programme and TARGET balances: monetary policy implementation and beyond. In: ECB Economic Bulletin 3/2017. 22–26.
- Escriva, J. L. and F. P. Fagan. 1996.** Empirical assessment of Monetary Policy Instruments and Procedures (MPIP) in EU Countries. Papers 2. European Monetary Institute.
- Gagnon, J. E. and B. Sack. 2014.** Monetary Policy with Abundant Liquidity: A New Operational Framework for the Federal Reserve. Peterson Institute for International Economics Policy Brief PB14-4.



- Galvenius, M. and P. Mercier. 2011.** The story of the Eurosystem framework. In: Mercier, P. and F. Papadia (eds.). *The Concrete Euro. Implementing Monetary Policy in the Euro Area.* Oxford: Oxford University Press. 115–214.
- Hanisch, E. 1995.** Maßnahmen der OeNB auf dem Gebiet der Mindestreserve. In: *Berichte und Studien der Oesterreichischen Nationalbank* 4/1995. 43–46.
- Hartmann, Ph. and F. Smets. 2018.** The First Twenty Years of the European Central Bank: Monetary Policy. ECB Working Paper 2219. January.
- Hellwig, M. 2018.** Target-Falle oder Empörungsfalle? Zur deutschen Diskussion über die Europäische Währungsunion. In: *Perspektiven der Wirtschaftspolitik* 19(4). 345–382.
- Jobst, C., Handig, M. and D. Schneeberger. 2012a.** The Cross-Border Movement of Euro Banknotes and Austria's TARGET2 Liabilities. In: OeNB. *Monetary Policy & the Economy* Q4/2012. 32–52.
- Jobst, C., Holzfeind, R. and M. Handig. 2012b.** Understanding TARGET2: The Eurosystem's Euro Payment System from an Economic and Balance Sheet Perspective. In: OeNB. *Monetary Policy & the Economy* Q1/12. 81–91.
- Jobst, C. and H. Kernbauer. 2016.** The Quest for Stable Money. *Central Banking in Austria, 1816–2016.* Frankfurt am Main: Campus Verlag.
- Jobst, C. and H. Stix. 2016.** Florin, crown, schilling and euro: an overview of 200 years of cash in Austria. In: OeNB. *Monetary Policy & the Economy* Q3–4/16. 94–119.
- Krsnakova, L. and M. Oberleithner. 2012.** How Euro Banknotes in Circulation Affect Intra-Eurosystem Balances. In: OeNB. *Monetary Policy & the Economy* Q1/12. 70–80.
- OeNB. 1996.** Die Entwicklung des geld- und währungspolitischen Instrumentariums der Oesterreichischen Nationalbank. In: *Berichte und Studien der Oesterreichischen Nationalbank* 2/1996. 7–14.
- OeNB. 1999.** Annual report and financial statements for the year 1998. Vienna.
- OeNB. 2000.** Annual report and financial statements for the year 1999. Vienna.
- OeNB. 2019.** Annual report and financial statements for the year 2018. Vienna.
- Papadia, F. and T. Välimäki. 2011.** Functioning of the Eurosystem framework since 1999. In: Mercier, P. and F. Papadia (eds.). *The Concrete Euro. Implementing Monetary Policy in the Euro Area.* Oxford: Oxford University Press. 215–342.
- Pann, J., Seliger, R. and J. Übeleis. 2010.** Foreign currency lending in Central, Eastern and Southeastern Europe: the case of Austrian banks. In: OeNB. *Financial Stability Report.* December 2010. 56–76.
- Pfeiffer, M. and M. Quehenberger. 1996.** Internationale Erfahrungen mit geldpolitischen Instrumenten. In: *Berichte und Studien der Oesterreichischen Nationalbank* 4/1996. 48–61.
- Ritzberger-Grünwald, D. and T. Scheiber. 2012.** Euro Cash in Central, Eastern and Southeastern Europe. In: OeNB. *Monetary Policy & the Economy* Q1/12. 41–55.
- Ritzberger-Grünwald, D. and H. Stix. 2018.** How Austrians bank and pay in an increasingly digitalized world – results from an OeNB survey. In: OeNB. *Monetary Policy & the Economy* Q3/18. 52–89.
- Schollmeyer, U. 2019.** Payment systems in a multinational currency union. Paper presented at the conference “The Economics of Monetary Unions. Past Experiences and the Eurozone”. Buckingham, February 21–22, 2019.
- Wooldridge, Ph. 2006.** The Changing Composition of Official Reserves. *BIS Quarterly Review.* September. 25–38.

# Approaching 20 years of euro cash in Austria: What has changed, and what's next?

Anton Schautzer, Helmut Stix<sup>1</sup>

Refereed by: Franz Seitz, Ostbayerische Technische Hochschule Amberg-Weiden

*This article discusses how the use of cash has evolved in Austria since euro banknotes and coins were introduced in January 2002 and how the underlying production/logistics processes have changed. Regarding the role of cash in Austria, we show that Austria is among the more cash-intensive economies within the euro area. In general, euro cash has remained an important medium of exchange and store of value. Its overall circulation has increased, in particular after the global economic and financial crisis, both in the euro area as a whole and in Austria. In the context of a growing demand for cash, we discuss how technical progress in the production of euro banknotes and in euro cash logistics has contributed to cost-efficiency. As euro cash is the joint product of all Eurosystem national central banks, we also address the role of the OeNB in the supply of banknotes. Finally, we provide a brief discussion about the likely future of cash.*

*Overall, there are three main messages that can be drawn from our brief contribution. First, euro cash is here to stay, although it is likely that its demand will decline in the coming years, mainly due to innovations in payment technologies and prospective increases in interest rates. Second, cash is not outdated given the technical developments in cash production and dissemination, the continued use of cash by consumers and the costs of cash vis-à-vis other payment means that merchants face. Third, there is a need for more research in order to better understand the demand for cash, in particular referring to those aspects that are unrelated to short-run payment needs.*

In the context of the 20<sup>th</sup> anniversary of the euro, this article looks at euro cash and, in particular, at euro banknotes – both from the user side and from the production side.<sup>2</sup> We consider this a worthwhile endeavour for at least three reasons.

First, euro banknotes and coins are the most tangible symbol of European monetary unification. The use of cash by citizens is a manifestation of trust in the Eurosystem. This trust builds upon economic conditions, mostly low and stable inflation, as well as on the “technical quality” of euro banknotes – with the latter referring both to the tangible quality as well as to the counterfeit resilience of banknotes which is the outcome of the entire production process, from the design and printing stage to banknote recycling.

Second, as euro cash is a joint product of all Eurosystem national central banks, the planning and production processes involved provide a vivid example of how cooperation within the Eurosystem works in practice. We describe how the Eurosystem aims for providing euro cash in the most efficient manner, safeguarding a very high quality of banknotes.

The third reason is that the rapid spread of new technologies in the field of payments and banking has the potential of fundamentally changing demand for cash and therefore gives rise to numerous questions: Will consumers continue to

<sup>1</sup> Oesterreichische Nationalbank, Cashier's Division, [anton.schautzer@oenb.at](mailto:anton.schautzer@oenb.at), and Economic Studies Division, [helmut.stix@oenb.at](mailto:helmut.stix@oenb.at) (corresponding author). Opinions expressed by the authors of this study do not necessarily reflect the official viewpoint of the OeNB or the Eurosystem. The authors would like to thank the reviewer as well as participants of an internal seminar for very helpful comments.

<sup>2</sup> The euro was introduced as an accounting currency on January 1, 1999. Euro banknotes and coins have been circulating since January 1, 2002.

use cash despite the availability of new payment and banking technologies? Why do consumers use cash more intensively in some euro area countries than in other countries (given that their institutional environments are rather similar)? How much of the circulating amount of cash is used for payments, as a store of value or for shadow economy transactions? How big a share circulates within the euro area and abroad? These are just a few examples of questions that are important for assessing the future of cash but for which researchers and central banks have only partial answers. Somewhat exaggerating, one could probably state that the best manifestation of the bounded knowledge about the demand for cash is that cash has repeatedly been declared to be outdated and doomed to disappear – while in actual fact cash demand has continued to grow.

Our article covers all these aspects. First, we take stock of the amounts of currency that have been circulating since the changeover to euro cash in 2002. This view is supplemented by survey information on the role of cash for Austrians and citizens of other euro area countries. This discussion shows that cash is still of major importance for daily transactions, both in Austria and in many other countries in the euro area.

Second, we address the various steps in a life of a banknote (design, production, logistics, anti-counterfeit measures, etc.) and the complex logistics required to ensure that only banknotes of the highest quality will enter or re-enter circulation. Given the costs involved in producing and disseminating cash and the importance of cost efficiency, we describe the considerable technical progress in cash production and logistics that has occurred over the past two decades or so. As euro cash is the joint product of all national central banks within the Eurosystem, we also address how this cooperation works in practice and the role of the OeNB in the supply of banknotes.

Finally, we provide a brief discussion about the likely future of cash. From today's perspective, it can be expected that the amount of cash used by the public will decline somewhat, in particular for day-to-day payments, but that public demand for cash is here to stay in the near future.

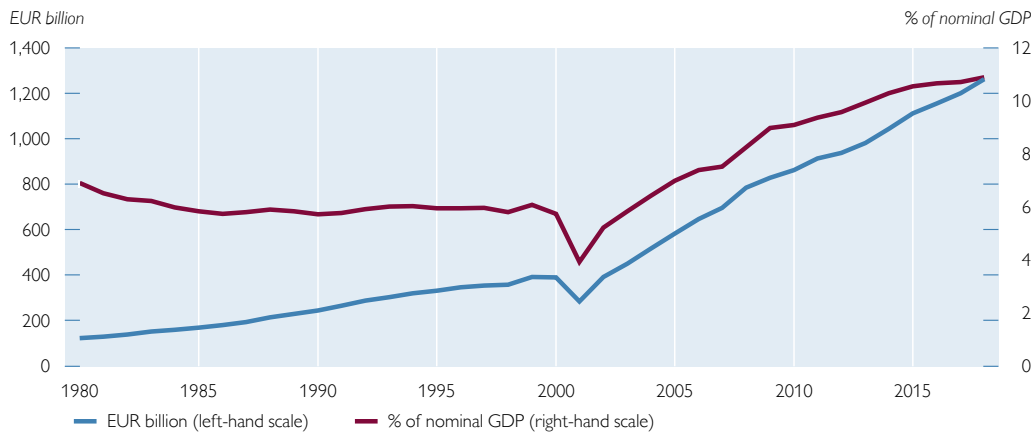
## 1 Euro cash in circulation has increased considerably

Chart 1 shows the evolution of currency in circulation in the euro area since 2002.<sup>3</sup> The underlying time series is a reflection of the public's desire to hold cash, given that the public is free to choose cash over bank deposits (or other financial assets) and that central banks accommodate any demand for banknotes. To put the recent development into perspective, the time series starts in 1980, using a synthetic aggregate of the euro's legacy currencies in circulation based on fixed conversion rates. Moreover, the second time series relates cash demand to changes in income, plotting the amount of currency in circulation as a percentage of nominal GDP (for both series, see Jobst and Stix, 2017).

<sup>3</sup> The chart shows the value of euro and legacy currency cash that is circulating (i.e. that has left the vaults of central banks).

Chart 1

### Euro currency in circulation



Source: ECB, OeNB, authors' calculations.

Note: Currency in circulation refers to the euro and all its legacy currencies.

While currency in circulation was rather stable from 1980 to 2000 relative to nominal GDP, it trended upward strongly after 2002: from 2002 to 2018, the ratio of currency in circulation to nominal GDP roughly doubled, subject to an acceleration of the upward trend during the global economic and financial crisis and a growth slowdown after 2015.

Given the evolution of cashless payment innovations, such a rise in cash demand is indeed striking. As discussed by Jobst and Stix (2017), the nominal GDP ratio of euro cash in circulation may be understood to have risen until 2006 to catch up with the value that the German mark used to have, with the euro taking over the role of the German mark as an international currency. Since 2007 however, the additional increase is likely to have been associated with (i) very low interest rates after the crisis, (ii) increased domestic hoarding, presumably to some extent as a consequence of increased uncertainty after the global economic and financial crisis and (iii) increased foreign demand.<sup>4</sup> Jobst and Stix (2017) further show that increases in cash demand after 2007 can be observed in many economies, and not just the euro area (see also Lalouette and Esselink, 2018).

At the end of 2018, a total of 22,614,824,598 euro banknotes were in circulation, representing an overall value of EUR 1,231 billion. In purely statistical terms, this means that every inhabitant of the euro area was holding 66 euro banknotes worth EUR 3,605. This compares with a per capita circulation of 30 banknotes worth EUR 1,536 in 2004.<sup>5</sup>

<sup>4</sup> Typically, a distinction is made between transactional demand and nontransactional demand for cash. The latter arises from various sources, e.g. foreign demand, hoarding, precautionary demand, demand for shadow economy transactions, demand due to uncertainty, etc. As these concepts overlap, we prefer to distinguish between transactional demand, foreign demand and hoarding (hoarding being the residual demand that does not arise from the desire to conduct transactions and that does not arise from abroad). However, this does not solve the problem that the separation between transaction demand and hoarding is difficult conceptually, e.g. if people save in cash for later purchases.

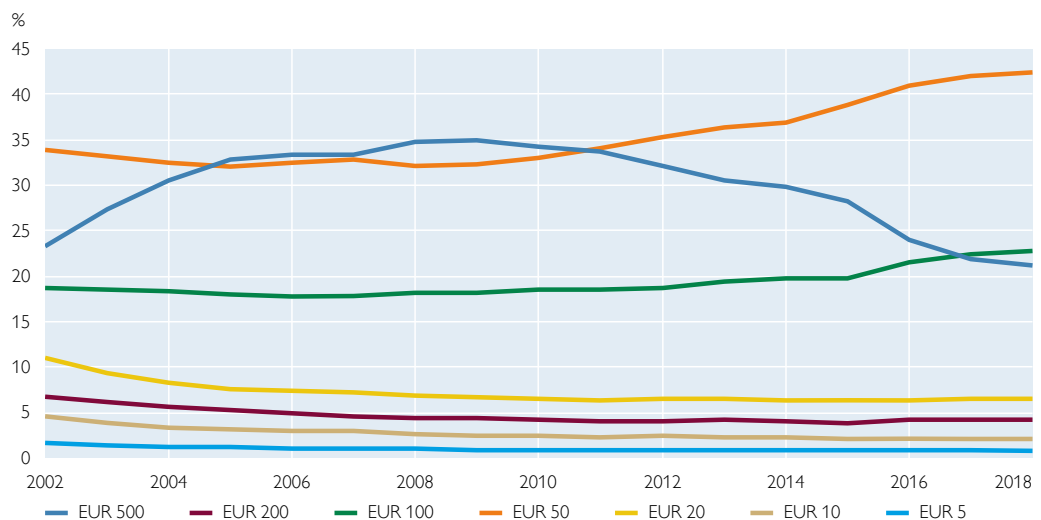
<sup>5</sup> We consider 2004 a better comparison year as the figures for 2002 and 2003 were hugely influenced by the cash changeover. For the sake of completeness, the corresponding figures for 2002 are a per capita amount of EUR 1,111 and 25 euro banknotes. Moreover, it should be added that the general price level increased by roughly 30% from 2004 to 2018, i.e. by about 1.75% annually, on average.

The 30 banknotes that circulated on average per capita in 2004 were held in the following denominations: three EUR 100 bills, ten EUR 50 bills, six EUR 20 bills, five EUR 10 bills and four EUR 5 bills – amounting to 64% of the total value of per capita circulation – plus one EUR 500 bill and four-tenths of a EUR 200 bill.<sup>6</sup> The comparison with end-2018 figures is quite impressive: the list for 2018 includes eight EUR 100 bills, thirty-one EUR 50 bills, twelve EUR 20 bills, eight EUR 10 bills and six EUR 5 bills – amounting to a total share of 75% of per capita currency in circulation – plus one-and-a-half EUR 500 bill and seven-tenths of a EUR 200 bill.

Chart 2, which visualizes the relative contribution of individual denominations to the overall value of banknotes in circulation over time (with the relative shares summing to 100% each year), highlights that the relative demand for individual denominations is not constant over time. In particular, the demand for EUR 50 banknotes has increased considerably (from 33% in 2004 to 42% of the total value of banknotes in circulation at the end of 2018). The relative importance of the EUR 500 bill, which is assumed to be the banknote that is used most for hoarding or for illicit activities, decreased after its peak in 2009. The ECB Governing Council's decision from May 4, 2016, to discontinue production of the EUR 500 banknote, seems to have induced a further decrease of its circulation.<sup>7</sup> In turn, the relative importance of EUR 50 and EUR 100 banknotes has increased.

Chart 2

### Contribution of individual denominations to euro banknotes in circulation



Source: ECB.

Note: This chart shows the relative contribution of individual banknote denominations to the overall value of banknotes in circulation in the euro area. These shares sum to 100% for each year.

<sup>6</sup> The number of banknotes is, if possible, rounded to integer values.

<sup>7</sup> The issuance of the EUR 500 banknote was stopped across the euro area at the end of January 2019 with the exception of Germany and Austria, where such bills were issued until the end of April 2019. The EUR 500 banknote remains legal tender, though, and can be exchanged at cash desks of Eurosystem central banks for an unlimited period of time.

Altogether, the sheer facts indicate both a high circulation of euro cash and a considerable increase after 2007/2008. However, it is clear that the per capita circulation figures are purely hypothetical, as considerable amounts of euro cash are held outside the euro area, thus narrowing down the amount of euro cash that is actually used domestically, for a range of purposes. The relative importance of the different uses can only be assessed indirectly, though, given the anonymity of cash. The ECB (2017) estimates that at the end of 2016 between 23% and 35% of euro cash were circulating outside the euro area.<sup>8</sup> Lalouette and Esselink (2018) estimate that roughly a quarter of the total value in circulation is used for day-to-day transactions within the euro area and that about 7% are held in bank vaults. The remaining share is either hoarded domestically or lost. For Australia, Finlay et al. (2018) present estimates according to which about 7.5% of banknotes are lost. Applying these estimates (30% foreign circulation, 25% used for domestic transactions, 7% held by banks in vaults, 7.5% destroyed) suggests that about 30% are hoarded within the euro area, which would amount to around EUR 1,080 per capita.<sup>9</sup> To our knowledge, no recent estimates exist on how much of this amount can be assigned to licit and to illicit activities.

Using banknote shipment data and return frequencies of banknote denominations, the OeNB computes an approximate estimate of the amount of euro cash that is circulating within Austria (chart 3).<sup>10</sup> Despite the necessary caution when interpreting the resulting figures, two observations are evident. First, demand for euro cash has evidently gone up in Austria as well, both in nominal and in real terms. Second, the absolute amounts circulating per capita in Austria are relatively high. At the end of 2018, the per capita amounts held by consumers, merchants, companies and banks totaled about EUR 3,500. This compares with a euro area average of about EUR 2,500 (EUR 3,605 euro minus the estimated foreign circulation of 30%).

Some of the difference can be attributed to the fact that per capita GDP in Austria exceeds the euro area average by 18%. Furthermore, statistical data on cash holdings by banks show that roughly 15% of the total estimated cash circulation in Austria are stored in banks' vaults, which is more than twice the euro area percentage.<sup>11</sup> In per capita terms, about EUR 540 can be identified as vault cash of banks.<sup>12</sup> Some part can also be attributed to a heightened cash preference of households in Austria, as established by surveys on cash holdings and payment behavior, which will be discussed in the next section. To our knowledge, no information is available about whether cash balances held by merchants or corporations are higher in Austria than in the euro area.

<sup>8</sup> *Jobst and Stix (2017) study the increase in the circulation of the euro, the U.S. dollar and the Swiss franc since the global economic and financial crisis of 2007. Their results suggest that roughly one-third of the increase in the circulation of these currencies since 2007 is due to international demand.*

<sup>9</sup> *Given the above-mentioned difficulties in separating transactional demand from hoarding, these estimates can be seen as indicative only.*

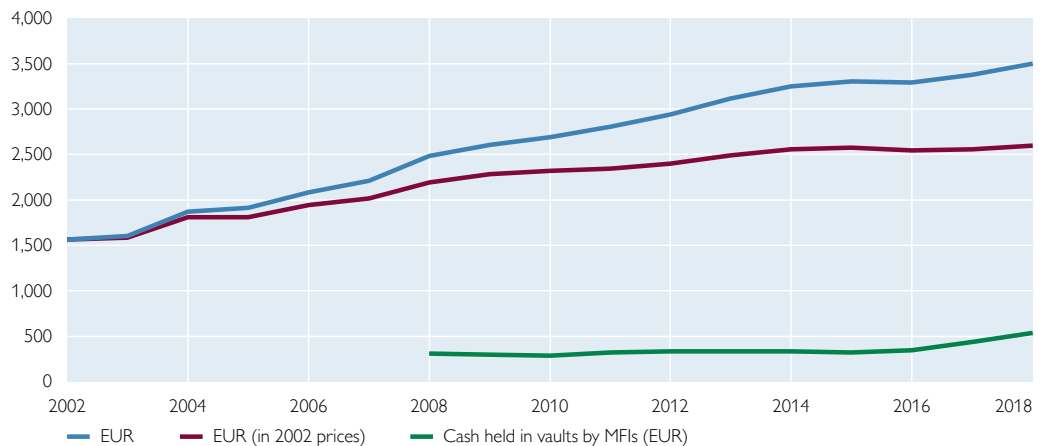
<sup>10</sup> *Cross-border flows (e.g. via banknote wholesale traders) are largely excluded.*

<sup>11</sup> *Source: ECB Statistical Data Warehouse.*

<sup>12</sup> *Cash held in vaults by banks increased from EUR 2.8 billion (EUR 323 per capita) in 2015 to EUR 4.8 billion in 2018 (EUR 536 per capita).*

### Euro currency in circulation in Austria

Euro amounts per capita



Source: OeNB, authors' calculations.

## 2 Despite profound changes in payment technologies, cash usage remains strong among Austrian consumers

Most information on the use of cash is available in the field of consumer payments. Although the demand for cash that arises from payments comprises only a relatively small share of the overall demand for currency, it is an interesting field as profound changes in payment technologies have occurred over the past 20 years. As a case in point, the number of point-of-sale payment terminals in Austria rose from 1,500 in 2002 to roughly 16,200 in 2017 (Mooslechner et al., 2012; ECB Statistical Data Warehouse). From 2002 to 2018, the share of Austrians (aged 14 or older) who were in possession of a debit card increased from 66% to 95% (Mooslechner et al., 2012; unpublished OeNB survey). In 2002, about 39% of Austrians were paying with a debit card once per week or more often. This share increased to 60% in the period until 2018. At the same time, the share of Austrians who indicated to withdraw cash from cash dispensers once per week or more often increased from 31% in 2002 to 45% in 2018.

### 2.1 The use of cash for payments

Information on the use of cash and other payment instruments is provided by payment diary surveys. In such studies, survey participants are asked to record all payments (except regular bill payments that are automatically deducted from accounts) over a prespecified period of time. The OeNB conducted the first such survey in 1996 and has since repeated the surveys every four to five years. Essentially, these surveys indicate that the use of cash in daily transactions has been declining in Austria, but that the vast majority of transactions are still settled in cash (Rusu and Stix, 2017).

A similar survey conducted by the European Central Bank in 2016 confirmed the preference of Austrians for paying cash, putting the percentage of transactions conducted in cash at 85% in terms of the number of transactions and at 67% in terms of the value of transactions (Esselink and Hernandez, 2017). Chart 4 summarizes



the results for most euro area countries.<sup>13</sup> The main messages of these findings are: First, cash is still important in euro area economies. Second, there are large differences across countries. This has also been confirmed by another international comparison which includes Canada, Australia and the U.S.A. (Bagnall et al., 2016). Third, Austria is among the countries with a high use of cash for payments.

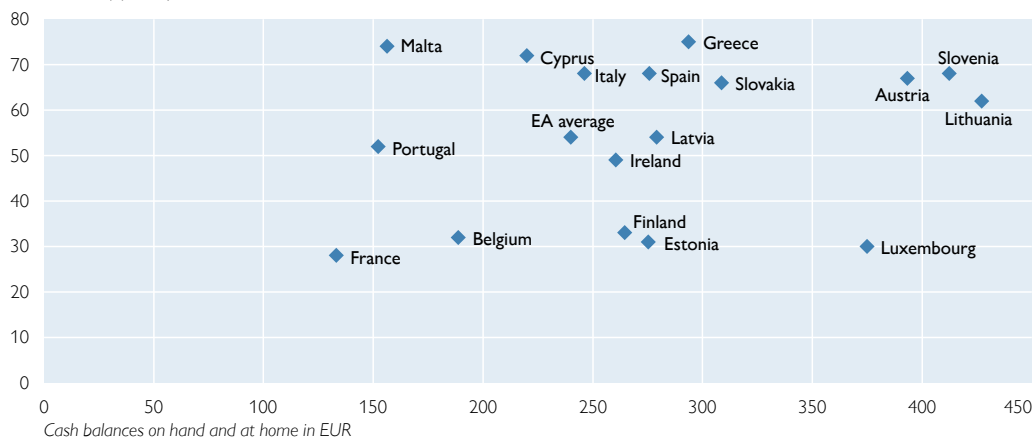
## 2.2 Cash holdings

The ECB's payment diary study also aimed to identify the amount of cash respondents tend to carry with them. Austrians have, on average, EUR 89 on hand (in their pockets, in their wallets, etc.), which is the fourth-highest value among the countries which participated in the ECB study. Also, the survey asked about cash held at home or in vaults. Adding both – cash kept at home and cash carried on hand – yields that adult Austrians (aged 18 or over) hold on average roughly EUR 400 in cash, which is the third-highest value among the countries depicted in chart 4.<sup>14</sup> It is evident that the intensive use of cash for payments and cash holdings are interrelated. Although this holds for Austria, chart 4 does not reveal a strong correlation between the mean value of cash holdings and the use of cash for payments.<sup>15</sup> Differences across countries in withdrawal fees from cash dispensers, the density of cash dispenser networks, crime rates (affecting the risk of theft), wealth levels or in the propensities

Chart 4

### Consumers' use of cash for payments and average cash holdings

Share of cash (by value) in %



Source: Esselink and Hernández (2017) and authors' calculations.

Note: "Cash balances on hand and at home" denotes the average value of cash held per respondent per country. This value should be treated as a rough and imprecise estimate and should be used only for the purpose of country comparisons. "Share of cash (by value)" denotes the importance of cash for payments, measured by the value share of cash for all recorded transactions (see Esselink and Hernandez, 2017).

<sup>13</sup> Germany was not covered in the ECB study. The Deutsche Bundesbank (2017) reports a value share of 55%.

