



OESTERREICHISCHE NATIONALBANK

EUROSYSTEM

# FOCUS ON EUROPEAN ECONOMIC INTEGRATION

Q4/16

Stability and Security.

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

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

**Editors in chief** Doris Ritzberger-Grünwald, Helene Schubert

**General coordinator** Peter Backé

**Scientific coordinators** Markus Eller, Martin Feldkircher

**Editing** Ruth Day, Dagmar Dichtl, Jennifer Gredler

**Layout and typesetting** Sylvia Dalcher, Walter Grosser

**Design** Information Management and Services Division

**Printing and production** Oesterreichische Nationalbank, 1090 Vienna

DVR 0031577

ISSN 2310-5291 (online)

© Oesterreichische Nationalbank, 2016. 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: Visiting Research Program	4
---	---

## Recent economic developments and outlook

Developments in selected CESEE countries: Temporarily sluggish investment dampens CESEE growth whereas domestic demand continues to thrive	6
Box 1: Western Balkans: domestic demand is key to economic growth	17
Box 2: Ukraine: weak recovery after deep recession, further IMF tranche disbursed	40

*Compiled by Josef Schreiner*

Outlook for selected CESEE countries: Steady growth in CESEE-6 after temporary dip in early 2016 – trough reached in Russia	41
---	----

*Compiled by Antje Hildebrandt*

## Studies

On the optimal number of indicators – nowcasting GDP growth in CESEE	54
<i>David Havrlant, Peter Tóth, Julia Wörz</i>	
Currency substitution in CESEE: why do households prefer euro payments?	73
<i>Thomas Scheiber, Caroline Stern</i>	
CESEE-related abstracts from other OeNB publications	99

## Event wrap-ups and miscellaneous

The OeNB's 79 <sup>th</sup> East Jour Fixe: Capital Flows to CESEE – Impact on Macro-Financial Stability and Policy Responses	102
<i>Compiled by Stephan Barisitz, Markus Eller and Mathias Lahnsteiner</i>	

Statistical annex	108
-------------------	-----

*Compiled by Angelika Knollmayer*

## Notes

Periodical publications	116
Addresses	118

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

As from 2016, Focus on European Economic Integration is available online only at:  
<http://www.oenb.at/en/Publications/Economics/Focus-on-European-Economic-Integration.html>

To get updated on latest releases, please register at:  
<https://www.oenb.at/en/Services/Newsletter.html>

## Call for applications: Visiting Research Program

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

The OeNB offers a stimulating and professional research environment in close proximity to the policymaking process. Visiting researchers are expected to collaborate with the OeNB's research staff on a prespecified topic and to participate actively in the department's internal seminars and other research activities. They will be provided with accommodation on demand and will, as a rule, have access to the department's computer resources. Their research output may be published in one of the department's publication outlets or as an OeNB Working Paper. Research visits should ideally last between three and six months, but timing is flexible.

Applications (in English) should include

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

Applications for 2017 should be e-mailed to [eva.gehringer-wasserbauer@oenb.at](mailto:eva.gehringer-wasserbauer@oenb.at) by May 1, 2017.

Applicants will be notified of the jury's decision by mid-June. The following round of applications will close on November 1, 2017.

# Recent economic developments and outlook

# Developments in selected CESEE countries:

Temporarily sluggish investment dampens CESEE growth whereas domestic demand continues to thrive<sup>1,2</sup>

## 1 Regional overview

International environment remains challenging

The international environment for CESEE countries continued to pose challenges in the review period: Global growth lagged behind the buoyant pace of previous years, reflecting rebalancing in China, investment downscaling in commodity-exporting countries, exceptionally low world trade growth, and more moderate economic dynamics in several advanced economies. The expansion in the euro area – the CESEE region’s most important trading partner – decelerated notably from the first to the second quarter of 2016 and is projected to remain somewhat subdued throughout 2016.

Moreover, uncertainties continued to be high in the period. The U.K.’s vote to leave the EU in June had the most striking impact, with the implications and possible consequences of Brexit only just beginning to unfold. The potential risks for CESEE are manifold: Brexit is likely to have a negative impact on exports from the CESEE region, as several countries maintain close trade relations with the U.K. (e.g. the Czech Republic, Hungary, Poland and Slovakia). Furthermore, Brexit has already led to a moderate downward revision of growth forecasts for the euro area for the year 2017. Negative effects might also stem from stricter labor market regulations for foreigners working in the U.K. Especially Bulgaria, Poland and Romania have large shares of migrant workers in the U.K. Brexit will end inflows from one of the biggest net contributors to the EU budget and could potentially also impair EU fund flows to CESEE.

Increased global economic uncertainty put further downward pressure on global interest rates, as monetary policy is now expected to remain accommodative for longer than originally anticipated. The shift in expectations was particularly notable in the U.K., but U.S. rate hikes are now expected to be postponed as well. The ECB remained committed to monthly asset purchases and kept its policy rate at 0%. But monetary accommodation has so far failed to drive up inflation rates substantially. A range of additional factors contributed further to uncertainty: an increasingly fraying consensus about the benefits of cross-border economic integration, the war in Syria and the related refugee situation, and multiple acts of terrorism.

Growth moderates especially in the first quarter of 2016

Growth in the EU Member States in the country sample experienced a temporary setback especially in the first quarter of 2016. Gross fixed capital formation (GFCF) suffered from the end of the EU’s 2007–2013 programming period under the multiannual financial framework for the disbursement of EU funds (funds could be drawn until the end of 2015). Economic output accelerated again in the second quarter of 2016, however, bringing average growth back to a robust 1%

<sup>1</sup> Compiled by Josef Schreiner with input from Stephan Barisitz, Elisabeth Beckmann, Sebastian Beer, Mariya Hake, Antje Hildebrandt, Mathias Lahnsteiner, Thomas Reiningner, Caroline Stern and Zoltan Walko.

<sup>2</sup> Cutoff date: October 7, 2016. This report focuses primarily on data releases and developments from April 2016 up to the cutoff date and covers Slovakia, Slovenia, Bulgaria, Croatia, the Czech Republic, Hungary, Poland and Romania, as well as Turkey and Russia. The countries are ranked according to their level of EU integration (euro area member states, EU Member States, EU candidate countries and non-EU countries). For statistical information on selected economic indicators for CESEE countries not covered in this section (Albania, Bosnia and Herzegovina, Kosovo, FYR Macedonia, Montenegro, Serbia and Ukraine), see the statistical annex in this issue.

quarter-on-quarter rate, up from only 0.3% in the first quarter of 2016. This pattern was especially pronounced in Hungary, Poland and the Czech Republic, whereas GDP dynamics remained more stable in the other countries of the region. Growth was especially vigorous in Romania and fell substantially short of the regional average only in Slovenia and Croatia. Even in these countries, however, the economy expanded by a solid 0.5% (quarter on quarter). In Croatia, this rate represents a stable recovery from the recession that ended in 2015.

Russia reported some improvement in economic conditions, as the contraction of GDP slowed down markedly in the review period both in quarter-on-quarter and year-on-year terms. Hence, the recession is bottoming out.

By contrast, growth decelerated markedly in Turkey in the second quarter of 2016 (quarter on quarter and seasonally adjusted), as political uncertainties impacted negatively on capital formation and the tourism sector. Additionally, bilateral economic sanctions between Turkey and Russia reduced trade between the two countries in the first half of 2016.

Table 1

### Real GDP growth

	2014	2015	Q1 15	Q2 15	Q3 15	Q4 15	Q1 16	Q2 16
<i>Period-on-period change in %</i>								
Slovakia	2.5	3.6	1.0	0.9	1.0	1.0	0.8	0.9
Slovenia	3.1	2.3	0.5	0.6	0.3	0.6	0.5	0.5
Bulgaria	1.3	3.6	1.1	0.8	0.9	0.9	0.8	0.9
Croatia	-0.4	1.6	0.2	0.9	1.4	-0.5	0.5	0.5
Czech Republic	2.7	4.5	1.4	1.3	1.0	0.3	0.4	0.9
Hungary	3.7	2.9	1.4	0.1	0.4	0.9	-0.5	1.0
Poland	3.3	3.6	1.4	0.4	0.8	1.3	-0.1	0.9
Romania	3.0	3.8	1.2	-0.1	1.6	1.2	1.5	1.5
Turkey	3.0	4.0	1.3	1.3	1.3	0.7	0.8	0.2
Russia	0.7	-3.7	-1.2	-1.3	-0.6	-0.6	-0.2	-0.2
CESEE average <sup>1</sup>	1.9	0.2	0.1	-0.2	0.3	0.2	0.2	0.3
Euro area	0.9	1.7	0.6	0.4	0.3	0.4	0.5	0.3

Source: Eurostat, national statistical offices.

<sup>1</sup> Average weighted with GDP at PPP.

The strong development of domestic demand, the most important component of GDP growth in all countries under observation besides Russia, continued to support the economies of the region. Private consumption displayed an especially remarkable momentum.

Domestic demand benefited from two factors in particular: improving labor market conditions and rising real wages. Unemployment rates have been falling consistently since early 2013 in most CESEE countries, substantially so in some. For example, Hungary's unemployment rate in seasonally adjusted terms declined from a peak value of 11.4% in February 2012 to 5.1% in August 2016, the lowest rate since recording started in 1996. The decrease was also considerable in Bulgaria, Poland and Slovakia. The Czech Republic chalked up an unemployment rate of 3.9% in August 2016, the lowest rate in the EU. At the same time, unemployment also declined among the most vulnerable age cohorts, namely young persons (below 25 years) and older persons (above 50 years). Long-term unem-

Domestic demand reasserts its position as the most important driver of growth

ployment generally remained elevated, but some favorable trends could also be observed (e.g. in the Czech Republic, Slovakia, Bulgaria, Croatia and Poland). Employment expanded noticeably in all countries but Romania, making the first half of 2016 a generally very successful period for the labor market.

In some countries, however, those positive developments have led to signs of overheating. One important signal is wage growth: Nominal wages rose powerfully in the review period, averaging around 4.5% growth in the first half of 2016. Romania even reported double-digit wage increases (also caused by a hike in the minimum wage). This development has already caused competitiveness in several countries to deteriorate somewhat, as will be explained below.

Real wage growth was further boosted by low or negative inflation rates, especially in Central and Southeastern Europe (see also the description of inflation rates below). All of the above developments supported consumer spending but also had a positive impact on consumer sentiment, which in September 2016 reached the highest level since late 2007.

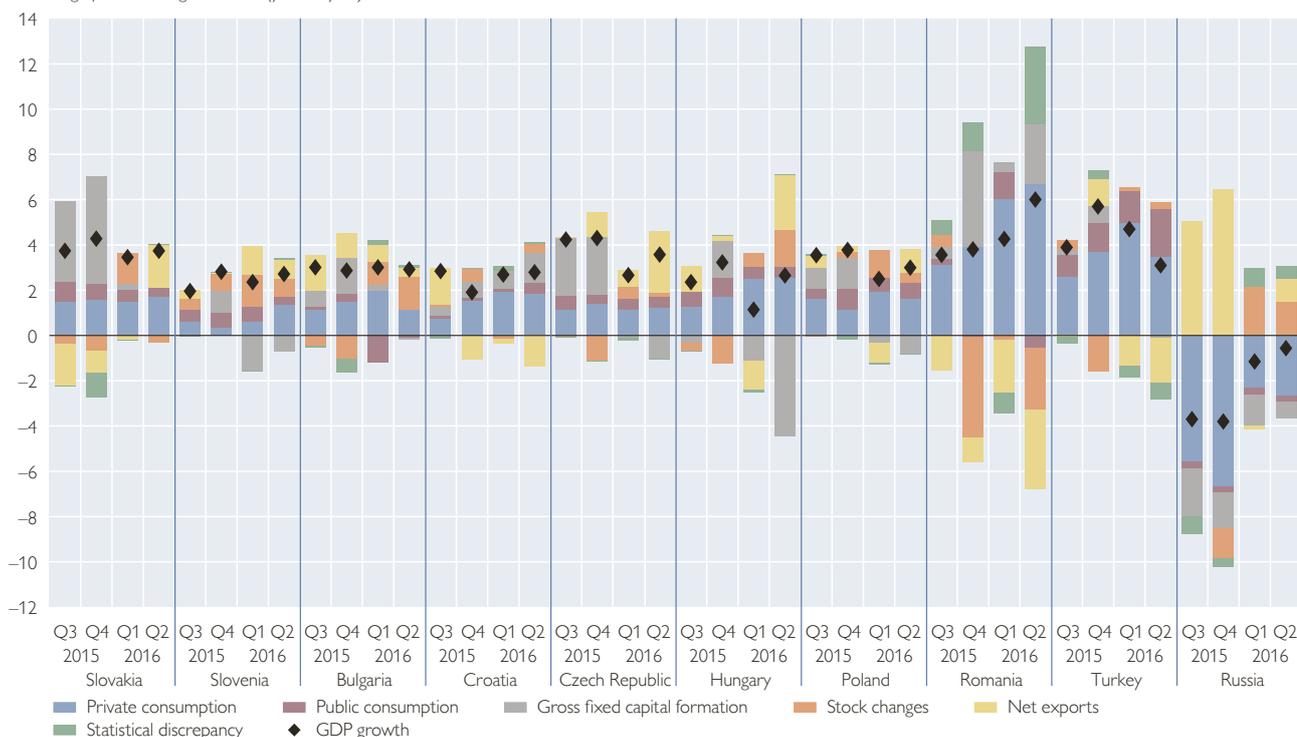
While consumption growth continued its dynamic trend of previous quarters, capital formation experienced a noticeable setback, especially in the EU Member States of the sample. Investment growth decelerated from an average 8.7% in the final quarter of 2015 to -1.2% in the first quarter of 2016 and to -2.6% in the second quarter of 2016. This drop was related to the end of the last year of overlapping programming periods for the disbursement of EU funds from the

Investment experiences a noticeable setback

Chart 1

### GDP growth and its main components

Percentage points, GDP growth in % (year on year)



Source: Eurostat, national statistical offices.

2007–2013 and the 2014–2020 financial frameworks. Public investment and investment in construction were particularly affected, but investment in machinery was also weaker in most countries.

In Turkey, investment growth weakened, too, and turned negative (year on year) in the second quarter of 2016. Capital formation has been softening for several quarters already. The recent decline, however, might well be linked to mounting political uncertainty and security risks in the country. By contrast, the contraction of investment in Russia moderated in the review period.

The external sector's contribution to growth developed somewhat unevenly in CESEE. Net exports exerted a notable drag on growth especially in Romania and Turkey. In both countries, imports increased more strongly than exports against the background of brisk consumption. In Turkey, exports also suffered from the ongoing economic downturn in major trading partner countries (e.g. Iraq), economic sanctions imposed by Russia as from January 2016, and a weak tourist season. A moderately negative growth contribution of net exports was also reported for Croatia, where both import and export growth decelerated somewhat from exceptionally high rates seen in 2015. In Russia, the contribution of net exports to growth declined to close to zero as exports dipped into the red, triggered by the renewed fall in the oil price at the beginning of the year. Conversely, the contraction of imports moderated, given the incipient recovery of the economy.

Yet in the other countries of the region, improving net exports absorbed some of the negative impact of weakening investment on GDP growth. Export growth picked up somewhat in Slovenia and Poland but lost some steam in Slovakia, the Czech Republic, Bulgaria and Hungary. However, the strong deterioration of investment activity caused import growth to decelerate even more than export growth.

Net exports absorb some of the negative impact weakening investment has on GDP

The weakening export dynamics observed in many countries of the region reflected somewhat softer demand from the euro area but may also be related to a rather broad-based deterioration of competitiveness. Unit labor costs (ULCs) in manufacturing (measured in euro) increased more strongly than in the euro area in all countries but Slovenia, Poland and Russia. While Slovenia benefited from a favorable development of productivity, competitiveness in Poland and Russia was bolstered most by exchange rate depreciation. The same is true for Turkey, where a weakening lira counteracted a pronounced rise in nominal labor costs (+19.2% in the first half of 2016), bringing ULC growth in line with that in the euro area. In the other countries, competitiveness deteriorated amid rising labor cost pressure and weak or in some cases even declining productivity. This development was strongest in Bulgaria and Romania.

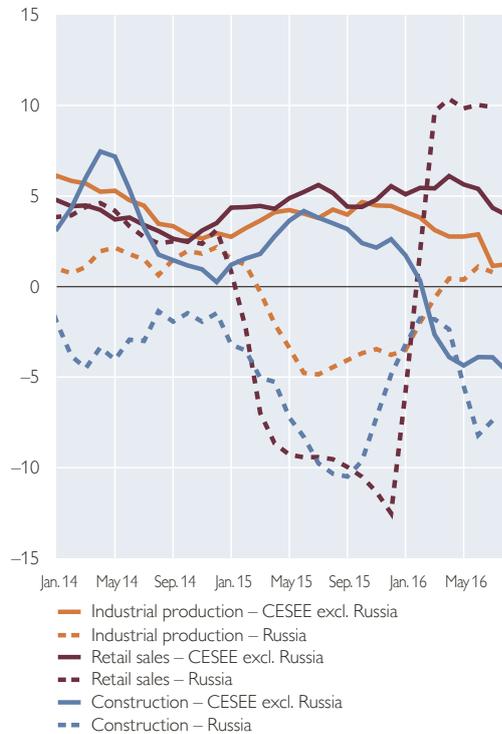
High-frequency activity indicators subsided in the review period in all countries but Russia. Above all, construction output started to contract at the beginning of the year, mirroring the development of capital formation against the background of lower EU fund disbursements. In August 2016, construction output declined by 4.7% in the region on average. Furthermore, the growth of industrial production decelerated notably, coming down from 4.1% at the beginning of the year to 1.2% in August 2016. Retail sales held up comparatively well and expanded by an average of 3.9% in August 2016. This figure, however, is also notably below the peak retail sales value of +6.1% in April.

High-frequency and sentiment indicators soften somewhat

**Leading indicators**

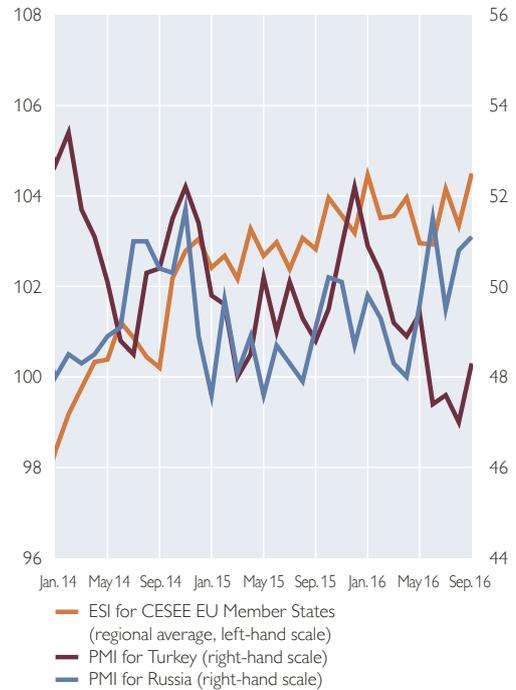
**Activity indicators (CESEE regional average)**

Year-on-year change in %, three-month moving averages



**Sentiment indicators**

Points



Source: Eurostat, wiw, European Commission, Markit.

As already mentioned, Russia marks the only exception to this general picture. Activity indicators clearly confirm that the recession in Russia has bottomed out. The growth of industrial production turned marginally positive, and retail sales even skyrocketed (+9.9% year on year in July 2016). Only construction did not manage a turnaround; it continued to contract substantially in the review period (-7.4% year on year in July).

Economic sentiment generally developed more favorably than activity indicators. The European Commission's Economic Sentiment Indicator (ESI) stood at levels substantially above its long-term average throughout the review period (average for the CESEE EU Member States). In September 2016, it even reached a peak of above 104 points, the highest level since mid-2008. The Purchasing Managers' Index (PMI) for Russia corroborates the improving state of the Russian economy, as it increased to above 50 points (the threshold indicating an expansion) in the review period. The PMI for Turkey, though, deteriorated markedly against the background of mounting political risks.

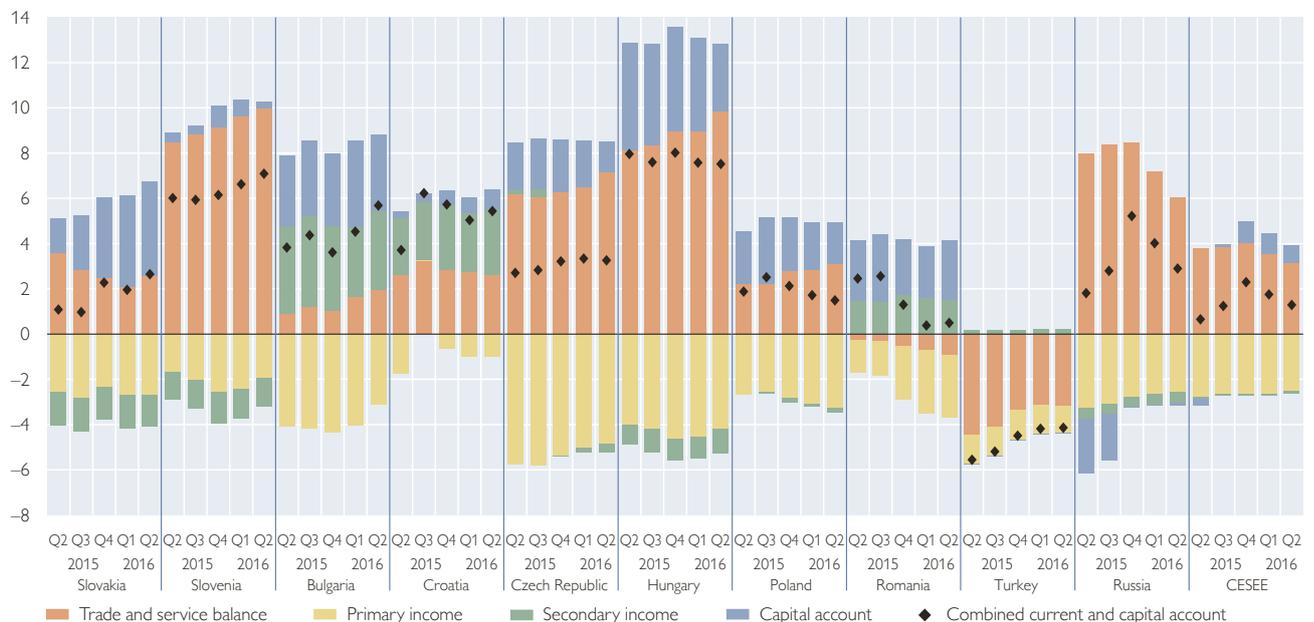
The combined current and capital account balance for the region as a whole deteriorated somewhat in the review period, decreasing from a surplus of 2.3% of GDP in the fourth quarter of 2015 to 1.3% of GDP in second quarter of 2016 (four-quarter moving sums). This development was mainly driven by a lower surplus in the trade and service balance, while the other components of the current account remained broadly unchanged.

CESEE's current account surplus declines moderately

Chart 3

### Combined current and capital account balance

% of GDP, four-quarter moving sum



Source: Eurostat, IMF, national central banks.

At the country level, it was especially Russia that influenced the development of the regional aggregate. In particular, the Russian surplus in the trade and service balance weakened in line with the low oil price and the slower contraction of domestic demand. A more notable improvement in the external position was reported for Bulgaria, whose trade balance and balance on primary income improved. In the other CESEE countries, external positions remained broadly unchanged, with absolute changes in the combined current and capital account balance not exceeding 1% of GDP in all countries between the end of 2015 and mid-2016. However, some more striking changes in the individual components of the current account were observed in several countries: Better outcomes in trade balances cushioned the deterioration in capital accounts that was related to lower EU funds flowing into the region.

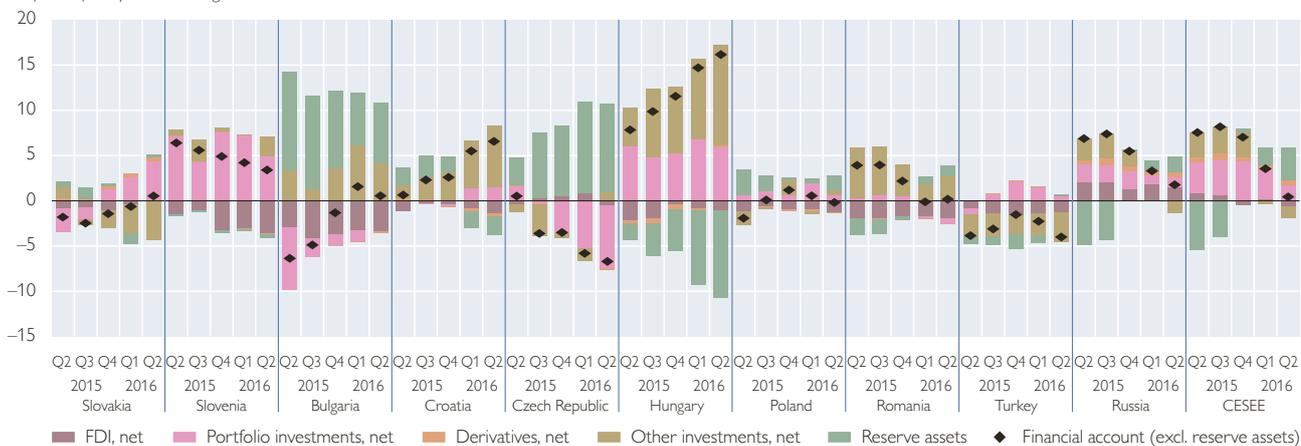
The financial account balance (the difference between the net acquisition of assets and the net incurrence of liabilities, excluding reserves) of the ten CESEE countries as a whole diminished from 7% of GDP in the fourth quarter of 2015 to 0.4% of GDP in the second quarter of 2016. Accordingly, CESEE countries' net acquisition of assets was roughly equal to their net incurrence of liabilities. This development was driven by other investments, where the CESEE region became a net debtor in the review period. Furthermore, holdings of portfolio investment assets declined substantially.

Developments in individual countries were heterogeneous. The financial account deteriorated in Slovenia, the Czech Republic, Poland, Romania, Turkey and Russia. Slovenia and Russia remained net creditors vis-à-vis the world, and the financial account was broadly balanced in Romania and Poland. The Czech Republic and Turkey incurred net liabilities in the review period.

Financial account reports a broadly balanced position

## Financial account balance

% of GDP, four-quarter moving sum



Source: National central banks.

No price pressure  
in the CESEE region  
except in Turkey  
and Russia

Slovakia, Bulgaria, Croatia and Hungary reported improvements of the financial account balance. All countries are net creditors vis-à-vis the world. While Slovenia and Hungary have already held this position for several quarters, Slovakia and Bulgaria became creditors in the review period.

Low energy prices continued to exert downward pressure on inflation rates in the CESEE EU Member States. Average annual inflation hovered around  $-0.5\%$  throughout the review period without clearly tending up or down. The only notable exception from this pattern was Romania. Price rises gained speed against the background of a base effect stemming from a broadening of the application of a reduced VAT rate in June 2015. Apart from Romania, only the Czech Republic reported positive inflation in August 2016.

Declining prices were clearly a function of deflationary pressure from the energy component of the HICP, as other components did not add much dynamism to price developments. Neither food nor industrial goods made a substantially positive contribution to inflation in most countries. Only services pushed prices up somewhat in the CESEE EU Member States. Against this background, core inflation rates remained low but still positive in the region. Only Bulgaria and – as of late – also Croatia reported moderate deflation also for the core components of the HICP.

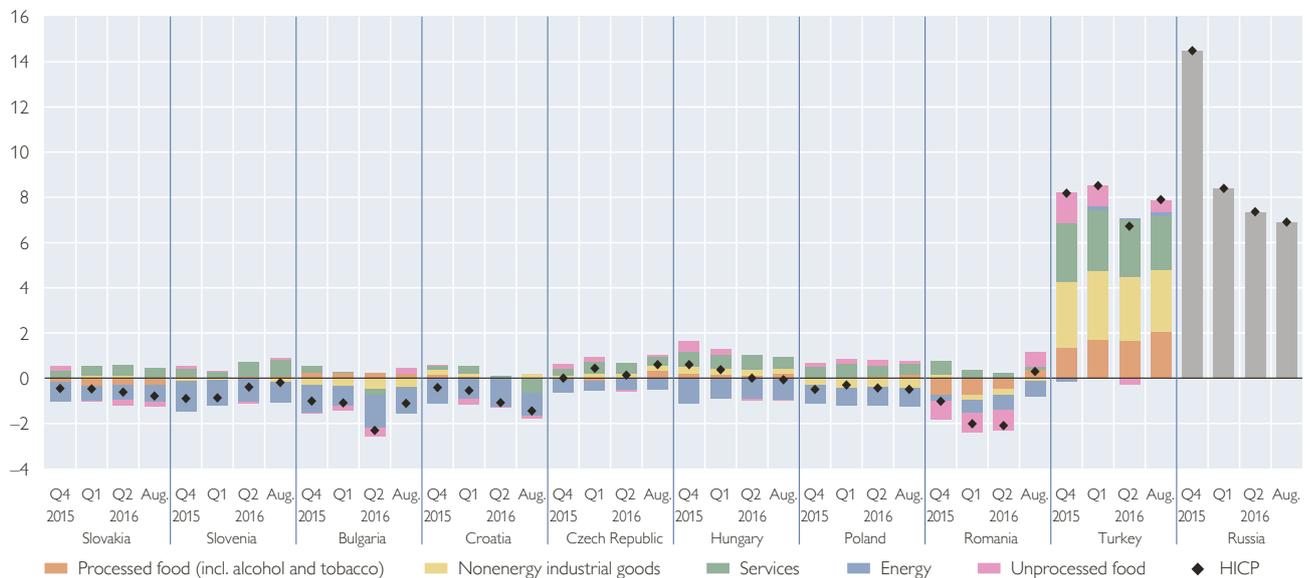
In Turkey, inflation came in at  $7.9\%$  in August 2016, notably below the  $9.6\%$  observed in January but also markedly above the inflation rate of  $6.6\%$  in April and May. Especially in July, inflation augmented sharply (to  $8.3\%$ ), as food prices edged up owing to higher prices for fresh produce and higher sales taxes on cigarettes. Some of the increased price pressure might have also been due to the slide of the Turkish lira following the attempted coup in mid-July. The currency stabilized in the weeks thereafter, but continues to trade weaker than before the failed coup.

In Russia, the inflation rate came down from  $15.8\%$  in August 2015 to  $6.9\%$  in August 2016. The drop in annual inflation was aided by a base effect (the impact of the sharp price rise in 2015 dissipated), persisting weak demand and the shrinking ratio of imports to GDP.

Chart 5

## HICP inflation and its main drivers

Percentage points, contribution to year-on-year change in HICP; HICP in %



Source: Eurostat.

Note: Russia: CPI. No breakdown according to COICOP available.

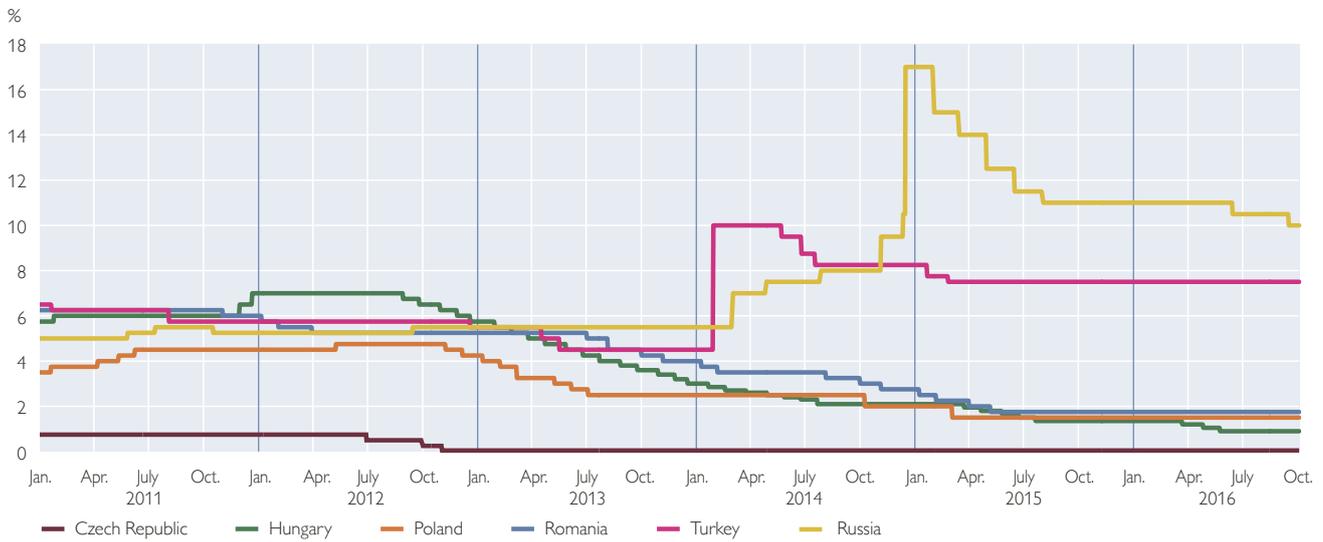
Against the backdrop of disinflation or deflationary trends, the central banks of CESEE countries continued to pursue a policy of monetary accommodation (see chart 6) and retained policy rates at historically low levels. The Hungarian central bank (MNB) even cut its policy rate in two steps from 1.2% in March to 0.9% in May. The overnight deposit rate has also remained below zero (−0.05%) since March 2016. Moreover, to support lending to the nonfinancial sector, the MNB has put a limit on access to the three-month deposit facility (its main policy tool), thereby increasing banking sector liquidity. The Czech Republic’s policy rate has been standing at “technically zero” since October 2012. In November 2013, the Czech National Bank (CNB) had decided to use the exchange rate as an additional instrument to ease monetary conditions and to prevent the exchange rate of the koruna from appreciating to levels below CZK 27 per EUR 1. The CNB ruled out a discontinuation of the exchange rate commitment before the start of 2017. In the review period, the CNB intervened several times in the foreign exchange market, buying a total of EUR 2.65 billion. Russia cut its policy rate in two steps by a total of 100 basis points to 10% in September as risks to inflation moderated.

Turkey kept its main policy rate (one-week repo lending rate) on hold in the review period. In an attempt to simplify its monetary policy framework, however, it adjusted its overnight lending rate several times from 10.75% in March to 8.25% in September, substantially narrowing the rate corridor of its overnight rates. The Turkish central bank’s rate cuts have deferred to government pressure for lower rates. At the same time, expectations of U.S. policy rate increases have been repeatedly postponed, resulting in relatively loose global liquidity conditions that have enabled Turkey to reduce rates without major negative consequences for the already weak lira.

Monetary policy stays accommodative

Chart 6

**Policy rate developments in CESEE**



Source: National central banks.

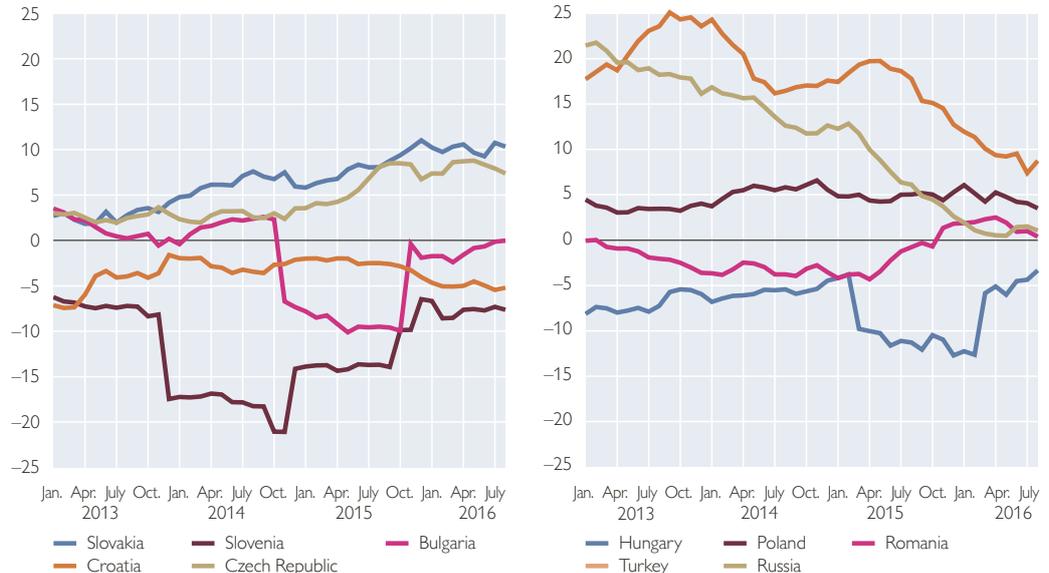
**Deleveraging still ongoing in several countries despite heterogeneous credit developments**

The development of domestic credit to the private sector (nominal lending to the nonbank private sector adjusted for exchange rate changes) was somewhat heterogeneous in the review period. Among the EU Member States, credit growth was highest in the Czech Republic and Slovakia at 7.4% and 10.3%, respectively, in August 2016. While dynamics were broadly unchanged in Slovakia, credit growth decelerated somewhat in the Czech Republic as corporate credit growth lost speed.