<sup>14</sup> This mean value should be treated with caution and should only be used for rankings across countries. The main reason is that the mean value is derived from categorical answers to which numeric values have been assigned – for instance, an arbitrary value of EUR 8,000 was assigned for the top category (EUR 5,000 or more). Assigning different values will slightly change the resulting estimate of the mean but will not affect the country ranking.

<sup>15</sup> The correlation is significantly stronger if we compare cash held on hand and the intensity of use of cash for payments.



for hoarding play a role. Furthermore, some euro area countries have introduced cash transaction limits, which might also blur the correlation.<sup>16</sup>

### 3 The supply side of euro banknotes: specialization, automation and technical progress to maintain cost efficiency and high quality

In the following, we describe the main aspects of banknote production and logistics in the euro area as well as the role of the OeNB. Moreover, we discuss the main developments since 2002.

Since the introduction of the euro as the sole legal tender in the euro area, cash has no longer been the responsibility of individual central banks alone. Specifically, euro banknotes are produced jointly by the national central banks of the euro area, whereas responsibility for minting euro coins lies with the national governments of the euro area countries (subject to approval of the overall value of coin production by the Governing Council of the ECB). As a result, cash logistics has become a cross-border issue, which is coordinated at a level superordinate to the individual central banks. For this purpose, the ECB acts as a platform for Eurosystem central banks. This cooperation is a basic prerequisite for the functioning of the “European cash cycle”.

#### 3.1 Banknote production: specialization within the Eurosystem

The volume of euro banknotes produced annually must be sufficient to cover any increases in banknote demand as well as to replace banknotes which are unfit for circulation. Moreover, sufficient logistical stocks must be available in order to cover seasonal and holiday fluctuations as well as hypothetical crisis scenarios.

On this basis, the Governing Council of the ECB decides on the volume to be produced. Based on this decision, the actual production of various banknote denominations has been handled by means of a decentralized pooling system since

Table 1

#### Banknote production volume in 2019

Denomination	Quantity (in million)	Value (in EUR million)	NCBs commissioning production
EUR 5	613.3	3,066.6	BE, ES, AT, PT
EUR 10	424.6	4,245.6	DE
EUR 20	970.9	19,417.4	EE, IE, FR, CY, LU, MT, NL, SI, SK, FI
EUR 50	1,729.2	86,457.9	DE, GR, ES, FR, IT, LV, LT
EUR 100	0.0	0.0	
EUR 200	0.0	0.0	
EUR 500	0.0	0.0	
Total	3,738.0	113,187.5	

Source: ECB.

2002. This means that each NCB in the euro area is assigned a certain share of the overall annual production volume for euro banknotes.<sup>17</sup> Moreover, each national central bank is only responsible for producing certain denominations. To exemplify this, table 1 shows the banknote production plan for 2019 according to which Austria produces only EUR 5 banknotes, together with Belgium, Spain and Portugal. Furthermore, no EUR 100 and EUR 200 banknotes will be produced in 2019 as the launch stock for the new series of those two denominations, to be introduced at

<sup>16</sup> As of end-2017, cash payment thresholds existed in 9 out of the 19 euro area countries (i.e. Belgium, France, Greece, Spain, Italy, Latvia, Portugal, Slovenia and Slovakia). The limits as well as the addressees of such limits (B2B, B2P, etc.) vary across countries, though.

<sup>17</sup> The allotted shares are based on the capital share of the central banks participating in the Eurosystem.

the end of May 2019, was already printed and distributed among the Eurosystem national central banks in 2018.

As not all banknote denominations are produced at each printing facility, and as stocks of banknotes are built up or reduced at different speeds due to specific national circumstances, it is necessary to transport cash between central banks. These cross-border transports ensure that banknotes are distributed in the euro area according to national banknote demand, which is affected by a multitude of factors (e.g. cross-border commuting, labor migration, tourism, population size, income levels and the public's preferences for specific payment methods or for hoarding as well as shipments of banknotes outside the euro area).

Together with the national central banks, the ECB monitors the circulation and generates detailed monthly reports on stocks, circulation and handling as well as on the quality of cash in circulation, based on cash-handling statistics (the number of unfit banknotes) or random statistical testing.

Box 1

### **Euro banknotes are an R&D-intensive product**

*Given that a banknote is, in the end, only a piece of printed paper, a considerable amount of research and development goes into it – in fact, it would not be an exaggeration to refer to banknotes as high-tech products. After all, banknotes must meet very high standards in terms of counterfeit resilience, production efficiency, sustainability and environmental aspects.*

*The initial design of the euro banknotes was the result of a competition among banknote designers. The winning design, contributed by the Austrian designer Robert Kalina, has since been overhauled by the German banknote designer Reinhold Gerstetter. The second euro banknote series, launched in stages from 2013 onward, comes with new and further advanced security features. Moreover, the design was adjusted to better meet the requirements of the visually impaired.*

*The counterfeit resilience of euro banknotes is not only provided by the well-known “FEEL-LOOK-TILT” security features (which banknote users are encouraged to test in authenticity checks) but also ensured with security features that are invisible to the naked eye, like micro-print, UV and IR features. These features, which can only be checked with special devices or sensors, facilitate the automation of cash payments and cash processing.*

*While euro banknote paper is made of cotton, the enhanced EUR 5 and EUR 10 banknotes, which started circulating in 2013 and 2014 respectively, have also been coated, which makes these banknotes more durable and hence reduces costs. As a case in point, 28.3% of all processed EUR 5 banknotes were sorted to unfit due to soil or stains in 2008. By 2018, this percentage had dropped to 19.1% mainly – but not exclusively – due to coating.*

*It is a general objective of the Eurosystem to ensure public confidence in euro banknotes by maintaining their quality in circulation. Banknotes of poor quality aggravate the recognition of counterfeits by the broad public and are more likely to be rejected by vending machines. The lifespan of a banknote, from first issuance to destruction at a national central bank, depends not only on its physical durability but also on national peculiarities, e.g. the use of higher denominations for transactions. Basically, the higher the denomination, the higher the average lifespan, as higher-denomination banknotes are used less often for transactions and more likely to be stored. Additionally, environmental factors such as humidity play an important role in the time it takes for a banknote to become unfit. As an example, the EUR 20 banknote has an average lifespan of about 2.6 years in the euro area (computed from the total number of EUR 20 banknotes in circulation and the number of EUR 20 banknotes destroyed per year).*

### 3.2 Banknote processing volumes have increased considerably

Newly printed euro banknotes are first delivered to the euro area central banks and then distributed onward to credit institutions, which supply the economy – businesses and households – with cash. The return flow of cash from economic actors is also handled by credit institutions, which return cash received from customers to the central bank. Due to the need to cut costs and increase efficiency, specialized players – like cash management companies or cash-in-transit companies – have increasingly taken over the role of credit institutions. This specialization has made it possible to achieve economies of scale in cash logistics. Acknowledging these developments, the Eurosystem created a legal framework in 2010 designed to ensure a level playing field among professional cash handlers while safeguarding minimum standards for the authenticity and fitness checking of euro banknotes.<sup>18</sup> Credit institutions and professional cash handlers currently process more banknotes (about 54% of all processed banknotes) than the Eurosystem central banks.

Every single banknote that is returned to a professional cash handler or a Eurosystem central bank is checked for both fitness and authenticity. The OeNB uses high-speed cash processing machines that check more than 30 banknotes per second. Across the entire euro area, some 68 billion banknotes are currently checked per year. This implies that euro banknotes are on average checked three times a year by either central banks, credit institutions or cash handlers. On average, banknotes return 1.33 times per year to a Eurosystem central bank, which compares with a value of 3.35 times per year in 2004. The decrease not only reflects the stronger involvement of private companies in the cash-handling process but also the increased share of banknotes that is circulating outside the euro area or that is hoarded.

In Austria, about 1.8 billion banknotes were checked by the OeNB in 2018 (compared to some 800 billion banknotes in 2002). Currently, about 25% of banknotes are processed outside the OeNB by credit institutions and other professional cash handlers in Austria. This is a lower share than in other euro area countries as the OeNB has opted for a stronger involvement in the cash cycle in order to better control the quality of banknotes in circulation as well as to realize economies of scale.

In cash logistics, processing is a key element that allows to control the quality of banknotes in circulation and to filter counterfeits. Since 2002 the capacities and the throughput of cash processing machines has increased considerably. This has contributed to the efforts to further increase efficiency.

### 3.3 Cash automation has grown in importance

In the first decade of the 21<sup>st</sup> century, cash automation focused primarily on cash distribution (i.e. mainly cash dispensers). Since then, new types of machines – so-called cash-handling machines (staff-operated or customer-operated) – have emerged which facilitate both cash payments and cash deposits. These machines process banknotes locally, i.e. they can conduct authenticity and fitness checks and reuse deposited banknotes. This shortens the cash supply chain and contributes to a more efficient cash cycle.

While the number of staff-operated machines has remained stable over the last couple of years, the number of customer-operated machines increased strongly. In

<sup>18</sup> See "Decision of the European Central Bank of 16 September 2010 on the authenticity and fitness checking and recirculation of euro banknotes" (ECB/2010/14).

2013, in total, some 21,500 machines were in use all over the euro area; by 2018 this number had increased to more than 51,000 machines. Austria is no difference in this respect; here, the number has gone up from 1,170 machines in 2013 to almost 2,400 machines in 2018. The growing importance of customer-operated machines reflects the trend in the banking sector to offer automated cash services rather than over-the-counter cash services, on one hand, and to close bank branches and/or replace them with automated cash service points, on the other hand.

#### 4 Conclusions and some considerations about the way forward

This article's goal was to discuss almost 20 years of euro cash in Austria – from the user side and from the production side – and the changes that have occurred over this time period. The stylized facts presented in this short article are clear and unambiguous: Euro cash continues to remain an important medium of exchange and store of value. A strong increase in cash holdings, in particular after 2007, can be observed both in the euro area as a whole as well as in Austria, which is one of the more cash-intensive euro area economies.

The growth in euro cash circulation might seem surprising, given the continued growth in the availability and use of cashless payment options. In fact, the use of cash for payments has been declining over time – although the decline was relatively modest in Austria, compared to other countries like Denmark, Sweden or France, for example. The overall increase implies that non-payment motives more than offset the declining cash demand for transactions. While increased circulation of euro cash in countries outside the euro area explains a sizeable portion of the increased circulation, the bulk of the increase is domestic, i.e. related to domestic hoarding (see Lalouette and Esselink, 2018). Low interest rates are an important driver of this development. A rise in uncertainty might be another factor – reflecting that cash is the only way for consumers to hold (safe) central bank money, which might have been important after the outbreak of the global economic and financial crisis and some turbulences thereafter. However, the evidence on this uncertainty effect is not clear (Bech et al., 2018; Jobst and Stix, 2017). Analyses by the Bundesbank (2019b), Seitz et al. (2018) and Jobst and Stix (2017), overall, cannot link a large share of euro currency in circulation with the shadow economy – although it is inherently difficult to assess the role of shadow economy transactions for cash demand.

How will demand for euro cash evolve in the coming years? Assessing the future of euro cash requires a profound understanding of the drivers behind its use for payments and its use as a store of value – and as argued in this article, this is the area where many questions are unresolved and more research is required. Studies have shown that consumers value the distinguishing features of cash (e.g. its ease of use, the speed of transactions, its anonymity and its suitability for monitoring expenses) and continue to use cash for payments mainly according to their preferences (e.g. Bagnall et al., 2017; Rusu and Stix, 2017) – and not because they are forced to use cash. However, most of the available research results refer to the field of payments and relatively little is known about the other uses of cash: hoarding or the use of cash for licit versus illicit activities, which are affected by a multitude of factors (interest rates, uncertainty, agents' desire for privacy and anonymity, the size of the shadow economy, tax enforcement rules, etc.). Apart from the prediction that a normalization of interest rates will reduce cash demand for hoarding, it is thus rather difficult to assess how this important demand component will evolve. The

experience of Japan suggests that a prolonged period of very low interest rates could lead to the build-up of substantial cash holdings (Fujiki and Kiyotaka, 2019).

On the payment side, it can be expected that new payment instruments will gain importance in the coming years – rapidly growing contactless and mobile payments as well as new payment solutions based on instant payments have a large potential. It is rather likely that this development will reduce the use of cash for payments – the experience of countries where cashless payments are already used more intensively than in Austria, like Sweden, Norway or Canada, suggests that the decline in cash use for payments can be substantial. Nevertheless, we think that these changes will not occur rapidly and might be less strong in countries like Austria where the public seems to have had stronger cash preferences than in other countries. As a case in point, digitalization must not automatically replace cash but can also foster its use – provided that some consumers continue to have a preference for using cash: Apps have already been developed that allow for cash withdrawals at zero costs for consumers in stores (such withdrawals also reduce the costs to both banks and merchants) or apps which allow to settle online payments by cash in physical stores.

Apart from preferences, relative costs are an important determinant.<sup>19</sup> If cash becomes expensive for consumers to use or for merchants to accept, relative to other payment instruments, then the use of cash will decline. A recent study on the costs of payment instruments arising for the German retail sector, which might be broadly comparable to the Austrian situation, finds that cash generates the lowest overall per transaction costs, in comparison to debit and credit cards (Deutsche Bundesbank, 2019a). Amount-wise, cash generates lower costs for retail payments up to payment amounts of EUR 20, beyond which debit card payments are cheaper.<sup>20</sup> These results challenge claims that cash is universally more expensive than payment cards and therefore should be replaced by the latter, notwithstanding that the overall economy-wide costs of the payment system are considerable, and that further potentials for cost-savings should be realized. The utilization of technical innovations and automation along the entire supply chain will contribute to achieving this goal (e.g. high-speed cash-processing machines, customer-operated cash-handling machines). Moreover, the new euro banknote series that was launched in 2013 has increased counterfeit resilience and contains security features that can only be checked with sensors and which facilitate the automation of cash payments and cash processing. However, this covers just one side. For consumers and merchants, the other side, withdrawal or deposit costs are relevant, inter alia. If cash is to remain relatively inexpensive for consumers and merchants, it is essential for a dense network of withdrawal and deposit facilities to be maintained. This might

<sup>19</sup> Due to brevity, we do not discuss the general pros and cons of cash, which go beyond the mere cost aspect. The reader is referred to McAndrews (2017) and Krueger and Seitz (2018) for a more general discussion of the advantages of cash. For Rogoff (2016), the disadvantages of cash (e.g. because of its use for criminal activities and because of the implied zero lower bound on interest rates) dominate.

<sup>20</sup> Although these results refer only to the costs of the retail sector, they are similar to studies which refer to the economy-wide costs with respect to the finding that cash is cheaper for low transaction values than cards. With regard to Austria, Abele and Schäfer (2016) find that cash payments are cheapest for transaction values up to roughly EUR 10. A comprehensive study conducted by the Bank of Canada reports a threshold of 6 Canadian dollars above which debit cards are cheaper than cash (Kosse et al., 2017). Krueger and Seitz (2018) present an overview of results from cost studies.

become a challenge given the tendency of the banking sector to automate or to downsize the branch network.

Overall, we think there are three main messages that can be drawn from our brief contribution. First, euro cash is here to stay, although it is likely that its demand will decline in the coming years, mainly due to innovations in payment technologies and prospective increases in interest rates. Even though digitalization has the potential of making cash transactions superfluous, in principle, some consumers will nevertheless continue to prefer cash over other payment instruments because of the distinguishing attributes of cash. Second, cash is not outdated given the technical developments in cash production and dissemination, the continued use of cash by consumers and the costs of cash vis-à-vis other payment means that merchants face. Third, there is a need for more research in order to better understand the demand for cash, in particular referring to those aspects that are unrelated to short-run payment needs. The quantitatively important demand component of hoarding is influenced by a multitude of factors and currently is difficult to predict.

## References

- Abele, H. and G. Schäfer. 2016.** The cost of cash and debit cards in Austria. In: *Journal of Financial Market Infrastructures* 4(4). 1–16.
- Bagnall, J., D. Bounie, K. P. Huynh, A. Kosse, T. Schmidt, S. Schuh and H. Stix. 2016.** Consumer Cash Usage and Management: A Cross-Country Comparison with Diary Survey Data. In: *International Journal of Central Banking* 12(4). 1–61.
- Bech, M. L., U. Faruqi, F. Ougaard and C. Picillo. 2018.** Payments are a-changin' but cash still rules, In: BIS. *Quarterly Review*. March 2018.
- Deutsche Bundesbank. 2017.** Zahlungsverhalten in Deutschland 2017. Vierte Studie über die Verwendung von Bargeld und unbaren Zahlungsinstrumenten. Deutsche Bundesbank.
- Deutsche Bundesbank. 2019a.** Kosten der Bargeldzahlung im Einzelhandel – Studie zur Ermittlung und Bewertung der Kosten, die durch die Bargeldzahlung im Einzelhandel verursacht werden. Deutsche Bundesbank in Zusammenarbeit mit EHI Retail Institute GmbH.
- Deutsche Bundesbank. 2019b.** Cash demand in the shadow economy. In: *Monthly Report*. March. 43–58.
- Doyle, M.-A., C. Fisher, E. Telez and A. Yadav. 2017.** How Australians Pay: Evidence from the 2016 Consumer Payments Survey. In: Reserve Bank of Australia. *Research Discussion Paper* 2017-04.
- Engert, W., B. Fung and S. Hendry. 2018.** Is a Cashless Society Problematic? Bank of Canada. *Staff Discussion Paper* 2018-12.
- European Central Bank. 2017.** Estimation of euro currency in circulation outside the euro area. Downloaded from [https://www.ecb.europa.eu/pub/pdf/other/estimating\\_eur\\_in\\_circulation\\_outside\\_the\\_euro\\_area-201704.en.pdf](https://www.ecb.europa.eu/pub/pdf/other/estimating_eur_in_circulation_outside_the_euro_area-201704.en.pdf) (January 16, 2019).
- Esselink, H. and L. Hernández. 2017.** The use of cash by households in the euro area. In: ECB. *Occasional Paper Series* 201.
- Finlay, R., A. Staib and M. Wakefield. 2018.** Where's the Money? An Investigation into the Whereabouts and Uses of Australian Banknotes. Reserve Bank of Australia. *Research Discussion Paper* 2018-12.
- Fujiki, H. and K. Nakashima. 2019.** Cash Usage Trends in Japan: Evidence Using Aggregate and Household Survey Data. In: TCER. *Working Paper* E-131.



- Jobst, C. and H. Stix. 2017.** Doomed to Disappear? – The Surprising Return of Cash Across Time and Across Countries. In: CEPR. Discussion Paper 12327.
- Koch, A. and D. Schneeberger. 2012.** Euro Cash in Austria, Ten Years On. In: OeNB. Monetary Policy & The Economy Q1/12. 28–40.
- Krueger, M. and F. Seitz. 2018.** The Pros and Cons of Cash: The State of the Debate. In: Credit and Capital Markets 51. 15–40.
- Kosse, A., H. Chen, M.-H. Felt, V. D. Jiongo, K. Nield and A. Welte. 2017.** The Costs of Point-of-Sale Payments in Canada. In: Bank of Canada. Staff Discussion Papers 2017-4.
- Lalouette, L. and H. Esselink. 2018.** Trends and developments in the use of euro cash over the past ten years, In: ECB. Economic Bulletin, Issue 6/2018.
- McAndrews, J. 2017.** The Case for Cash. In: ADBI. Working Paper Series No. 697.
- Mooslechner, P., H. Stix and K. Wagner. 2012.** The Use of Payment Instruments in Austria – A Study Based on Survey Data from 1996 to 2011, In: OeNB. Monetary Policy & the Economy Q4/12. 53–77.
- Politronacci, E., E. Ninlías, E. Palazzeschi and T. Ghjuvanni. 2018.** How many banknotes are circulating in France? In: Banque de France. Eco Notepad (July 24, 2018).
- Rogoff, K. S. 2016.** The Curse of Cash, Princeton and Oxford: Princeton University Press.
- Rusu, C. and H. Stix. 2017.** Cash and card payments – recent results of the Austrian payment diary survey, available for download at <https://ideas.repec.org/a/onb/oenbmp/y2017iq1-17b4.html>. Originally published in German as: Von Bar- und Kartenzahlern – Aktuelle Ergebnisse zur Zahlungsmittelnutzung in Österreich. In: OeNB. Monetary Policy & the Economy Q1/17. 54–85.
- Schautzer, A. 2007.** Cash Logistics in Austria and the Euro Area. In: OeNB. Monetary Policy & the Economy Q1/07. 138–149.
- Seitz, F., H.-E. Reimers and F. Schneider. 2018.** Cash in Circulation and the Shadow Economy: An Empirical Investigation for Euro Area Countries and Beyond. In: CESifo Working Paper Series 7143.



# The euro's effects on noncash retail payments

Christiane Dorfmeister<sup>1</sup>

Refereed by: Doris Schneeberger, ECB

*A common European currency, while being a milestone for the European Union, was just the first step toward integrated euro payments markets. The Single Euro Payments Area (SEPA) was not born until 2014, when the migration of domestic formats and national infrastructures for credit transfers and direct debits to European technical standards and procedures was completed. While these changes have of course come at a cost for the financial industry, SEPA has definitely had an impact on the efficiency and speed of retail payments, but also on the security of transactions as well as on pricing. Some issues remain to be solved, e.g. SEPA for card transactions or IBAN discrimination. Nevertheless, SEPA migration has been a success – and, in turn, a stepping stone to further innovations, like instant payments.*

The changeover to the euro 20 years ago has served as a strong catalyst for many other steps of financial market integration in Europe – such as the launch of TARGET, the Eurosystem's real-time large-value gross settlement system, also in 1999, and the migration to common standards and business rules for cashless retail payment instruments, in 2014, when the single euro payments area ("SEPA") was born.

This article describes the process of integrating European retail payments, including legislative initiatives, the impact of the retail payments infrastructure and the payments behavior of businesses and consumers.

## 1 The role of the Eurosystem in the area of payments

In the area of payments, the Eurosystem acts in different roles: It has an oversight function, it acts as a catalyst, and it operates infrastructures of its own.

In its oversight capacity, the Eurosystem sets out objectives for safety and efficiency and issues corresponding oversight regulations, standards, guidelines and recommendations. With a view to monitoring compliance and addressing market developments, it collects relevant information, assesses the information against the oversight objectives and adjusts the prevailing standards when necessary.

In its role as a catalyst, the Eurosystem engages in a number of initiatives aimed at promoting efficiency and innovation to achieve greater integration in financial markets in Europe, like SEPA.

In its operating function, the Eurosystem runs TARGET Services: These are a number of services which ensure the free flow of cash, securities and collateral across Europe and include TARGET2 (for settling payments), TARGET2Securities (T2S, for settling securities) and the recently launched TIPS (for settling instant payments). In this article we focus on the payments part of the European systems – on TARGET2 and TIPS.

Being an integral part of the Eurosystem, the Oesterreichische Nationalbank acts in those roles as well. Besides representing Austria in various committees and working groups of the Eurosystem, market groups and European legislators, the OeNB focuses also on the development and support of the domestic payments market, as policymaker, overseer and operator of the Austrian clearing services: Clearing Service Austria (CS.A) for domestic transactions and Clearing Service International (CS.I) for cross-border transactions in euro within the EU. Both are

<sup>1</sup> Oesterreichische Nationalbank, Equity Interest and Payments Management Division, [christiane.dorfmeister@oenb.at](mailto:christiane.dorfmeister@oenb.at).

operated by Geldservice Austria (GSA), which is a subsidiary of the OeNB and Austria's largest commercial bank, ensuring the supply of cash for banks, savings banks, post offices and also for many commercial businesses. Since 2011, GSA has also been providing the clearing services for SEPA credit transfers and SEPA direct debits.

Box 1

### TARGET2

**TARGET2** is the Real-Time Gross Settlement (RTGS) system owned and operated by the Eurosystem. TARGET2 uses central bank money to settle payments related to the Eurosystem's monetary policy operations as well as bank-to-bank and commercial transactions. Every five days, TARGET2 processes a value close to the entire amount of euro area GDP, which makes it one of the largest payment systems in the world. Apart from other central banks, more than 1,000 banks use TARGET2 to initiate transactions in euro, either on their own behalf or on behalf of their customers.<sup>2</sup> As the name implies, TARGET2 is already the second generation of the system; it replaced TARGET in 2007.

## 2 Migration to SEPA

The Single Euro Payments Area (SEPA) created a pan-European market for cashless retail payments in euro – mainly for credit transfers and direct debit. Migration to SEPA of the previous national retail payment systems was a staggered process, which started in 2008. SEPA can be seen as a natural progression from the introduction of euro and a further step in realizing the full potential of the Single Market for Europe.

SEPA replaced a multitude of national retail payment systems, which had originally been created by individual banks and banking communities to meet national requirements for handling payments in national currencies and used proprietary national standards for credit transfers and direct debits. These national payment networks operated with no or little cross-border interoperability in a fragmented retail payments market. Austrian banks, for instance, used the so-called EDIFACT standard<sup>3</sup> as well as national account identifiers and national bank identifiers for domestic payments. Conducting cross-border transactions required other technical formats and additional processing channels (like pan-European clearing houses), thus leading to higher costs and processing times.

The underlying idea of SEPA was to remove this fragmentation, create interoperability between payment systems by using international (ISO XML) standards, benefit end users and lead to more competition on a European level.

<sup>2</sup> <https://www.ecb.europa.eu/paym/target/html/index.en.html>.

<sup>3</sup> EDIFACT is an international message standard; it is an acronym for electronic data interchange for Administration, Commerce and Transport. [https://www.gxs.co.uk/wp-content/uploads/tutorial\\_edifact.pdf](https://www.gxs.co.uk/wp-content/uploads/tutorial_edifact.pdf).

Box 2

### SEPA standards

To enable frictionless end-to-end straight-through processing of SEPA transactions, the European Payments Council (EPC) developed payment schemes for SEPA credit transfers and SEPA direct debits.<sup>4</sup>

As a common technical standard, subsets of XML ISO 20022 were chosen. Bank-to-bank messages (“pacs”) are mandatory for use, whereas customer-to-bank payment initialization messages (“pain”) are not, but they are strongly recommended.

The most obvious change resulting from SEPA migration for consumer and enterprises was the implementation of international bank account numbers (IBAN) and business identifier codes (BIC) instead of the domestic account and bank identifiers. Following a phasing-in period, use of the new identifiers became mandatory for initiating credit transfers and direct debits on August 1, 2014. Since February 2016, the “IBAN only” rule has applied for credit transfers and direct debits within the euro area; i.e. it is no longer necessary to indicate the BIC for such transactions. The Austrian IBAN consists of 20 digits, containing the country code, two check digits<sup>5</sup> and the national identifiers of the bank and the account.