Chart 7

**Growth of credit to the private sector**

Year-on-year percentage change, adjusted for exchange rate changes



Source: National central banks.

Solid credit developments in both countries were promoted by favorable expectations regarding general economic developments and a sound liquidity position. Furthermore, banking sectors are in healthy shape, with low nonperforming loan (NPL) ratios, sound profitability, deposit overhangs over credit, persistent competitive pressure as well as low stocks of loans denominated in foreign currency.

Credit growth was also rather swift in Poland. Key indicators for the country's banking sector, however, are somewhat weaker than in Slovakia and the Czech Republic. In Poland, the loan-to-deposit ratio remained above 100, and the country still reports a substantial share of foreign currency loans (especially Swiss franc loans) in total loans. The discussion about a conversion of those loans is ongoing, thereby adding to banking sector uncertainty. Furthermore, a bank asset tax in effect since February 2016 might dent banks' profitability and capital ratios. Bank lending has already softened moderately in recent months.

The credit stock continued to decrease in Hungary and Slovenia in the review period. Especially in Hungary, however, the contraction moderated. This was in part a statistical effect: The conversion of foreign currency loans to households at an exchange rate below the prevailing market exchange rate in the first quarter of 2015 dropped out of the base. Nevertheless, both household and corporate loans displayed some more favorable momentum in recent months, partly owing to central bank measures (Funding for Growth Scheme, Growth Supporting Programme). Furthermore, the reduction of the bank tax as of January 2016 already strengthened banking sector profitability.

In Slovenia, credit to households expanded moderately. This development, however, was not sufficient to offset the effect of strongly contracting corporate credit on private sector credit growth. Nevertheless, the country made some progress in cleaning up balance sheets, raising banking sector profitability and improving capitalization.

In Romania, credit growth declined and came to a standstill in August. As in the case of Slovenia, especially corporate credit was a drag on credit growth; household credit actually accelerated. Progress has been achieved in shoring up the banking sector in recent years; NPLs have been reduced and the loan-to-deposit ratio has been lowered. The recently adopted mortgage law allowing retail mortgage borrowers to return real estate collateral to banks in exchange for writing off their loans, however, might have negative implications for profitability and capitalization.

The contraction of the credit stock in Bulgaria ground to a halt in August 2016. The development was driven by both corporate credit and household credit. The Bulgarian banking sector reports an overhang of deposits over credit, a comparatively high but declining share of credit denominated in foreign currency, and rising profitability amid improving balance sheets. The release of a stress test and an asset quality review in August certified that the Bulgarian banking system remains well capitalized.

In Croatia, the process of conversion and the partial write-off of loans in Swiss francs initiated in the last quarter of 2015 compounded the impact of the debt overhang and the lack of collateral, thus causing credit growth to decline further in the review period.

Credit growth moderated in Turkey and Russia. In Turkey, loan growth has been declining since mid-2015 and came down to 7.4% in July before picking up

Lending surveys  
draw a broadly  
positive picture

again to 8.7% in August 2016. Macroprudential measures adopted in previous years impacted especially on household credit. In Russia, slower credit growth was clearly related to the ongoing economic recession. The most recent data indicate that the credit cycle might have reached its bottom in summer 2016: The contraction of household credit abated and corporate credit gained some speed.

Lending surveys clearly indicate a pickup in demand for credit in the CESEE region. The most recent CESEE Bank Lending Survey of the European Investment Bank (EIB) found that demand for loans rallied across the board in the first half of 2016. This marked the sixth consecutive semester of favorable developments. All factors influencing demand made a positive contribution. Access to funding also continued to improve in the CESEE region, supported by easy access to domestic sources, mainly retail and corporate deposits. The development of supply conditions, however, was less straightforward, as already observed in the second half of 2015. Credit standards continued to ease for consumers as well as for corporates. However, the regulatory environment and banks' capital constraints adversely affected supply conditions. NPLs are also consistently indicated as a drag on supply by the EIB survey.

Banks expect demand to continue to increase robustly in the second half of 2016. However, supply conditions are expected to make significantly less progress, generating a widening demand-supply gap.

Country-level bank lending surveys reported mixed findings that only partly support this general picture. A positive development of supply and demand conditions was found only in Hungary and the Czech Republic. In the other countries, lending standards remained unchanged or were tightened depending on the particular loan segment. Demand has been increasing for consumer loans in most countries, while demand for corporate loans and housing loans was stable or in some cases weaker.

Analyzing the operation of international banking groups in the region, the EIB survey found that 27% of banking groups continued to reduce their total exposure to the region, thereby contributing to a further moderate decline of aggregate exposure in the review period. However, this negative trend seems to be bottoming out, as more and more groups expect a stabilization of exposure over the second half of 2016. While cross-border banking groups continue to discriminate between countries of operation as they reassess their country-by-country strategies, they are also increasingly signaling their intentions to expand operations selectively in the region. The survey also found that roughly 70% of groups describe the profitability of CESEE operations as outperforming the profitability of the banking group as a whole.

### Western Balkans:<sup>1</sup> domestic demand is key to economic growth

In the first half of 2016, economic growth moderated in most Western Balkan countries compared to the same period of the previous year. In Bosnia and Herzegovina, FYR Macedonia and Montenegro, GDP growth slowed by around 1.5 percentage points and amounted to about 2%. With a growth rate of 3%, Kosovo exhibited a less pronounced slowdown (first half of 2015: 3.5%). By contrast, the Albanian and Serbian economies performed more favorably in the first half of 2016, recording growth of 3.1% and 2.9%, respectively. Particularly Serbia made up leeway, with growth 2 percentage points higher than in the same period of 2015, supported especially by a strong first quarter.

Despite more moderate economic growth, private consumption gained speed in almost all countries. Household consumption was marginally lower only in FYR Macedonia, as the ongoing political tensions weighted negatively on consumer confidence. In Kosovo, notably, private consumption rose by almost 6% in the first half of 2016. Furthermore, private consumption growth turned positive in the first half of 2016 in Albania and Serbia compared to a decline in 2015. This turnaround was largely supported by positive developments in the labor markets and higher purchasing power supported by muted price pressure. Impulses for growth from remittances were rather weak. In Albania, for instance, remittances slumped by 10% in the first quarter of 2016 (no data are available yet for the second quarter of 2016). The poor economic situation in Italy and Greece, the main destination of Albanian migrants, weighed on the flow of funds. In Kosovo – another country that relies heavily on remittances – inflows also dipped slightly in the first half of 2016. Public consumption growth was rather subdued or negative in most Western Balkan countries, reflecting fiscal consolidation.

Investment activity in the region generally developed positively in the first half of 2016, mostly because public sector investment was dynamic. In Montenegro, GFCF grew by an astonishing 25% in the first half of 2016; in Kosovo, GFCF also accelerated by more than 20% in the first quarter of 2016 (no data are available yet for the second quarter of 2016). In both countries, highway construction was behind booming (public sector) investment. In Montenegro, additionally, expenditures for power-generating projects and for tourism infrastructure boosted public investment. In Albania and Serbia, fixed investment expanded at a robust pace in the first half of 2016, albeit somewhat more moderately than in 2015. FYR Macedonia registered a drop of almost 10% in GFCF in the first quarter of 2016, but public infrastructure projects supported stepped-up investment activity in the subsequent months. To some extent, slowing private investment dynamics in FYR Macedonia are due to base effects, but they are also grounded in greater uncertainty of investors on the fence because of ongoing political disputes.

Turning to foreign trade, export growth gained momentum in most countries. In particular, Albania, FYR Macedonia and Serbia posted higher export growth in the first half of 2016. In Kosovo, export growth remained more or less unchanged. Import growth also speeded up in the region, reflecting higher domestic demand. Public demand for investment goods mounted owing to import-intensive infrastructure projects, such as activities related to the Trans-Adriatic Pipeline and hydropower plants in Albania and to the already mentioned highway construction and further infrastructure projects in Montenegro. Additionally, imports were lifted by accelerating private consumption growth. Stronger export growth fell far short of booming import growth; hence, the contribution of net exports dragged down economic growth in the Western Balkans. This was especially the case for Montenegro, where the negative contribution reached almost 10 percentage points in the first half of 2016.

<sup>1</sup> The Western Balkans comprise the EU candidate countries Albania, FYR Macedonia, Montenegro and Serbia as well as the potential candidate countries Bosnia and Herzegovina, and Kosovo. The designation “Kosovo” is used without prejudice to positions on status and is in line with UNSC 1244 and the opinion on the Kosovo Declaration of Independence.

The Western Balkan countries are marked by deep shortfalls in the trade balance. In the first half of 2016, Montenegro posted the highest trade deficit; at more than 43% of GDP, the trade deficit has climbed further compared to 2015. Albania and Kosovo also posted widening trade deficits. Only in Serbia, the country with the lowest shortfall among the Western Balkans, did the trade deficit narrow by almost 2 percentage points to around 11% of GDP. The worsening of trade balances is largely the result of increasing imports connected to large public investments. The trade deficits have also left their mark on current account balances. Most countries posted higher current account deficits in the first half of 2016 than in 2015, with Montenegro showing the largest shortfall of around 18% of GDP (2015: 13.3%). In Serbia, by contrast, the deficit narrowed to 4.3%. Serbia was also the only country of the region where the current account deficit was fully covered by net FDI. In the other countries, the coverage ratio lay between 14% (Montenegro) and 66% (Albania) in the first half of 2016. Despite stubbornly high unemployment rates, improvements in the labor market were perceivable especially in FYR Macedonia and Serbia. Both countries brought their unemployment rates down by 2 to 3 percentage points in the second quarter of 2016 from the same period of last year. Progress in the labor markets was also reflected in higher employment rates, with Albania and Serbia topping the list. At the same time, wage growth gained speed in the region. In Montenegro and Serbia, gross real wages in the whole economy picked up by more than 3% in the first half of 2016 after declining for several consecutive quarters. Bosnia and Herzegovina as well as FYR Macedonia also showed positive wage dynamics ranging from 2% to 3%. Even though wages increased, average monthly incomes only reached comparatively low levels that currently range from below EUR 400 in Albania to about EUR 750 in Montenegro (no data for Kosovo available).

The growth of domestic credit to resident households and nonfinancial corporations (adjusted for exchange rate movements) was positive in all Western Balkan countries in the first half of 2016. The ongoing process of cleaning up banks' balance sheets, more favorable lending conditions and elevated domestic demand fed through to credit dynamics. Growth moved into positive territory in the second half of 2016 (+1.4% year on year), even in Albania, the country with the most sluggish credit dynamics in 2015 and with one of the highest NPL levels. Similarly, both Montenegro and Serbia returned to positive credit growth in the first half of 2016 after deleveraging in 2015. More recent data for both countries show that credit continued to expand in July and August 2016. In Bosnia and Herzegovina, credit growth also quickened slightly in the first half of 2016, accelerating to almost 3% year on year after posting just 1% in 2015. With annual growth of more than 8%, credit growth in FYR Macedonia and Kosovo remained very robust. However, especially in FYR Macedonia, credit growth lost momentum in July and August 2016, subsiding to less than 4%.

In the first eight months of 2016, deflation persisted across most of the region, largely as a result of low commodity prices. Only in Albania and Serbia were price rises positive, with inflation at around 1% in the first eight months of 2016. Driven by higher food prices, inflation in Albania registered 2% in August 2016, close to the lower bound of the inflation target of the Bank of Albania (3% with a tolerance band of  $\pm 1$  percentage point). Yet inflation moderated slightly again in September. In Serbia, the second inflation targeting country, inflation amounted to 0.6% in September, which is well below the inflation target of 4%  $\pm 1.5$  percentage points. The National Bank of Serbia loosened its monetary policy stance and cut its key interest rate by 25 basis points to 4% in July 2016 in view of ongoing low inflationary pressure.

Fiscal consolidation needs in the Western Balkans are high on the agenda, with developments in Serbia taking center stage, as the Stand-By Arrangement (SBA) between the IMF and Serbia is largely contingent on the country's budgetary performance. According to the fourth and fifth program reviews of September 2016, Serbia's consolidation path is well on track. The IMF expects Serbia's deficit to come down from 3.8% of GDP in 2015 to 2.5% of GDP in 2016, considerably below the IMF program target, as a result of higher-than-expected revenues. In Montenegro, the fiscal situation remains challenging. The fiscal outcome reflects

budgetary strains in particular from the highway project mentioned above. According to Montenegro's Economic Reform Program 2016–2018 published early this year, the budget deficit is scheduled to drop to 6.1% of GDP in 2016 from 8.6% in 2015. However, the IMF (World Economic Outlook, October 2016) projects the 2016 shortfall to rise to above 12% of GDP. FYR Macedonia adopted two supplementary budgets in 2016. Lower-than-expected GDP growth for 2016<sup>2</sup> necessitated the first supplementary budget to adjust for lower revenues. Accordingly, the expected budgetary shortfall was set to increase from 3.2% to 3.6%. The second supplementary budget of August 2016 included expenditure related to the flood damage of the summer of 2016 and brought the expected budget deficit to 4% of GDP. The IMF expects the budget deficit to reach 0.8% (2015: 0.2%) in Bosnia and Herzegovina and 2.0% (2015: 1.9%) in Kosovo.

With regard to the EU accession process of the Western Balkans, some further steps were taken. Negotiations with Montenegro and Serbia are progressing: Montenegro has now opened 24 chapters, with four chapters having been added since early 2016. Serbia opened two more chapters, bringing the total to four open chapters. Negotiations have not yet begun with Albania or FYR Macedonia. Albania, however, has passed comprehensive judicial reforms, which will support its EU integration process. In September 2016, the Council of the EU accepted the membership application of Bosnia and Herzegovina, a potential candidate country to the EU. The country applied for membership in February 2016 but was requested to implement reforms to have the membership application accepted. In a next step, the European Commission will prepare an assessment of the country's readiness to join the EU.

Looking at relations with the IMF, Albania just completed its eighth review under a three-year Extended Fund Facility (EFF, in place since 2014), freeing up the next tranche for disbursement, as the program is considered to be largely on track. In Serbia, the combined fourth and fifth reviews of the precautionary SBA were completed in August 2016. In Kosovo, the first review under a 22-month SBA was concluded in early 2016. The second review, which started in spring 2016, has not been finalized yet. In Bosnia and Herzegovina, the IMF agreed to a three-year EFF in September 2016.

<sup>2</sup> The IMF revised down its forecast for FYR Macedonia from 3.6% (World Economic Outlook, April 2016) to 2.2% (World Economic Outlook, October 2016).

## 2 Slovakia: competitive exporting sector bolsters consumption-based growth

Export growth offsets temporary decline in investment activity

Notwithstanding a sharp decline in GFCF growth, Slovakia's economy expanded rapidly (by 3.6% on average) during the first half of 2016. Brisk private consumption growth as well as noticeable export growth in the second quarter were the main forces behind this favorable development. While the recent slump in capital formation contrasts dramatically with expansion rates of 18% prevailing late in 2015, the slowdown was largely due to the start of a new EU funding cycle and is thus a temporary phenomenon. Public investment will regain momentum as the new programming period progresses. The stock of private capital, on the other hand, will benefit from a new automotive plant slated for construction from 2016.

Sustained dynamics in the labor market buoy private consumption

Following a dip to 2.5% year on year in the first quarter, private consumption growth picked up in the second quarter of 2016 (3%). The rebound was partly the result of beneficial trends in the labor market. Employment levels have already been improving for two years and increased by another 2.3% in the second quarter of 2016. Tax and social security system reforms, deflationary tendencies, and nominal wage growth fostered real disposable income and were thus additional key drivers of private consumption growth. According to a survey by the National Bank of Slovakia, the private sector is starting to perceive shortages in skilled labor, however. This labor market tightness has likely added to the recent wage dynamics (+5% in the trade and construction sector, for instance) and potentially explains why vacant positions are increasingly being filled by foreigners. The government's plan to increase teachers' salaries may prompt a further short-run acceleration of wage growth, thus underscoring the importance of private consumption for real activity.

Consumer prices continue to decline

Headline inflation was negative in the first half of 2016 and decreased more rapidly than anticipated (-0.5% in the first quarter, -0.6% in the second quarter), owing to domestic and global developments alike. While the base effect of a notable oil price decline in 2015 is starting to fade, energy prices continued to decline in the first part of 2016. The government contributed to negative food price developments by extending the basket of items which qualify for a reduced VAT rate. The sluggish price dynamics prevailing in the entire euro area have triggered monetary policy measures by the ECB that are likely to be conducive to Slovakia's robust credit growth. Loans to households advanced by double-digit rates throughout the review period. Broad money increased by roughly 9% in the first half of 2016, with two-thirds of the rise stemming from the expansion of household credit.

Policies to stimulate investment lift public debt

Surging public investment in the last year of the drawdown window for EU funds led to higher-than-expected government expenditures. As a consequence, the fiscal balance hit the excessive deficit threshold of 3% of GDP in 2015. Going forward, gross debt as a share of GDP is projected to stay constant at 52.9% of GDP this year, according to the latest forecast of the National Bank of Slovakia. As envisaged public spending includes the construction of a highway around Bratislava, the reduction in the corporate tax rate and the elimination of required minimum corporate tax payments (corporate tax licenses), reaching the medium-term budgetary objective (a structural deficit of 0.5% of GDP) by 2018 as foreseen in the latest EU Stability Programme for Slovakia will require considerable consolidation efforts.

Table 2

## Main economic indicators: Slovakia

	2013	2014	2015	Q1 15	Q2 15	Q3 15	Q4 15	Q1 16	Q2 16
<i>Year-on-year change of the period total in %</i>									
GDP at constant prices	1.4	2.5	3.6	2.9	3.4	3.7	4.3	3.5	3.7
Private consumption	-0.8	2.3	2.4	1.5	2.3	2.8	2.8	2.5	3.0
Public consumption	2.2	5.9	3.4	1.8	3.6	5.2	3.2	3.1	2.2
Gross fixed capital formation	-1.1	3.5	14.0	6.7	9.6	17.3	19.4	1.5	0.0
Exports of goods and services	6.2	3.6	7.0	5.4	6.1	7.3	9.2	0.2	7.7
Imports of goods and services	5.1	4.3	8.2	5.2	7.3	9.9	10.5	0.4	5.9
<i>Contribution to GDP growth in percentage points</i>									
Domestic demand	0.3	2.9	4.7	2.5	4.2	5.6	6.3	3.7	1.8
Net exports of goods and services	1.2	-0.4	-0.8	0.5	-0.8	-1.8	-1.0	-0.2	1.9
Exports of goods and services	5.7	3.4	6.4	5.3	5.7	6.2	8.4	0.2	7.3
Imports of goods and services	-4.5	-3.8	-7.3	-4.9	-6.5	-8.0	-9.4	-0.4	-5.4
<i>Year-on-year change of the period average in %</i>									
Unit labor costs in the whole economy (nominal, per person)	0.4	0.7	0.8	0.7	0.2	0.5	1.6	1.6	0.5
Unit labor costs in manufacturing (nominal, per hour)	-1.1	-3.8	-1.4	-6.8	-0.1	-1.2	2.4	5.0	-11.4
Labor productivity in manufacturing (real, per hour)	6.6	8.2	5.9	13.0	3.8	5.1	2.7	-1.5	16.5
Labor costs in manufacturing (nominal, per hour)	5.3	4.1	4.5	5.3	3.6	3.9	5.1	3.4	3.1
Producer price index (PPI) in industry	-1.0	-3.5	-3.0	-3.7	-2.6	-2.4	-3.2	-4.2	-5.1
Consumer price index (here: HICP)	1.5	-0.1	-0.3	-0.5	-0.1	-0.3	-0.5	-0.5	-0.6
EUR per 1 SKK, + = SKK appreciation	..	..	..	..	..	..	..	..	..
<i>Period average levels</i>									
Unemployment rate (ILO definition, %, 15–64 years)	14.3	13.2	11.5	12.5	11.3	11.3	11.0	10.4	9.7
Employment rate (%, 15–64 years)	59.9	61.0	62.7	61.9	62.5	63.0	63.5	64.1	64.9
Key interest rate per annum (%)	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0
SKK per 1 EUR	..	..	..	..	..	..	..	..	..
<i>Nominal year-on-year change in the period-end stock in %</i>									
Broad money (including foreign currency deposits)	5.9	4.9	11.1	5.6	7.5	10.7	11.1	9.3	8.8
<i>Contributions to the year-on-year change of broad money in percentage points</i>									
Net foreign assets of the banking system	-2.7	4.9	6.1	10.4	8.1	10.6	1.7	-2.2	2.9
Domestic credit of the banking system	-6.3	7.9	24.8	14.1	11.3	14.2	17.2	13.5	12.4
<i>of which: claims on the private sector</i>	5.3	10.5	13.2	5.7	6.4	6.4	7.7	6.5	5.7
<i>claims on households</i>	8.2	9.8	11.6	5.7	5.7	6.1	5.9	5.8	6.1
<i>claims on enterprises</i>	-2.9	0.7	1.6	0.0	0.7	0.3	1.9	0.7	-0.4
<i>claims on the public sector (net)</i>	-11.6	-2.6	11.6	8.4	4.9	7.8	9.5	7.0	6.7
Other assets (net) of the banking system	21.9	-1.7	-14.4	-18.9	-12.0	-14.1	-7.9	-2.0	-6.6
<i>% of GDP</i>									
General government revenues	38.6	39.2	42.7	..	..	..	..	..	..
General government expenditures	41.3	41.9	45.6	..	..	..	..	..	..
General government balance	-2.7	-2.7	-3.0	..	..	..	..	..	..
Primary balance	-0.8	-0.8	-1.1	..	..	..	..	..	..
Gross public debt	55.0	53.9	52.9	..	..	..	..	..	..
<i>% of GDP</i>									
Debt of nonfinancial corporations (nonconsolidated)	49.8	50.0	49.5	..	..	..	..	..	..
Debt of households and NPISHs (nonconsolidated)	30.1	32.8	35.3	..	..	..	..	..	..
<i>% of GDP (based on EUR), period total</i>									
Trade balance	4.1	3.8	2.4	5.1	3.2	0.8	0.8	3.4	4.7
Services balance	0.6	0.1	0.1	0.4	0.2	0.3	-0.4	0.4	0.5
Primary income	-0.9	-2.2	-2.3	-2.1	-3.5	-3.5	-0.3	-3.7	-3.4
Secondary income	-1.8	-1.6	-1.4	-1.6	-1.6	-1.4	-1.2	-1.7	-1.3
Current account balance	2.0	0.1	-1.3	1.8	-1.7	-3.8	-1.1	-1.5	0.4
Capital account balance	1.4	1.0	3.6	1.2	1.7	4.0	7.0	3.3	2.4
Foreign direct investment (net)	0.3	0.2	-1.1	-4.5	3.0	0.1	-3.5	-1.4	4.4
<i>% of GDP (rolling four-quarter GDP, based on EUR), end of period</i>									
Gross external debt	83.0	89.3	86.3	90.8	87.4	87.3	86.3	85.6	87.9
Gross official reserves (excluding gold)	0.9	1.5	2.1	3.2	1.7	2.6	2.1	2.0	2.0
<i>Months of imports of goods and services</i>									
Gross official reserves (excluding gold)	0.1	0.2	0.3	0.4	0.2	0.3	0.3	0.3	0.3
<i>EUR million, period total</i>									
GDP at current prices	73,835	75,560	78,071	17,859	19,425	20,619	20,169	18,403	20,053

Source: Bloomberg, European Commission, Eurostat, national statistical offices, national central banks, wiw, OeNB.

### 3 Slovenia: stabilization entrenched

GDP growth holds up unexpectedly well during the first half of 2016

GDP growth accelerated to 2.5% year on year during the first half of 2016, also helped by working-day effects. Despite some deterioration in consumer confidence, private consumption growth quickened particularly strongly, supported by employment gains, steadily falling unemployment, faster real wage growth and weak but continued credit expansion. Public consumption also advanced more robustly due to public sector wage increases. Investment growth turned negative as the overlapping disbursement period of EU funds stopped at the end of 2015, causing a slump in construction investment. By contrast, investment in machinery and equipment continued to expand at a double-digit pace, reflecting historically high capacity utilization rates and optimistic business expectations. However, stock changes offset the negative contribution of investment to overall growth. Export growth speeded up somewhat during the first half of 2016, mirroring gains in price competitiveness during 2015. However, as imports also mounted, the contribution of net real exports remained broadly unchanged from 2015. In its spring forecast, the European Commission expected GDP growth to decline to 1.7% in 2016, mainly as a result of lower public investment and a smaller contribution of net real exports. Available high-frequency indicators suggest ongoing strong economic activity at the beginning of the third quarter of 2016. Inflation remained in negative territory throughout the review period, but deflationary pressure moderated somewhat over the summer months.

Excessive deficit procedure closes in mid-2016; further deficit reduction planned

Following Slovenia's budget deficit reduction to 2.9% of GDP in 2015 and given a projected deficit of 2.2% of GDP in 2016, the EU Council closed the excessive deficit procedure for Slovenia in June 2016. The government plans to cut the deficit further from 1.6% of GDP in 2017 to 0.4% of GDP by 2019. The structural deficit is also set to decline from 1.5% of GDP in 2016 to 0.6% of GDP by 2019, thus undershooting the medium-term objective (MTO). According to the government's plans, this reduction should take the form of structural measures of a permanent nature. Major objectives include shifting tax revenues away from labor taxation toward real property taxation, reducing administrative barriers and improving the effectiveness of tax collection; on the expenditure side, they include containing wage costs and following a restrictive policy of social transfers and subsidies. The EU Council is less optimistic about Slovenia's fiscal prospects, forecasting higher deficits in 2016 and 2017 and requesting additional action to ensure adjustment to the MTO. The EU Council has also called for sufficiently specified measures to achieve budgetary goals from 2017 onward.

Banking sector profitability improves as credit risks diminish

Deleveraging remains a characteristic of the Slovenian financial sector. Banking sector assets as well as domestic credit to the nonbank private sector kept on contracting during the first half of 2016. Nonetheless, banking sector profitability improved substantially in the reporting period, helped by the decline in provisioning and value adjustments and improvements in noninterest income. Lower provisions are linked to the improvement in banks' asset quality, as indicated by the continuous decline in nonperforming assets, with foreign borrowers and non-financial corporations remaining the riskiest client segments. Even so, alongside income risk amid the persistent environment of low interest rates and contracting assets, credit risk has remained the biggest risk for banks.

Table 3

**Main economic indicators: Slovenia**

	2013	2014	2015	Q1 15	Q2 15	Q3 15	Q4 15	Q1 16	Q2 16
<i>Year-on-year change of the period total in %</i>									
GDP at constant prices	-1.1	3.1	2.3	2.5	2.0	2.0	2.8	2.3	2.7
Private consumption	-4.0	2.0	0.5	0.3	-0.3	1.1	0.6	1.2	2.6
Public consumption	-2.1	-1.2	2.4	1.4	1.8	3.2	3.4	3.4	2.1
Gross fixed capital formation	3.2	1.4	1.0	-1.7	0.7	-0.2	5.4	-7.8	-3.6
Exports of goods and services	3.1	5.7	5.6	6.5	6.5	5.0	4.3	5.1	6.7
Imports of goods and services	2.1	4.2	4.6	3.9	4.8	5.1	4.7	3.9	6.5
<i>Contribution to GDP growth in percentage points</i>									
Domestic demand	-1.9	1.7	1.3	0.2	0.5	1.6	2.7	1.1	1.8
Net exports of goods and services	0.8	1.4	1.1	2.3	1.6	0.4	0.1	1.3	0.8
Exports of goods and services	2.2	4.3	4.2	5.0	4.8	3.8	3.4	4.0	5.1
Imports of goods and services	-1.4	-2.9	-3.2	-2.8	-3.2	-3.4	-3.3	-2.8	-4.3
<i>Year-on-year change of the period average in %</i>									
Unit labor costs in the whole economy (nominal, per person)	0.5	-1.3	0.3	-0.2	0.7	0.2	0.4	1.8	0.3
Unit labor costs in manufacturing (nominal, per hour)	3.0	0.0	-5.3	-5.1	-4.0	-7.9	-3.8	-6.1	-6.2
Labor productivity in manufacturing (real, per hour)	-2.3	3.7	6.0	7.3	6.3	6.4	4.2	7.0	7.6
Labor costs in manufacturing (nominal, per hour)	0.6	3.8	0.5	1.9	2.0	-2.0	0.2	0.5	1.0
Producer price index (PPI) in industry	0.0	-0.7	-0.2	0.1	0.6	-0.4	-1.2	-1.9	-2.3
Consumer price index (here: HICP)	1.9	0.4	-0.8	-0.5	-0.8	-0.8	-0.9	-0.9	-0.4
EUR per 1 SIT, + = SIT appreciation	..	..	..	..	..	..	..	..	..
<i>Period average levels</i>									
Unemployment rate (ILO definition, %, 15–64 years)	10.3	9.9	9.1	9.9	9.3	8.7	8.5	9.0	7.9
Employment rate (%, 15–64 years)	63.3	63.9	65.2	63.5	65.5	66.7	65.2	64.2	66.2
Key interest rate per annum (%)	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0
SIT per 1 EUR	..	..	..	..	..	..	..	..	..
<i>Nominal year-on-year change in the period-end stock in %</i>									
Broad money (including foreign currency deposits)	0.2	7.8	5.3	5.5	5.0	3.8	5.3	6.3	5.4
<i>Contributions to year-on-year change of broad money in percentage points</i>									
Net foreign assets of the banking system	29.1	48.9	23.5	16.8	3.3	-0.7	-1.6	-6.4	1.5
Domestic credit of the banking system	-16.4	-32.9	-10.7	-11.0	1.0	3.0	7.8	11.6	3.8
<i>of which: claims on the private sector</i>	-30.0	-38.4	-20.7	-13.4	-12.6	-12.4	-4.8	-8.0	-6.7
<i>claims on households</i>	-2.3	-2.2	-0.3	-0.1	0.1	0.0	0.4	0.0	0.3
<i>claims on enterprises</i>	-27.7	-36.2	-20.4	-13.4	-12.7	-12.4	-5.2	-8.0	-7.0
<i>claims on the public sector (net)</i>	13.6	5.5	10.0	2.4	13.6	15.4	12.6	19.6	10.4
Other assets (net) of the banking system	-13.2	-7.9	0.8	-0.3	0.7	1.5	-0.9	1.1	0.1
<i>% of GDP</i>									
General government revenues	45.2	44.9	45.1	..	..	..	..	..	..
General government expenditures	60.3	49.9	48.0	..	..	..	..	..	..
General government balance	-15.0	-5.0	-2.9	..	..	..	..	..	..
Primary balance	-12.5	-1.8	0.1	..	..	..	..	..	..
Gross public debt	71.0	81.0	83.2	..	..	..	..	..	..
<i>% of GDP</i>									
Debt of nonfinancial corporations (nonconsolidated)	89.4	81.1	71.4	..	..	..	..	..	..
Debt of households and NPISHs (nonconsolidated)	30.0	28.5	27.8	..	..	..	..	..	..
<i>% of GDP (based on EUR), period total</i>									
Trade balance	2.0	3.2	3.9	3.9	3.9	4.3	3.5	5.3	4.8
Services balance	4.8	4.5	5.2	4.4	5.3	6.1	5.0	5.0	5.8
Primary income	-0.5	-0.3	-2.5	-1.3	-3.4	-2.9	-2.6	-0.9	-1.5
Secondary income	-1.4	-1.1	-1.4	-2.2	-1.1	-1.1	-1.3	-1.7	-1.0
Current account balance	4.8	6.2	5.2	4.9	4.7	6.5	4.7	7.8	8.1
Capital account balance	0.5	0.4	1.0	0.5	0.6	1.3	1.4	-0.4	-1.0
Foreign direct investment (net)	-0.1	-1.6	-3.2	-3.9	-0.5	-2.2	-6.4	-3.5	-2.5
<i>% of GDP (rolling four-quarter GDP, based on EUR), end of period</i>									
Gross external debt	117.3	124.0	116.7	126.1	119.4	119.2	116.7	116.6	113.9
Gross official reserves (excluding gold)	1.6	2.0	1.8	2.1	2.1	1.9	1.8	1.7	1.7
<i>Months of imports of goods and services</i>									
Gross official reserves (excluding gold)	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3
<i>EUR million, period total</i>									
GDP at current prices	35,917	37,332	38,570	8,938	9,870	9,931	9,831	9,298	10,213

Source: Bloomberg, European Commission, Eurostat, national statistical offices, national central banks, wiw, OeNB.

#### 4 Bulgaria: growth driven by private consumption

Lower unemployment rates and positive consumer sentiment propel GDP

Robust GDP growth was sustained throughout the first half of 2016 and amounted to 3%. Gaining 1.6 percentage points, private consumption contributed the lion's share to growth in the review period. However, public consumption reduced GDP growth by 0.6 percentage points due to the continued budget consolidation policy of the government. Moreover, export dynamics slowed down somewhat in the first half of 2016 from 2015. Still, net exports added 0.5 percentage points to GDP growth. Investment was subdued in the first half of 2016, contributing just 0.1 percentage points to GDP growth. Benefiting from a further moderate decline of the unemployment rate (to 8.2% as of end-June 2016), dynamic wage growth, low oil prices and positive consumer sentiment, powerful private consumption was also reflected in retail sales growth rates of above 3%. Strong wage growth was already reflected in a notable increase in unit labor costs. Investment activity was weak in the first half of 2016. The new programming period for EU investment (2014–2020) has not been effectively exploited to date, and public sector investment was subdued.

Deflationary phase is ongoing in Bulgaria

Bulgaria is still experiencing a deflationary phase, with negative headline inflation coming to  $-1.1\%$  in August 2016. Moreover, core inflation was negative at  $-0.3\%$  in August 2016. With the exception of food prices, all inflation components contributed negatively to price rises in the review period. Food prices and especially processed food prices added to inflation in the wake of the boost in fees and duties on tobacco products.

Bulgarian National Bank publishes stress test results

The growth of loans to households ( $-0.3\%$ ) and corporates ( $-0.9\%$ ) remained negative in the first half of 2016, although deposits were increasing ( $9.5\%$ ). A lending survey conducted by the Bulgarian National Bank (BNB) shows that banks also tightened their lending standards on corporate loans but eased them on consumer loans. After the failure of Corporate Commercial Bank in 2014, the BNB performed an asset quality review and stress test for the whole banking sector. The results were published in August 2016. The asset quality review will lead to additional adjustments of BGN 665 million, which will be reflected in banks' 2016 financial statements. The stress test results also show that under the adverse scenario, the aggregated common equity tier 1 ratio would fall from  $18.9\%$  (year-end 2015) to  $14.4\%$  by the end of the projection period (year-end 2018), thus remaining well above the regulatory minimum requirement.