SEPA was a major undertaking not only with regard to the development and implementation of common technical standards and business procedures but also with regard to the establishment of a European legislative framework setting common rules for retail payment instruments, establishing the principle of the equality of charges between cross-border and national payments in euro and creating the conditions for more competition in the provision of payment services (see box 3). This legislative framework is being constantly updated to ensure more competition, transparency, safety, efficiency and innovation for the European retail payments market.

The roll-out of SEPA credit transfers (SCT) and SEPA direct debits (SDD) started in 2008 and 2009, respectively. Thus, seven or eight years after the euro had arrived in people’s pockets, retail customers became able to make euro payments throughout Europe as easily, securely and efficiently as they did within their own countries – provided their payment service providers were already offering the new payment instruments at the time, because migration to the new system remained voluntary initially. In fact, adoption of SEPA schemes proceeded slowly because voluntary migration was perceived as expensive and risky for first movers (who would have to keep both systems running in parallel).

Therefore, additional EU legislation was enacted to set end dates for completing the migration of credit transfers and direct debits to the harmonized SEPA standards: ultimately, August 1, 2014, for euro area countries and on October 31, 2016, for non-euro area countries. SEPA covers all euro payments in the EU and applies to payments in euros in other European countries: Iceland, Norway, Switzerland, Liechtenstein, Monaco and San Marino.<sup>6</sup>

<sup>4</sup> Credit transfer: A payment instrument allowing a payer to instruct the institution with which its account is held to transfer funds to a beneficiary. Direct debit: A payment instrument for the debiting of a payer’s account whereby a payment transaction is initiated by the payee on the basis of authorization given by the payer (ECB glossary): <https://www.ecb.europa.eu/home/glossary/html/glossc.en.html>.

<sup>5</sup> <https://www.iban.com/iban-checker>.

<sup>6</sup> <https://www.ecb.europa.eu/paym/retpaym/html/index.en.html>.

### Timeline of the SEPA migration process

Adoption of Payment Service Directive 1	Launch of SEPA credit transfers	Launch of SEPA direct debits	SEPA migration end date for euro area countries <sup>1</sup>	Adoption of Payment Service Directive 2	SEPA migration end date for non-euro area countries
2007	2008	2009	2014	2015	2016

Source: Author's compilation.

<sup>1</sup> Subject to a waiver for niche products (less than 10% market share) and one-off direct debits at points of interaction until 2016.

Box 3

#### Legal acts relating to SEPA

**Regulation (EC) No. 2560/2001** of the European Parliament and of the Council of 19 December 2001 on cross-border payments: This regulation stipulates that the transactions charges for cross-border transactions in euro must be equal to those for domestic transactions.

**Directive 2007/64/EC** of the European Parliament and of the Council of 13 November 2007 on payment services in the internal market (**Payment Services Directive 1 – PSD 1**): This directive is known as the legal framework for SEPA. It provides clarity with regard to the core rights and obligations of users and providers of payment services. It introduces a new type of payment service provider – payment institutions – and obliges payment service providers to process payments within certain time limits (execution time “D+1” has applied since January 1, 2012).

**Regulation (EC) No. 924/2009** of the European Parliament and of the Council of 16 September 2009 on cross-border payments in the Community: Replaced Regulation (EC) No. 2560/2001 by including also the charges for cross-border SEPA direct debits.

**Regulation (EU) No. 260/2012** of the European Parliament and of the Council establishing technical and business requirements for credit transfers and direct debits in euro and amending Regulation (EC) No. 924/2009 (**SEPA Regulation**): This regulation set February 1, 2014 (later August 1, 2014) as the deadline for replacing national credit transfers and direct debits with SEPA credit transfers and SEPA direct debits for euro area countries, and October 31, 2016, for non-euro area EU Member States. The regulation also requires the use of certain common standards and technical requirements, such as the use of international bank account numbers (**IBAN**) and the financial services messaging standard **ISO 20022 XML** for all credit transfers and direct debits in euro in the EU.

**Directive 2014/92/EU** on the comparability of fees related to payment accounts, payment account switching and access to payment accounts with basic features (**Payment Account Directive – PAD**): This directive provides EU citizens with a right to a basic payment account irrespective of their place of residence or financial situation. It also improved the transparency of bank account fees and set uniform rules for switching a bank account from one bank to another.

**Directive (EU) 2015/2366** of the European Parliament and of the Council on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No. 1093/2010, and repealing Directive 82007/64/EC (**Payment Services Directive 2 – PSD2**): This directive sought to improve the existing rules of the Payment Services Directive, so that it also covered third-party providers of payment services (e.g. payment initiation services and account information services). Further proposed changes were aimed at further strengthening consumer protection in the context of payments, e.g. reduced liability for non-authorized payments or unconditional refund right for SEPA direct debits.

**Regulation (EU) 2015/751** of the European Parliament and of the Council on interchange fees for card-based payment transactions (**Interchange Fee Regulation**): This regulation applies to card transactions for which both payment service providers are established within the EU. It introduced a cap on interchange fees for consumer debit and credit cards and removed a number of business rules that had restricted pan-European issuing, acquiring and processing in the cards market.

### 3 Impact of SEPA on the efficiency of payments

#### 3.1 Fees and charges for payment services

One of the objectives of SEPA was to make European payments more efficient, i.e. to lead to faster payments and lower costs and charges for payment service providers, businesses and consumers. This effect has since been evaluated repeatedly, for instance by PWC (2014) and by the European Commission (2013). In the assessment of the Payment Services Directive 1 made by the European Commission, a comparison of the level of fees and charges in 2012 with those reported in previous studies showed that, in general, fees for domestic and cross-border credit transfers have decreased. In the case of debit card-based withdrawals at ATMs, fees in the euro area have remained stable with a slight decrease in average prices although there were differences across Member States. For over-the-counter transfers, fees were higher in 2012 than in 2005 in some countries – which may be attributable to the fact that the manual handling of payments and cash (payment service providers have been trying to scale back) is more expensive than fully automated processing.

Non-euro area EU Member States, while covered by Regulation 924/2009 (see box 3), did not benefit from the effects of that regulation because in these Member States domestic payments in euro are expensive or are not possible. As a consequence, end users in non-euro area EU Member States pay high fees whenever euro payments cross the border of their country or when people pay abroad. For this reason, Regulation 924/2009 was reviewed in 2018 and has been amended in 2019 to include all currencies of the EU.

The Payment Services Directive 2, which was incorporated into national law by January 13, 2018, provides the legal foundation for the further development of an integrated European market for cashless payments. It takes into account innovative payment services like Internet and mobile payments. The directive also opened up the market to third-party providers offering account information services and payment initiation services.

The Payment Services Directive 2 has since been complemented by the Interchange Fee Regulation, which puts a cap on interchange fees charged between banks for card-based transactions. This should decrease the costs for merchants when accepting consumer debit and credit cards and therefore could lead to an increased acceptance of cards.

#### 3.2 Speed

The Payment Services Directive 1 introduced a maximum time limit for the processing of credit transfers in euro in the EU in order to improve the efficiency of payments. Since 2012 all credit transfers initiated by the payer and denominated in euro or the currency of a Member State outside the euro area are subject to a maximum one-day execution time. For all other payments, like for example direct debits and card payments, in the absence of an explicit agreement between the payment service provider and the payer setting a longer execution time, the same one-day execution time applies. The agreed periods could be extended by an additional business day in the case of paper-based payment orders. In line with the Payment Services Directive 2, Member States may establish rules specifying an execution time shorter than one business day.

### 3.3 Security

The Payment Services Directive 2 set rules for improved security in electronic payments: “The security of electronic payments is fundamental in order to ensure the protection of users and the development of a sound environment for e-commerce. All payment services offered electronically should be carried out in a secure manner, adopting technologies able to guarantee the safe authentication of the user and to reduce, to the maximum extent possible, the risk of fraud.”<sup>7</sup>

As outlined in the corresponding regulatory technical standards of the European Banking Authority (EBA RTS),<sup>8</sup> the “strong customer authentication” generated by the Payment Services Directive 2 is based on two or more of three kinds of elements that are independent of one another.<sup>9</sup> The requirements of strong customer authentication apply to payments initiated by the payer, regardless of whether the payer is a natural person or a legal entity. The authorization must also include elements that dynamically link the transaction to a specific amount and a specific payee.

Alongside this authentication, the Payment Services Directive 2 requires payment service providers to have in place security measures to protect the confidentiality and the integrity of payment service users’ personalized security credentials when payer access their payment accounts online, initiate an electronic payment transaction and/or carries out any action through a remote channel.

The Payment Services Directive 2 also introduced a liability shift: Providers who fail to authenticate a transaction appropriately will now be held liable for any resulting breaches. In cases where the payer’s payment service provider does not require strong customer authentication, the payer will not be required to bear any financial losses unless the payer has acted fraudulently. In cases where the payee – or the payee’s payment service provider – fails to accept strong customer authentication, it will be required to refund the financial loss caused to the payer’s payment service provider.

### 3.4 Costs of SEPA migration

Implementing ISO 20022 XML – which was one of the technical requirements for payment service providers, companies and public administrations under Regulation (EU) No. 260/2012, with a view to bringing efficiency gains due to more and international standardization – of course came at a cost for banks and companies. Unfortunately, hardly any concrete figures have become available on this point. Therefore, most documents (including the recently published SEPA Impact Assessment of the Eurosystem<sup>10</sup>) refer to a cost and benefit analysis made by Europe Economics (2016) for seven EU Member States<sup>11</sup> covering migration costs, indirect costs, benefits and the implementation process.

<sup>7</sup> *Payment Services Directive 2, recital 95.*

<sup>8</sup> *Commission Delegated Regulation (EU) 2018/389 supplementing Directive (EU) 2015/2366 of the European Parliament and of the Council with regard to regulatory technical standards for strong customer authentication and common and secure open standards of communication.*

<sup>9</sup> *Categorized as knowledge, possession or inherence. See for instance <https://www.adyen.com/blog/psd2-understanding-strong-customer-authentication>.*

<sup>10</sup> <https://www.ecb.europa.eu/pub/pdf/other/ecb.sepamigration201902~4bbd0e41b8.en.pdf?8216d87fd2371e7007e9ee151d02df7>.

<sup>11</sup> *Five euro area countries (Belgium, Finland, France, Ireland and the Netherlands) and two non-euro area countries (Denmark and the U.K.)*



In terms of benefits, a report of the European Commission highlights the improved efficiency of financial transactions due to lower transaction fees for cross-border transactions in the euro area and due to information being passed in full and without alteration. These benefits are available to large corporates and small and medium-sized enterprises, allowing them to fully exploit the Single Market opportunities.<sup>12</sup> There was also evidence of improved liquidity management and of an increase in competition at all levels of the value chain.

#### 4 Challenges remaining to be solved

The SEPA Impact Report from the European Commission to the European Parliament and the Council<sup>13</sup> concludes that the SEPA Regulation has been applied correctly across the EU. Some issues that persist have been addressed by Member States and their resolution will be monitored in the future.

##### 4.1 IBAN discrimination

“IBAN discrimination” means the practice of accepting payments only when made from an account located in a country specified by the payee. Companies and institutions within the SEPA area are obliged by law to accept payments from any account identified by the IBAN of any EU Member State. This includes credit transfers as well as direct debits. Article 9 of the SEPA Regulation says that a payer (in the case of a credit transfer) or the payee (when initiating a direct debit) shall not specify the Member State in which that payment account is to be located, because this could restrict competition on the payments market.

Currently there are still cases where companies allow their customers to pay only from accounts in specific countries. Cases of IBAN discrimination are closely monitored by the relevant national authorities (such as the Financial Market Authority in Austria) and the European Commission.

Box 4

##### SEPA for cards

*Payment cards are the most widely used electronic payment instrument in Austria (and in the European Union too), accounting for 43% of all noncash transactions, followed by credit transfers (32%) and direct debits (25%).<sup>14</sup> They are also the fastest growing cashless payment instrument with an average yearly increase of approximately 7% per number of transactions in Austria (approximately 10% in Europe).<sup>15</sup>*

*The rapid growth has also been supported by the use of contactless cards. Contactless payments are faster and more convenient and so may provide an incentive to use electronic payments at the point of interaction. They seem to have the potential to replace a number of low value transactions usually done with cash. In Austria the number of near-field communication*

<sup>12</sup> European Commission staff working paper (SEC(2010) 1584 final) accompanying the proposal for Regulation (EU) No. 260/2012.

<sup>13</sup> Report from the Commission to the European Parliament and the Council on the application of Regulation (EU) No. 260/2012 establishing technical and business requirements for credit transfers and direct debits in euro and amending Regulation (EC) No. 924/2009, COM(2017) 683 final, 23 November 2017.

<sup>14</sup> ECB Statistical Data Warehouse; based on 2017 data.

<sup>15</sup> ECB Statistical Data Warehouse, number of transactions 2014–2017, payments by cards issued by resident payment service providers.



(NFC) transactions with debit cards at points of interaction tripled from end 2016 until end 2018. By now more than 60% of all debit card transactions at physical points of interaction are contactless.<sup>16</sup>

With regard to credit transfers and direct debits, common schemes were set up that allow users to send and receive euro payments to/from any beneficiary in the SEPA countries. For card payments, another strategy has been chosen to allow existing schemes and their operators to adjust to a new set of technical and business standards and processes. The Eurosystem and the European Payments Council have supported the creation of “SEPA for cards” and some progress had been made – also with the support of the European regulators that enacted the Interchange Fee Regulation.

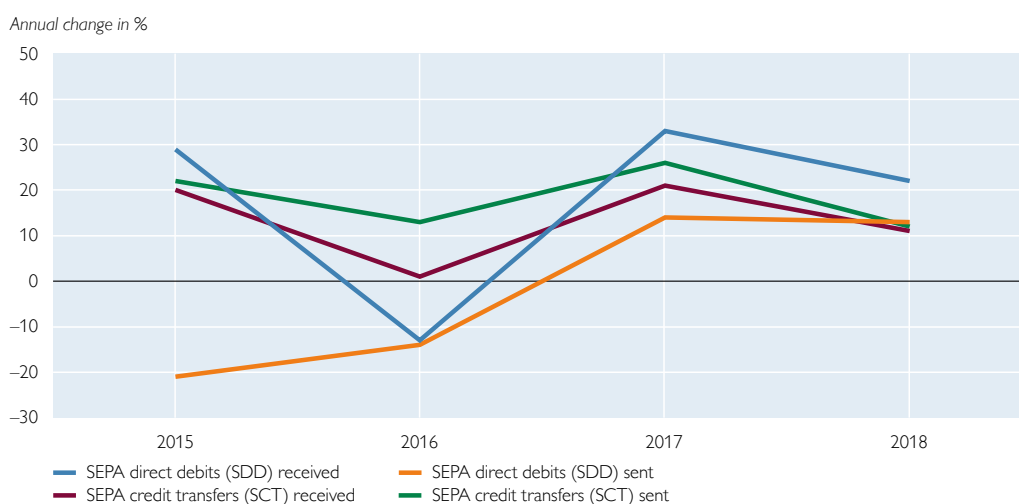
## 5 Has payments behavior changed in Europe and Austria?

In 2016 the Eurosystem conducted a study about point-of-sale payments. These data show that most payments in the euro area and Austria continue to be made by cash.<sup>17</sup> Additional data from Austrian studies<sup>18</sup> confirm that payment behavior is changing slowly: The cash share is decreasing, whereas the share of payments by payment cards, credit transfers and direct debit has been increasing continually. That means electronic payments are getting more important, especially in a world that becomes more and more digital and international (e.g. e-commerce).

One of the indicators for the success of SEPA is the cross-border use of the SEPA credit transfer and direct debit schemes. The following chart shows the annual changes (in %) of cross-border SEPA credit transfers and direct debits processed by Austrian Clearingservice International (CS.I) in recent years.

Chart 1

### Development of cross-border SEPA transactions



Source: OeNB.

<sup>16</sup> Statistics provided by Payment Service Austria; end of 2017.

<sup>17</sup> Esselink and Hernandez (2017).

<sup>18</sup> Rusu and Stix (2017).

The increase in cross-border credit transfers confirms that the migration to the SEPA credit transfer scheme has been successful, having created new opportunities for end users of payment services sending and receiving credit transfers in the EU. The numbers confirm that this offer has been taken up.

Compared to credit transfers, no cross-border solutions for direct debits existed before the launch of the SEPA direct debit scheme. It could have been expected that there would be very few cross-border SEPA direct debits in the initial years after migration until the knowledge of the scheme and its capabilities became widespread. However, this appears not to be the case.

As the number of transactions sent by Austrian banks via CS.I have remained stable,<sup>19</sup> the number of SEPA direct debits received has increased steadily.

It can be concluded that this increase shows the success of the SEPA direct debit scheme in increasing competition. Pan-European companies have been able to consolidate their direct debit processing to one country and consumers have been starting to use a single payment account for all their direct debits. The increase in cross-border SEPA direct debits shows the value and importance of the migration to the SEPA direct debit scheme despite the fact that the migration to the SEPA direct debit scheme was considered as costly and complex by many stakeholders.

It must be noted that the cross-border use of both the SEPA credit transfer and direct debit scheme is still only a fraction of the transactions at the domestic level (6.5% and 1.2% of, respectively, credit transfers and direct debits<sup>20</sup>), but more and more euro payments are made between countries of the EU. SEPA migration has provided the foundation to facilitate an interoperable, efficient and competitive payment network in the EU.

## 6 Instant payments – The way to pay in the future?

The speed of retail payments has gained increasing importance with the latest improvements in the integration of retail payment markets, payment innovations and Internet access. Today retail payment services usually take up to one working day – in accordance with the Payment Services Directive 2. But consumers expect easier and faster services. With the spread of smartphones and e-commerce, the digitalization of the economy entails a general acceleration of payments. Customers shop on the Internet anywhere and at any time, including during evening hours, weekends and holidays – when most traditional electronic payments are not operational. At the same time, suppliers want the certainty of being paid as soon as they sell their goods and services.

As a response to growing consumer demand for instant payments – meaning credit transfers within 10 seconds – several European countries have developed their own national solutions for rapid payments, but usually these schemes stop at national borders, creating a fragmented European landscape – again. They would slow down the further harmonization of payments in Europe – one of the building blocks of the Single Market – at a time when harmonization of direct debits and credit transfers has finally been achieved. A challenge for the Eurosystem is to ensure that these national solutions do not (re)introduce fragmentation into the European retail payments market. Therefore, the EPC has created another SEPA

<sup>19</sup> One large Austrian bank stopped using the CS.I system in mid-2015.

<sup>20</sup> SEPA credit transfers and direct debits sent via Clearingservices (domestic and cross-border).

scheme for pan-European instant credit transfers (SCT inst),<sup>21</sup> which a large number of payment service providers across Europe are expected to use. With RT1 (developed by EBA Clearing<sup>22</sup>) and TIPS<sup>23</sup> (developed by the Eurosystem) two infrastructures for the processing of instant payments have already been made available.

Box 5

### **TARGET Instant Payment System (TIPS)**

*TIPS was developed as an extension of TARGET2, which already has an extensive network of participants across Europe. TIPS offers final and irrevocable settlement of instant SEPA credit transfers in euro, at any time of day and on any day of the year. Participating payment service providers can set aside part of their liquidity on a dedicated account opened with their respective central bank, from which instant payments can be settled. The TIPS service has been available since November 2018.*

## **7 Conclusion and outlook**

After the successful introduction of the euro, the European payment industry started the SEPA project as vision of an area in which consumers, companies and other actors are able to send and receive euro payments, whether domestic or cross-border, under the same conditions, rights and obligations. The European regulators as well as the Eurosystem have strongly supported this vision by providing the necessary legislative framework, an adequate governance structure and the appropriate infrastructure. A common euro retail payments market advances European integration, drives competition and innovation and brings better services for all end users. SEPA migration was completed in August 2014 and has proved to be a success.

But the SEPA project did not end with migration to SEPA credit transfer and direct debit standards. It is very much alive through initiatives like instant SEPA credit transfers (“SCT inst”) or the SEPA Proxy Lookup service, a just recently started initiative aiming at interoperating peer-to-peer mobile payments solutions across the EU.<sup>24</sup> These projects are supported by the Euro Retail Payments Board (ERPB), chaired by the European Central Bank in its role as a catalyst. The Eurosystem continuously investigates ways to enhance its financial market infrastructure so that it continues to meet the needs of the market, stays ahead of cyber security challenges and keeps up with the latest technological developments.

Beside all European projects, it should be noted that smaller domestic solutions have proved to play an important role when it comes to innovation in payments. Usually they are tailor-made for the national market and fulfill national needs. If they are successful, they could have the potential to expand to other European markets. Otherwise interoperability between different national solutions has to be ensured to avoid fragmentation. Such attempts are fostered by the Eurosystem and national central banks.

<sup>21</sup> <https://www.europeanpaymentscouncil.eu/what-we-do/sepa-instant-credit-transfer>.

<sup>22</sup> <https://www.ebaclearing.eu/services/instant-payments/introduction/>.

<sup>23</sup> <https://www.ecb.europa.eu/paym/retpaym/instant/html/index.en.html>.

<sup>24</sup> <https://www.europeanpaymentscouncil.eu/what-we-do/other-schemes/sepa-proxy-lookup-scheme>.

## References

- Abele, H. and G. Schäfer. 2016.** The cost of cash and debit cards in Austria, In: Journal of Financial Market Infrastructures 4(4). 1–16.
- Esselink, H. and L. Hernández. 2017.** The use of cash by households in the euro area. In: ECB. Occasional Paper Series 201.
- European Commission – prepared by London Economics and iff in association with PaySys. 2013.** Study on the impact of directive 2007/64/EC on payment services in the Internal Market and on the application of regulation (EC) No. 924/2009 on cross-border payments in the Community.
- Europe Economics. 2016.** Costs and benefits of migration to ISO 20022 in SEPA. Final report. November.
- PWC – Price Waterhouse Coopers. 2014.** Economic Analysis of SEPA. Economic analysis of SEPA Benefits and opportunities ready to be unlocked by stakeholders.
- Rusu, C. and H. Stix. 2017.** Cash and card payments – recent results of the Austrian payment diary survey, available for download at <https://ideas.repec.org/a/onb/oenbmp/y2017iq1-17b4.html>. Originally published in German as: Von Bar- und Kartenzahlern – Aktuelle Ergebnisse zur Zahlungsmittelnutzung in Österreich. In: OeNB. Monetary Policy & the Economy Q1/17. 54–85.

# The case for macroprudential policy as a stabilizing tool for the euro area

Michaela Posch, Stefan W. Schmitz, Katharina Steiner, Eva Ubl<sup>1</sup>  
Referee: Barbara Attinger, ESRB Secretariat

*Current account deficits are not destabilizing per se and cross-border capital flows can contribute to the economic convergence of the euro area and private risk-sharing if monitored more adequately than provided for by the current macroeconomic governance framework of the European Union. Macroprudential policy could fill this gap. This would allow countries with lower capital stocks to continue importing capital and to strengthen private risk-sharing in the euro area, while avoiding negative side effects, such as excessive credit growth and the risk of a balance of payment crisis. We make a case for broadening the EU's macroeconomic imbalances procedure (MIP) to include the assessment of the macroprudential stance, particularly with respect to the possible negative side effects of capital inflows. Our argument is inspired by the effective application of macroprudential policy in Austria in the post-World War II era, when Austria featured a structural balance of payment deficit and liberalized both its capital account and its banking sector without a balance of payment crisis.*

JEL classification: E42, E61, F32, F33

Keywords: Macroprudential supervision, capital flows, monetary union

Beyond the realm of monetary policy, efforts to stabilize the euro area economy initially focused on fiscal deficits and public debt while neglecting financial imbalances in the private sector. In response to the global financial crisis and the European sovereign debt crisis, the European Union reformed its governance framework, in particular the Stability and Growth Pact (SGP), and enhanced its toolkit by launching a further surveillance procedure (the macroeconomic imbalances procedure – MIP) with a view to preventing and correcting also external and internal macroeconomic imbalances like asset bubbles and large current account deficits or surpluses. In this respect, we argue that current account deficits are not destabilizing per se and that cross-border capital flows can contribute to the economic convergence of the euro area and private risk-sharing, if monitored more adequately than is currently the case. Specifically, we make a case for broadening macroprudential policy<sup>2</sup> beyond the scope of banking and for enhancing the MIP framework by including the assessment of the macroprudential stance, particularly with respect to the possible negative side effects of capital inflows. In laying out our argument, we proceed in four steps that also define the structure of the paper: first, we recall selected stylized facts of the balance of payment crisis in euro area periphery countries. Second, we ask to what extent these aspects are addressed by the MIP scoreboard. Third, we study

<sup>1</sup> Oesterreichische Nationalbank, Financial Stability and Macroprudential Supervision Division, michaela.posch@oebn.at, stefan.schmitz@oebn.at, katharina.steiner@oebn.at, eva.ubl@oebn.at. The views expressed in this paper are exclusively those of the authors and do not necessarily reflect those of the OeNB or the Eurosystem. The authors would like to thank Walpurga Köhler-Töglhofer, Ernest Gnan and the participants in a workshop among the authors of this volume as well as the referee, Barbara Attinger, for their very useful comments. All remaining errors are those of the authors.

<sup>2</sup> Macroprudential policy is “the forward-looking analysis and identification of risks to the stability of the financial system”. Based on the findings, the respective national macroprudential committee (in Austria the Austrian Financial Market Stability Board) decides to activate macroprudential policy measures in order to increase the resilience of the financial system and to prevent the build-up or reduce systemic risk (for more details see: [www.oebn.at/en/financial-market/macroprudential-supervision](http://www.oebn.at/en/financial-market/macroprudential-supervision)).

the historic evidence regarding the effectiveness of macroprudential policy in addressing balance of payment imbalances. Finally, we discuss the potential contribution of the current macroprudential toolkit to strengthen the resilience of the euro area economy as well as the remaining challenges.

## 1 Not all current account deficits are equal: the structure and allocation of capital flows matters

While the euro area as a whole showed almost balanced external positions during its first decade of its existence, persistent macroeconomic imbalances<sup>3</sup> were building up beneath this benign surface very much in line with the textbook principle that one country's current account surplus (financial account deficit) is another country's current account deficit (financial account surplus): While core euro area countries like Germany ran substantial current account surpluses, euro area periphery countries like Greece, Ireland, Italy, Portugal and Spain featured matching current account deficits (Wolf, 2014). Moreover, nominal interest rates declined significantly following the establishment of the currency union (European Commission, 2008; Pierluigi and Sondermann, 2018). In this context, the tightening spreads of periphery countries' government bond yields over German government bonds were simply regarded as an indication that the currency area worked: investors and regulators had assessed government bonds of euro area countries as close risk-free substitutes (Aizenman, 2016).<sup>4</sup> Yet in euro area periphery countries, increasing capital inflows led to the build-up of high external and domestic debt (charts 1–3). Crucially, net debt inflows and domestic credit growth were strongly correlated (Lane 2013, 2015), and in euro area periphery countries, the related capital inflows were predominantly directed towards mortgages and consumption rather than towards investment in tradable, productive sectors (Allen et al., 2011; Avdjiev et al., 2018). In addition, the capital inflows contributed little to cross-border risk-sharing as short-term interbank debt played a large role relative to more stable and risk-bearing forms of funding (Allen et al., 2011).<sup>5</sup> At the same time, key fiscal indicators for some periphery countries that experienced balance of payment crisis were low prior to the crisis: in Spain and Ireland government gross debt in percent of GDP averaged only 48% and 31%, respectively, between 1999 and 2007 (compared to 65% and 69% for Germany and France).

Most policymakers, market participants and researchers underestimated the destabilizing effects associated with reversals of capital flows within the euro area (balance of payment crisis) and the systemic risk implications of the strong bank-sovereign nexus (Pierluigi and Sondermann, 2018; Eichengreen, 2018). The

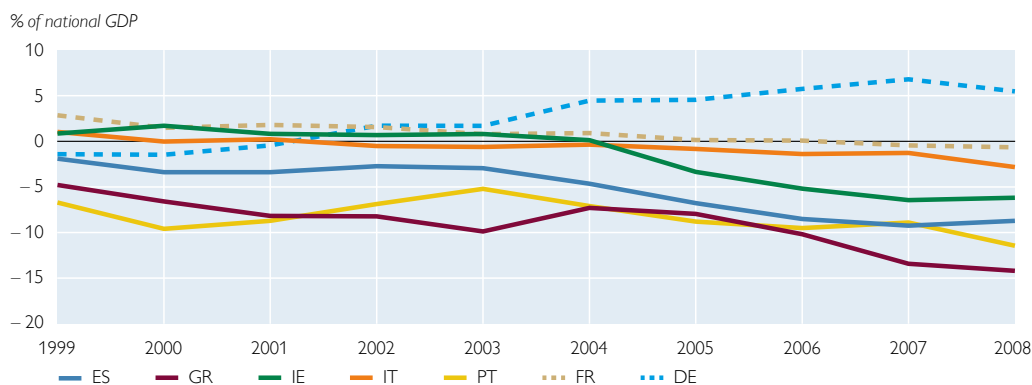
<sup>3</sup> Imbalances refer to "situations where stock and flow variables are out of equilibrium for an extended period of time [...]" (Pierluigi and Sondermann, 2018, p.3). For a more differentiated picture of economic developments in euro area periphery countries like Spain and Portugal, see European Commission (2008).

<sup>4</sup> The notion that government debt is broadly risk-free only accounts for countries that issue debt in their own currency they control and not for member countries with a common currency (at least very low risks of default but risks of inflation remains, Wolf 2014; Aizenman, 2016). In addition, market participants probably confused the absence of exchange rate risk with the absence of credit risk. In addition, market participants expected government bailouts in case of difficulties in banks, which was another incentive in favor of additional risk-taking by creditors (Eichengreen, 2018).

<sup>5</sup> Chart 2 shows the increase in cross-border interbank inflows. Due to a change in the reporting system of balance of payments data in 2014, very detailed data (e.g. according to maturities and sectors) is only available for 2014 onwards.

Chart 1

### Euro area periphery countries were net capital importers from the rest of the world prior to the crisis

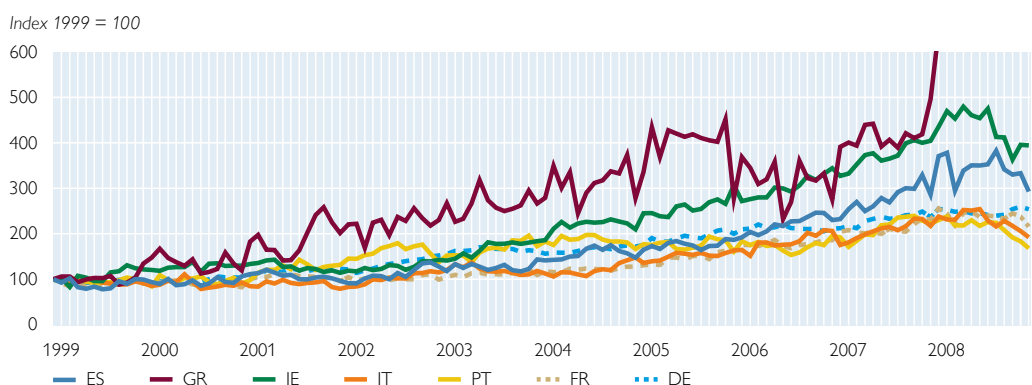


Source: European Commission (Ameca).

Note: This chart shows domestic net lending (+) or borrowing (-) in relation to national GDP. The measures correspond to the sum total of the current and capital account balances in the balance of payments and thus represent the net resources that the total economy made available to the rest of the world (+) or received from the rest of the world (-).

Chart 2

### Interbank debt inflows increased strongly in many euro area periphery countries prior to the crisis



Source: ECB.

Note: The chart shows cross-border interbank flows from euro area countries to the individual reporting countries. The outlier for Greece measured 1061 at the end of 2018.

financial crisis of 2008 and the subsequent sovereign debt crisis laid this bare.<sup>6</sup> For example, the International Monetary Fund (IMF) pointed at risks related to the above-mentioned external imbalances in euro area periphery countries like Ireland, Portugal and Spain, but attested good availability of external financing. In addition, the related IMF reports highlighted the mitigating factors put forth by domestic policy and thus underestimated the probability that a crisis would occur (IMF, 2007a, b, c).

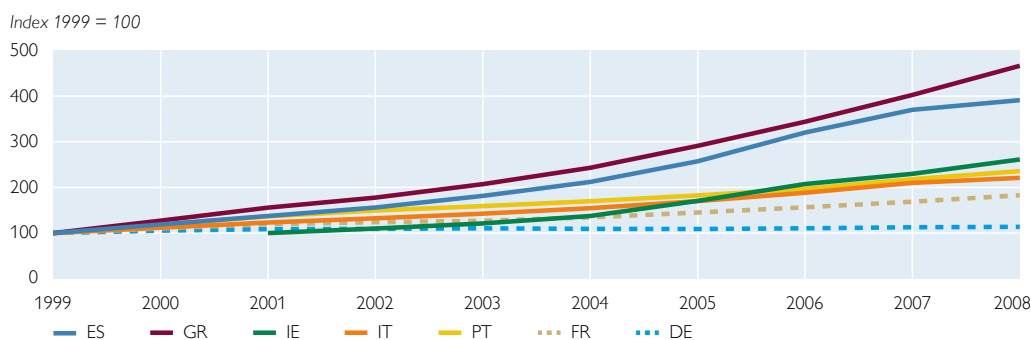
When establishing the Economic and Monetary Union (EMU), its masterminds had focused on the real economy and macroeconomic aggregates, based on

<sup>6</sup> Some studies noted that the loss of exchange rate policy as policy instrument and insufficient countercyclical fiscal policy rules distorted the allocation of resources and that macroeconomic heterogeneity and missing risk-sharing mechanisms (e.g. concerning deposit insurance and management of liquidity risk) could become a matter of concern (e.g. Blanchard and Giavazzi, 2002; for further examples see Pierluigi and Sondermann, 2018).



Chart 3

### Increasing indebtedness of the private nonfinancial sector in euro area periphery countries



Source: Eurostat.

Note: Consolidated data. Data for IE are only available from 2001 onward (index 2001 = 100).

the theory of optimum currency areas (OCA), and neglected the nexus between monetary policy and financial vulnerability.<sup>7</sup> The fact that the OCA theory was heavy on the real economy was at least partly a consequence of the state of macroeconomics in the 1960s – the time when the OCA theory was developed.<sup>8</sup> Back then, exchange rates were fixed (Bretton-Woods system), financial integration was low and cross-border capital mobility limited due to capital controls and tight banking regulation (Dellas and Tavlas, 2010; Eichengreen, 2018).<sup>9</sup> The OCA theory essentially covered labor and capital mobility, wage and price flexibility and cross-border transfers (Handler, 2013). A different strand of research developed in the late 1990s put the main stress on systemic risks caused by the occurrence of currency and banking crises (“twin crisis”). Research found that problems in the banking sector typically precede currency crises, which reinforce banking crises leading to a “vicious spiral” (Kaminsky and Reinhart, 1999). As the focus was on emerging markets in Latin America and Asia, the related results – though internationally well recognized – were apparently not considered relevant for policy implementation in the euro area.

A further explanation for the narrow focus on asymmetric real shocks might be that policymakers expected that the build-up of systemic risks in the financial sector would be prevented by banks’ risk management<sup>10</sup> and by microprudential bank supervision. Yet the crisis demonstrated that compliance with microprudential requirements did not guarantee systemic stability. In addition, some euro area member countries had to reimpose capital controls, e.g. Cyprus in 2016 or Greece in 2015, although they are incompatible with a currency union.

<sup>7</sup> Academia never considered the euro area an OCA, but they expected that the gradual convergence of economies would ensure the viability of the monetary union (Handler, 2013). Its designers assumed that internal devaluations, the mobility of the factors of production, and market driven interest rate differentials (due to different risk premia) across member states would effectively substitute for exchange rate flexibility. They ruled out fiscal transfers between member states, which played a substantial role in other currency areas.

<sup>8</sup> In this early phase of OCA theory, the academic discourse led by Mundell, Kenen and MacKinnon identified criteria that regions would have to meet to qualify as an optimum currency area (for more details see e.g. Handler, 2013).

<sup>9</sup> This explains why the potentially destabilizing effects of cross-border capital flows received less attention than real asymmetries (Aizenman, 2016; Eichengreen, 2018) back then with the notable exception of Ingram (1969).

<sup>10</sup> The incentives for bank stakeholders are not always compatible with societal objectives (Posch et al., 2018).

On this basis, we argue that the tensions observed in the euro area during and after the financial and economic crisis were largely due to the three main catalysts of balance of payment crisis rather than mere fiscal excesses: (i) capital inflows in the most volatile form (short-term bank debt), (ii) the allocation of capital to excessive credit growth and bubbles rather than productive investment, and (iii) the bank-sovereign nexus.<sup>11</sup> And we go on to ask whether recent reforms of the euro area institutional framework have been adequate to address these catalysts effectively.

## **2 The existing toolkit for stabilizing the euro area economy does not adequately address problems related to the structure of cross-border capital flows**

The Stability and Growth Pact focuses on fiscal rules to ensure that EU Member States pursue sound public finances, preventing negative spillovers to other Member States and to common policy areas such as monetary policy within the euro area. Before the Great Recession, the SGP defined (i) common rules for fiscal policy (upper limits for the debt-to-GDP ratio at 60% and for the fiscal deficit at 3%) and provided for (ii) an instrument to sanction countries that did not comply with the benchmarks. However, the EU institutions never enforced the SGP, especially once the two largest member countries, France and Germany, violated the rules with impunity in the first five years of monetary union and as influential states tweaked them in their favor (Hallerberg and Baerg, 2016). This led to the de facto suspension of the requirements laid down in the SGP (Van Riet, 2010).

The experience of the financial crisis motivated policymakers to broaden EU macroeconomic surveillance in areas beyond the fiscal aspects covered by the SGP, inter alia by putting more weight on preventing large current account imbalances, asset bubbles, etc., with the introduction of the macroeconomic imbalance procedure (MIP) in 2011. The aim of the MIP was to prevent the accumulation of macroeconomic imbalances that could adversely affect economic stability in a particular EU Member State, the euro area, or the EU as a whole. Countries identified as having imbalances receive country-specific recommendations (CSRs) from the European Commission and the EU Council in the context of the so-called European Semester. Surveillance may be escalated through activation of the excessive imbalance procedure (EIP), which comprises the delivery of a corrective action plan with a set of policy measures to be carried out within a predetermined time frame. The repeated delivery of an insufficient corrective action plan or repeated lack of compliance with the policy measures detailed in the plan may imply sanctions.<sup>12</sup>

In response to the sovereign debt crisis, the euro area also introduced institutional reforms to strengthen the monetary union with the creation of a fully-fledged banking union. A new supervisory framework was launched, consisting of the Single Supervisory Mechanism (SSM) and the Single Resolution Mechanism (SRM), which have been implemented, and the European Deposit Insurance Scheme (EDIS), which has yet to be finalized. The rationale for the banking union was to reduce the likelihood of banking crises caused by inadequate banking supervision and regulatory capture of national supervisors (SSM) and to break the

<sup>11</sup> *Only the financial crisis in 2008 brought the vicious circle between banks and their domestic sovereigns to the center of policy attention (for more details see Dell’Ariccia, 2018).*

<sup>12</sup> [https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu-economic-governance-monitoring-prevention-correction/macro-economic-imbalance-procedure/scoreboard\\_en](https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu-economic-governance-monitoring-prevention-correction/macro-economic-imbalance-procedure/scoreboard_en).

bank-sovereign nexus (SRM, EDIS). To complete banking union, European policy-makers also launched a far-reaching capital markets union project to foster the diversification of investment finance.

While these reforms are wide-ranging, they continue to neglect the structure and allocation of cross-border capital flows. Although the MIP constitutes progress relative to the SGP by having included a wider range of macroeconomic imbalances, the monitoring framework for current account imbalances only scratches the surface, so to say, of balance of payments developments by looking at aggregate figures. The MIP neglects the deeper structure of the related capital inflows. In turn, potential positive effects on economic convergence such as private risk-sharing are dismissed. Given that monetary policy cannot be country-specific and might even reinforce the build-up of imbalances in some parts of EMU while being too restrictive in others, other policy tools are needed such as an effective national macroprudential policy.

In the euro area, the process to set up a macroprudential policy framework started with the creation of the European Systemic Risk Board (ESRB) in 2010. This committee gathers representatives from national central banks and supervisors from all EU countries. The ESRB was not given any direct authority over macroprudential policy instruments, but has the power to issue legally nonbinding warnings and recommendations about systemic risks to the EU, to Member States, to the European supervisory authorities or to national supervisory authorities.

The next layer of a macroprudential policy framework for the euro area was created in 2014 with new EU legislation providing for national macroprudential tools to counteract the build-up of systemic risk. Specifically, these instruments are stipulated in the Capital Requirements Regulation and Directive (CRR and CRD) and can be distinguished along three lines: (i) capital-based measures, (ii) liquidity-based measures, and (iii) borrower-based measures. Capital- and liquidity-based measures comprise the capital conservation buffer, the countercyclical capital buffer, the systemic risk buffer, capital buffers for global and other systemically important institutions, the liquidity coverage ratio and the net stable funding ratio. Wherever available within the national legal framework, national authorities can also impose borrower-based measures that restrict lending, for example for mortgages, at the level of the individual borrower, such as caps on loan-to-value ratios (LTVs) or on debt-to-income/debt-service-to-income ratios (DTIs/DSTIs).<sup>13</sup> While these macroprudential tools are solely in the hands of the national authorities, the SSM Regulation empowers the ECB to impose more stringent measures laid down in Union law (so-called “topping-up” power) to prevent inaction bias of national authorities, if spillover effects substantially increase systemic risk for the euro area financial sector.<sup>14</sup>

Austria implemented its macroprudential policy framework primarily via (EU) secondary legislation in the form of amendments to the Austrian Banking Act (Posch et al., 2018). The Austrian Banking act thus installed the Financial Market

<sup>13</sup> Art. 458 CRR also includes own funds, large exposure limits, public disclosure, the capital conservation buffer, sectoral risk weights (in the residential and commercial property sectors) and intra-financial sector exposures whereby higher risk weights can be set vis-à-vis financial sector exposures that can be applied for macroprudential purposes.

<sup>14</sup> In particular, Article 5 of the SSM Regulation provides that the ECB may, if deemed necessary, apply higher requirements for capital buffers than applied by the national competent authorities or national designated authorities of participating Member States. These capital buffers are to be held by credit institutions at the relevant level in addition to own funds requirements. The ECB may also apply more stringent measures aimed at addressing systemic or macroprudential risks at the level of credit institutions subject to the procedures set out in Regulation (EU) No 575/2013 and Directive 2013/36/EU in the cases specifically set out in relevant Union law.

Stability Board as the decision-making body (based on the ESRB recommendation on the macroprudential mandate of national authorities) and created the legal basis for activating a systemic risk buffer and other systemically important institutions buffers in 2015, effective from January 1, 2016. However, to be truly effective in contributing to the stability of the euro area, the focus of macroprudential policy would need to be broadened to also address the catalysts of balance of payment crises.

### **3 Historic experience highlights the effectiveness of macroprudential policy to improve the allocation of capital inflows and to reduce the risk of balance of payment crises**

Capital inflows can contribute to economic convergence and private risk-sharing, but they can also lead to a balance of payment crisis. Capital inflows may benefit especially small, open economies or emerging economies if capital can be directed into long-term/risk-bearing and productive investments. Macroprudential policy can be useful in this regard. Austria is a case in point – it introduced credit controls, bank lending limits and additional reserve requirements to avoid the building up of systemic risk due to excessive credit growth, misallocation of credit and to avoid disturbances to the financial system caused by volatile short-term capital flows after World War II (Döme et al., 2016; Schmitz, 2016). These measures have been effective: sustained capital inflows contributed to the convergence of the Austria economy to Western European standards by the mid-1970s.

Macroprudential policy was re-invented in the aftermath of the financial crisis of 2008. We have since observed a more active use of these instruments, such as capital requirements, reserve requirements, loan-to-value ratios and taxes on credit, to smooth out the credit cycle to avert major crises. Austria has implemented macroprudential measures to curb foreign currency lending and to improve the refinancing structure of subsidiaries of Austrian banks, as well as structural instruments – the systemic risk buffer and the other systemically important institutions buffer – to address long-term, noncyclical systemic risk. A recent study (Döme et al., 2018) shows that the implementation of these measures has been effective. Banks have been substituting euro-denominated loans for foreign currency loans. The policy measure introduced for some Austrian banks and their subsidiaries in 2014 to reduce excessive wholesale funding (a maximum loan-to-local-stable-funding ratio) reduced banks' excessive wholesale funding, while no significant negative side effects on banks' profitability and competitiveness have been observed. The evidence regarding the activation of the systemic risk buffer has also shown that systemic risk has decreased, and that the CET1 ratios of Austrian banks have improved strongly (+270 basis points from Q2 2015 to Q4 2017) as did bank lending to the real economy (+500 basis points) (Posch et al., 2018). The measure led to a rating upgrade for the Austrian financial system, which was accompanied by rating upgrades for Austrian bank liabilities. This reduced bank funding costs and the funding costs of the real economy.<sup>15</sup>

<sup>15</sup> See *inter alia* the upgrade of the Austrian banking system from BICRA (Banking Industry and Country Risk Assessment) group 3 to group 2 out of 10 (1 lowest risk, 10 highest risk; no banking system in group 1 as of 1 June 2018): "...its stability has improved, primarily due to capital strengthening, supported by the derisking of larger banks in Central and Eastern Europe. Given this positive transformation in recent years, we consider that overall industry risk for the Austrian banking sector has reduced to be on par with that of previously stronger peers, such as Germany, France, Belgium, or the Netherlands." (Standard and Poor's, 2018) and Moody's (2017).

Studies for other countries (e.g. Brazil, Spain) confirm that macroprudential policy measures have been effective in addressing the catalysts of balance of payment crises, but not always to the extent necessary. Brazil experienced large capital inflows during late 2010, fueled by “real” carry trades (Glocker and Towbin, 2012 and 2015). This hampered the effectiveness of monetary policy and led to higher inflation and a credit boom. The central bank of Brazil introduced a number of macroprudential measures, such as additional reserve requirements and capital flow management measures. Higher reserve requirements led to an exchange rate depreciation, a current account improvement, and an increase in prices. Exchange rate depreciation dampened capital inflows to Brazil. Steering the inflowing capital to more long-term investment could only be realized by introducing capital flow management measures on foreign purchases of domestic bonds and equities, which was intended to stem volatile carry trades and lengthen the maturities of the inflows. To manage a sustainable credit allocation Brazil introduced additional capital requirements for consumer loans and LTV ratios. The evidence for Brazil suggests that macroprudential measures improve (i) the form of inflows and (ii) the allocation of credit, but there were no measures to explicitly address (iii) the bank-sovereign nexus. Of course, some of the measures (capital controls) are not applicable in the euro area because they are in contradiction to the core fundamentals of the internal market. The Spanish experience (Jimenez et al, 2017; Rubio, 2017) showed that dynamic provisioning (a countercyclical instrument) reduced the amplitude of the financial cycle but could not prevent a crisis; in particular, risks stemming from excessive mortgage growth fueling a housing bubble were not addressed properly.

A number of cross-country studies conducted in recent years found that macroprudential policy was effective, in particular when it was targeted and intrusive

Table 1

### Overview of cross-country studies about the use and the effectiveness of macroprudential instruments

Paper	Countries	Period	Policies	Results
Kliatskova (2018)	24 emerging economics	1997–2014	5	Macroprudential policies and capital controls on inflows are employed in a countercyclical fashion in the sample countries
Cerutti, Claessens and Laeven (2017)	117	2000–2013	12	Instruments have been economically effective, even more so for emerging markets but less effective for open economies
Cerutti, Correa, Fiorentino and Segalla (2017)	64	Q1 01–Q2 14	5	Capital requirements have the most changes, LTV ratio limits and reserve requirements have the largest number of tightening and loosening episodes
Kuttner and Shim (2016)	57	Q1 80–Q2 12	9	DSTI ratio effective to curb housing credit, increases in housing-related taxes have significant negative effects
Vandenbussche, Vogel and Detragiache (2015)	16 (CESEE)	1997–Q1 11	29	Impact on housing prices: capital requirements, sectoral leverage ratio (for household loans), reserve requirements on foreign borrowing and credit ceilings
McDonald (2015)	17	1990–2013	2: LTV, DTI limits.	Tightening measures (such as lowering the maximum LTV ratio) during upturns lower the level of housing credit over the following year by 4% to 8% and the level of house prices by 6% to 12%

Source: Authors' compilation.

(see table 1). The reviewed instruments include market-wide measures such as dynamic loan-loss provisioning, reserve requirements, tightening of capital requirements, credit growth caps, levy/tax on financial institutions, caps on leverage ratio and counter-cyclical requirements, but also sectoral instruments such as LTV or DTI ratios, limits on foreign lending and concentration limits. The measures have different objectives and the effectiveness differs among instruments and identified risk.

Especially in a currency union macroprudential measures based on a national mandate can be effective in addressing imbalances. Allen et al. (2011) suggest applying macroprudential tools, especially borrower-based ones, to prevent asset price bubbles, especially in residential real estate. They also find that cross-border bank exposure is more stable when it operates through subsidiaries (FDI) rather than debt. Brzoza-Brzezina et al. (2015) find that macroprudential policy could have lowered the amplitude of credit and output fluctuations in the euro area periphery. Houben and Kakes (2013) argue that credit cycles are still national and that, therefore, macroprudential tools at the national level would have made the banking system more resilient. Rubio (2017) shows that macroprudential tools can limit the building up of bubbles in EU Member States.

Based on the Austrian and the international experience we conclude that macroprudential measures can be effective in addressing the catalysts of potential balance of payment crisis, especially if intrusive measures are activated in a timely and decisive manner (Döme et al., 2016). At the same time, some of the most effective instruments to steer capital inflows employed in non-EU countries are not available in the euro area, such as balance of payment controls. The Austrian experience in the late 1960s and early 1970s shows that macroprudential measures can effectively substitute for capital controls (Schmitz, 2016). Korinek and Sandri (2016) underpin that finding theoretically. They show that in more developed economies, where the liberalization of the balance of payments limits the role of capital controls, macroprudential measures can address the potential negative side effects of capital flows.

#### **4 Macroprudential instruments should complement the current instruments to avoid excessive macroeconomic imbalances**

The integration of macroprudential policy in the MIP to avoid the negative side effects of capital inflows would enhance the stability of the euro area. It should address the three main catalysts of recent balance of payment crisis identified in section 1 (bank sovereign-nexus, structure and allocation of capital inflows). The MIP should contain a comprehensive assessment of the appropriateness of the macroprudential stance of the Member State with respect to the catalysts of potential balance of payment crises. The European Systemic Risk Board (ESRB) already conducts similar analyses on a regular basis (ESRB, 2016b, 2018; and nonpublic country risk assessment reports). These results should form the basis for assessments by the European Commission to avoid the duplication of work. However, the European Commission shall not be bound by the ESRB's view, because it is the Commission that bears the final responsibility for the MIP.

The ESRB is currently developing a conceptual framework on a macroprudential stance (ESRB, 2019) which we regard as key concept for our policy proposal to apply macroprudential policy to avoid negative side effects of capital inflows and to integrate it into the MIP. The aim is to arrive at a common language for policy-makers when talking about macroprudential policy. The framework offers a



method to assess whether the activation of macroprudential instruments is neutral, tight or loose relative to the underlying systemic risk.<sup>16</sup> This framework can also be applied to assess the appropriateness of the macroprudential policy with respect to the catalysts of balance of payment crises. That's the focus of the following sections.

#### 4.1 Breaking the bank-sovereign nexus

The CRD IV already includes macroprudential tools that can be employed to reduce the bank-sovereign nexus. The global and the other systemically important institutions (GSII and OSII) buffers reduce the probability and costs of bank failures. However, Sigmund (2018) find that the OSII buffer-levels differ substantially across euro area member states for similar levels of systemic importance. European Commission assessments of OSII policies in the MIP can address insufficient buffers in some EU Member States.

If a bank fails nonetheless, the Banking Recovery and Resolution Directive (BRRD) aims at reducing the negative externalities of banks exiting the market. The Single Resolution Board (SRB) and the national resolution authorities (NRAs) should make sure that all banks become resolvable. For very large banks, this implies vigorous early intervention combined with sufficient minimum requirements for risk-bearing liabilities (MREL). In this respect, the introduction of the SSM and the SRB are substantial improvements. The respective inaction biases of national authorities before and during the crisis caused substantial spillover effects, which the SSM and the SRB can internalize. However, the regular calls for various layers of public backstops show that more needs to be done to make banks resolvable.