Strong government commitment to budget consolidation path

Bulgaria's budgetary position developed positively in the first half of 2016. Tax revenues increased by  $7.5\%$  over the first five months of 2016, mainly based on increased revenues from value added tax and customs duties. On the expenditure side, outlays decreased by  $5.1\%$ , mainly because the government sector cut capital expenditures. Based on the EU Convergence Programme for 2016–2019, Bulgaria's main policy goal with regard to fiscal policy is to overcome fiscal imbalances through gradual fiscal consolidation. The government expects a reduction of the general government deficit from  $2.1\%$  of GDP in 2015 to  $1.9\%$  of GDP for the whole year 2016. The primary deficit is also expected to decrease in 2016, and a surplus is envisaged from 2017 onward.

Table 4

## Main economic indicators: Bulgaria

	2013	2014	2015	Q1 15	Q2 15	Q3 15	Q4 15	Q1 16	Q2 16
<i>Year-on-year change of the period total in %</i>									
GDP at constant prices	0.9	1.3	3.6	3.9	3.1	3.8	3.6	3.6	3.5
Private consumption	-2.5	2.7	4.5	1.5	2.0	6.4	7.5	2.5	1.2
Public consumption	0.6	0.1	1.4	-2.4	1.9	2.0	3.6	-6.4	-0.6
Gross fixed capital formation	0.3	3.4	2.7	-3.4	0.8	3.4	7.4	1.4	-0.3
Exports of goods and services	9.6	3.1	5.7	14.9	6.5	1.9	2.1	3.0	4.6
Imports of goods and services	4.3	5.2	5.4	8.0	7.0	2.5	4.6	0.9	2.8
<i>Contribution to GDP growth in percentage points</i>									
Domestic demand	-2.2	2.7	3.5	0.0	3.5	4.1	5.3	1.9	2.2
Net exports of goods and services	3.1	-1.3	0.1	3.7	-0.4	1.6	1.1	0.7	0.4
Exports of goods and services	5.9	2.0	3.7	9.7	4.3	3.0	3.7	2.5	3.4
Imports of goods and services	-2.8	-3.4	-3.6	-6.0	-4.7	-1.5	-2.7	-1.8	-3.0
<i>Year-on-year change of the period average in %</i>									
Unit labor costs in the whole economy (nominal, per person)	7.8	4.5	-1.4	-1.3	-1.4	-3.3	0.4	6.1	4.8
Unit labor costs in manufacturing (nominal, per hour)	4.4	0.4	5.7	4.9	5.1	6.4	6.5	8.2	11.5
Labor productivity in manufacturing (real, per hour)	-0.3	6.4	2.4	1.2	3.5	2.4	2.3	2.9	-0.8
Labor costs in manufacturing (nominal, per hour)	4.3	6.8	8.3	6.1	8.8	9.0	9.0	11.4	10.6
Producer price index (PPI) in industry	-1.5	-1.2	-2.0	-1.3	0.0	-2.4	-4.2	-4.7	-5.2
Consumer price index (here: HICP)	0.4	-1.6	-1.1	-1.7	-0.6	-0.9	-1.0	-1.1	-2.3
EUR per 1 BGN, + = BGN appreciation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Period average levels</i>									
Unemployment rate (ILO definition, %, 15–64 years)	13.0	11.5	9.3	10.7	10.0	8.3	8.0	8.7	8.2
Employment rate (%, 15–64 years)	59.5	61.1	62.9	61.0	62.4	64.5	63.7	62.3	63.7
Key interest rate per annum (%) <sup>1</sup>	..	..	..	..	..	..	..	..	..
BGN per 1 EUR	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
<i>Nominal year-on-year change in the period-end stock in %</i>									
Broad money (including foreign currency deposits)	8.9	1.1	8.8	1.9	2.5	2.1	8.8	6.1	8.9
<i>Contributions to year-on-year change of broad money in percentage points</i>									
Net foreign assets of the banking system	12.8	15.7	18.3	14.0	15.7	11.3	8.3	11.0	14.1
Domestic credit of the banking system	5.9	-4.9	-5.7	-10.1	-12.5	-8.4	1.7	-3.0	-2.5
<i>of which: claims on the private sector</i>	2.9	-6.7	-7.6	-6.8	-8.0	-7.7	-1.2	-1.8	-0.6
<i>claims on households</i>	-0.4	-0.5	-0.8	-0.5	-0.5	-0.4	-0.4	-0.4	-0.2
<i>claims on enterprises</i>	3.3	-6.2	-6.8	-6.3	-7.5	-7.3	-0.9	-1.4	-0.4
<i>claims on the public sector (net)</i>	3.0	1.8	1.9	-3.3	-4.6	-0.7	2.9	-1.2	-2.0
Other assets (net) of the banking system	-0.6	-0.6	-2.6	-2.0	-0.7	-0.8	-1.3	-2.0	-2.7
<i>% of GDP</i>									
General government revenues	37.2	36.6	38.2	..	..	..	..	..	..
General government expenditures	37.6	42.1	40.2	..	..	..	..	..	..
General government balance	-0.4	-5.4	-2.1	..	..	..	..	..	..
Primary balance	0.3	-4.6	-1.0	..	..	..	..	..	..
Gross public debt	17.1	27.0	26.7	..	..	..	..	..	..
<i>% of GDP</i>									
Debt of nonfinancial corporations (nonconsolidated)	112.3	108.9	96.6	..	..	..	..	..	..
Debt of households and NPISHs (nonconsolidated)	25.5	24.9	23.3	..	..	..	..	..	..
<i>% of GDP (based on EUR), period total</i>									
Trade balance	-7.0	-6.5	-5.8	-6.7	-4.6	-3.9	-8.0	-3.6	-4.1
Services balance	6.3	5.9	6.8	4.0	5.6	13.8	3.1	3.8	6.2
Primary income	-3.8	-3.1	-4.3	-4.2	-6.8	-4.0	-2.3	-2.6	-3.2
Secondary income	5.7	3.8	3.6	8.1	4.0	2.6	1.0	5.0	5.6
Current account balance	1.3	0.1	0.4	1.2	-1.8	8.6	-6.2	2.7	4.5
Capital account balance	1.1	2.2	3.1	3.1	3.9	2.5	3.1	5.7	2.2
Foreign direct investment (net)	-3.0	-2.1	-3.5	-6.0	-3.5	-5.0	-0.2	-4.0	-3.9
<i>% of GDP (rolling four-quarter GDP, based on EUR), end of period</i>									
Gross external debt	91.8	97.1	81.4	96.5	83.9	82.5	81.4	82.1	82.4
Gross official reserves (excluding gold)	31.9	35.6	42.3	40.4	39.3	41.7	42.3	43.5	45.4
<i>Months of imports of goods and services</i>									
Gross official reserves (excluding gold)	5.9	6.5	8.1	7.4	7.3	7.9	8.1	8.5	9.0
<i>EUR million, period total</i>									
GDP at current prices	42,011	42,762	45,287	9,260	11,214	12,207	12,605	9,816	11,403

Source: Bloomberg, European Commission, Eurostat, national statistical offices, national central banks, wiiw, OeNB.

<sup>1</sup> Not available in a currency board regime.

## 5 Croatia: recovery gains traction amid slow but steady fiscal consolidation

Return to growth backed by recovery of private consumption and investment	<p>In the first half of 2016, GDP growth accelerated further to 2.75%. It remained fueled by domestic demand – both by private consumption and investment. Conversely, the contribution of net exports to growth was mildly negative.</p>
Tourism boosts current account surplus	<p>The current account surplus had increased to 5.1% of GDP in 2015. The surplus was bolstered by the rise in tourism and a further increase in the surplus of secondary income attributable to the growing use of EU funds. Balance of payments data for the first half of 2016 do not signal major changes in trend. Croatia has seen a record tourist season this year: Tourism revenues rose noticeably in the first three quarters of 2016. Croatia seems to profit from a high level of internal security and, unlike some other parts of the Mediterranean region, the absence of terrorist attacks. Comparing the first half of 2015 to the first half of 2016, the goods trade deficit showed no significant changes. Growth in goods exports was to a large extent due to higher exports of ships as well as oil and refined petroleum products; exports of medicinal and pharmaceutical products also strengthened. At end-2015, gross external debt, around one-third of which was government debt, stood at 103.7% of GDP. External debt declined to 97.3% of GDP in the second quarter, as a result of a deleveraging of all major sectors in the economy.</p>
Price level contracts mildly; NPL ratio high but declining	<p>Inflation turned negative in 2015 and remained in negative territory in the first half of 2016, mainly as a result of more moderate energy prices and somewhat lower food prices. The ratio of NPLs to total loans remained high at about 15% in the second quarter of 2016 but fell for the fifth quarter in a row. Credit growth was again negative in 2015 and remained so in the first half of 2016. The development of household debt was largely influenced by the conversion of Swiss franc loans into euro loans at historical exchange rates under the legal framework which entered into force on September 30, 2015. According to the Croatian National Bank (HNB), household loans in Swiss francs and indexed to Swiss franc stood at HRK 21.7 billion at the end of November 2015 and declined to HRK 2.3 billion at the end of May 2016. As much as HRK 11.2 billion of this HRK 19.4 billion decline can be ascribed to conversion, and HRK 5.8 billion of the decline consisted in the write-off of part of the principal of Swiss franc-denominated loans. Overall, the percentage of foreign currency loans to resident non-MFIs remains high at 66.1% of total loans (July 2016).</p>
Broadly stable exchange rate, moderately favorable financial market developments	<p>During the course of this year, the kuna has marginally appreciated against the euro within its exchange rate framework of a tightly managed float. In February 2016, the HNB introduced structural repo operations aimed at providing banks with longer-term sources of kuna liquidity and has so far placed a total of HRK 0.9 billion with banks.</p>
Budgetary situation improves but further consolidation efforts are needed	<p>Despite the improvements in the fiscal situation in 2015 further progress is needed to underpin the sustainability of the fiscal position, especially in light of high gross public sector debt (86.7% of GDP at end-2015). After the center-right coalition, which had taken office following the last parliamentary elections in late 2015, fell apart after being in office for only five months, it is up to the new government, again a center-right coalition, to address these fiscal challenges. The new prime minister announced that the 2017 budget will clearly reflect efforts to reduce the budget deficit and public debt. The plan is to cut the deficit to 2% of GDP next year (from an expected shortfall of 2.5% in 2016).</p>

Table 5

## Main economic indicators: Croatia

	2013	2014	2015	Q1 15	Q2 15	Q3 15	Q4 15	Q1 16	Q2 16
<i>Year-on-year change of the period total in %</i>									
GDP at constant prices	-1.1	-0.4	1.6	0.5	1.2	2.8	1.9	2.7	2.8
Private consumption	-1.8	-0.7	1.2	0.4	0.6	1.4	2.4	3.1	3.0
Public consumption	0.3	-1.9	0.6	0.6	0.4	0.6	0.8	0.6	2.6
Gross fixed capital formation	1.4	-3.6	1.6	-0.4	0.8	2.2	3.7	4.3	6.3
Exports of goods and services	3.1	7.3	9.2	7.2	10.2	8.0	11.6	7.1	4.1
Imports of goods and services	3.1	4.3	8.6	5.7	6.9	8.1	13.6	6.1	6.7
<i>Contribution to GDP growth in percentage points</i>									
Domestic demand	-1.1	-1.7	1.2	0.4	0.0	1.3	3.0	2.7	4.1
Net exports of goods and services	0.0	1.3	0.5	0.0	1.1	1.6	-1.1	-0.2	-1.4
Exports of goods and services	1.3	3.1	4.2	2.5	4.3	5.1	4.8	2.6	1.9
Imports of goods and services	-1.3	-1.8	-3.8	-2.5	-3.2	-3.5	-5.9	-2.8	-3.3
<i>Year-on-year change of the period average in %</i>									
Unit labor costs in the whole economy (nominal, per person)	-2.2	-2.4	-0.4	-0.3	0.7	-0.9	-1.2	-2.3	-3.6
Unit labor costs in manufacturing (nominal, per hour)	2.5	-5.4	-3.6	-1.8	-2.8	-5.0	-5.1	..	..
Labor productivity in manufacturing (real, per hour)	-1.0	5.3	6.0	3.0	7.0	6.8	6.7	..	..
Labor costs in manufacturing (nominal, per hour)	2.0	-0.3	2.0	1.2	4.0	1.4	1.3	3.2	2.7
Producer price index (PPI) in industry	-0.4	-2.7	-3.9	-4.6	-2.6	-4.1	-4.2	-4.7	-6.1
Consumer price index (here: CPI)	2.3	0.2	-0.3	-0.3	0.0	-0.3	-0.4	-0.5	-1.1
EUR per 1 HRK, + = HRK appreciation	-0.8	-0.7	0.3	-0.4	0.3	0.6	0.6	0.8	0.9
<i>Period average levels</i>									
Unemployment rate (ILO definition, %, 15–64 years)	17.5	17.5	16.5	18.3	15.8	15.6	16.3	15.6	13.0
Employment rate (%, 15–64 years)	52.6	54.6	55.8	53.8	56.2	57.5	55.8	54.9	57.4
Key interest rate per annum (%)	..	..	..	..	..	..	..	..	..
HRK per 1 EUR	7.6	7.6	7.6	7.7	7.6	7.6	7.6	7.6	7.5
<i>Nominal year-on-year change in the period-end stock in %</i>									
Broad money (including foreign currency deposits)	4.0	3.2	5.1	2.8	4.8	4.6	5.1	3.4	4.6
<i>Contributions to year-on-year change of broad money in percentage points</i>									
Net foreign assets of the banking system	12.7	10.9	11.5	7.3	5.3	4.7	6.5	3.7	5.9
Domestic credit of the banking system	-3.1	-1.8	-0.2	-1.2	2.1	1.8	-0.3	-2.4	-2.6
<i>of which: claims on the private sector</i>	-7.0	-2.5	-4.1	-0.8	-0.7	-1.5	-2.4	-5.2	-4.8
<i>claims on households</i>	-1.7	-1.3	-1.1	0.4	0.4	-0.3	-0.7	-3.8	-3.4
<i>claims on enterprises</i>	-5.3	-1.2	-3.0	-1.2	-1.2	-1.2	-1.7	-1.4	-1.4
<i>claims on the public sector (net)</i>	3.9	0.7	3.9	-0.4	2.8	3.3	2.2	2.8	2.2
Other assets (net) of the banking system	-1.8	-1.8	-2.8	-3.4	-2.6	-1.9	-1.1	2.1	1.3
<i>% of GDP</i>									
General government revenues	42.5	42.6	43.7	..	..	..	..	..	..
General government expenditures	47.8	48.1	46.9	..	..	..	..	..	..
General government balance	-5.3	-5.5	-3.2	..	..	..	..	..	..
Primary balance	-1.8	-2.0	0.4	..	..	..	..	..	..
Gross public debt	82.2	86.5	86.7	..	..	..	..	..	..
<i>% of GDP</i>									
Debt of nonfinancial corporations (nonconsolidated)	102.7	101.4	97.8	..	..	..	..	..	..
Debt of households and NPISHs (nonconsolidated)	40.2	40.2	38.9	..	..	..	..	..	..
<i>% of GDP (based on EUR), period total</i>									
Trade balance	-15.1	-14.8	-15.2	-17.1	-16.1	-14.2	-13.5	-16.6	-16.9
Services balance	15.6	16.8	18.0	3.4	17.4	41.3	5.9	3.2	17.7
Primary income	-2.0	-2.0	-0.6	-2.1	-3.8	2.8	0.0	-3.7	-3.6
Secondary income	2.6	2.1	2.9	3.0	2.8	2.3	3.5	1.6	4.2
Current account balance	1.0	2.1	5.1	-12.8	0.3	32.3	-4.2	-15.5	1.3
Capital account balance	0.1	0.2	0.6	0.3	0.5	0.4	1.4	0.6	1.2
Foreign direct investment (net)	-1.9	-1.9	-0.4	-2.7	-0.1	0.5	0.2	-4.6	-2.2
<i>% of GDP (rolling four-quarter GDP, based on EUR), end of period</i>									
Gross external debt	105.7	108.5	103.7	114.1	112.8	107.5	103.7	100.1	97.3
Gross official reserves (excluding gold)	29.7	29.5	31.2	32.9	31.7	30.8	31.2	29.8	29.0
<i>Months of imports of goods and services</i>									
Gross official reserves (excluding gold)	8.3	8.0	7.9	8.8	8.3	8.0	7.9	7.6	7.3
<i>EUR million, period total</i>									
GDP at current prices	43,492	43,024	43,911	9,834	10,965	12,140	10,973	10,163	11,342

Source: Bloomberg, European Commission, Eurostat, national statistical offices, national central banks, wiw, OeNB.

## 6 Czech Republic: exports and private consumption fuel solid growth

Exports compensate temporary shortfall in capital formation

The Czech Republic returned to more modest but solid growth dynamics. Real GDP expanded by more than 3% on average in the first two quarters of 2016. When contrasted with the exceptional performance of 2015 (4.5% on average), the slowdown is notable. However, it was mainly caused by temporary and external factors. Most importantly, the start of a new EU programming period implied a substantial drop in GFCF. Investment activity is expected to regain some momentum as the new EU funding cycle proceeds. With a growth contribution of 2.7 percentage points in the second quarter, net exports were the main driver behind the recent growth dynamics. The Czech National Bank's (CNB's) exchange rate floor, implemented chiefly with the intention to support price stability, arguably also helped shield the competitiveness of the exporting industry to some degree by preventing an appreciation of the Czech koruna against the euro to below 27 CZK per 1 EUR. Going forward, however, high-frequency indicators suggest that economic activity will be more firmly based on private consumption again.

Private consumption remains a key source for growth

Private consumption expanded by 2.5% in the first two quarters of 2016. This increase was the result of positive consumer sentiment, beneficial wage and employment dynamics and accommodative monetary policies. Real purchasing power was bolstered by continuing subdued inflation. Disposable income increased in the first half of 2016 notwithstanding a sizeable decline in property income and reforms of the tax and social security systems.

Price dynamics disappoint again

Headline inflation remained below the CNB's projection and well below its target in the first two quarters of 2016. While consumer prices started to pick up in the first quarter (0.4%), a decline in administered and food prices caused headline inflation to slow down to 0.1% in the second quarter. External factors are perceived to be the main drivers in the sluggish price dynamics. Deflationary tendencies emanated from declining foreign producer prices, low oil prices and low or negative interest rates abroad. The CNB's policy rate has been standing at "technically zero" since October 2012. In November 2013, the CNB decided to use the exchange rate as an additional instrument to ease monetary conditions. According to a recent CNB survey, credit standards in the Czech banking sector were eased further for both corporate and consumer loans. This partly explains the vivid private sector credit growth observed throughout the first half of 2016.