In Austria, the systemic risk buffer (SyRB) addresses systemic vulnerabilities and thereby reduces the bank-sovereign nexus: bank insolvency or resolution will always impose costs on sound banks, but the “systemic vulnerabilities” component of the SyRB ensures that sound banks can bear these costs without jeopardizing financial stability and without public bail-outs. This includes the ability of the banks to provide ex post contributions and loans to their deposit guarantee schemes (DGS). The “common exposure” component of the Austrian SyRB also contributes to reducing the bank-sovereign nexus by internalizing the negative externalities of common exposures of Austrian banks to CESEE.

The introduction of collective action clauses for sovereign bonds in 2022 will contribute to private risk-sharing in the euro area. Based on a decision at the Euro summit on December 18, 2018, the European Stability Mechanism will be reformed by facilitating the dialogue between member states and their creditors, in line with IMF practice. From 2022 onwards, sovereign bonds will contain single-limb collective action clauses in order to make the prevention of bail-in by smaller creditors more difficult. This could improve the efficiency of possible debt restructurings in the exceptional case that these were deemed necessary (Allen et al., 2011).

Not least, some countries (i.e. Sweden) introduced prudential risk weights for sovereign bonds. The legal implementation of such a tool in euro area countries

<sup>16</sup> In a first step, the policy stance assessment addresses the question how tight or loose the policy stance is (if it is neutral, no further action is required). In a second step, a policy action assessment addresses the question if policy adjustments are needed based on a costs-benefits analysis with a conclusion on what policy should be implemented. While there are many challenges in operationalising the macroprudential stance framework, one core issue is how to measure the various components of stance, i.e. risks, resilience and policies, appropriately.



would reduce the bank-sovereign nexus as would concentration limits on exposures to banks' home sovereigns.

#### **4.2 Steering the allocation of capital imports from consumption loans and mortgages towards productive investments**

The CRD V introduces a sectoral systemic risk buffer (SyRB) to address structural risks related to specific sectors (e.g. residential mortgages versus investment loans to nonfinancial corporates). However, the current framework does not allow for activating different SyRB rates for different sectors. The CRD V will fill that gap by introducing sectoral capital buffers for household mortgages, other household loans, commercial real estate and other nonfinancial corporates' loans. Thus, the sectoral SyRB will soon be available to steer the allocation of structural capital imports from, say, consumption loans to nonfinancial corporate loans by applying higher buffer rates for the former.

All euro area countries should introduce borrower-based measures to address excessive mortgages growth and the deterioration of mortgages lending standards. Both of these contributed substantially to the crisis in Ireland, Spain, and Portugal. In addition, Art. 124 of the CRR empowers the national competent authority (NCA) to increase the risk weights on exposures secured by mortgages on immovable property on the basis of financial stability considerations for banks under the standardized approach. If losses on such exposures increase, the NCA can increase risk weights for exposures secured by residential and commercial real estate to up to 150%. Similarly, Art. 164 of the CRR empowers NCAs to increase the loss-given default (LGD) for banks using an internal ratings-based approach under the same conditions. Some member states have already taken measures under these articles. However, their effectiveness in terms of mortgage pricing, volume growth, and capital allocation has turned out to be low relative to borrower-based measures.

#### **4.3 Steering capital inflows towards more stable forms**

Fewer and less well tested instruments are available to steer capital flows to more risk-bearing and longer-term forms, such as equity, risk-bearing liabilities, and foreign direct investment. Art. 458 of the CRR provides the so-called national designed authorities (NDAs) with a wide range of tools to address systemic risk, of which higher liquidity requirements (LCR and NSFR)<sup>17</sup> and stricter limits on intra financial sector exposures are of particular interest with respect to steering capital inflows in the banking sector towards more stable forms.<sup>18</sup> The liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR) are insufficient to address systemic liquidity risk (Houben et al., 2015; ECB, 2018). This stems from two sources: (i) the common exposure of a large number of banks to the risk of sudden reversal of capital flows and (ii) the endogeneity of liquidity. Steering capital inflows from short-term interbank lending to long-term lending, from less risk bearing to more risk-bearing forms would improve the private risk sharing in the euro area. Prior to the financial crisis, short-term interbank lending accounted for

<sup>17</sup> The LCR (liquidity coverage ratio) requires banks to hold a minimum of highly liquid assets to cover stressed liquidity outflows over a 30-day period; the NSFR (net stable funding ratio) requires banks to fund exposures with a remaining maturity above one year with stable funding of remaining maturity above one year. The ratios aim at limiting banks' short-term and structural liquidity risk.

<sup>18</sup> See also footnote 12.

the largest share of cross-border capital flows. The short maturity led to a very sudden stop of funding of peripheral banks, instead of effective risk sharing. Few peripheral banks held enough high-quality liquid assets (HQLA) to absorb the funding shock and the effects became systemic. Stricter limits on intra financial sector exposures could be targeted at capital inflows via cross-border intra-financial sector exposures. As such they could discourage, and thus limit, the least stable forms of capital inflows. However, this instrument has so far not been activated by euro area member states and little can be said about its effectiveness.

#### 4.4 Challenges

We identify three main challenges to unlock the full potential of macroprudential policy for the stabilization of the euro area:

The macroprudential toolkit lacks effective instruments to steer capital inflows from short-term unsecured money market to more stable forms of funding such as foreign direct investment. We suggest introducing macroprudential instruments to address systemic liquidity risk. This includes expanding the macroprudential policy beyond banking (ESRB, 2016a), such as amendments to the European Market Infrastructure Regulation (EMIR) that allow for instruments to address systemic risk stemming from the procyclicality of funding conditions in financial markets. These include the dynamic adjustment of minimum haircuts and margins for derivatives, securities financing transactions (SFTs) and other clearing activities such as cash equity/bond markets. Furthermore, tools covering insurance companies and investment funds are lacking.

The identification of productive investments is challenging. The record of the credit allocation policies of the post-World War II era is sobering in this respect. However, the objectives of macroprudential policy are less ambitious. It already improves the allocation of credit by preventing bubbles and excessive credit growth, especially in the residential real estate sector (Allen et al., 2011). These contribute little to long-term productivity growth, as the lion's share of transactions takes place in existing real estate.

The institutional set-up in the euro area includes procedures to enforce compliance with fiscal rules vis-à-vis member states, but not to incentivize the activation of macroprudential measures. The NDAs are independent. At the euro area level, the ECB has a top-up power for macroprudential capital buffers, but it is also independent. Bearing this in mind, we regard the MIP to be an adequate instrument to prevent inaction-bias and to provide for moral suasion to nudge the NDAs towards adopting an appropriate macroprudential stance.

## 5 Conclusions

The current approach to euro area stabilization focuses excessively on avoiding structural current account imbalances and, consequently, structural capital inflows. This can hamper private risk-sharing and reduce the speed of economic convergence in the euro area. The MIP should take a more balanced structural approach to current account imbalances and incentivize private long-term and risk-bearing capital flows, in line with the objectives of the capital markets union.

The integration of macroprudential policy in the MIP would allow for a more nuanced and structural perspective on cross-border capital flows (and current account imbalances). While it is beyond the scope of this policy proposal to flesh

out all the details, we argue that macroprudential measures can be effective in addressing the potential negative side effects of structural and cyclical capital inflows. Integration in the MIP would improve the activation of existing macroprudential instruments and speed up the introduction of any instruments that may be required in addition to address the catalysts of potential balance of payment crises in the euro area.

A number of macroprudential instruments are already available to complement the current macroeconomic instruments designed to prevent excessive macroeconomic imbalances, particularly in the area of the bank-sovereign nexus and excessive credit growth. A substantial body of literature found that these are effective in reducing the risk of balance of payment crisis. However, not all national authorities have yet recognized the power of these tools to make the euro area more resilient or prefer to rely on common backstops of ex post stabilization (Eurosystem or ESM). In addition, the BRRD can contribute to stabilizing the euro area economy, if such measures are enforced effectively by the SRB. Finally, we call for additional macroprudential instruments geared towards channeling the use of capital imports from consumption loans and mortgages towards productive investments, from short-term debt to private long-term risk-bearing capital inflows – i.e. instruments whose focus goes beyond the reach of banking.

## References

- Aizenman, J. 2016.** Optimal currency area: a 20th century idea for the 21st century? NBER Working Paper 22097.
- Allen, F., T. Beck, E. Carletti, P. R. Lane, D. Schoenmaker and W. Wagner. 2011.** Cross-Border Banking in Europe: Implications for Financial Stability and Macroeconomic Policies. Centre for Economic Policy Research. London.
- Avdjiev, S., B. Hardy, S. Kalemli-Özcan and L. Servén. 2018.** Gross capital flows by banks, corporates and sovereigns. BIS Working Paper 760.
- Blanchard, O. and F. Giavazzi. 2002.** Current Account Deficits in the euro area: The End of the Feldstein-Horioka Puzzle? In: *Brookings Papers on Economic Activity* 2. 147–186.
- Brzoza-Brzezina, M., M. Kolasa and K. Makarski. 2015.** Macroprudential policy and imbalances in the euro area. In: *Journal of International Money and Finance* 51. 137–154.
- Cerutti, E., S. Claessens and L. Laeven. 2017.** The use and effectiveness of macroprudential policies: New evidence. In: *Journal of Financial Stability* 28. 203–224.
- Cerutti, E., R. Correa, E. Fiorentino and E. Segalla. 2017.** Changes in Prudential Policy Instruments – A New Cross-Country Database. In: *International Journal of Central Banking* 13, 2, 477–503.
- Dell’Ariccia, G., C. Ferreira, N. Jenkinson, L. Laeven, A. Martin, C. Minoiu and A. Popov. 2018.** Managing the sovereign-bank nexus. IMF Departmental Paper No. 18/16.
- Dellas, H. and G. Tavlás. 2010.** An optimum currency area odyssey. CEPR Discussion Paper 7645.
- Döme, S., M. Sigmund and E., Ubl. 2018.** How to Assess the Effectiveness and Negative Side Effects of Macroprudential Policies: From Theory to Empirical Evidence. Working paper. SSRN.
- Döme, S., S. W. Schmitz, K. Steiner and E. Ubl. 2016.** The changing role of macroprudential policy in Austria after World War II. OeNB. Monetary Policy & the Economy Q3-4/16. 163–189.
- Eichengreen, B. 2018.** Optimum Currency Areas Past and Future. Oxford Research Encyclopedia of Economics and Finance. June.

- ECB. 2018.** Systemic liquidity concept, measurement and macroprudential instruments. ECB Occasional Paper No. 214. October.
- ESRB. 2019.** Features of a macroprudential stance: initial considerations. February.
- ESRB. 2018.** A Review of Macroprudential Policy in the EU in 2017. April.
- ESRB. 2016a.** Macroprudential policy beyond banking: an ESRB strategy paper. July.
- ESRB. 2016b.** ESRB report on the vulnerabilities in the residential real estate sector. November.
- European Commission. 2008.** EMU@10: successes and challenges after 10 years of Economic and Monetary Union. *European Economy* 2.
- Glocker, C. and P. Towbin. 2012.** Reserve Requirements for Price and Financial Stability – When Are They Effective? Working papers 363. Banque de France.
- Glocker, C. and P. Towbin. 2015.** Reserve requirements as a macroprudential instrument – Empirical evidence from Brazil. *Journal of Macroeconomics* 44. 158–176.
- Hallerberg and Baerg. 2016.** Explaining Instability in the Stability and Growth Pact: The Contribution of Member State Power and Euroskepticism to the Euro Crisis. Sage journals. March.
- Handler, H. 2013.** The Eurozone: Piecemeal Approach to an Optimum Currency Area. WIFO Working Paper 446/2013.
- Houben, A. and J. Kakes, 2013.** Financial imbalances and Macroprudential policy in a currency union. DNB Occasional Studies 11/5.
- Houben, A., S. W. Schmitz, M. Wedow. 2015.** Systemic liquidity and macroprudential supervision. OeNB. Financial Stability Report 30. 85–92.
- IMF. 2007a.** Ireland: 2007 Article IV Consultation – Staff Report; Staff Supplement; and Public Information Notice on the Executive Board Discussion. IMF Country Report 07/325.
- IMF. 2007b.** Portugal: 2007 Article IV Consultation – Staff Report; Staff Statement; Public Information Notice on the Executive Board Discussion; and Statement by Executive Director for Portugal. IMF Country Report 07/341.
- IMF. 2007c.** Spain: 2007 Article IV Consultation – Staff Report; Staff Statement; and Public Information Notice on the Executive Board Discussion. IMF Country Report 07/175.
- Ingram, J. 1969.** Comment: the currency area problem. In: Mundell, R. and A.R. Swoboda (ed.). *Monetary Problems of the International Economy*. The University of Chicago Press.
- Jiménez, G, S. Ongena, J. Peydró and J. Saurina. 2017.** Macroprudential Policy, Countercyclical Bank Capital Buffers, and Credit Supply: Evidence from the Spanish Dynamic Provisioning Experiments. In: *Journal of Political Economy* 125/6. 2126–2177.
- Kaminsky G. and C. Reinhart. 1999.** The Twin Crises: The Causes of Banking and Balance-of-Payments Problems. Available at SSRN: <https://ssrn.com/abstract=2882512>
- Katterl, A. and W. Köhler-Töglhofer, 2018.** Stabilization and shock absorption instruments in the EU and the euro area – the status quo. In: OeNB. *Monetary Policy & the Economy* Q2/18. 87–110.
- Kliatskova, T. 2018.** Capital Controls and Macroprudential Policies: Are they countercyclical? Working paper. May.
- Korinek, A. and D. Sandri. 2016.** Capital controls or macroprudential regulation? In: *Journal of International Economics* 99. 27–42.
- Kuttner, K. and I. Shim. 2016.** Can non-interest rate policies stabilize housing markets? Evidence from a panel of 57 economies. In: *Journal of Financial Stability* 26(C). 31–44.
- Lane, P. 2013.** Capital flows in the euro area. April 2013. *Economic papers* 497. April.
- Lane, P. 2015.** International financial flows and the Eurozone crisis. VOX CEPR Policy Portal. September.
- McDonald, C. 2015.** When is macroprudential policy effective? BIS Working Papers 496.
- Pierluigi, B. and D. Sondermann. 2018.** Macroeconomic imbalances in the euro area: where do we stand? ECB Occasional Paper Series 211.

- Posch, M., S. W. Schmitz, P. Strobl. 2018.** Strengthening the euro area by addressing flawed incentives in the financial system. In: OeNB. Monetary Policy & the Economy Q2/18. 34–50.
- Rubio, M. 2017.** The role of macro-prudential policies in prevention and correction of asset imbalances in the euro area. Publication of the Eurogroup in the Economic and Monetary Affairs Committee.
- Sigmund, M. 2018.** The capital buffer calibration for Other Systemically Important Institutions – is there too much country-heterogeneity in the EU? OeNB Mimeo.
- Schmitz, S. W. 2016.** The OeNB's reaction to the end of the Bretton Woods system: tracing the roots of the Indicator. In: OeNB. Monetary Policy and the Economy Q3–4/16. 190–210.
- Van Riet, A. 2010.** euro area Fiscal Policies and the Crisis. Occasional Paper Series 109. European Central Bank. April.
- Vandenbussche J., U. Vogel and E. Detragiache. 2015.** Macroprudential Policies and Housing Price: A New Database and Empirical Evidence for Central, Eastern and Southeastern Europe. In: Journal of Money, Credit, and Banking 47/S1. 343–377.
- Wolf, M. 2014.** The shifts and the shocks. What we've learned - and have still to learn – from the financial crisis. Penguin Press.

# Economic growth slows in Austria as global economy weakens

Economic outlook for Austria from 2019 to 2021 (June 2019)

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

Cut-off date: May 24, 2019

## 1 Executive Summary

While economic activity in Austria has been slowing down amid weakening global growth, resilient domestic demand is mitigating the effects of lower contributions from net exports. Following booming growth in both 2017 and 2018 (+2.7%), the OeNB expects real GDP growth to weaken visibly in 2019 (+1.5%) and to rebound slightly and level off in 2020 and 2021 (+1.6%). Compared with the OeNB's December 2018 outlook, this implies a string of downward revisions (−0.5 percentage points for 2019, −0.3 percentage points for 2020 and −0.1 percentage point for 2021). At the same time, the unemployment rate (Eurostat definition) is projected to drop from 4.8% in 2018 to 4.7% in 2019. HCIP inflation is expected to sink from 2.1% in 2018 to 1.7% in 2019. Thereafter, both the unemployment and HICP inflation levels should remain stable until end-2021. The general government surplus stands to grow from 0.1% of GDP in 2018 to 0.5% in 2021. In parallel, the debt-to-GDP ratio is expected to drop to 65.3% by 2021, from 73.8% in 2018.

The global economy weakened considerably during 2018, especially as a result of mounting trade tensions between the U.S.A. and China. The ongoing struggles of Germany's manufacturing industry, its automotive industry in particular, have also been a drag on economic growth in Europe. Furthermore, the uncertainty over Brexit and post-Brexit relations between the U.K. and the EU has created heightened risks for economic agents and companies, thus dampening demand for investment.

The growth setback in China and East Asia has also been adding to the deceleration of global economic activity and trade. Like the U.S.A., the Central, Eastern and Southeastern European (CESEE) economies – which continue to outperform the euro area economy – cannot decouple from global growth conditions. As global import growth has been weakening in 2019, Austria's export industry has started to do less well. In view of the global economic slowdown, Austrian manufacturers (exporters in particular) have been adjusting their expectations. Notably, expectations of order intake, exports and production levels have become increasingly bleak since early 2019 and have approached, or even dropped below, long-term averages. Given these signals, export growth is likely to weaken further until mid-2019. Judging from the May results for the OeNB's export indicator, Austria's exporters are unlikely to see even small improvements before the third quarter of 2019. Hence exports are projected to grow only moderately (+2.0%) in 2019, and to accelerate in 2021 (+3.4%).

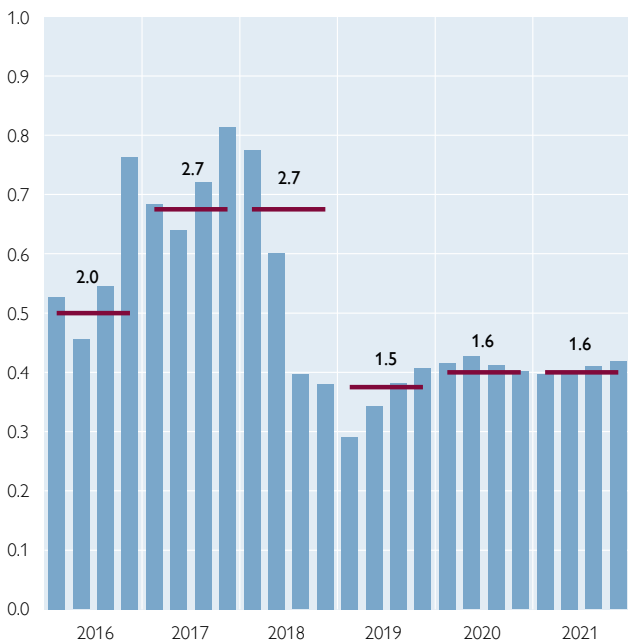
While the global economy has been dampening GDP growth in Austria, strong domestic demand continues to be a stabilizing factor. Private consumption has

<sup>1</sup> Oesterreichische Nationalbank, Economic Analysis Division, christian.ragacs@oenb.at, klaus.vondra@oenb.at. With contributions from Friedrich Fritzer, Ernst Glatzer, Ernest Gnan, Walpurga Köhler-Töglhofer, Doris Prammer, Doris Ritzberger-Grünwald and Alfred Stiglbauer. We wish to thank Beate Resch and Anita Roitner for valuable technical assistance.

## Main results of the forecast

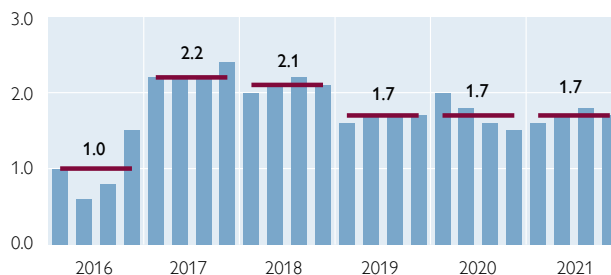
### Real GDP growth

Change on previous period in %



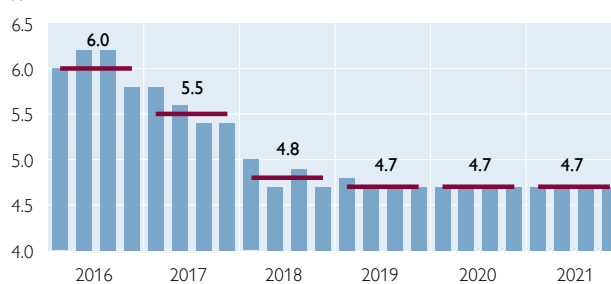
### Harmonised Index of Consumer Prices (HICP)

Annual change in %



### Unemployment rate

%



Source: WIFO, Statistics Austria. OeNB June 2019 outlook.

Note: The GDP data are seasonally and working day-adjusted (trend-cycle component).

been growing strongly since 2016, supported by dynamic employment growth, higher gross wages, and income tax relief measures. The booming economy facilitated higher wage settlements for 2019 than for 2018. Combined with higher tax relief provided for families with children from 2019 onward, this is going to boost consumer demand further in 2019. In 2020 and 2021, disposable household income – and hence also consumer demand – is expected to grow at a slightly slower pace, as wage increases and employment growth are both set to weaken. Specifically, private consumption is projected to grow by 1.6% in 2019, by 1.4% in 2020, and by 1.3% in 2021. The saving ratio will inch up from 7.4% in 2018 to 7.6% in 2019, and thereafter drop to 7.2% in 2021.

A longside private consumption, growth of gross fixed capital formation will be driving economic activity in Austria. While the contributions to GDP growth from investment in equipment have become increasingly weaker since early 2019, the contributions from construction investment to total gross fixed capital formation have been outpacing long-term averages. This trend will remain in place until the end of the year. In other words, the current investment cycle, which is already longer than average, is set to continue. It will not end before the residential construction cycle has run its course as signaled by the declining number of residential building permits. In sum, investment growth is expected to reach 2.7% in 2019, and 1.9% and 1.8% in 2020 and 2021. The investment-to-GDP ratio should reach 24.3% in 2019, which is the highest rate since the early 2000s.

The labor market has continued to strengthen visibly. Employment growth peaked in late 2017 and has since been decelerating somewhat. In the first quarter



Table 1

**OeNB June 2019 outlook for Austria – main results<sup>1</sup>**

	2018	2019	2020	2021
<b>Economic activity</b>				
<i>Gross domestic product (GDP)</i>				
Private consumption	+2.7	+1.5	+1.6	+1.6
Government consumption	+1.6	+1.6	+1.4	+1.3
Gross fixed capital formation	+0.5	+1.5	+1.2	+1.1
Exports of goods and services	+3.5	+2.7	+1.9	+1.8
Imports of goods and services	+4.2	+2.0	+2.8	+3.4
Importe insgesamt	+3.0	+2.0	+2.6	+3.0
<i>% of nominal GDP</i>				
Current account balance	2.3	2.2	2.3	2.6
<b>Contribution to real GDP growth</b>				
<i>Percentage points</i>				
Private consumption	+0.8	+0.8	+0.7	+0.7
Government consumption	+0.1	+0.3	+0.2	+0.2
Gross fixed capital formation	+0.8	+0.6	+0.5	+0.4
Domestic demand (excluding changes in inventories)	+1.7	+1.7	+1.4	+1.3
Net exports	+0.8	+0.1	+0.3	+0.4
Changes in inventories (including statistical discrepancy)	+0.1	-0.3	+0.0	+0.0
<i>Annual change in %</i>				
Harmonised Index of Consumer Prices (HICP)	+2.1	+1.7	+1.7	+1.7
Private consumption expenditure (PCE) deflator	+2.0	+1.8	+1.6	+1.6
GDP deflator	+1.6	+1.5	+1.6	+1.6
Unit labor costs (whole economy)	+1.5	+2.5	+1.5	+1.1
Compensation per employee (nominal)	+2.4	+2.7	+2.1	+1.8
Compensation per hour worked (nominal)	+2.3	+2.9	+2.3	+1.9
Import prices	+2.2	+1.6	+1.9	+1.8
Export prices	+1.5	+1.3	+2.0	+1.9
Terms of trade	-0.6	-0.4	+0.1	+0.1
<b>Income and savings</b>				
Real disposable household income	+2.4	+2.2	+1.4	+0.9
<i>% of nominal disposable household income</i>				
Saving ratio	7.4	7.6	7.4	7.2
<b>Labor market</b>				
<i>Annual change in %</i>				
Payroll employment	+2.2	+1.6	+1.2	+1.1
Hours worked (payroll employment)	+2.3	+1.4	+1.0	+0.9
<i>% of labor supply</i>				
Unemployment rate (Eurostat definition)	4.8	4.7	4.7	4.7
<b>Public finances</b>				
<i>% of nominal GDP</i>				
Budget balance	0.1	0.3	0.4	0.5
Government debt	73.8	70.7	68.0	65.3

Source: 2018: WIFO, Eurostat, Statistics Austria; 2019 to 2021: OeNB June 2019 outlook.

<sup>1</sup> The outlook was drawn up on the basis of seasonally and working day-adjusted national accounts data (trend-cycle component: flash estimate for Q1 19). 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 2018 also differ from the nonseasonally adjusted data published by Statistics Austria.

of 2019, annual employment growth continued to be as high as 1.9%. The outlook for 2019 as a whole is 1.6%, given continued strong growth in payroll employment in early 2019. Looking ahead, employment growth is expected to reach 1.2% in 2020, and 1.1% in 2021. In line with weakening GDP growth, the number of hours worked will increase at a lesser rate than the employment figures. At the

same time, labor supply growth is projected to keep rising at a robust pace from 2019 to 2021. Unemployment reached 4.8% in 2018 and is forecast to drop slightly, to 4.7%, in 2019, and to remain stable at 4.7% in 2020 and 2021.

HICP inflation is forecast to run to 1.7% in 2019 and to remain unchanged in 2020 and 2021. Compared with 2018, a rate of 1.7% corresponds to a decrease by 0.4 percentage points on the year, which is attributable above all to the subdued increase in energy prices. Core inflation (HICP excluding energy and food) will exceed HICP inflation over the forecast horizon, with a rate of 1.8% projected for 2019 and a rate of 1.9% for both 2020 and 2021.

The general government is forecast to reach a surplus also in 2019. The surplus will be driven mainly by revenue-enhancing conditions (strong employment and wage bill growth, progressive income tax system, robust consumer demand growth) and a further decrease of debt servicing costs. These two factors will also remain instrumental in the two subsequent years, driving up the surplus to 0.4% of GDP in 2020 and to 0.5% of GDP in 2021. The fiscal projections are based on a no-policy-change assumption. In other words, the projections reflect only measures which have been specified in detail and which are most likely to be put into practice. This does not hold for most of the tax reform measures announced for 2020 and 2021 by the government coalition that has since been dissolved. The projected decline of the debt-to-GDP ratio to 65.3% would reinstate 2007 conditions. The expected budget surpluses and continued debt reductions by public wind-down vehicles will bring the nominal debt ratio down further each year. Adjusted for cyclical and one-off effects, the structural budget will be broadly balanced in 2019 and (somewhat) in surplus thereafter. In other words, Austria is going to achieve its medium-term budgetary objective of  $-0.5%$  of GDP as agreed under the fiscal framework of the European Commission.

## 2 Technical assumptions

This forecast for the Austrian economy is the OeNB's contribution to the June 2019 Eurosystem staff macroeconomic projections. The forecasting horizon ranges from the second quarter of 2019 to the fourth quarter of 2021. The cutoff date for all assumptions on the performance of the global economy, interest rates, exchange rates and crude oil prices was May 21, 2019. 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). The data used by the OeNB differ from the quarterly series published by Eurostat since the changeover to the European System of Accounts (ESA 2010) in fall 2014. While also seasonal and working-day adjusted, the Eurostat data include irregular fluctuations that cannot be fully mapped to specific economic fundamentals. The values for 2018 also differ from the data published by Statistics Austria, which are not seasonally adjusted. Detailed national accounts data are based on the flash estimate for the first quarter of 2019. Short-term interest rates are based on market expectations for the three-month EURIBOR. Long-term interest rates are based on market expectations for Austrian government bonds with an agreed maturity of ten years. This implies negative short-term rates for all three forecasting years and a gradual rise in long-term rates, but not beyond 1%, until the end of 2021. One euro is expected to buy 1.12 U.S. dollars on average throughout the forecasting horizon. Based on futures prices, the price

of a barrel of Brent crude oil is expected to decrease from USD 71.1 in 2018 to USD 68.1 in 2019, and to ease further to USD 62.7 in 2021. The prices of nonenergy commodities are also assumed to move in line with futures prices.

### 3 Global upswing continues amid growing risks

Global GDP growth, and global trade growth in particular, have been decelerating markedly in recent months. Between the second quarter of 2018 and the first quarter of 2019, world GDP growth remained 0.1 percentage point below the December 2018 projections in all quarters. Thus, the growth rate has been revised downward by 0.3 percentage points for 2019 as a whole. The downward revisions were even more pronounced for world trade growth. The weaker momentum of international trade reflects the cumulative adverse effect of developments in individual countries and regions on global economic activity since the start of 2019.

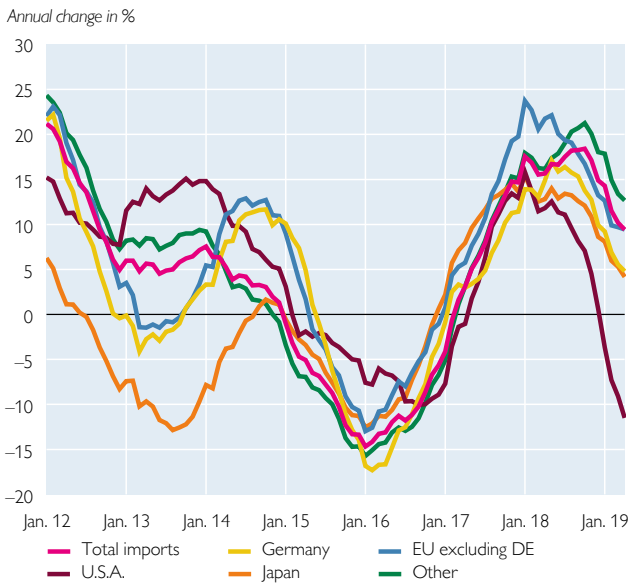
The *U.S. economy*, which has been in expansion mode since 2010, continued to grow, despite a five-week government shutdown before Congress was able to agree on a spending bill for the fiscal year 2019 in late January 2019. Yet the stimulus from the 2018 tax reform has been fading gradually, and the uncertainty arising from trade tensions has also been a drag on investment decisions. For the time being, there is no indication of further increases of the federal funds rate, which is good news for the economy. The higher tariffs imposed on imports from China (tariffs were raised from 10% to 25% on May 10, affecting Chinese imports worth USD 200 billion) and the tariffs on U.S. imports with which China reciprocated (a staggered regime of 10%, 20% or 25% on U.S. imports worth USD 60 billion) have had increasingly adverse effects on bilateral transactions. In the U.S.A., these tariffs also imply redistribution effects from consumers (higher product prices) to the government (customs revenues). Yet downstream industries relying on imports of intermediate goods hit by the import tariffs also suffer from the higher prices. Despite the inverted yield curve, the long growth cycle of the U.S. economy is expected to end only gradually; the outlook for 2021 is a healthy growth rate of 1.8%.

The *Chinese economy* has been hit more strongly by the trade dispute than the U.S. economy because the range of Chinese products affected by the new tariffs is much larger by comparison. Chinese imports from the U.S.A. have been shrinking on the year since the end of 2018 (see upper left-hand panel of chart 2). While not having contracted so far, imports from other countries, such as Germany and Japan, have also been growing less robustly. In 2018, the Chinese economy was also affected by tighter regulations for shadow banks and deleveraging measures to reduce off-balance-sheet local government debt. These one-off effects have been reinforcing the ongoing transformation of the Chinese economy from manufacturing to a service economy. As a result, import growth projections for 2019 were revised downward from +4.3% in the OeNB's December 2018 outlook to -5.2% in the June 2019 outlook. Ultimately, this also means negative import growth in 2019 for the aggregate of emerging market economies. As an offsetting measure, the Chinese government adopted a comprehensive package of fiscal stimulus measures for the economy already in 2018. These measures have, moreover, been supported by a range of accommodative monetary policy measures. Hence, we project GDP growth in China to continue to slightly exceed 6.0% in 2019 and 2020.

Absent new bilateral trade agreements with the U.S.A., the trade dispute between the U.S.A. and China might start to affect the *euro area* economies and

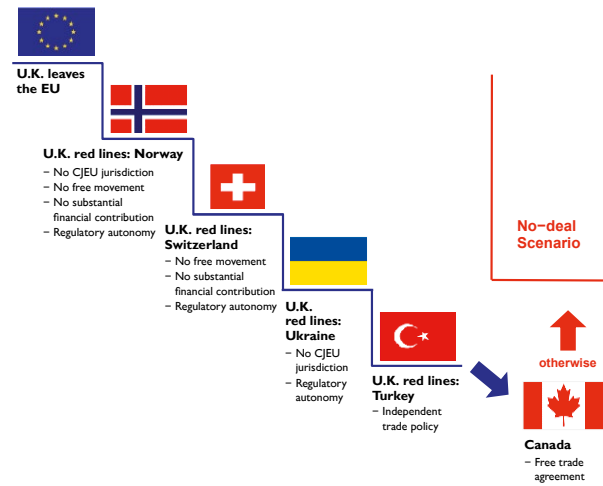
### International risk factors

#### China: goods imports



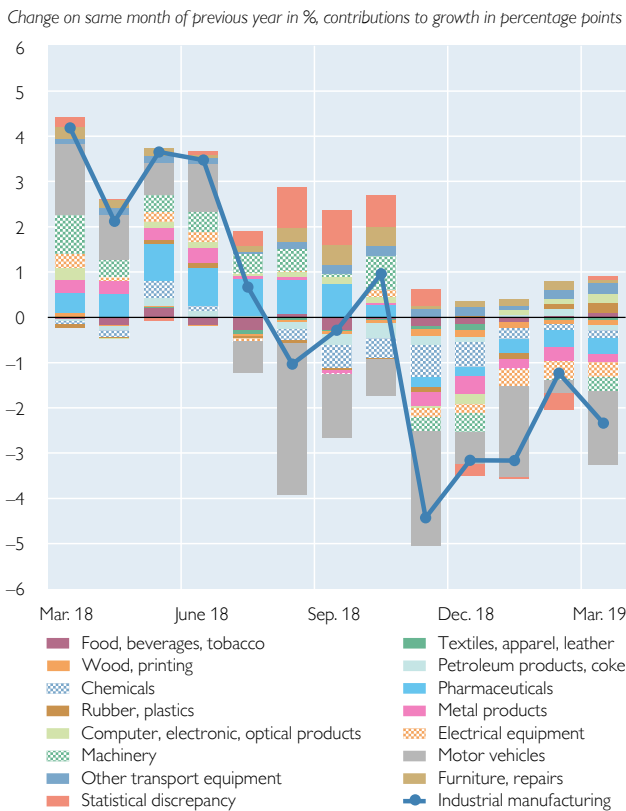
Source: BOFIT, Chinese customs statistics.  
Note: Nominal monthly value of imports in U.S. dollars, based on 12-month rolling averages.

#### U.K.: red lines in the Brexit negotiations



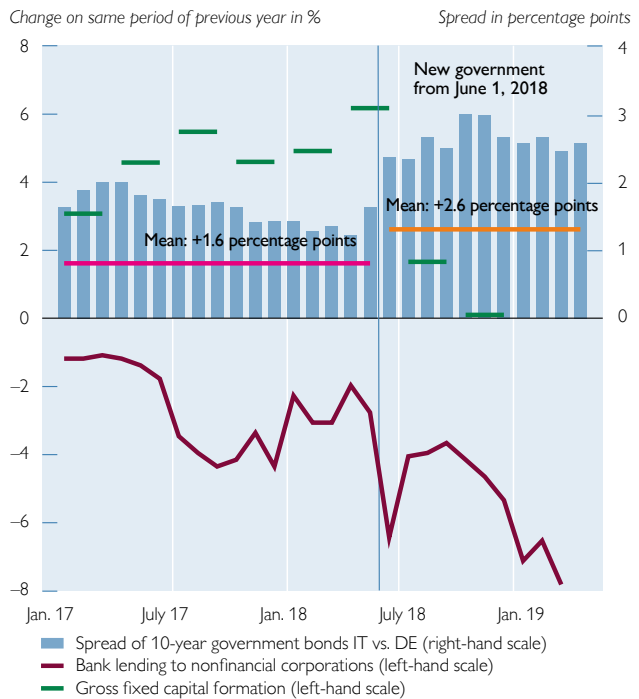
Source: European Commission, authors' adaptation.  
Note: CJEU = Court of Justice of the European Union.

#### Germany: industrial manufacturing



Source: Eurostat.

#### Italy: financing costs and investment growth



Source: Macrobond, Eurostat.

Japan in late 2019. Furthermore, the uncertainty surrounding Brexit has been a drag on economic activity. Initially, the United Kingdom had been scheduled to leave the EU by March 29, 2019. Yet as the U.K. parliament was unable to agree on an exit deal negotiated with Brussels, the exit date has since been moved, for a second time, to October 31, 2019, as the latest possible date. Until then, the U.K. will remain a full-fledged EU member, and Community law will continue to apply also during any transitional period following ratification of the exit deal. For a broad-brush picture of the repercussions of Brexit see chart 2 (upper right-hand panel). Yet the actual implementation of Brexit and the future economic relations between the U.K. and the EU remain open to conjecture pending parliamentary adoption of the existing exit deal in the U.K. The uncertainty surrounding the initial exit date caused imports to the U.K. to rise by as much as 6.8% in the first quarter of 2019 against the previous quarter. Most of these imports served to build up inventories. Looking ahead, quarterly import growth in 2019 is expected to be negative, but the outcome will ultimately depend on how the Brexit-related negotiations proceed. At any rate, the ongoing uncertainty continues to weigh on economic sentiment in the U.K. and across the EU.

The *Central, Eastern and Southeastern European (CESEE) economies* continue to be a bright spot in the global economy. Growth in the area, while having weakened following the latest peak in 2017, remains robust. Compared with the OeNB's December 2018 projections, the growth outlook for 2019 and 2020 has in fact been revised upward. Domestic demand benefits from strong employment growth and the newly rising uptake of EU structural funds. Offsetting effects include mounting labor shortages and weak import demand from the euro area.

Within the euro area, *Germany* has suffered the most from international market distortions. This is above all due to the high degree of openness of the German economy. Taken together, German exports and imports reached 101% of GDP in 2018. The corresponding measures for France and Italy were 67% and 63%. In other words, exporting to other economies is much more important for Germany than for the other large players in the euro area. Germany accounts for more than half of all exports from the euro area to China.<sup>2</sup> As a result, weak import growth in China is particularly bad news for the German economy. While exports to China continued to grow in 2018, exports to Southeast Asian economies as a whole were already contracting. On top of that, there are home-grown problems resulting from the automotive industry, which plays a comparatively large role in German manufacturing.<sup>3</sup> The automotive industry has been struggling with tighter emission tests, which slowed down production processes and led to delivery delays. Initially, starting in mid-2018, the weakness of the German manufacturing sector was above all attributable to the automotive industry (see chart 2, lower left-hand panel). By late 2018, however, other manufacturing industries in Germany were struggling as well, however. As a result, the German economy stagnated in the second half of 2018. In contrast, the strong GDP growth rate measured in the first quarter of 2019 was supported by domestic demand, above all construction investment and private

<sup>2</sup> At the same time, Germany accounts for just below one-third of all euro area exports.

<sup>3</sup> These two factors are, however, highly interrelated as the German automotive industry was also hit by the decrease in new car registrations reported by China for 2018. In 2018, China was the second-biggest market of German automotive manufacturers, with the corresponding transactions (SITC 78) accounting for 11%.

consumption. The data for the second quarter of 2019 are expected to be driven by reversed trends, mostly on account of contracting net export growth. Yet domestic demand will remain robust, fueled by buoyant employment growth, considerable income gains and low unemployment rates. Across the forecasting horizon, real GDP growth in Germany is expected to pick up only slowly, though. This means that the German economy will be growing below potential until the end of 2021.

The *Italian economy* has been suffering from the adverse international conditions as well as domestic structural problems, which have had a sustained decelerating impact on growth. Italy has in fact been urged again and again to adopt measures to enhance its long-term growth potential and to ensure the long-term stability of the banking sector – also with a view to removing supply-side restrictions to credit lending. In Italy, credit lending has been shrinking in recent years, even amid the accommodative measures implemented by the Eurosystem (APP and TLTRO measures). The fiscal stimulus measures adopted by the new Italian government, in deviation from the fiscal consolidation program agreed earlier with the European Commission, have driven up yields on Italian sovereign bonds and have led to a tightening of financial conditions for Italian companies. Hence investment growth weakened considerably in the second half of 2018 (see lower right-hand panel of chart 2). Overall, output growth is expected to remain fairly weak in Italy throughout the forecasting horizon.

Unlike Germany and Italy, *Spain* continues to experience a sustained expansion. *France* adopted comprehensive tax relief measures in response to yellow vest

Table 2

### Underlying global economic conditions

	2018	2019	2020	2021
	<i>Annual change in % (real)</i>			
<b>Gross domestic product</b>				
World excluding the euro area	+3.8	+3.3	+3.6	+3.6
U.S.A.	+2.9	+2.5	+2.0	+1.8
Japan	+0.8	+0.6	+0.5	+0.8
Asia excluding Japan	+6.1	+5.6	+5.8	+5.6
Latin America	+0.7	+0.3	+2.1	+2.4
United Kingdom	+1.4	+1.4	+1.2	+1.1
CESEE EU Member States <sup>1</sup>	+4.3	+3.9	+3.2	+3.2
Switzerland	+2.5	+1.4	+2.0	+1.8
Euro area <sup>2</sup>	+1.8	+1.2	+1.4	+1.4
	<i>Annual change in %</i>			
<b>World trade (imports of goods and services)</b>				
World	+4.1	+1.4	+3.1	+3.4
World excluding the euro area	+4.6	+0.7	+2.8	+3.4
Growth of euro area export markets (real)	+3.6	+1.7	+2.6	+3.1
Growth of Austrian export markets (real)	+3.7	+2.5	+3.1	+3.5
<b>Prices</b>				
Oil price in USD/barrel (Brent)	71.1	68.1	65.8	62.7
Three-month interest rate in %	-0.3	-0.3	-0.3	-0.2
Long-term interest rate in %	0.7	0.3	0.4	0.6
USD/EUR exchange rate	1.18	1.12	1.12	1.12
Nominal effective exchange rate of the euro (euro area index)	117.9	116.7	116.8	116.8

Source: Eurosystem.

<sup>1</sup> Bulgaria, Croatia, Czechia, Hungary, Poland and Romania.

<sup>2</sup> 2018: Eurostat; 2019 to 2021: Results of the Eurosystem's June 2019 projections.



protests. These measures will support output growth above all in 2019. Economic growth for the euro area as a whole has been revised downward compared with the December 2018 projections. The *euro area* economy is currently expected to grow by 1.2% in 2019 and by 1.4% in both 2020 and 2021.

#### 4 Mixed signals for the Austrian economy from decelerating net exports and strong domestic demand

##### 4.1 Austrian exports suffer from global trade disputes and weak demand from Germany and Italy

Following good results during the boom year 2017, Austrian exports started to lose steam already in 2018. While quarterly export rates had still averaged 1.5% (quarter on quarter and in real terms) in 2017, this figure dropped to 0.7% in 2018. The decrease reflected above all weaker growth of import demand from within the euro area, from Germany in particular. Export demand from Asian economies weakened as well, but this had a smaller impact on the Austrian than, for instance, on the German economy. Incoming data for the initial months of 2019 show that Austrian exporters benefited from broad regional diversification and broad product ranges. Geographically speaking, exports to Germany and Italy showed signs of weakness, whereas exports to the CESEE economies continued to grow at a robust rate. In terms of industrial diversification, exports of chemicals were key growth drivers, while exports of machinery and transport equipment created only little impetus for growth.

The short-term outlook for Austria's export industry is very subdued, given weaker expectations of import demand from Austrian trading partners and the sharp contraction of export confidence indicators (order intake from abroad, expectations of export activity), which have been below their historical means since early 2019. In contrast, these indicators were still at record highs in early 2018. In light of this, export growth is anticipated to drop further in the second quarter, before rebounding moderately but gradually from the third quarter onward in line with the expected recovery of global import growth. This outlook is based on a number of assumptions. For instance, the growth-inhibiting impact of one-off effects in Germany, which were expected to be a temporary phenomenon, should fade out eventually. In addition, import demand from Asia should be stabilizing again.<sup>4</sup> As a consequence, import demand from Austria's trading partners will rise moderately in 2020 and 2021, thus reaching levels last observed in 2016.

In recent years, Austrian exporters have been pricing their goods and services broadly in line with their competitors in export markets, which kept price competitiveness broadly stable. As in recent years, Austrian exporters are expected to continue losing market shares a bit to emerging economies – the market shares gained in 2018 were an exception. Export growth is set to accelerate from 2.0% in 2019 to 3.4% in 2021. With the investment cycle nearing completion, export growth will exceed import growth (given the high import share of investment). Net exports will thus support GDP growth slightly in all three forecast years.

<sup>4</sup> The outlook already reflects the latest escalation of the trade dispute between the U.S.A. and China (including higher U.S. customs tariffs introduced on May 10 for goods imports from China worth USD 200 billion as well as China's reciprocal measures worth USD 60 billion).



In 2018, Austria's balance of trade surplus increased to 1.2% of nominal GDP, from 0.2% in 2017. This increase, which was key in driving up the current account surplus measured in 2018, is attributable to booming trade in goods not crossing borders.<sup>5</sup> The balance of services excluding travel deteriorated slightly, while the travel surplus increased slightly. The balances of primary and secondary income remained broadly unchanged. In 2019, weaker exports given international conditions and moderate import growth will cause the trade balance to deteriorate, but the

Table 3

### Austria's exports and imports and price competitiveness

	2018	2019	2020	2021
<b>Exports</b>				
<i>Annual change in %</i>				
Competitor prices on Austria's export markets	+0.9	+2.9	+2.2	+2.1
Export deflator	+1.5	+1.3	+2.0	+1.9
Changes in price competitiveness	-0.6	+1.6	+0.2	+0.2
Import demand on Austria's export markets (real)	+3.7	+2.5	+3.1	+3.5
Austrian exports of goods and services (real)	+4.2	+2.0	+2.8	+3.4
Austrian market share	+0.5	-0.5	-0.3	-0.1
<b>Imports</b>				
<i>Annual change in %</i>				
International competitor prices on the Austrian market	+0.8	+2.3	+1.9	+2.0
Import deflator	+2.2	+1.6	+1.9	+1.8
Austrian imports of goods and services (real)	+3.0	+2.0	+2.6	+3.0
<b>Terms of Trade</b>				
	-0.6	-0.4	+0.1	+0.1
<i>Percentage points of real GDP</i>				
<b>Contribution of net exports to GDP growth</b>	+0.8	+0.1	+0.3	+0.4
<i>% of nominal GDP</i>				
Export ratio	54.5	54.7	55.6	56.7
Import ratio	50.8	51.2	51.8	52.6

Source: 2018: WIFO, Eurosystem; 2019 to 2021: OeNB June 2019 outlook.

Table 4

### Austria's current account

	2018	2019	2020	2021
<i>% of nominal GDP</i>				
<b>Balance of trade</b>	3.8	3.7	3.9	4.2
Balance of goods	1.2	0.7	0.9	1.1
Balance of services	2.7	2.9	3.0	3.0
<b>Balance of primary income<sup>1</sup></b>	-0.5	-0.5	-0.5	-0.5
<b>Balance of secondary income<sup>2</sup></b>	-1.0	-1.0	-1.1	-1.1
<b>Current account balance</b>	2.3	2.2	2.3	2.6

Source: 2018: OeNB; 2019 to 2021: OeNB June 2019 outlook.

<sup>1</sup> Balance of income (compensation of labor, investment income, etc.).

<sup>2</sup> Balance of current transfers.

<sup>5</sup> According to the balance of payments and the system of national accounts, this includes (1) trade in goods not crossing borders, (2) adjustments for foreign entities registered for VAT but not physically present and (3) goods under merchanting. For details on these flows and on the adjustment of international trade statistics for balance of payment or national account purposes, see: <https://www.oenb.at/isaweb/report.do?lang=EN&report=9.1.11>.

resulting impact on the current account balance will be cushioned by an improving services balance. Until the end of 2021, the balance of goods will improve, causing the current account surplus to rise as well (to 2.6% of GDP in 2021).

#### 4.2 Strong investment cycle gradually nearing completion

Business investment has been a key pillar of the latest economic boom, contributing close to 1 percentage point to GDP growth in each of the past three years. Initially, the strong cycle was driven by replacement investment. Later, solid global economic activity led to the expansion of existing investment, especially in equipment. As the momentum of equipment investment weakened in the past two years, construction investment took over increasingly as the key driver of the investment cycle. Investment demand has been strengthened through favorable financing conditions resulting from the low interest rate environment and businesses' strong internal financing capacity. The investment-to-GDP ratio thus reached 23.9% in 2018. This is the highest result since the early 2000s and the sixth-highest measure within the EU (euro area: 21.0% of GDP; EU: 20.5% of GDP).

As the international economy is weakening, order intake and capacity utilization are set to decline until mid-2019, thus freeing production capacity and directly affecting equipment investment, which is highly sensitive to the cycle. Following average annual growth of 5.6% between 2015 and 2018, equipment investment is expected to increase at a much slower pace in 2019 and 2020. The OeNB anticipates equipment investment to keep growing slightly until the end of the forecast horizon, with growth picking up somewhat in 2021. The increases will be carried by an

Table 5

#### Investment activity in Austria

	2018	2019	2020	2021
	<i>Annual change in %</i>			
<b>Total gross fixed capital formation (real)</b>	+3.5	+2.7	+1.9	+1.8
<i>of which: investment in plant and equipment</i>	+3.7	+2.1	+1.6	+1.9
<i>residential construction investment</i>	+3.2	+4.2	+2.9	+1.8
<i>nonresidential construction investment and other investment</i>	+2.9	+1.2	+1.1	+0.9
<i>investment in research and development</i>	+4.3	+4.2	+2.6	+2.4
<i>public sector investment</i>	-1.8	+1.6	+3.0	+1.7
<i>private investment</i>	+4.3	+2.9	+1.8	+1.8
	<i>Percentage points</i>			
<b>Contribution to the growth of real gross fixed capital formation</b>				
Investment in plant and equipment	+1.3	+0.7	+0.6	+0.7
residential construction investment	+0.6	+0.8	+0.5	+0.3
Nonresidential construction investment and other investment	+0.7	+0.3	+0.3	+0.2
Investment in research and development	+0.9	+0.9	+0.6	+0.5
Public sector investment	-0.2	+0.2	+0.4	+0.2
Private investment	+3.7	+2.5	+1.6	+1.6
	<i>Percentage points</i>			
<b>Contribution to real GDP growth</b>				
Total gross fixed capital formation	+0.8	+0.6	+0.5	+0.4
Changes in inventories	+0.4	-0.2	+0.0	+0.0
	<i>% of nominal GDP</i>			
<b>Investment ratio</b>	23.9	24.3	24.3	24.3

Source: 2018: WIFO; 2019 to 2021: OeNB June 2019 outlook.

ongoing need for replacement; in addition, the global economy is forecast to improve slowly, but steadily, from mid-2019.

Construction investment has emerged as the second key pillar of investment growth since 2017. Above-average growth rates have been observed for both residential and nonresidential construction investment. The cycle of residential construction investment is, however, maturing. The number of building permits – which typically lead building completions by about two years – contracted by 13% in 2018, following strong growth in 2016 and 2017. Thus, the growth of residential construction investment is expected to decline gradually in 2020 and 2021.

In sum, investment growth is forecast to initially reach 2.7% (2019), and to ease thereafter to 2.0% (2020) and 1.7% (2021). Given the economic slowdown, the investment-to-GDP ratio is set to remain stable at 24.3% from 2019 to 2021.

### 4.3 Private consumption remains a major pillar of growth

Private consumption has been a key pillar of the Austrian economy since 2016. Accelerating consumption went hand in hand with strong growth of real disposable household income, with households having benefited from three factors: (1) the tax relief provided by the tax reform of 2016, (2) comparatively higher wage settlements achieved since 2018, and (3) strong employment growth (employment has been growing since 2014 and, in 2018, reached the highest level since Austria joined the euro area).

In 2019, employment growth will lessen somewhat while continuing to exceed the long-term average since 1999. With a rate of 2.9%, wage settlements are even higher for 2019 than they were for 2018 (2.6%). Nominal wage growth is expected to remain robust in 2020 (2.4%) and 2021 (2.2%) as well. Moreover, higher tax relief for families with children introduced at the start of 2019 adds to disposable household income. The response of private consumption will become visible by mid-2019.<sup>6</sup> Additional measures were in the pipeline as part of a multi-tier tax reform. In line with cyclical conditions, the contributions to disposable household income growth from investment income and mixed income of the self-employed will be much smaller than the contribution from employee compensation throughout the forecasting horizon.