Lower debt servicing costs support fiscal consolidation

Gross public debt as a share of GDP has decreased noticeably over the last few years. With a structural balance of -0.3% of GDP, the Czech Republic exceeded its medium-term budgetary objective of -1% of GDP in 2015. These beneficial developments are further supported by a reduction in debt servicing costs. Advantageous financial market developments and the perception of the Czech Republic as a credible borrower reflected in a heightened demand for the Czech koruna – the CNB needed to intervene repeatedly in the foreign exchange market to uphold its commitment – have pushed government bond yields to a record low. The average time to maturity of government debt decreased from 6.5 years in 2011 to 3.4 years in the second quarter of 2016.

Table 6

## Main economic indicators: Czech Republic

	2013	2014	2015	Q1 15	Q2 15	Q3 15	Q4 15	Q1 16	Q2 16
<i>Year-on-year change of the period total in %</i>									
GDP at constant prices	-0.5	2.7	4.5	4.6	5.0	4.2	4.3	2.7	3.6
Private consumption	0.5	1.8	3.0	3.6	3.3	2.4	2.9	2.4	2.6
Public consumption	2.5	1.1	2.0	1.3	1.3	3.3	1.9	2.3	2.5
Gross fixed capital formation	-2.5	3.9	9.0	5.4	10.5	10.1	9.5	-0.5	-4.1
Exports of goods and services	0.2	8.7	7.7	7.6	7.5	6.3	9.3	5.0	8.4
Imports of goods and services	0.1	10.1	8.2	8.9	8.9	6.8	8.4	4.6	5.6
<i>Contribution to GDP growth in percentage points</i>									
Domestic demand	-0.6	3.2	4.4	4.8	5.5	4.3	3.3	2.0	0.9
Net exports of goods and services	0.1	-0.5	0.1	-0.3	-0.5	0.0	1.1	0.7	2.7
Exports of goods and services	0.1	6.6	6.4	6.6	6.2	5.0	7.6	4.4	6.9
Imports of goods and services	0.0	-7.1	-6.3	-6.9	-6.7	-5.0	-6.5	-3.6	-4.2
<i>Year-on-year change of the period average in %</i>									
Unit labor costs in the whole economy (nominal, per person)	0.6	0.4	-0.5	-1.1	-0.5	-0.3	0.0	2.5	1.5
Unit labor costs in manufacturing (nominal, per hour)	-0.6	-1.3	-1.2	-2.9	-2.4	-6.4	7.3	-3.3	3.1
Labor productivity in manufacturing (real, per hour)	3.2	4.9	4.2	5.0	4.6	5.1	2.3	3.0	0.9
Labor costs in manufacturing (nominal, per hour)	2.4	3.6	3.1	1.9	2.2	-1.6	9.7	-0.4	4.0
Producer price index (PPI) in industry	0.7	1.0	-2.5	-2.0	-1.5	-3.1	-3.4	-4.0	-4.5
Consumer price index (here: HICP)	1.4	0.4	0.3	0.0	0.7	0.3	0.0	0.4	0.1
EUR per 1 CZK, + = CZK appreciation	-3.2	-5.6	0.9	-0.7	0.2	2.0	2.1	2.2	1.3
<i>Period average levels</i>									
Unemployment rate (ILO definition, %, 15–64 years)	7.0	6.2	5.1	6.0	5.0	4.9	4.5	4.4	4.0
Employment rate (%, 15–64 years)	67.7	69.0	70.2	69.4	70.2	70.5	70.8	71.0	71.7
Key interest rate per annum (%)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
CZK per 1 EUR	26.0	27.5	27.3	27.6	27.4	27.1	27.1	27.0	27.0
<i>Nominal year-on-year change in the period-end stock in %</i>									
Broad money (including foreign currency deposits)	5.8	5.9	8.0	5.6	7.0	8.8	8.0	9.4	9.5
<i>Contributions to year-on-year change of broad money in percentage points</i>									
Net foreign assets of the banking system	11.3	5.8	7.2	0.5	2.2	3.5	6.7	6.4	8.0
Domestic credit of the banking system	5.2	12.1	10.2	8.9	6.8	5.5	2.0	1.7	1.1
<i>of which: claims on the private sector</i>	4.8	5.8	7.7	3.2	4.5	6.3	4.6	5.8	5.6
<i>claims on households</i>	3.1	2.5	4.0	1.1	2.1	2.2	2.8	2.8	2.4
<i>claims on enterprises</i>	1.6	3.3	3.7	2.1	2.4	4.1	1.8	3.0	3.2
<i>claims on the public sector (net)</i>	0.4	6.3	2.5	5.7	2.3	-0.8	-2.6	-4.2	-4.5
Other assets (net) of the banking system	-5.6	-5.7	-3.1	-3.9	-2.1	-0.2	-0.8	1.4	0.4
<i>% of GDP</i>									
General government revenues	41.6	40.8	42.2	..	..	..	..	..	..
General government expenditures	42.8	42.8	42.6	..	..	..	..	..	..
General government balance	-1.3	-1.9	-0.4	..	..	..	..	..	..
Primary balance	0.1	-0.7	0.7	..	..	..	..	..	..
Gross public debt	45.1	42.7	41.1	..	..	..	..	..	..
<i>% of GDP</i>									
Debt of nonfinancial corporations (nonconsolidated)	57.9	60.5	59.4	..	..	..	..	..	..
Debt of households and NPISHs (nonconsolidated)	29.8	30.1	30.7	..	..	..	..	..	..
<i>% of GDP (based on EUR), period total</i>									
Trade balance	4.1	5.1	4.6	7.3	4.9	3.3	3.2	7.9	7.1
Services balance	1.7	1.3	1.6	1.7	1.8	1.7	1.5	2.0	2.0
Primary income	-6.1	-6.0	-5.4	-1.6	-9.0	-7.9	-2.6	-0.4	-8.1
Secondary income	-0.3	-0.2	0.0	1.4	-0.3	-0.2	-0.9	0.6	-1.0
Current account balance	-0.5	0.2	0.9	8.7	-2.6	-3.1	1.2	10.0	0.0
Capital account balance	2.0	0.7	2.3	2.9	4.6	0.7	1.2	1.7	1.8
Foreign direct investment (net)	0.2	-1.9	0.6	-0.2	-0.6	1.2	1.8	0.9	-5.7
<i>% of GDP (rolling four-quarter GDP, based on EUR), end of period</i>									
Gross external debt	63.2	67.8	69.4	67.7	67.7	71.7	69.4	70.3	71.9
Gross official reserves (excluding gold)	25.7	28.4	35.3	30.5	31.4	34.1	35.3	37.8	39.0
<i>Months of imports of goods and services</i>									
Gross official reserves (excluding gold)	4.3	4.5	5.5	4.8	4.9	5.3	5.5	6.0	6.3
<i>EUR million, period total</i>									
GDP at current prices	157,625	156,641	167,003	38,109	41,744	42,938	44,212	40,500	44,156

Source: Bloomberg, European Commission, Eurostat, national statistical offices, national central banks, wiw, OeNB.

## 7 Hungary: loose monetary policy and fiscal stimulus to help economy out of temporary low

GDP growth slows during first half of 2016

Hungarian GDP registered 1.9% year-on-year growth (unadjusted) during the first half of 2016, down from 2.9% in 2015. The key factor behind the deceleration was the sharp contraction of investment activity as the inflow of EU funds slowed following the end of the dual disbursement period at end-2015. By contrast, after several years of destocking, stock changes added around 1.3 percentage points to the overall GDP growth rate. Private consumption growth accelerated gradually during the first half of 2016, supported by faster real wage growth and continued employment gains, a lower and less risky debt burden, historically strong consumer confidence and improving credit developments. Public consumption advanced by a steady 2.5% during the first two quarters of 2016. Export growth decelerated somewhat from the levels seen in 2015, reflecting the temporary closure of a car factory during the first quarter and weaker demand for Hungarian goods by EU countries. As import growth fell less than export growth, the contribution of net real exports was cut by roughly half from 2015 levels. So far, high-frequency indicators have not signaled an improvement in economic activity in the third quarter.

Fiscal expansion planned for 2017

Calculations by the central bank indicate that favorable budgetary developments during the first half of 2016 allow the government considerable fiscal room to stimulate the economy without endangering the budget deficit target of 2% of GDP in 2016. For 2017, the government plans an increase in the headline deficit to 2.4% of GDP. The widening of the deficit will be caused mainly by the reduction of VAT rates for selected products, additional tax benefits for families, the cut in the special tax on financial institutions, increased outlays for home subsidies for households and public sector pay rises. This widening will not be fully counterbalanced by stronger GDP growth and better tax collection efficiency. The fiscal expansion should, however, be reversed in the coming years, with the deficit sinking gradually to 1.2% of GDP by 2020. In the same period, the structural deficit is also expected to fall from 2.1% of GDP in 2016 and 2017 to 1.2% of GDP, i.e. below the new medium-term objective of 1.5% of GDP. The EU Council was less upbeat on the outlook in its assessment of the Convergence Programme, missing sufficiently specified measures for the planned deficit reduction and thus seeing a high risk of a significant deviation from the adjustment path.

Central bank maintains loose policy stance

In its latest rate cutting cycle from March to May 2016, the Hungarian National Bank (MNB) lowered its policy rate by a total of 45 basis points to 0.9%. The overnight deposit rate has been negative (-0.05%) since late March 2016. Since the last rate cut, the MNB has repeatedly signaled that maintaining the current loose monetary conditions for an extended period is consistent with the medium-term inflation target. Moreover, in order to support lending, the MNB has put a limit on access to the three-month deposit facility (main policy tool), thereby increasing banking sector liquidity that would otherwise end up on the government securities and the interbank market and that would cause a drop in interest rates. This move should also benefit lending to the private sector. Additionally, in June 2016, the MNB increased the volume of funds available until end-2016 in its Growth Supporting Scheme by one-third in response to banking sector requests.

Table 7

## Main economic indicators: Hungary

	2013	2014	2015	Q1 15	Q2 15	Q3 15	Q4 15	Q1 16	Q2 16
<i>Year-on-year change of the period total in %</i>									
GDP at constant prices	1.9	3.7	2.9	3.5	2.7	2.4	3.2	1.1	2.6
Private consumption	0.3	1.8	3.0	3.3	2.7	2.7	3.4	4.8	5.1
Public consumption	2.4	2.9	0.6	-3.3	-2.4	3.5	4.3	2.5	2.5
Gross fixed capital formation	7.3	11.2	1.9	-5.5	5.0	-1.4	6.5	-7.8	-20.0
Exports of goods and services	6.4	7.6	8.4	8.7	8.8	8.6	7.7	5.7	8.2
Imports of goods and services	6.3	8.5	7.8	7.4	7.5	8.1	8.0	7.8	6.1
<i>Contribution to GDP growth in percentage points</i>									
Domestic demand	1.4	3.9	1.8	1.7	1.0	1.3	3.0	2.4	0.2
Net exports of goods and services	0.5	-0.2	1.2	1.8	1.7	1.1	0.2	-1.2	2.4
Exports of goods and services	5.5	6.7	7.5	8.1	7.9	7.6	6.6	5.5	7.6
Imports of goods and services	-5.1	-6.9	-6.4	-6.3	-6.2	-6.5	-6.4	-6.7	-5.2
<i>Year-on-year change of the period average in %</i>									
Unit labor costs in the whole economy (nominal, per person)	0.9	1.9	3.3	4.7	3.2	3.2	2.0	5.8	4.9
Unit labor costs in manufacturing (nominal, per hour)	3.1	-2.4	-0.1	-0.6	0.6	-0.2	-0.2	8.4	6.3
Labor productivity in manufacturing (real, per hour)	0.6	5.9	4.1	4.0	3.7	4.2	4.6	-3.0	-1.6
Labor costs in manufacturing (nominal, per hour)	3.6	3.4	4.0	3.3	4.3	4.0	4.3	5.1	4.6
Producer price index (PPI) in industry	0.6	-0.4	-0.9	-2.2	0.2	-0.6	-1.1	-1.5	-2.0
Consumer price index (here: HICP)	1.7	0.0	0.1	-0.9	0.4	0.2	0.6	0.4	0.0
EUR per 1 HUF, + = HUF appreciation	-2.6	-3.8	-0.4	-0.3	0.0	0.1	-1.3	-1.0	-2.4
<i>Period average levels</i>									
Unemployment rate (ILO definition, %, 15–64 years)	10.3	7.8	6.9	7.8	6.9	6.5	6.2	6.1	5.1
Employment rate (%, 15–64 years)	58.1	61.8	64.0	62.4	63.8	64.8	64.8	65.1	66.4
Key interest rate per annum (%)	4.4	2.4	1.6	2.1	1.8	1.4	1.4	1.3	1.0
HUF per 1 EUR	296.9	308.7	309.9	308.9	305.9	312.1	312.6	312.1	313.3
<i>Nominal year-on-year change in the period-end stock in %</i>									
Broad money (including foreign currency deposits)	5.5	5.1	6.3	4.7	3.9	4.1	6.3	5.0	5.4
<i>Contributions to year-on-year change of broad money in percentage points</i>									
Net foreign assets of the banking system	11.7	14.5	8.9	5.1	2.5	-0.3	1.4	-1.2	-0.6
Domestic credit of the banking system	-11.6	0.6	2.3	-3.4	1.3	2.4	1.8	6.4	4.5
<i>of which: claims on the private sector</i>	-18.1	-4.9	-8.1	-5.2	-5.6	-6.1	-7.4	-3.3	-2.8
<i>claims on households</i>	-9.6	-3.0	-5.3	-3.7	-3.9	-4.1	-4.4	-2.2	-2.0
<i>claims on enterprises</i>	-8.5	-1.9	-2.8	-1.6	-1.8	-2.0	-3.0	-0.9	-0.6
<i>claims on the public sector (net)</i>	6.4	5.5	10.4	1.8	6.9	8.5	9.2	9.8	7.4
Other assets (net) of the banking system	2.0	-4.2	0.5	3.0	0.1	2.0	3.1	-0.2	1.4
<i>% of GDP</i>									
General government revenues	47.0	47.5	48.7	..	..	..	..	..	..
General government expenditures	49.6	49.8	50.7	..	..	..	..	..	..
General government balance	-2.6	-2.3	-2.0	..	..	..	..	..	..
Primary balance	1.9	1.7	1.6	..	..	..	..	..	..
Gross public debt	76.8	76.2	75.3	..	..	..	..	..	..
<i>% of GDP</i>									
Debt of nonfinancial corporations (nonconsolidated)	92.0	88.8	87.6	..	..	..	..	..	..
Debt of households and NPISHs (nonconsolidated)	28.1	25.3	21.2	..	..	..	..	..	..
<i>% of GDP (based on EUR), period total</i>									
Trade balance	3.3	2.3	4.0	6.2	2.6	2.8	4.7	6.2	5.1
Services balance	3.7	4.7	5.0	4.7	5.6	6.5	3.1	4.7	6.4
Primary income	-2.7	-4.2	-4.6	-3.0	-5.2	-4.9	-5.2	-2.7	-3.8
Secondary income	-0.5	-0.7	-0.9	-1.9	-0.8	-0.8	-0.5	-2.0	-1.3
Current account balance	3.8	2.1	3.4	6.0	2.2	3.6	2.2	6.2	6.4
Capital account balance	3.6	3.8	4.6	3.2	4.7	2.5	7.5	1.1	0.3
Foreign direct investment (net)	-1.1	-2.7	-0.4	0.5	3.3	-3.4	-1.5	-1.7	2.3
<i>% of GDP (rolling four-quarter GDP, based on EUR), end of period</i>									
Gross external debt	118.5	115.2	107.5	121.5	116.5	109.3	107.5	104.6	104.3
Gross official reserves (excluding gold)	33.3	33.1	27.8	35.0	32.6	29.8	27.8	25.2	22.5
<i>Months of imports of goods and services</i>									
Gross official reserves (excluding gold)	5.0	4.8	4.0	5.1	4.7	4.3	4.0	3.6	3.2
<i>EUR million, period total</i>									
GDP at current prices	101,268	104,245	108,731	24,304	26,924	27,865	29,639	24,629	27,520

Source: Bloomberg, European Commission, Eurostat, national statistical offices, national central banks, wiw, OeNB.

## 8 Poland: growth rebounds after slowdown due to lower fixed investment

Exports as the main pillar of growth; stronger import growth despite investment slump

GDP growth reached 2.7% in the first half of 2016 (2015: 3.6%) and speeded up in the second quarter. Total final demand growth increased to 5.2%, as real exports rose by 9.7%, domestic demand went up by 2.7% and real imports expanded by 10.1%. Foreign demand contributed nearly twice as much as domestic demand to GDP growth, while the net export contribution was close to zero. Compared to 2015, both export and import growth accelerated substantially, while domestic demand growth declined. The main reason for the growth slowdown was the slump in fixed investment caused mainly by initially lower EU fund absorption under the new EU budget and affecting above all public investment. A strong inventory buildup could only partially offset this. Conditions for business investment remained supportive, given contained ULC increases, stable profitability, a healthy liquidity position, stable industrial confidence and rising export orders. Housing investment growth slackened in parallel to housing loan growth. Real wage sum growth remained close to 5% also because of higher employment and deflation, yet real pension growth weakened. Consumer confidence continued to improve, but private consumption expanded considerably less than real income, possibly due to deflation expectations. In seasonal and working-day adjusted terms, private consumption growth remained at the comparatively low level of the fourth quarter of 2015. On October 19, the Sejm is scheduled to start discussing the issue of Swiss franc loans, with President Duda's proposal envisaging compensation payments for foreign exchange spreads; earlier plans for compulsory conversion (at historical exchange rates) were dropped for financial stability reasons.

Weaker zloty offsets moderate ULC rise, preserving price competitiveness

In manufacturing, labor costs increased faster, while labor productivity growth declined thanks to higher employment growth. Thus, ULCs rose by about 2 percentage points more year on year than those in the euro area. However, the zloty's euro value was about 5 percentage points lower in the first half of 2016 than a year earlier. In the third quarter, the zloty reappreciated moderately. In August, annual headline inflation was negative (−0.5% HICP, −0.8% national CPI), while core inflation stood at 0.2% (HICP) and −0.4% (CPI), with deflation in industrial goods and inflation in services. The Polish Monetary Policy Council (MPC), pursuing an inflation target of 2.5% (CPI), has kept rates on hold since March 2015. On October 5, 2016, it again decided to keep the key interest rate at 1.5%, expecting stable economic growth and abating headline deflation in the coming months.

Fiscal headline deficit may undershoot 2.6% target; substantial structural deficit

In the first eight months of 2016, the central budget deficit amounted to roughly one-quarter of the annual plan (2.3% of GDP), given tax revenue growth of 7% and expenditures below plan. Thus, the gross general government deficit 2016 could be lower than the target of 2.6% of GDP envisaged in the government's Convergence Programme submitted in April 2016 (2015: 2.6%). For 2017, a headline deficit of 2.9% of GDP is foreseen, while the structural deficit path aims at 3.1% of GDP in 2016 (after 2.3% of GDP in 2015) and 2.9% in 2017. This implies a marked deviation from the MTO of a structural deficit of 1% of GDP. General government gross debt is expected to rise moderately to 52.5% of GDP at the end of 2017.

Table 8

## Main economic indicators: Poland

	2013	2014	2015	Q1 15	Q2 15	Q3 15	Q4 15	Q1 16	Q2 16
<i>Year-on-year change of the period total in %</i>									
GDP at constant prices	1.3	3.3	3.6	3.8	3.1	3.3	4.3	2.5	3.0
Private consumption	0.2	2.4	3.0	3.7	3.4	2.7	2.2	3.0	2.7
Public consumption	2.2	4.7	3.4	1.6	1.0	0.6	9.0	3.6	4.0
Gross fixed capital formation	-1.1	10.0	5.8	10.9	5.5	5.2	4.4	-2.2	-4.6
Exports of goods and services	6.1	6.4	6.8	8.3	5.4	5.4	8.2	6.8	12.5
Imports of goods and services	1.7	10.0	6.3	7.3	5.5	4.6	8.0	9.2	11.1
<i>Contribution to GDP growth in percentage points</i>									
Domestic demand	-0.7	4.8	3.3	3.1	3.1	2.9	4.2	3.4	1.9
Net exports of goods and services	1.9	-1.5	0.3	0.6	0.0	0.6	0.2	-0.9	1.0
Exports of goods and services	2.7	3.0	3.2	4.1	2.6	1.9	4.0	3.5	6.2
Imports of goods and services	-0.8	-4.4	-2.9	-3.4	-2.6	-1.3	-3.8	-4.4	-5.2
<i>Year-on-year change of the period average in %</i>									
Unit labor costs in the whole economy (nominal, per person)	0.5	0.6	-2.3	-2.3	-2.6	-1.9	-2.3	1.2	1.4
Unit labor costs in manufacturing (nominal, per hour)	-0.1	2.1	1.0	0.8	1.0	1.7	0.5	3.4	2.5
Labor productivity in manufacturing (real, per hour)	3.5	2.4	2.8	5.1	1.9	2.9	1.6	0.3	0.6
Labor costs in manufacturing (nominal, per hour)	3.4	4.7	3.9	5.9	3.0	4.7	2.1	3.7	3.1
Producer price index (PPI) in industry	-1.2	-1.3	-2.1	-2.5	-1.9	-2.3	-1.6	-1.5	-1.0
Consumer price index (here: HICP)	0.8	0.1	-0.7	-1.2	-0.6	-0.5	-0.5	-0.3	-0.4
EUR per 1 PLN, + = PLN appreciation	-0.3	0.3	0.0	-0.2	2.0	-0.3	-1.2	-4.0	-6.5
<i>Period average levels</i>									
Unemployment rate (ILO definition, %, 15–64 years)	10.5	9.1	7.6	8.7	7.5	7.1	7.0	7.1	6.3
Employment rate (%, 15–64 years)	60.0	61.7	62.9	61.9	62.6	63.5	63.7	63.7	64.3
Key interest rate per annum (%)	2.9	2.4	1.6	1.8	1.5	1.5	1.5	1.5	1.5
PLN per 1 EUR	4.2	4.2	4.2	4.2	4.1	4.2	4.3	4.4	4.4
<i>Nominal year-on-year change in the period-end stock in %</i>									
Broad money (including foreign currency deposits)	6.2	8.2	9.1	8.7	8.2	8.3	9.1	9.1	11.4
<i>Contributions to year-on-year change of broad money in percentage points</i>									
Net foreign assets of the banking system	0.3	0.4	4.5	5.2	2.5	1.8	1.3	-1.1	4.3
Domestic credit of the banking system	9.5	18.2	20.1	8.1	9.5	8.1	9.9	11.5	10.8
<i>of which: claims on the private sector</i>	6.7	11.5	14.3	7.6	7.7	7.4	6.8	4.6	4.9
<i>claims on households</i>	3.0	6.1	7.2	4.2	4.7	3.6	3.7	2.5	2.7
<i>claims on enterprises</i>	3.7	5.4	7.0	3.3	3.0	3.8	3.1	2.1	2.2
<i>claims on the public sector (net)</i>	2.8	6.7	5.9	0.5	1.8	0.7	3.0	6.9	6.0
Other assets (net) of the banking system	1.2	-3.6	-6.7	-4.5	-3.8	-1.6	-2.1	-1.3	-3.7
<i>% of GDP</i>									
General government revenues	38.4	38.9	38.9	..	..	..	..	..	..
General government expenditures	42.4	42.2	41.5	..	..	..	..	..	..
General government balance	-4.0	-3.3	-2.6	..	..	..	..	..	..
Primary balance	-1.5	-1.4	-0.8	..	..	..	..	..	..
Gross public debt	56.0	50.5	51.3	..	..	..	..	..	..
<i>% of GDP</i>									
Debt of nonfinancial corporations (nonconsolidated)	44.1	45.0	45.8	..	..	..	..	..	..
Debt of households and NPISHs (nonconsolidated)	35.4	34.9	35.6	..	..	..	..	..	..
<i>% of GDP (based on EUR), period total</i>									
Trade balance	-0.1	-0.8	0.5	1.6	0.3	-0.7	0.9	1.0	1.4
Services balance	1.9	2.2	2.6	2.5	2.9	2.5	2.2	3.0	3.5
Primary income	-3.0	-3.4	-3.5	-2.8	-3.2	-4.3	-3.6	-3.7	-4.0
Secondary income	-0.1	-0.1	-0.2	-0.9	0.4	0.1	-0.4	-0.5	0.0
Current account balance	-1.3	-2.1	-0.6	0.4	0.4	-2.4	-0.8	-0.2	1.0
Capital account balance	2.3	2.4	2.4	3.7	1.1	4.4	0.7	2.5	0.0
Foreign direct investment (net)	-0.8	-2.4	-2.1	-2.8	0.0	-2.5	-2.8	-3.3	-1.0
<i>% of GDP (rolling four-quarter GDP, based on EUR), end of period</i>									
Gross external debt	70.7	71.5	70.6	74.7	73.6	72.7	70.6	70.5	73.0
Gross official reserves (excluding gold)	18.8	19.3	19.6	21.0	21.5	20.7	19.6	19.9	22.5
<i>Months of imports of goods and services</i>									
Gross official reserves (excluding gold)	5.1	5.0	5.0	5.4	5.5	5.3	5.0	5.1	5.7
<i>EUR million, period total</i>									
GDP at current prices	394,674	410,788	427,596	98,531	105,432	104,382	119,252	97,632	102,086

Source: Bloomberg, European Commission, Eurostat, national statistical offices, national central banks, wiw, OeNB.

## 9 Romania: strong but unbalanced growth widens the current account deficit

Private consumption continues to boom

GDP growth speeded up in the first half of 2016, mainly propelled by the ongoing powerful acceleration of private consumption growth. In addition, GFCF continued to recover, whereas exports showed moderate growth. Procyclical economic policy continued to support private consumption, and a further minimum wage hike in May 2016 even pushed its annual growth rate above 10% in the second quarter. Real wages grew by 15% year on year in the first half of 2016. Residential building activity supported by government-guaranteed mortgage lending under the first home program (and the related growth of housing loans), late disbursements of EU funds under the 2007–2013 financial framework and an overall favorable economic sentiment backed the development of GFCF. Strong domestic demand resulted in quickly rising imports, dragging the contribution of net exports deeper into negative territory.

Current account deficit widens...

High, domestic demand-driven growth caused the trade deficit and in turn also the current account deficit to widen markedly. As the capital account remained robust thanks to EU fund inflows, Romania maintained a positive net lending position from the current and capital accounts in the first half of 2016, however. It is also noteworthy that net FDI inflows picked up somewhat. In sum, developments in the balance of payments still made a further reduction of the external debt stock possible without recourse to official foreign currency reserves. The banking sector contributed most to the decline of external debt, accompanied by a further fall in the domestic credit-to-deposit ratio.

...mainly due to the economic policy mix

The continued sharp rise in ULCs in the manufacturing sector precipitated by productivity declines and increases in labor costs poses risks to the export performance, whereas rapid wage growth and further fiscal stimulus are likely to keep import demand at elevated levels. Starting in August, wages in the health and education sector were raised by 10%. In parallel to a series of minimum wage hikes and public sector wage boosts, labor market conditions have tightened, as reflected by a falling unemployment rate and an increasing job vacancy rate. In the first eight months of 2016, the consolidated budget deficit came in lower than planned at 0.4% of GDP, implying fiscal space in the forefront of elections in December, as the full-year deficit target stands at 2.8% of GDP (considerably above the deficit of 0.7% of GDP recorded in 2015). Some initiatives in parliament ahead of parliamentary elections in December 2016 could also materialize in the fiscal burden for 2017 and could increase adjustment needs for the next government.

Lessening impact of indirect tax cuts in 2015 ends deflation

CPI and HICP inflation rates bottomed out in May 2016 at –3.0% and –2.9%, respectively. Since then, the year-on-year declines in price levels have moderated, as the direct impact of the extension of the 9% reduced VAT to all food items (implemented in June 2015) came to a halt from June. The annual change of the HCPI turned positive in August, while the CPI inflation rate came in at –0.3%. The direct disinflationary impact of the cut in the standard VAT rate (implemented in January 2016) will last until the end of this year. The Banca Națională României (BNR) currently projects the headline CPI rate to enter the target variation band of 2.5% ±1 percentage point in the second half of 2017. The BNR has kept its policy rate unchanged at 1.75% since May 2015.

Table 9

## Main economic indicators: Romania

	2013	2014	2015	Q1 15	Q2 15	Q3 15	Q4 15	Q1 16	Q2 16
<i>Year-on-year change of the period total in %</i>									
GDP at constant prices	3.5	3.0	3.8	4.3	3.4	3.6	3.8	4.3	6.0
Private consumption	1.3	3.9	6.0	4.8	5.4	6.4	7.3	9.5	10.8
Public consumption	-6.8	0.5	1.7	2.9	1.6	2.9	0.2	3.9	3.4
Gross fixed capital formation	-6.8	3.1	7.7	8.4	7.6	2.1	17.6	2.3	10.7
Exports of goods and services	18.1	8.4	5.2	7.9	8.0	4.6	1.0	5.3	4.0
Imports of goods and services	9.4	8.3	9.2	11.3	9.9	9.7	6.5	9.7	12.1
<i>Contribution to GDP growth in percentage points</i>									
Domestic demand	-0.1	3.2	5.3	6.7	7.3	4.4	3.6	7.4	6.0
Net exports of goods and services	3.6	-0.2	-1.5	-2.0	-1.9	-1.5	-1.1	-2.3	-3.5
Exports of goods and services	7.4	3.4	2.3	4.2	3.3	1.8	-0.4	1.7	1.7
Imports of goods and services	-3.7	-3.6	-3.8	-6.2	-5.1	-3.3	-0.7	-4.0	-5.3
<i>Year-on-year change of the period average in %</i>									
Unit labor costs in the whole economy (nominal, per person)	0.5	2.6	-1.9	0.4	-4.2	-0.3	-3.5	5.0	7.7
Unit labor costs in manufacturing (nominal, per hour)	-0.5	-0.3	9.0	7.6	9.5	9.2	9.6	8.3	11.2
Labor productivity in manufacturing (real, per hour)	6.2	5.8	-0.3	0.6	-0.8	-1.1	0.2	-2.3	-1.7
Labor costs in manufacturing (nominal, per hour)	5.6	5.6	8.7	8.2	8.6	8.0	9.9	5.9	9.3
Producer price index (PPI) in industry	2.1	-0.1	-2.2	-1.6	-2.4	-2.6	-2.3	-2.9	-2.6
Consumer price index (here: HICP)	3.2	1.4	-0.4	0.5	0.4	-1.5	-1.0	-2.0	-2.1
EUR per 1 RON, + = RON appreciation	0.9	-0.6	0.0	1.1	-0.4	-0.3	-0.5	-0.9	-1.2
<i>Period average levels</i>									
Unemployment rate (ILO definition, %, 15–64 years)	7.4	7.1	7.1	7.6	7.0	6.8	6.8	6.8	6.1
Employment rate (%, 15–64 years)	60.1	61.0	61.4	59.1	62.0	63.2	61.4	59.8	61.8
Key interest rate per annum (%)	4.8	3.3	1.9	2.4	1.8	1.8	1.8	1.8	1.8
RON per 1 EUR	4.4	4.4	4.4	4.5	4.4	4.4	4.5	4.5	4.5
<i>Nominal year-on-year change in the period-end stock in %</i>									
Broad money (including foreign currency deposits)	8.8	8.4	9.3	6.5	8.8	8.4	9.3	9.9	13.1
<i>Contributions to year-on-year change of broad money in percentage points</i>									
Net foreign assets of the banking system	20.7	26.6	17.8	8.8	6.0	4.4	5.5	7.0	11.3
Domestic credit of the banking system	-5.4	-10.9	0.7	-1.4	3.1	3.3	5.4	2.8	2.7
<i>of which: claims on the private sector</i>	-1.9	-6.3	0.0	-2.8	0.1	0.5	2.5	2.4	1.0
<i>claims on households</i>	-0.5	-1.1	1.9	0.0	1.5	1.5	2.2	2.2	2.1
<i>claims on enterprises</i>	-1.4	-5.2	-2.0	-2.8	-1.4	-1.0	0.3	0.2	-1.1
<i>claims on the public sector (net)</i>	-3.5	-4.7	0.7	1.4	3.0	2.7	2.9	0.4	1.8
Other assets (net) of the banking system	-3.6	2.3	0.0	-0.9	-0.2	0.6	-1.5	0.2	-1.0
<i>% of GDP</i>									
General government revenues	33.1	33.5	34.8	..	..	..	..	..	..
General government expenditures	35.2	34.3	35.5	..	..	..	..	..	..
General government balance	-2.1	-0.9	-0.7	..	..	..	..	..	..
Primary balance	-0.4	0.9	0.9	..	..	..	..	..	..
Gross public debt	38.0	39.8	38.4	..	..	..	..	..	..
<i>% of GDP</i>									
Debt of nonfinancial corporations (nonconsolidated)	48.0	44.7	41.2	..	..	..	..	..	..
Debt of households and NPISHs (nonconsolidated)	19.0	17.9	17.1	..	..	..	..	..	..
<i>% of GDP (based on EUR), period total</i>									
Trade balance	-4.0	-4.2	-4.9	-3.9	-4.6	-4.7	-5.8	-5.7	-5.7
Services balance	3.3	3.9	4.3	4.7	4.7	4.4	3.7	5.5	4.9
Primary income	-2.2	-1.3	-2.4	-1.3	-4.1	-2.2	-1.9	-3.4	-3.8
Secondary income	1.9	1.1	1.8	2.2	1.5	1.3	2.1	1.4	1.3
Current account balance	-1.1	-0.4	-1.1	1.7	-2.5	-1.2	-1.9	-2.2	-3.3
Capital account balance	2.1	2.6	2.4	4.8	1.8	2.0	1.8	4.0	3.2
Foreign direct investment (net)	-2.0	-1.8	-1.7	-2.6	-2.1	-2.2	-0.4	-2.6	-2.9
<i>% of GDP (rolling four-quarter GDP, based on EUR), end of period</i>									
Gross external debt	68.4	61.8	56.3	60.4	58.6	56.7	56.3	55.0	53.6
Gross official reserves (excluding gold)	22.7	21.4	20.2	19.9	19.4	18.5	20.2	19.4	19.3
<i>Months of imports of goods and services</i>									
Gross official reserves (excluding gold)	6.7	6.2	5.8	5.8	5.5	5.3	5.8	5.5	5.5
<i>EUR million, period total</i>									
GDP at current prices	144,102	150,359	160,367	31,584	36,641	44,564	47,578	32,654	39,762

Source: Bloomberg, European Commission, Eurostat, national statistical offices, national central banks, wiw, OeNB.

## 10 Turkey: economy starts to lose momentum amid elevated risks

Internal political risks increase considerably

GDP growth started to lose pace in the first half of 2016, coming down to 3.9% year on year. Available high-frequency indicators for the third quarter of 2016 already point toward a continued deceleration of economic momentum amid high and rising uncertainties. In particular, risks stemming from ongoing geopolitical tensions but also from higher domestic political instability following the military coup attempt in mid-July 2016 increased considerably.

On July 21, the Turkish government declared a state of emergency, which was extended in October for a total of six months. Following the coup attempt, several thousand civil servants and judges as well as teachers have been detained or suspended, which is likely to threaten the capacity of Turkey's policymaking institutions and suppress investor sentiment, in turn weighing on economic growth. Accordingly, Standard & Poor's and Moody's cut Turkey's rating to below investment grade in July and September, respectively.

GDP growth largely driven by an upswing in private consumption

The pronounced shift toward domestic-driven GDP growth, which had started in 2015, continued in the first half of 2016. In particular, easier financing conditions, elevated employment growth and the 30% hike of the minimum wage in January 2016 boosted private consumption. Both public consumption and public investment posted robust growth, thus partly balancing the slowdown of private investment. However, overall GFCF stagnated in the first half of 2016.