The inflation rate is expected to remain stable at 1.7% in all three years of the forecasting horizon. As a result, real disposable household income is set to grow by 2.2% in 2019, by 1.4% in 2020, and by 0.9% in 2021. Private consumption is forecast to weaken less; it is expected to grow by 1.6% in 2019, by 1.4% in 2020, and by 1.3% in 2021. To some extent, consumption growth will be financed by lower saving, causing the saving ratio to drop from 7.6% in 2019 to 7.2% in 2021.

<sup>6</sup> This lag is attributable to the lag with which payout started or tax credit was applied during payroll accounting. To some extent the tax relief will not materialize until income tax returns have been filed in 2020 (by self-employed workers in particular). Thus, the full effect of the reform will not manifest itself until 2020.

### Public finances from 2019 to 2021<sup>7</sup>

**Budget balance expected to be in surplus throughout the forecasting horizon:** In 2019, the general government budget balance will improve by 0.2 percentage points, to 0.3% of GDP. This means that Austria's budget will be in surplus for the second time in a row, and for the second time at all since 1974. The improvement will again be driven by revenue-enhancing conditions (progressive income tax system, strong employment and wage bill growth, robust consumer demand growth) and by a further decline in interest expenditure. Offsetting effects include the fiscal measures that have already been implemented and effective since the start of 2019. Higher tax relief for families with children is going to reduce income tax revenues by some 0.2% of GDP in 2019, and by another 0.1% of GDP in 2020. Moreover, the rate for employer contributions to the accident insurance scheme, which used to be 1.3%, was lowered to 1.2%. Lower unemployment insurance contributions for low income earners from July 2018 and the lower VAT rate on hotel overnight stays from November 2018 (cut from 13% to 10%) will also reduce tax revenue growth in 2019. On the expenditure side, spending decreases (related to the phasing-out of some previous temporary spending increases and to cuts of child benefits for children living abroad) will be fully offset by spending increases (higher research subsidies).

The projections of further improvements of the budget surplus, to 0.4% of GDP in 2020 and to 0.5% of GDP in 2021, are also mainly driven by the underlying cyclical conditions and a further decline in interest expenditure. In line with ESCB requirements, these projections are, as a rule, based on a no-policy-change assumption. New fiscal measures, or newly announced fiscal measures, are to be taken into account only if they have been adequately specified by the government and if they are truly likely to be implemented. Given that the Austrian coalition government was dissolved in mid-May 2019, the OeNB's June 2019 outlook was hence based only on those measures of the tax reform package announced on May 1, 2019, that had already advanced to the public consultation stage at the time the projections were completed. In other words, the projections do not reflect the most comprehensive measures of the announced tax reform, namely cuts of health insurance contributions for low income earners from 2020 and the tax bracket reform from 2021.

The consultation process had already been launched for the reform of digital taxation and some minor tax reform measures ("tax reform act I 2019/2020"). In sum, the fiscal effect of these measures is broadly neutral in 2020 and 2021, and the loss in tax revenues resulting from the single biggest measure – raising the immediate write-off limits for low-cost assets to EUR 800 – corresponds to no more than 0.06% of GDP. Given that expected or budgeted savings generated by anti-fraud measures are, as a rule, not taken into account for ESCB projections, the OeNB's June 2019 projections do not reflect the anti-tax fraud act currently under public consultation. The overall impact of all fiscal measures that have been taken into account (i.e., measures that have already been implemented, such as the higher tax relief for families with children, or measures that are under public consultation) is limited. The budget surplus is expected to keep rising in 2020 and 2021, given the prevailing system of progressive income tax brackets, expectations of a further decline in interest expenditure, and the continued moderate rise of other government spending items.

**Debt-to-GDP ratio back to pre-crisis levels in 2021:** The absolute level of indebtedness and hence the debt-to-GDP ratio will continue to go down visibly over the forecasting horizon. In Austria, nominal reductions of government debt levels in more than one year in a row, as observed since 2017, were last seen in the 1970s. The key underlying factors include successive budget surpluses, the ongoing debt reductions by public wind-down vehicles (through asset sales and the use of cash reserves) and relatively high nominal GDP growth (as a driver of the debt ratio decrease). The debt ratio is expected to drop to about 65% of GDP in 2021.

<sup>7</sup> Author: Doris Prammer, Oesterreichische Nationalbank, Economic Analysis Division, [doris.prammer@oenb.at](mailto:doris.prammer@oenb.at).

**Compliance with EU fiscal rules:** Adjusted for cyclical and one-off effects, the budget will be broadly balanced in 2019 and (somewhat) in surplus thereafter. In other words, Austria is going to achieve its medium-term budgetary objective for a structural deficit of  $-0.5\%$  of GDP as agreed under the fiscal framework of the European Commission. The improvement of the structural budget balance is largely attributable to the decline in interest expenditure. These costs are going down over the forecasting horizon as the absolute debt levels shrink and as interest rates for maturing government debt continue to visibly exceed the debt rollover rates over the forecasting horizon. The rapid reduction of the debt ratio is also in line with the requirements of the EU fiscal framework, under which the debt-to-GDP ratio of EU countries should not exceed the reference value of 60%, or else approach the reference value at a satisfactory pace.

## 5 Unemployment rate anticipated to remain stable at 4.7% from 2019 to 2021

When the Austrian economy started to recover in 2015, labor market conditions started to improve as well. Payroll employment levels increased by 1.5% in 2016, and subsequently by 1.9% in 2017 and 2.2% in 2018. The economic boom also went hand in hand with a strong rise in the number of hours worked. Unlike in previous years, more jobs newly created in manufacturing were full-time jobs, and the share of part-time employees declined in general. With employment growth lagging cyclical growth, the labor market momentum started to weaken gradually

Table 6

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

	2018	2019	2020	2021
	<i>Annual change in %</i>			
Payroll employment	+2.2	+1.6	+1.2	+1.1
Wages and salaries per employee	+2.4	+2.7	+2.1	+1.8
Compensation of employees	+4.7	+4.4	+3.3	+2.9
Property income	+6.6	+1.5	+3.6	+3.9
Self-employment income and operating surpluses (net)	+7.0	+3.4	+2.8	+2.7
	<i>Percentage points</i>			
<b>Contribution to household disposable income growth</b>				
Compensation of employees	+4.0	+3.8	+2.9	+2.5
Property income	+0.7	+0.2	+0.4	+0.4
Self-employment income and operating surpluses (net)	+1.2	+0.6	+0.5	+0.5
Net transfers less direct taxes <sup>1</sup>	-1.3	-0.7	-0.4	-0.3
	<i>Annual change in %</i>			
Disposable household income (nominal)	+4.5	+4.0	+3.0	+2.5
Consumption deflator	+2.0	+1.8	+1.6	+1.6
Disposable household income (real)	+2.4	+2.2	+1.4	+0.9
Private consumption (real)	+1.6	+1.6	+1.4	+1.3
	<i>% of nominal disposable household income growth</i>			
Saving ratio	7.4	7.6	7.4	7.2
	<i>% of nominal GDP</i>			
Consumption ratio	51.6	51.9	51.7	51.4

Source: 2018: WIFO. Statistics Austria; 2019 to 2021: OeNB June 2019 outlook.

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

Table 7

**Labor market growth in Austria**

	2018	2019	2020	2021
	<i>Annual change in %</i>			
<b>Total employment (heads)</b>	+1.7	+1.3	+1.0	+0.9
Payroll employment	+2.2	+1.6	+1.2	+1.1
of which: public sector employees	+0.3	+0.5	+0.3	+0.1
Self-employment	-1.6	-1.1	-0.6	-0.4
<b>Total hours worked</b>	+1.6	+1.1	+0.7	+0.8
Payroll employment	+2.3	+1.4	+1.0	+0.9
Self-employment	-1.6	-0.5	-0.5	-0.3
Labor supply	+0.9	+1.0	+1.0	+1.0
Registered unemployment	-12.3	-6.2	+1.0	+4.2
	<i>% of labor supply</i>			
<b>Unemployment rate (Eurostat definition)</b>	4.8	4.7	4.7	4.7

Source: 2018: WIFO, Statistics Austria; 2019 to 2021: OeNB June 2019 outlook.

again once the business cycle had peaked in late 2017/early 2018. In the first quarter of 2019, Austria's payroll employment numbers still grew by as much as 1.9%, thus continuing to exceed historical averages. Yet the growth rates for both vacant jobs and leased employees signal that the labor market momentum is set to weaken further. Due to solid growth in early 2019, payroll employment numbers are expected to rise by 1.6% in 2019 as a whole. Thereafter, the growth rates are expected to ease to 1.2% (2020) and 1.1% (2021). As the cycle weakens, the number of hours worked will grow less and less rapidly over the forecasting horizon (2019: +1.4%; 2020: +1.0%; 2021: +0.9%).

The continued strong growth of labor supply anticipated for the period from 2019 to 2021 will tend to drive up the unemployment rate but also to reduce skills shortages in individual industries. Until the end of 2021, some 45,000 to 50,000 individuals will enter the labor market each year.<sup>8</sup> Labor supply growth will be fueled by migration, the rising labor force participation rate of older workers and the procyclicality of labor force attachment (with people marginally attached to the labor force becoming job seekers in boom periods). Net migration will inch up slightly over the forecasting period, to slightly above 30,000 individuals in 2021. Another factor adding to the labor supply is a rise in the labor force participation rate by some 20,000 workers. Most of them are older employees, whose legal retirement eligibility age has gone up as a result of previous pension reforms. Excluding migration, demographic change will be negative across the forecasting horizon. This impact will be particularly pronounced in 2021, with a minus of more than 21,000 individuals.

<sup>8</sup> 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 migration) and a change in population including immigration (Statistics Austria – baseline forecast minus forecast excluding migration effects).

### Austria's labor market to be opened for workers from Croatia

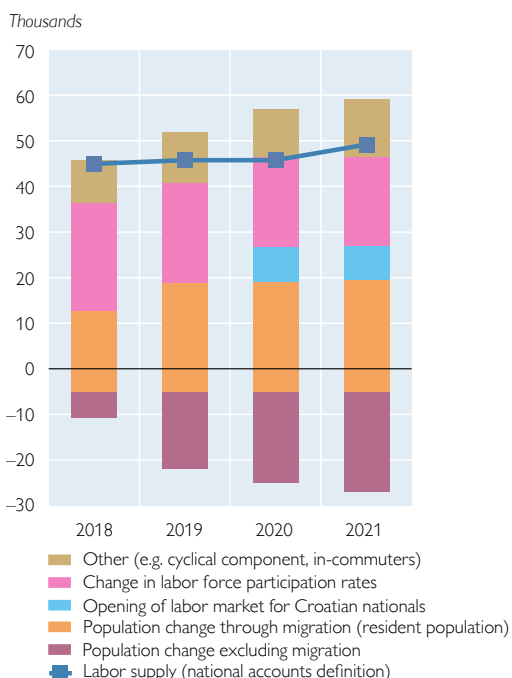
From July 2020 onward, workers from Croatia will have the same rights in Austria as domestic workers. Past experience would imply a sharp initial increase of labor migration from Croatia. When the Austrian labor market was opened up in 2011 for members of the EU's 2004 enlargement round and in 2014 for members of the 2007 enlargement round, the number of migrants from the respective countries taking up jobs Austria increased by about 50% and about 75% in the first two years following full labor market integration. At the time of writing, some 34,000<sup>9</sup> Croatian nationals were working in Austria according to (seasonally adjusted) social security statistics. This figure is expected to rise by 15,000 until the end of the forecasting horizon. This implies a smaller impact of full labor market integration than in the two previous instances, for two reasons. Germany opted to open its labor market to Croatian nationals as early as in 2015, and Croatia has seen a sharp drop in unemployment in recent years (from 17.6% in early 2014 to currently 7.4%).

Austria's unemployment rate (Eurostat definition) increased from 4.1% in 2008 to 6.0% in 2016. Given economic tailwinds, robust employment growth has since been driving down unemployment. In 2018, the unemployment rate dropped

Chart 3

### The structure of labor supply

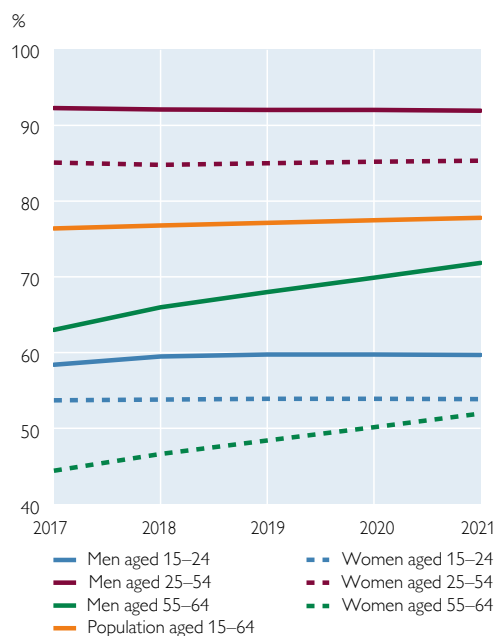
#### Labor supply growth



Source: OeNB, Statistics Austria.

<sup>1</sup> Resident population: Domestic households according to microcensus data, forecast extrapolated from trend labor force participation rates and Statistics Austria's November 2018 population forecast (adjusted for actual population figures for 2018). The projections for total population growth are based on the baseline scenario, whereas the projections for "population change excluding migration" are based on the "no migration" scenario. The data on labor supply used in the forecast (national accounts definition) may differ from the microcensus-based equivalent.

#### Labor force participation (resident population)<sup>1</sup>



<sup>9</sup> This figure is likely to be too high, as the social security figures do not adequately reflect naturalizations.



to 4.8%. Incoming data point toward a further tiny drop in 2019 (to 4.7%) and toward unchanged conditions (likewise 4.7%) in both 2020 and 2021.

## 6 Inflation to remain at 1.7% throughout the forecasting horizon

For 2019 as a whole, the OeNB projects the HICP inflation rate to stand at 1.7%, down 0.4 percentage points against 2018 (2.1%). The year-on-year deceleration of HICP inflation vis-à-vis 2018 is mainly due to a comparatively lower increase in energy prices. Inflation is forecast to remain stable at 1.7% also in 2020 and 2021. The core inflation rate is set to accelerate slightly from 1.8% in 2019 to 1.9% in 2020, and to remain unchanged at 1.9% in 2021. Core inflation, which will exceed HICP inflation throughout the forecasting horizon, is traceable, above all, to the sharp increase in unit labor costs. The latter are expected to rise further this year due to wage settlements already agreed. Additionally, on the demand side, continued strong growth in private consumption results in upward pressures on prices. Price increases in the services sector in particular will be higher in the forecasting period than before. At the same time, consumer demand is likely to keep the inflation rate for nonenergy industrial goods on an above-average level.<sup>10</sup>

Austria's inflation differential against both Germany and the euro area has narrowed notably since 2018. In April 2019, Austria's inflation rate of 1.7% was no less than 0.4 percentage points below Germany's HICP inflation rate and on a par with euro area inflation. From January 2018 to April 2019, Austria's average inflation differential against Germany amounted to 0.1 percentage point, while averaging 0.5 percentage points over the period from January 2010 to April 2019. The narrowing of Austria's inflation differential is attributable to all HICP special aggregates, but

Table 8

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

	2018	2019	2020	2021
<i>Annual change in %</i>				
Harmonised Index of Consumer Prices (HICP)	+2.1	+1.7	+1.7	+1.7
HICP energy	+5.3	+0.8	-0.5	-0.2
HICP excluding energy	+1.8	+1.8	+1.9	+1.9
Private consumption expenditure (PCE) deflator	+2.0	+1.8	+1.6	+1.6
Investment deflator	+2.2	+2.0	+1.6	+1.4
Import deflator	+2.2	+1.6	+1.9	+1.8
Export deflator	+1.5	+1.3	+2.0	+1.9
Terms of trade	-0.6	-0.4	+0.1	+0.1
GDP deflator at factor cost	+1.6	+1.5	+1.6	+1.4
Collective wage and salary settlements	+2.6	+2.9	+2.4	+2.2
Compensation per employee	+2.4	+2.7	+2.1	+1.8
Compensation per hour worked	+2.3	+2.9	+2.3	+1.9
Labor productivity per employee	+1.0	+0.2	+0.7	+0.7
Labor productivity per hour worked	+1.0	+0.4	+0.9	+0.9
Unit labor costs	+1.5	+2.5	+1.5	+1.1
Profit margins <sup>1</sup>	+0.1	-1.0	+0.2	+0.4

Source: 2018: WIFO, Statistics Austria; 2019 to 2021: OeNB June 2019 outlook.

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

<sup>10</sup> The inflation rate for nonenergy industrial goods is expected to come to 0.9% for the year 2019 as whole. In 2020, it is projected to climb to 1.1%, therefore remaining above the post-2013 average of 0.8%.

Table 9

**Compensation of employees**

	2018	2019	2020	2021
	<i>Annual change in %</i>			
<b>Gross wages and salaries<sup>1</sup></b>				
In nominal terms	+4.7	+4.4	+3.3	+2.9
Consumption deflator	+2.0	+1.8	+1.6	+1.6
In real terms	+2.6	+2.6	+1.7	+1.3
<b>Collectively agreed wages and salaries<sup>1</sup></b>	+2.6	+2.9	+2.4	+2.2
<b>Wage drift</b>	-0.1	-0.3	-0.2	-0.4
<b>Compensation per employee</b>				
Gross <sup>2</sup> compensation (nominal)	+2.4	+2.7	+2.1	+1.8
Gross compensation (real)	+0.4	+0.9	+0.5	+0.2
<b>Compensation per hour worked</b>				
Gross compensation (nominal)	+2.3	+2.9	+2.3	+1.9
Gross compensation (real)	+0.3	+1.1	+0.7	+0.3
	<i>% of nominal GDP</i>			
<b>Wage share</b>	47.6	48.2	48.3	48.1

Source: 2018: WIFO, Statistics Austria; 2019 to 2021: OeNB June 2019 outlook.

<sup>1</sup> Overall economy.

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

recently, the marked decline in the inflation rate of services has been the key driver. From 2019 to 2021, Austria's inflation differential against Germany and the euro area average is forecast to remain positive, as services prices are still rising at a comparatively faster pace in Austria, but it will be smaller than the longer-term average. The more pronounced labor shortage in Germany, leading to higher wage settlements in Germany than in Austria, will add to the inflation differential being comparatively smaller.

Collectively agreed wages will rise by 2.9% in 2019 (2018: 2.6%). This is the highest increase since 2013. Starting with the bargaining round in fall, when a pay rise of 3.5% was agreed upon in the metals industry, several sectors have seen high wage settlements.<sup>11</sup> Several factors have been at play: the recently favorable economic developments and productivity gains as well as high inflation, with the latter reflected in collectively agreed wages with a lag only. Slowing economic growth and lower inflation inform the projected moderate rise in nominal wage settlements for 2020 (2.4%) and 2021 (2.2%). With HICP inflation to run to 1.7% in 2019, real wage gains are expected to be considerably higher this year (some 1.2%). Wage settlements are also expected to be above the inflation rate in 2020 and 2021.

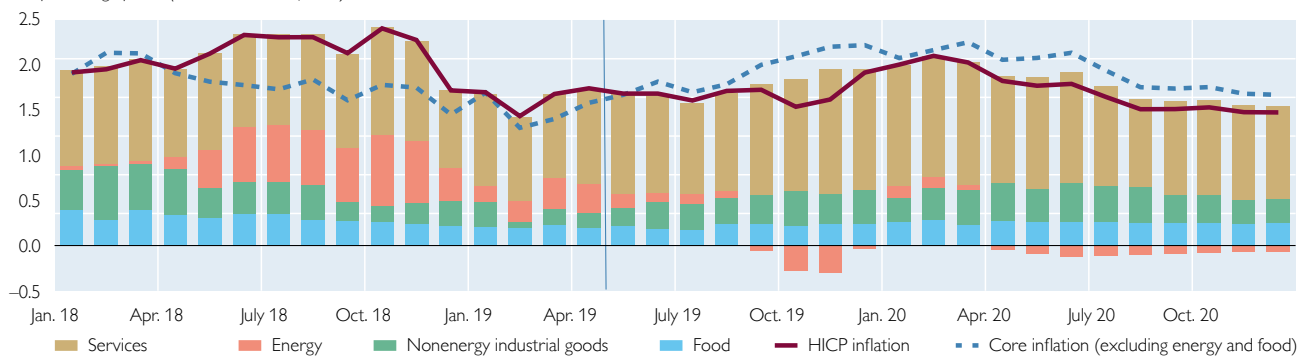
The wage drift – the difference between the increase in collectively agreed wages and the increase in actual wages – will be negative from 2019 to 2021. Since the boom in the industrial sector, which has led to an increase in the number of full-time jobs, is petering out, the share of part-time employees is expected to increase again. From a macroeconomic point of view, remuneration in excess of minimum wages will decline amid the expected downturn of the economy despite

<sup>11</sup> This is particularly true for the industrial sector (energy supply companies, refined petroleum industry and chemical industry: +3.4% each; lumber industry: +3.45%; construction industry: +3.35%). Markedly higher agreements were also reached in parts of the services sector compared with the previous year (employee leasing: +3.07%; wholesale and retail trade: from +2.5% to 3.2%; health care and social services: +3.2%; hospitality industry and public service sector: +2.76% each).

### Contributions to Austrian HICP inflation and core inflation

Annual change in % (inflation)

and percentage points (contributions to inflation)



Source: Statistics Austria, OeNB.

Note: Forecast: May 2019 to December 2020.

a projected labor shortage in some sectors. In total, real gross wages per capita are forecast to grow by 0.9% (2019), 0.5% (2020) and 0.2% (2021). The increase in actual hourly compensation will be slightly higher (2019: 1.1%, 2020: 0.7% and 2021: 0.3%). The wage share of GDP will remain more or less stable over the three-year forecasting horizon.

## 7 External forecast risks are on the downside, while domestic risks are on the upside

*External risks* to the growth outlook are clearly tilted toward the downside. The forecast is based on the following assumptions: the trade conflict between the U.S.A. and China/the EU will not intensify further, demand in Asia will stabilize again, and the conflict between the U.S.A. and Iran will not escalate. Moreover, the following assumptions apply to Europe: the growth-inhibiting one-off effects in Germany are only temporary, the uncertainty about the Italian government's economic policy stance will not trigger a conflict with the European Commission, there will not be a no-deal Brexit, and no unexpected, new geopolitical tensions will arise. If these assumptions do not hold, there will be a downward revision of the forecast.

Austrian exporters are projected to suffer market share losses in each of the three forecasting years. However, in case of the continued favorable development of competitiveness, this effect could be less pronounced than projected or it could even not occur at all. The market share losses are accompanied by an upward risk to the export forecast.

*Domestic risks*, in contrast, are in sum tilted toward the upside. Employment and therefore income are still growing, which is why the increase in private consumption could be even stronger than forecast. Additionally, a potential tax reform package that strengthens disposable household income poses a clear upward risk. A quicker contraction of the investment cycle than forecast poses a downward risk. Labor market risks are balanced. Despite a slowdown in economic growth, payroll increases over the past quarters have stood out positively; however, labor shortages might become a stronger factor. The opening of the labor market to Croatian nationals

constitutes an upward risk to the unemployment rate in case currently employed people are substituted.

Risks to *inflation* are neutral. Rising crude oil prices (due to an increase in international conflicts) represent an upward risk. Another upside risk stems from looming labor shortages, which might put pressure on the wage-setting process.

Box 3

### Scenarios: The effect of a prolonged economic slowdown in Germany on Austrian output growth

In economic forecasts, growth tends to be underestimated during upswings and overestimated during downturns.<sup>12</sup> This box highlights two scenarios that simulate the effects a prolonged economic slowdown in Germany may have on the Austrian economy.

Scenario 1 simulates a negative trade shock in the euro area. Here, the German economy is assumed to stagnate until the end of 2020. This is then assumed to lead to weaker GDP growth rates in France, Italy, Spain, the Netherlands and Belgium. According to this simulation, 86% of overall economic output in the euro area will be affected by this trade shock. The impact of weaker GDP growth on the individual countries' import growth is then calculated by applying country-specific foreign trade elasticities. Next, the OeNB's macroeconomic quarterly model is used to simulate the effects triggered by the declining demand for Austrian exports.

Building on scenario 1, scenario 2 additionally simulates a domestic negative confidence shock. Weaker longer-term economic prospects will lead to a more pessimistic assessment of companies' future earnings opportunities and will therefore dampen investment spending. For reasons of simplicity, an investment shock

Table

#### GDP growth: forecast and two scenarios

	Baseline	Scenario 1	Scenario 2
Annual change in real GDP in %			
2018	2.7	2.7	2.7
2019	1.5	1.5	1.3
2020	1.6	1.4	1.0
2021	1.6	1.4	1.4

Source: OeNB.

Chart 5

#### Simulation: effects of a prolonged period of weakness

Annual change in real GDP in %



Source: WIFO, OeNB.

Note:

Scenario 1: GDP growth stagnates in DE and slows in FR, IT, ES, NL, BE

Scenario 2: Scenario 1 + business investment in AT declines sharply (Q3 19 – Q2 20 like in 2014 + growth stutters until Q4 20)

<sup>12</sup> See e.g. Fenz, G., C. Ragacs, M. Schneider and K. Vondra. 2018. *The practitioner's corner: A decomposition of forecast errors for Austria*. 1st Vienna Workshop on Economic Forecasting, IHS.

similar in size to that seen in 2014 is used,<sup>13</sup> when investment declined due to increased uncertainty about the conflict between Russia and Ukraine.

Both scenario 1 and 2 result in negative effects, particularly on the GDP forecast for 2020. In mid-2019, full-year growth can be projected with a relatively high degree of certainty. Therefore, the negative effects on the Austrian economy will be reflected in comparatively weak growth from 2020 onward. Both simulation scenarios confirm these results. Even though the simulations disregard any other negative effects Germany's stagnation may have on the global economy and therefore underestimate the likely effects, both scenarios demonstrate that Austrian economic growth is sufficiently robust to avoid tipping into recession.

## 8 Major downward revision of the outlook for 2019 and 2020

The external environment has deteriorated distinctly since the December 2018 outlook. Global trade growth projections and, by extension, growth in demand for Austrian exports have weakened notably throughout the forecasting horizon and in 2019 in particular. The slowdown in the global economy and especially in global trade has mainly been driven by the intensifying trade conflict between the U.S.A. and China. Contrary to the expectations reflected in the December 2018 outlook, this conflict is now also assumed to adversely affect Austria via direct effects. Weaker import growth in the U.S.A. and China, combined with indirect effects

Table 10

### Change in external economic conditions since the December 2018 outlook

	June 2019			December 2018			Difference		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
<i>Annual change in %</i>									
Growth of Austria's export markets	+2.5	+3.1	+3.5	+4.2	+4.2	+3.8	-1.7	-1.1	-0.3
Competitor prices on Austria's export markets	+2.9	+2.2	+2.1	+2.9	+2.1	+2.0	+0.0	+0.1	+0.1
Competitor prices on Austria's import markets	+2.3	+1.9	+2.0	+2.3	+1.9	+2.0	+0.0	+0.0	+0.0
<i>USD per barrel (Brent)</i>									
Oil price	68.1	65.8	62.7	67.5	66.8	65.9	+0.6	-1.0	-3.2
<i>Annual change in %</i>									
Nominal effective exchange rate (exports)	+0.5	+0.0	+0.0	+0.1	+0.0	+0.0	+0.4	+0.0	+0.0
Nominal effective exchange rate (imports)	+0.3	+0.0	+0.0	+0.0	+0.0	+0.0	+0.3	+0.0	+0.0
<i>%</i>									
Three-month interest rate	-0.3	-0.3	-0.2	-0.3	0.0	0.3	+0.0	-0.3	-0.5
Long-term interest rate	0.3	0.4	0.6	0.9	1.1	1.3	-0.6	-0.7	-0.7
<i>Annual change in %</i>									
U.S. GDP (real)	+2.5	+2.0	+1.8	+2.5	+2.0	+1.8	+0.0	+0.0	+0.0
<i>USD/EUR</i>									
USD/EUR exchange rate	1.12	1.12	1.12	1.14	1.14	1.14	-0.02	-0.02	-0.02

Source: Eurosystem.

<sup>13</sup> Based on 2014, growth of gross fixed capital formation is assumed to weaken by 0.8 percentage points, relative to the baseline scenario, in the third and fourth quarters of 2019. As a result, investments in these two quarters will shrink marginally. In the first half of 2020, growth of gross fixed capital formation is assumed to stagnate, while, in the second half of 2020, its growth rates are initially projected to be half as high as those of the baseline scenario.

Table 11

**Breakdown of revisions to the outlook**

	GDP			HICP		
	2019	2020	2021	2019	2020	2021
	<i>Annual change in %</i>					
June 2019 outlook	+1.5	+1.6	+1.6	+1.7	+1.7	+1.7
December 2018 outlook	+2.0	+1.9	+1.7	+2.1	+2.0	+1.9
Difference	-0.5	-0.3	-0.1	-0.4	-0.3	-0.2
	<i>Percentage points</i>					
<b>Caused by:</b>						
External assumptions	-0.3	-0.4	+0.0	-0.1	-0.2	-0.1
New data <sup>1</sup>	-0.3	+0.0	+0.0	-0.1	x	x
of which: revisions to historical data up to Q3 18	+0.0	x	x	+0.0	x	x
forecast errors for Q4 18 and Q1 19	-0.3	+0.0	x	-0.1	+0.0	+0.0
Sonstiges <sup>2</sup>	+0.1	+0.1	-0.1	-0.2	-0.1	-0.1

Source: OeNB June 2019 and December 2018 outlooks. Note: Due to rounding, the sum of growth contributions subject to individual revisions may differ from the total revision.

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

<sup>2</sup> Different assumptions about trends in domestic variables such as wages, government consumption, effects of tax measures, other changes in assessments and model changes.

via their trade partners, is the reason for the downward revision of growth expectations for Austria's export markets. Austria's most important trading partner – Germany – is disproportionately affected by the trade conflict and faces additional problems in industrial production. Furthermore, the strong import growth in several CESEE countries likewise had to be revised downward. As a result, demand for Austrian exports is forecast to be weaker than expected in the December 2018 outlook (-1.7 percentage points in 2019, -1.1 percentage points in 2020 and -0.3 percentage points in 2021).

Nominal developments, such as those of interest rates, (effective) exchange rates and changes in crude oil prices, do not require a revision of a similar size. The current market expectation for crude oil prices for 2019 is USD 68.1 per barrel Brent, which is only USD 0.6 higher than forecast in December 2018. In 2020 and 2021, crude oil prices are projected to be USD 1.0 and USD 3.2 below the values presented in the previous outlook. The exchange rate of the euro against the U.S. dollar has remained nearly unchanged since the December 2018 outlook. Long-term interest rates have been revised downward for all three forecasting years; short-term interest rates for 2020 and 2021. Investment growth will slightly benefit from this in comparison to the December outlook.

In sum, the revised assumptions for 2019 and 2020 have led to downward revisions to both the outlook for GDP growth and for inflation.

Table 11 provides a detailed overview of the reasons for which revisions were made to the outlook. The revisions are attributable to the impact of changed external assumptions, the impact of newly available data and a residual. The influence of new data includes the effects of the revisions of both the historical data that were available at the time of the OeNB's December 2018 economic outlook (i.e. data up to the third quarter of 2018) and the forecasting errors for the periods for which data have now been published for the first time (i.e. data for the fourth quarter of 2018 and the first quarter of 2019). The residual includes new expert assessments of domestic indicators, such as government consumption or wage settlements, as well as any changes to the forecasting model.

Table 12

**Comparison of the OeNB June 2019 outlook and the December 2018 outlook**

	Actual figures	June 2019			Revision since December 2018 outlook		
	2018	2019	2020	2021	2019	2020	2021
<b>Economic activity</b>							
<i>Annual change in % (real)</i>							
Gross domestic product (GDP)	+2.7	+1.5	+1.6	+1.6	-0.5	-0.3	-0.1
Private consumption	+1.6	+1.6	+1.4	+1.3	-0.1	-0.2	+0.0
Government consumption	+0.5	+1.5	+1.2	+1.1	+0.0	+0.0	-0.2
Gross fixed capital formation	+3.5	+2.7	+1.9	+1.8	+0.1	-0.3	+0.1
Exports of goods and services	+4.2	+2.0	+2.8	+3.4	-1.8	-1.2	-0.3
Imports of goods and services	+3.0	+2.0	+2.6	+3.0	-1.6	-1.2	-0.4
<i>% of nominal GDP</i>							
Current account balance	+2.3	+2.2	+2.3	+2.6	-0.2	-0.3	-0.2
<b>Contribution to real GDP growth</b>							
<i>Percentage points</i>							
Private consumption	+0.8	+0.8	+0.7	+0.7	-0.1	-0.1	+0.0
Government consumption	+0.1	+0.3	+0.2	+0.2	+0.0	+0.0	+0.0
Gross fixed capital formation	+0.8	+0.6	+0.5	+0.4	+0.0	+0.0	+0.0
Domestic demand (excluding changes in inventories)	+1.7	+1.7	+1.4	+1.3	-0.1	-0.2	+0.0
Net exports	+0.8	+0.1	+0.3	+0.4	-0.2	+0.0	+0.1
Changes in inventories (including statistical discrepancy)	+0.1	-0.3	+0.0	+0.0	-0.2	+0.0	+0.0
<b>Prices</b>							
<i>Annual change in %</i>							
Harmonised Index of Consumer Prices (HICP)	+2.1	+1.7	+1.7	+1.7	-0.4	-0.3	-0.2
Private consumption expenditure (PCE) deflator	+2.0	+1.8	+1.6	+1.6	-0.2	-0.3	-0.2
GDP deflator	+1.6	+1.5	+1.6	+1.6	-0.5	-0.3	-0.1
Unit labor costs (whole economy)	+1.5	+2.5	+1.5	+1.1	+0.7	-0.1	-0.3
Compensation per employee (nominal)	+2.4	+2.7	+2.1	+1.8	+0.0	-0.4	-0.3
Compensation per hour worked (nominal)	+2.3	+2.9	+2.3	+1.9	+0.1	-0.3	-0.3
Import prices	+2.2	+1.6	+1.9	+1.8	-0.6	-0.2	-0.3
Export prices	+1.5	+1.3	+2.0	+1.9	-0.8	-0.1	-0.1
Terms of trade	-0.6	-0.4	+0.1	+0.1	-0.3	+0.1	+0.2
<b>Income and savings</b>							
<i>% of nominal disposable household income</i>							
Real disposable household income	+2.4	+2.2	+1.4	+0.9	+0.1	-0.2	-0.4
<i>% of nominal disposable household income</i>							
Saving ratio	7.4	7.6	7.4	7.2	+0.5	+0.3	+0.2
<b>Labor market</b>							
<i>Annual change in %</i>							
Payroll employment	+2.2	+1.6	+1.2	+1.1	+0.2	+0.1	+0.1
Hours worked (payroll employment)	+2.3	+1.4	+1.0	+0.9	+0.1	+0.0	+0.0
<i>% of labor supply</i>							
Unemployment rate (Eurostat definition)	4.8	4.7	4.7	4.7	+0.0	+0.0	+0.2
<b>Public finances</b>							
<i>% of nominal GDP</i>							
Budget balance (Maastricht definition)	+0.1	+0.3	+0.4	+0.5	+0.2	+0.0	+0.0
Government debt	73.8	70.7	68.0	65.3	0.0	0.5	0.5

Source: 2018 (actual figures): WIFO, Statistics Austria, OeNB; OeNB June 2019 and December 2018 outlooks.

For 2019, GDP growth has been revised downward by 0.5 percentage points. On the one hand, this is due to changes in external assumptions (0.3 percentage points), particularly the weaker growth in demand for Austrian exports. On the other hand, national accounts data newly published for the fourth quarter of 2018 and the first quarter of 2019 are lower than those in the December 2018 outlook.



The data patently show that exports have not been driving growth as strongly as expected. The revisions for 2020 and 2021 are primarily attributable to a change in the assessment of our trading partners' demand for Austrian exports. Overall, changes in external conditions lead to a downward revision to export, import, investment and consumer demand in 2019 and 2020. The overall effect on GDP growth is  $-0.3$  percentage points in 2019 and  $-0.4$  percentage points in 2020. Compared to the December 2018 outlook, only minimal negative effects are expected for 2021.

The projections for HICP inflation, like the GDP growth forecast, have also been revised downward compared to the OeNB's December 2018 outlook. The revision amounts to  $-0.4$  percentage points for 2019,  $-0.3$  percentage points for 2020 and  $-0.2$  percentage points for 2021. The main drivers of these changes are low food commodity prices, the overestimation of inflation in the services sector in the December 2018 outlook and the sluggishness of global real activity.

## Annex: detailed result tables

Table 13

## Demand components (real)

Chained volume data (reference year = 2010)

	2018	2019	2020	2021	2018	2019	2020	2021
	EUR million				Annual change in %			
Private consumption	169,952	172,719	175,122	177,397	+1.6	+1.6	+1.4	+1.3
Government consumption	64,499	65,464	66,251	66,956	+0.5	+1.5	+1.2	+1.1
Gross fixed capital formation	79,678	81,831	83,413	84,891	+3.5	+2.7	+1.9	+1.8
of which: investment in plant and equipment	28,588	29,184	29,651	30,218	+3.7	+2.1	+1.6	+1.9
residential construction investment	14,248	14,846	15,273	15,548	+3.2	+4.2	+2.9	+1.8
nonresidential construction investment and other investment	20,011	20,246	20,467	20,661	+2.9	+1.2	+1.1	+0.9
Changes in inventories (including statistical discrepancy)	7,385	6,245	6,177	6,156	x	x	x	x
Domestic demand	321,513	326,259	330,962	335,400	+1.9	+1.5	+1.4	+1.3
Exports of goods and services	196,330	200,261	205,962	212,949	+4.2	+2.0	+2.8	+3.4
Imports of goods and services	181,275	184,909	189,718	195,482	+3.0	+2.0	+2.6	+3.0
Net exports	15,055	15,351	16,245	17,467	x	x	x	x
<b>Gross domestic product</b>	<b>336,568</b>	<b>341,610</b>	<b>347,207</b>	<b>352,867</b>	<b>+2.7</b>	<b>+1.5</b>	<b>+1.6</b>	<b>+1.6</b>

Source: 2018: Eurostat; 2019 to 2021: OeNB June 2019 outlook.

Table 14

## Demand components (nominal)

	2018	2019	2020	2021	2018	2019	2020	2021
	EUR million				Annual change in %			
Private consumption	199,659	206,534	212,776	219,030	+3.6	+3.4	+3.0	+2.9
Government consumption	74,303	77,141	79,443	81,731	+2.8	+3.8	+3.0	+2.9
Gross fixed capital formation	92,243	96,591	99,997	103,194	+5.8	+4.7	+3.5	+3.2
Changes in inventories (including statistical discrepancy)	6,086	3,929	3,723	3,724	x	x	x	x
Domestic demand	372,291	384,195	395,939	407,679	+3.9	+3.2	+3.1	+3.0
Exports of goods and services	210,832	217,821	228,547	240,698	+5.8	+3.3	+4.9	+5.3
Imports of goods and services	196,504	203,740	213,104	223,476	+5.3	+3.7	+4.6	+4.9
Net exports	14,328	14,082	15,443	17,222	x	x	x	x
<b>Gross domestic product</b>	<b>386,619</b>	<b>398,277</b>	<b>411,383</b>	<b>424,901</b>	<b>+4.3</b>	<b>+3.0</b>	<b>+3.3</b>	<b>+3.3</b>

Source: 2018: Eurostat; 2019 to 2021: OeNB June 2019 outlook.

Table 15

## Demand components (deflators)

	2018	2019	2020	2021	2018	2019	2020	2021
	2010 = 100				Annual change in %			
Private consumption	117.5	119.6	121.5	123.5	+2.0	+1.8	+1.6	+1.6
Government consumption	115.2	117.8	119.9	122.1	+2.2	+2.3	+1.8	+1.8
Gross fixed capital formation	115.8	118.0	119.9	121.6	+2.2	+2.0	+1.6	+1.4
Domestic demand (excluding changes in inventories)	116.6	118.8	120.8	122.7	+2.1	+1.9	+1.6	+1.6
Exports of goods and services	107.4	108.8	111.0	113.0	+1.5	+1.3	+2.0	+1.9
Imports of goods and services	108.4	110.2	112.3	114.3	+2.2	+1.6	+1.9	+1.8
Terms of trade	99.1	98.7	98.8	98.9	-0.6	-0.4	+0.1	+0.1
<b>Gross domestic product</b>	<b>114.9</b>	<b>116.6</b>	<b>118.5</b>	<b>120.4</b>	<b>+1.6</b>	<b>+1.5</b>	<b>+1.6</b>	<b>+1.6</b>

Source: 2018: Eurostat; 2019 to 2021: OeNB June 2019 outlook.

Table 16

**Labor market**

	2018	2019	2020	2021	2018	2019	2020	2021
	<i>Thousands</i>				<i>Annual change in %</i>			
Total employment	4,490.0	4,549.4	4,593.1	4,633.7	+1.7	+1.3	+1.0	+0.9
of which: private sector	3,745.0	3,800.9	3,842.1	3,882.0	+2.0	+1.5	+1.1	+1.0
Payroll employment (national accounts definition)	3,945.8	4,010.8	4,057.7	4,100.4	+2.2	+1.6	+1.2	+1.1
	<i>% of labor supply</i>							
Unemployment rate (Eurostat definition)	4.8	4.7	4.7	4.7	x	x	x	x
	<i>EUR per real unit of output x 100</i>							
Unit labor costs (whole economy) <sup>1</sup>	62.2	63.8	64.7	65.4	+1.5	+2.5	+1.5	+1.1
	<i>EUR thousand per employee</i>							
Labor productivity (whole economy) <sup>2</sup>	75.0	75.1	75.6	76.2	+1.0	+0.2	+0.7	+0.7
	<i>EUR thousand</i>							
Compensation per employee (real) <sup>3</sup>	39.7	40.0	40.3	40.3	+0.4	+0.9	+0.5	+0.2
	<i>At current prices in EUR thousand</i>							
Compensation per employee (gross)	46.6	47.9	48.9	49.8	+2.4	+2.7	+2.1	+1.8
	<i>At current prices in EUR million</i>							
Total compensation of employees (gross)	184,018	192,063	198,460	204,202	+4.7	+4.4	+3.3	+2.9

Source: 2018: Eurostat; 2019 to 2021: OeNB June 2019 outlook.

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

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

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

Table 17

**Current account balance**

	2018	2019	2020	2021	2018	2019	2020	2021
	<i>EUR million</i>				<i>% of nominal GDP</i>			
<b>Balance of trade</b>	14,788.0	14,555.3	15,931.1	17,723.5	3.8	3.7	3.9	4.2
Balance of goods	4,488.0	2,897.1	3,733.8	4,820.6	1.2	0.7	0.9	1.1
Balance of services	10,300.0	11,658.2	12,197.3	12,902.9	2.7	2.9	3.0	3.0
<b>Balance of primary income</b>	-2,037.0	-1,902.0	-2,000.0	-2,000.0	-0.5	-0.5	-0.5	-0.5
<b>Balance of secondary income</b>	-3,762.0	-4,080.0	-4,400.0	-4,800.0	-1.0	-1.0	-1.1	-1.1
<b>Current account balance</b>	8,989.0	8,573.3	9,531.1	10,923.5	2.3	2.2	2.3	2.6

Source: 2018: Eurostat; 2019 to 2021: OeNB June 2019 outlook.

Table 18

## Quarterly outlook results

	2019	2020	2021	2019				2020				2021			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>Prices, wages, costs</b>															
<i>Annual change in %</i>															
HICP	+1.7	+1.7	+1.7	+1.6	+1.7	+1.7	+1.7	+2.0	+1.8	+1.6	+1.5	+1.6	+1.7	+1.8	+1.7
HICP excluding energy	+1.8	+1.9	+1.9	+1.5	+1.7	+1.8	+2.2	+2.2	+2.1	+1.8	+1.7	+1.8	+1.9	+2.0	+1.8
Private consumption expenditure deflator	+1.8	+1.6	+1.6	+2.0	+1.9	+1.7	+1.6	+1.6	+1.6	+1.7	+1.7	+1.6	+1.6	+1.6	+1.6
Gross fixed capital formation deflator	+2.0	+1.6	+1.4	+2.2	+2.0	+1.9	+1.7	+1.6	+1.6	+1.6	+1.5	+1.5	+1.4	+1.4	+1.3
GDP deflator	+1.5	+1.6	+1.6	+1.6	+1.5	+1.4	+1.4	+1.5	+1.5	+1.7	+1.8	+1.7	+1.7	+1.6	+1.5
Unit labor costs	+2.5	+1.5	+1.1	+2.3	+2.7	+2.7	+2.3	+1.9	+1.4	+1.3	+1.3	+1.2	+1.1	+1.0	+0.9
Compensation per employee (nominal)	+2.7	+2.1	+1.8	+2.5	+2.8	+2.7	+2.7	+2.4	+2.1	+2.0	+2.0	+2.0	+1.9	+1.8	+1.6
Productivity	+0.2	+0.7	+0.7	+0.2	+0.1	+0.0	+0.4	+0.6	+0.7	+0.7	+0.7	+0.8	+0.8	+0.7	+0.7
Compensation per employee (real)	+0.9	+0.5	+0.2	+0.5	+0.9	+1.0	+1.1	+0.9	+0.5	+0.4	+0.3	+0.4	+0.3	+0.1	+0.0
Import deflator	+1.6	+1.9	+1.8	+1.6	+1.5	+1.5	+1.9	+2.2	+2.0	+1.9	+1.7	+1.7	+1.8	+1.8	+1.8
Export deflator	+1.3	+2.0	+1.9	+1.1	+1.2	+1.2	+1.6	+2.2	+2.0	+2.0	+2.0	+1.9	+1.9	+1.8	+1.8
Terms of trade	-0.4	+0.1	+0.1	-0.6	-0.3	-0.3	-0.3	+0.0	+0.0	+0.1	+0.2	+0.2	+0.1	+0.1	+0.0
<b>Economic activity</b>															
<i>Annual and/or quarterly changes in % (real)</i>															
GDP	+1.5	+1.6	+1.6	+0.3	+0.3	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4
Private consumption	+1.6	+1.4	+1.3	+0.4	+0.5	+0.5	+0.4	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3	+0.4
Government consumption	+1.5	+1.2	+1.1	+0.4	+0.3	+0.2	+0.3	+0.3	+0.3	+0.3	+0.3	+0.2	+0.3	+0.3	+0.3
Gross fixed capital formation	+2.7	+1.9	+1.8	+0.6	+0.6	+0.6	+0.5	+0.4	+0.4	+0.5	+0.4	+0.4	+0.4	+0.4	+0.4
Exports	+2.0	+2.8	+3.4	+0.4	+0.2	+0.4	+0.7	+0.8	+0.9	+0.9	+0.8	+0.8	+0.9	+0.9	+0.8
Imports	+2.0	+2.6	+3.0	+0.4	+0.4	+0.5	+0.6	+0.7	+0.7	+0.7	+0.8	+0.7	+0.8	+0.8	+0.8
<i>Contribution to real GDP growth in percentage points</i>															
Domestic demand	+1.7	+1.4	+1.3	+0.4	+0.5	+0.4	+0.4	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3
Net exports	+0.1	+0.3	+0.4	+0.0	-0.1	+0.0	+0.0	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1
Changes in inventories	-0.3	+0.0	+0.0	-0.2	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0
<b>Labor market</b>															
<i>% of labor supply</i>															
Unemployment rate (Eurostat definition)	4.7	4.7	4.7	4.8	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
<i>Annual and/or quarterly changes in %</i>															
Total employment	+1.3	+1.0	+0.9	+0.3	+0.3	+0.2	+0.2	+0.3	+0.2	+0.2	+0.2	+0.2	+0.2	+0.3	+0.3
of which: private sector	+1.5	+1.1	+1.0	+0.3	+0.3	+0.2	+0.2	+0.3	+0.3	+0.2	+0.2	+0.2	+0.3	+0.3	+0.3
Payroll employment	+1.6	+1.2	+1.1	+0.4	+0.4	+0.3	+0.3	+0.3	+0.3	+0.2	+0.2	+0.3	+0.3	+0.3	+0.3
<b>Additional variables</b>															
<i>Annual and/or quarterly changes in % (real)</i>															
Disposable household income	+2.2	+1.4	+0.9	+0.9	+0.8	+0.3	+0.4	+0.3	+0.3	+0.3	+0.3	+0.2	+0.2	+0.2	+0.3
<i>% of real GDP</i>															
Output-Gap	0.5	0.4	0.3	0.7	0.6	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.2

Source: OeNB June 2019 outlook. Quarterly values based on seasonally and working day-adjusted data.

**Comparison of current economic forecasts for Austria**

	OeNB			WIFO		IHS		OECD		IMF		European Commission	
	June 2019			March 2019		March 2019		May 2019		April 2019		May 2019	
	2019	2020	2021	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020
<i>Annual change in %</i>													
<b>Main results</b>													
GDP (real)	+1.5	+1.6	+1.6	+1.7	+1.8	+1.5	+1.6	+1.4	+1.6	+2.0	+1.7	+1.5	+1.6
Private consumption (real)	+1.6	+1.4	+1.3	+1.7	+1.7	+1.6	+1.4	+1.8	+1.7	x	x	+1.6	+1.6
Government consumption (real)	+1.5	+1.2	+1.1	+0.7	+0.5	+0.8	+0.8	+0.9	+0.5	x	x	+0.9	+0.7
Gross fixed capital formation (real)	+2.7	+1.9	+1.8	+2.3	+1.8	+1.9	+1.6	+2.4	+1.7	x	x	+2.0	+1.6
Exports (real)	+2.0	+2.8	+3.4	+3.1	+3.6	+2.4	+3.2	+2.3	+2.6	+2.7	+2.6	+2.8	+3.2
Imports (real)	+2.0	+2.6	+3.0	+2.5	+3.0	+2.4	+3.0	+1.9	+2.5	+2.3	+2.4	+2.9	+2.8
GDP per employee <sup>1</sup>	+0.2	+0.7	+0.7	+0.5	+0.6	+0.2	+0.7	+0.2	+0.7	x	x	+0.5	+1.1
GDP deflator	+1.5	+1.6	+1.6	+2.0	+1.9	+2.0	+1.9	+2.0	+1.9	+1.7	+2.0	+2.0	+1.9
CPI	x	x	x	+1.7	+1.8	+1.8	+1.9	x	x	x	x	x	x
HICP	+1.7	+1.7	+1.7	+1.6	+1.7	+1.8	+1.9	+1.9	+2.0	+1.8	+2.0	+1.8	+1.9
Unit labor costs	+2.5	+1.5	+1.1	+2.1	+1.6	+2.4	+1.6	x	x	x	x	+2.1	+1.4
Payroll employment	+1.6	+1.2	+1.1	+1.6	+1.1	+1.3	+0.9	+1.2	+0.8	+0.7	+1.1	+1.0	+0.5
<i>% of labor supply</i>													
Unemployment rate (Eurostat definition)	4.7	4.7	4.7	4.6	4.6	4.8	4.8	4.6	4.6	5.1	5.0	4.7	4.7
<i>% of nominal GDP</i>													
Current account balance	2.2	2.3	2.6	1.9	1.8	x	x	2.4	2.4	2.0	1.9	2.4	2.6
Budget balance (Maastricht definition)	0.3	0.4	0.5	0.4	0.7	0.2	0.2	0.3	0.2	-0.1	-0.3	0.3	0.2
<b>External assumptions</b>													
Oil price in USD/barrel (Brent)	68.1	65.8	62.7	74.0	75.0	74.0	77.0	68.4	70.0	59.2	59.0	69.2	67.8
Short-term interest rate in %	-0.3	-0.3	-0.2	-0.3	-0.2	-0.3	0.0	-0.3	-0.3	-0.3	-0.2	-0.3	-0.3
USD/EUR exchange rate	1.12	1.12	1.12	1.15	1.16	1.14	1.14	1.12	1.12	1.14	1.16	1.13	1.13
<i>Annual change in %</i>													
Euro area GDP (real)	+1.2	+1.4	+1.4	+1.4	+1.7	+1.3	+1.6	+1.2	+1.4	+1.3	+1.5	+1.2	+1.5
U.S. GDP (real)	+2.5	+2.0	+1.8	+2.5	+1.7	+2.4	+1.8	+2.8	+2.3	+2.3	+1.9	+2.4	+1.9
World GDP (real)	+3.1	+3.4	+3.3	x	x	+3.2	+3.3	+3.2	+3.4	+3.3	+3.6	+3.2	+3.5
World trade	+1.4	+3.1	+3.4	x	x	+2.5	+3.0	+2.1	+3.1	+3.4	+3.9	+2.9	+3.3

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

<sup>1</sup> WIFO: GDP per hour worked.