In the first half of 2016, net external demand exerted a drag on growth: Exports increased by a modest 1.3% while imports surged by 7.5%. Despite the slight uptick in exports to the EU, the ongoing economic downturn in major trading partner countries (e.g. Iraq), economic sanctions imposed by Russia as from January 2016 and a sharp deterioration in tourism weighed on export growth.

External imbalances continue to accumulate

The oil price-driven adjustment continued as the four-quarter current account deficit narrowed to 4.2% of GDP until June 2016, slightly down from 4.5% of GDP in 2015. On the financing side, net FDI inflows are on the decline and nearly halved to 0.7% of GDP in the first half of 2016, thus covering only 15% of the current account deficit. Accordingly, the economy continued to rely heavily on more volatile portfolio inflows and loans. Gross external debt is on a steady upward trend and stood at 61.3% of GDP as of mid-2016; the share of short-term debt has nearly doubled to 13% of GDP. Gross external financing needs remain elevated and are projected to amount to close to 25% of GDP in 2016.

Inflation pressures ease somewhat amid the central bank's continued monetary policy easing

Since April 2016, the Central Bank of the Republic of Turkey (CBRT) has followed a monetary policy easing cycle, progressively reducing the overnight lending rate in six steps from 10.5% to 8.25% in September 2016. These steps narrowed the interest rate corridor, leaving the lower band unchanged at 7.25%. The Turkish lira is under strong depreciation pressure, although at a decelerating pace. In fact, despite the depreciation spikes following the military coup attempt and Turkey's downgrade by Moody's, the lira weakened by 3.1% against the U.S. dollar and by 7% vis-à-vis the euro in the first nine months of 2016.

On a slightly positive note, price pressures eased somewhat in 2016, especially since the beginning of the second quarter, given lower unprocessed food prices. Conversely, the growth of property prices reached 7.9% year on year in real terms in the first quarter, substantially above readings for other emerging markets. Yet tax hikes on tobacco, alcohol and electricity and the minimum wage hike pushed inflation up to 7.3% in September 2016.

Table 10

**Main economic indicators: Turkey**

	2013	2014	2015	Q1 15	Q2 15	Q3 15	Q4 15	Q1 16	Q2 16
<i>Year-on-year change of the period total in %</i>									
GDP at constant prices	4.2	3.0	4.0	2.5	3.7	3.9	5.7	4.7	3.1
Private consumption	5.1	1.4	4.8	4.3	5.5	3.9	5.4	7.1	5.2
Public consumption	6.5	4.7	6.7	2.8	7.3	8.0	8.1	10.9	15.9
Gross fixed capital formation	4.4	-1.3	4.0	0.7	10.1	1.3	3.5	0.0	-0.6
Exports of goods and services	-0.2	7.4	-0.9	-1.4	-2.7	-1.4	2.0	2.4	0.2
Imports of goods and services	9.0	-0.3	0.2	3.6	1.4	-1.3	-2.6	7.3	7.7
<i>Contribution to GDP growth in percentage points</i>									
Domestic demand	7.4	1.1	4.1	4.2	4.0	4.2	4.1	6.5	5.8
Net exports of goods and services	-2.3	1.8	-0.3	-1.3	-1.0	-0.1	1.2	-1.3	-1.9
Exports of goods and services	-0.1	1.7	-0.2	-0.3	-0.7	-0.3	0.5	0.5	0.0
Imports of goods and services	-2.3	0.1	-0.1	-0.9	-0.4	0.3	0.7	-1.9	-2.0
<i>Year-on-year change of the period average in %</i>									
Unit labor costs in the whole economy (nominal, per hour)	..	..	..	..	..	..	..	..	..
Unit wage costs in manufacturing (nominal, per hour)	10.3	12.8	10.3	12.9	9.6	11.2	7.7	13.6	15.3
Labor productivity in manufacturing (real, per hour)	1.6	1.3	4.2	1.0	5.2	4.8	5.5	5.6	2.7
Gross wages in manufacturing (nominal, per hour)	12.1	14.3	14.9	14.1	15.3	16.5	13.6	20.0	18.3
Producer price index (PPI) in industry	4.5	10.2	5.3	3.3	6.0	6.3	5.6	4.7	3.2
Consumer price index (here: HICP)	7.5	8.9	7.7	7.5	7.9	7.4	8.2	8.5	6.7
EUR per 1 TRY, + = TRY appreciation	-8.6	-12.9	-3.8	9.5	-1.8	-9.8	-11.3	-14.6	-9.8
<i>Period average levels</i>									
Unemployment rate (ILO definition, %, 15-64 years)	8.9	10.1	10.5	11.4	9.5	10.3	10.6	11.0	9.6
Employment rate (%, 15-64 years)	49.5	49.5	50.2	48.4	51.1	51.1	50.0	49.4	52.0
Key interest rate per annum (%)	4.8	8.7	7.6	7.8	7.5	7.5	7.5	7.5	7.5
TRY per 1 EUR	2.5	2.9	3.0	2.8	3.0	3.2	3.2	3.2	3.3
<i>Nominal year-on-year change in the period-end stock in %</i>									
Broad money (including foreign currency deposits)	21.1	11.8	16.2	15.8	18.3	20.4	16.2	13.2	12.0
<i>Contributions to year-on-year change of broad money in percentage points</i>									
Net foreign assets of the banking system	-5.2	-10.8	-6.5	-4.2	-4.7	-2.8	-2.3	-0.1	1.5
Domestic credit of the banking system	51.9	57.7	48.6	25.2	27.8	27.9	24.3	19.1	16.2
<i>of which: claims on the private sector</i>	55.6	58.6	47.2	25.1	28.6	28.9	23.6	17.8	15.1
<i>claims on households</i>	15.2	11.4	5.7	3.6	4.0	3.4	2.9	2.2	2.1
<i>claims on enterprises</i>	40.4	47.2	41.5	21.5	24.6	25.5	20.7	15.6	13.0
<i>claims on the public sector (net)</i>	-3.7	-0.9	1.4	0.0	-0.8	-1.0	0.7	1.3	1.1
Other assets (net) of the banking system	-12.9	-11.7	-12.2	-5.2	-4.8	-4.7	-5.7	-5.8	-5.6
<i>% of GDP</i>									
General government revenues	..	..	..	..	..	..	..	..	..
General government expenditures	..	..	..	..	..	..	..	..	..
General government balance	0.2	-1.5	-1.4	..	..	..	..	..	..
Primary balance	..	..	..	..	..	..	..	..	..
Gross public debt	36.1	33.5	32.9	..	..	..	..	..	..
<i>% of GDP</i>									
Debt of nonfinancial corporations (nonconsolidated)	..	..	..	..	..	..	..	..	..
Debt of households and NPISHs (nonconsolidated)	..	..	..	..	..	..	..	..	..
<i>% of GDP (based on EUR), period total</i>									
Trade balance	-9.8	-8.0	-6.7	-6.3	-7.8	-6.6	-6.0	-4.9	-6.7
Services balance	2.9	3.3	3.4	1.7	3.1	6.0	2.6	1.1	1.7
Primary income	-1.0	-1.0	-1.3	-1.4	-1.7	-1.0	-1.2	-1.1	-1.4
Secondary income	0.1	0.2	0.2	0.2	0.1	0.2	0.3	0.3	0.2
Current account balance	-7.8	-5.5	-4.5	-5.9	-6.3	-1.5	-4.4	-4.6	-6.2
Capital account balance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foreign direct investment (net)	-1.1	-0.7	-1.6	-1.8	-1.1	-2.4	-1.2	-0.8	-0.6
<i>% of GDP (rolling four-quarter GDP, based on EUR), end of period</i>									
Gross external debt	50.2	59.5	58.3	62.4	59.1	57.9	58.4	58.3	61.3
Gross official reserves (excluding gold)	13.1	14.6	13.2	15.0	13.9	14.0	13.2	13.1	14.4
<i>Months of imports of goods and services</i>									
Gross official reserves (excluding gold)	4.8	5.4	5.1	5.7	5.3	5.3	5.1	5.1	5.7
<i>EUR million, period total</i>									
GDP at current prices	619,300	602,390	646,126	160,064	163,459	163,405	159,198	153,306	160,832

Source: Bloomberg, European Commission, Eurostat, national statistical offices, national central banks, wiw, OeNB.

## 11 Russia: recession draws to a close, banking sector continues to face challenges

Domestic demand contraction slows substantially, helping to ease recession

The contraction of the Russian economy has slowed down considerably. Whereas in the past year, GDP shrank by 3.7%, in the first half of 2016 it declined by 0.9% (year on year), with negative growth rates moderating to 1.2% in the first quarter and to 0.6% in the second quarter (year on year). On the demand side, the decrease of private consumption and fixed investment slowed down, and the previously strong rundown of inventories came to a halt. On the supply side, a modest increase of agricultural, oil and other raw material output (which partly reached record levels) as well as a stagnation of industrial production (after a decrease in 2015) contributed to the weakening of the recession.

Weak demand, a shrinking ratio of imports to GDP and tight monetary policy drive inflation down further

Russia's recession eased despite the further drop in the Urals grade oil price by about 30% on average from January to August 2016 over the same period of the previous year, which may point to some adaptation of the economy to the low oil price environment. This easing was probably helped by the flexible exchange rate of the ruble, which depreciated by about 20% against the U.S. dollar in the same period. Persisting weak demand, the shrinking ratio of imports to GDP and the Central Bank of Russia's (CBR's) continued tight monetary policy (the CBR held the repo auction rate at 11% until June 2016) pushed CPI inflation (year on year) to below 8% in the spring of 2016. This relatively favorable development contributed to the decision of the CBR to lower the key rate to 10.5% in mid-June. Inflation subsided further to 6.6% in September 2016, which prompted the CBR to cut the rate to 10%.

Further drop of oil price raises budget deficit and erodes Reserve Fund

The further decline in the oil price drove up the federal budget deficit in the first eight months of the parliamentary election year 2016, bringing it to about 2.9% of pro-rata GDP. The shortfall was still largely financed by the Reserve Fund, whose level fell further to USD 32.2 billion at end-August 2016 (less than 3% of annual GDP). At this speed of withdrawal, the Reserve Fund could be exhausted at the end of 2016 or in the first half of 2017. By contrast, the assets of the National Wealth Fund, whose main purpose is to support the pension system, have remained stable since the beginning of 2016 (end-August: USD 72.7 billion or around 6% of annual GDP).

Marked decrease in current account surplus and in private capital outflows

The oil price-triggered further contraction of exports and the demand-triggered slower contraction of imports combined to reduce the current account surplus from January to August 2016 to USD 14.8 billion (about 1.9% of pro-rata GDP as against USD 47 billion in the corresponding period of 2015). By contrast, net private capital outflows fell to USD 10 billion from January to August 2016 (compared to USD 51 billion in the corresponding period of 2015). The shrinkage of net capital outflows is largely owed to reduced debt service payments and to the repatriation of assets from abroad. Russia's total external debt remained more or less stable in the first half year and came to USD 525.3 billion at mid-2016 (43% of GDP).

Banks are sufficiently liquid but struggle with rising NPLs and remain cautious lenders

Given the slide of the ruble and the rise of the ratio of NPLs (broadly defined) to 17.8% of total loans at end-July 2016 from 16.5% at the beginning of the year, lending continued to contract by 8.2% in the year to end-August 2016 (in real terms and exchange rate adjusted), while deposits increased marginally (+1.1%). The country's international reserves (including gold) rose by about EUR 2.8 billion from the beginning of the year to EUR 296.6 billion in the second quarter (27% of GDP).

Table 11

## Main economic indicators: Russia

	2013	2014	2015	Q1 15	Q2 15	Q3 15	Q4 15	Q1 16	Q2 16
<i>Year-on-year change of the period total in %</i>									
GDP at constant prices	1.3	0.7	-3.7	-2.8	-4.5	-3.7	-3.8	-1.2	-0.6
Private consumption	4.3	1.5	-9.5	-6.9	-8.0	-10.4	-12.4	-4.3	-5.2
Public consumption	1.4	0.2	-1.8	-1.8	-1.8	-1.8	-1.7	-1.5	-1.2
Gross fixed capital formation	0.9	-2.6	-7.6	-6.4	-7.3	-11.3	-6.0	-9.9	-4.3
Exports of goods and services	4.6	0.6	3.6	5.8	0.5	-1.4	9.8	-5.6	0.0
Imports of goods and services	3.6	-7.6	-25.7	-26.0	-30.1	-25.4	-21.2	-10.9	-6.7
<i>Contribution to GDP growth in percentage points</i>									
Domestic demand	0.8	-0.9	-9.1	-8.8	-9.8	-8.0	-9.9	-1.8	-2.1
Net exports of goods and services	0.5	1.8	6.2	7.0	6.3	5.0	6.4	-0.2	1.0
Exports of goods and services	1.3	0.2	1.0	1.7	0.2	-0.4	2.6	-1.8	0.0
Imports of goods and services	-0.8	1.7	5.1	5.3	6.1	5.4	3.9	1.7	1.0
<i>Year-on-year change of the period average in %</i>									
Unit labor costs in the whole economy (nominal, per hour)	..	..	..	..	..	..	..	..	..
Unit labor costs in industry (nominal, per person)	7.9	5.6	9.9	6.9	13.7	9.7	9.4	7.1	4.1
Labor productivity in industry (real, per person)	2.3	3.4	-1.8	0.9	-3.3	-2.7	-1.8	2.1	3.3
Average gross earnings in industry (nominal, per person)	10.3	9.2	8.0	7.8	9.9	6.7	7.4	9.4	7.5
Producer price index (PPI) in industry	3.4	6.1	12.4	9.7	13.8	12.9	13.1	4.5	3.8
Consumer price index (here: CPI)	6.8	7.8	15.6	16.2	15.8	15.7	14.5	8.4	7.4
EUR per 1 RUB, + = RUB appreciation	-5.7	-17.0	-25.0	-32.4	-17.5	-31.8	-17.2	-13.8	-21.8
<i>Period average levels</i>									
Unemployment rate (ILO definition, %, 15–64 years)	5.5	5.2	5.6	5.7	5.6	5.3	5.7	5.9	5.7
Employment rate (%, 15–64 years)	..	..	..	..	..	..	..	..	..
Key interest rate per annum (%)	5.5	7.9	12.6	15.5	12.8	11.2	11.0	11.0	10.9
RUB per 1 EUR	42.3	51.0	68.0	71.1	58.1	70.5	72.4	82.5	74.4
<i>Nominal year-on-year change in the period-end stock in %</i>									
Broad money (including foreign currency deposits)	15.7	15.5	19.7	17.2	17.6	24.0	19.7	15.9	14.4
<i>Contributions to year-on-year change of broad money in percentage points</i>									
Net foreign assets of the banking system	2.7	24.6	40.1	15.3	17.8	28.3	18.3	15.6	12.3
Domestic credit of the banking system	35.1	33.6	31.6	16.1	15.0	16.3	15.4	14.7	15.0
<i>of which: claims on the private sector</i>	36.9	43.3	33.7	19.3	15.7	16.6	9.5	9.1	9.6
<i>claims on households</i>	16.5	11.9	2.0	1.9	0.1	-1.0	-1.6	-0.9	-0.3
<i>claims on enterprises</i>	20.4	31.4	31.7	17.3	15.6	17.7	11.1	10.0	9.8
<i>claims on the public sector (net)</i>	-1.9	-9.7	-2.1	-3.1	-0.7	-0.3	5.9	5.6	5.4
Other assets (net) of the banking system	-8.2	-24.7	-33.5	-14.2	-15.2	-20.7	-14.0	-14.4	-13.0
<i>% of GDP</i>									
General government revenues	34.4	34.3	32.8	..	..	..	..	..	..
General government expenditures	35.6	35.4	36.3	..	..	..	..	..	..
General government balance	-1.2	-1.1	-3.5	..	..	..	..	..	..
Primary balance	..	..	..	..	..	..	..	..	..
Gross public debt	9.8	10.8	10.6	..	..	..	..	..	..
<i>% of GDP</i>									
Debt of nonfinancial corporations (nonconsolidated)	..	..	..	..	..	..	..	..	..
Debt of households and NPISHs (nonconsolidated)	..	..	..	..	..	..	..	..	..
<i>% of GDP (based on EUR), period total</i>									
Trade balance	8.1	9.2	11.2	15.8	12.0	8.6	9.1	8.9	7.3
Services balance	-2.6	-2.7	-2.8	-2.9	-2.6	-3.6	-2.1	-2.0	-2.0
Primary income	-3.6	-3.3	-2.8	-2.1	-4.5	-2.1	-2.2	-1.5	-4.4
Secondary income	-0.4	-0.4	-0.4	-0.4	-0.3	-0.6	-0.5	-0.5	-0.4
Current account balance	1.5	2.8	5.2	10.4	4.5	2.3	4.4	4.9	0.5
Capital account balance	0.0	-2.2	0.0	0.0	0.0	0.0	0.0	0.0	-0.5
Foreign direct investment (net)	0.8	1.8	1.2	0.3	1.6	2.5	0.2	3.1	0.1
<i>% of GDP (rolling four-quarter GDP, based on EUR), end of period</i>									
Gross external debt	32.0	31.9	39.9	36.0	36.0	38.2	40.0	39.4	43.0
Gross official reserves (excluding gold)	20.5	18.1	24.6	20.0	20.4	23.0	24.6	24.8	27.0
<i>Months of imports of goods and services</i>									
Gross official reserves (excluding gold)	11.6	10.4	13.9	11.2	11.6	12.8	13.9	14.1	14.9
<i>EUR million, period total</i>									
GDP at current prices	1,675,267	1,533,694	1,194,438	256,162	331,809	302,232	304,235	225,059	268,716

Source: Bloomberg, national statistical offices, national central banks, wiiw, OeNB.

### Ukraine: weak recovery after deep recession, further IMF tranche disbursed

Following a deep recession in 2014 and 2015, a hesitant recovery lifted economic activity by 0.8% in the first half of 2016. The slight rebound was driven by private consumption and gross fixed capital formation (GFCF), whereas net exports delivered a marginally negative growth contribution. After peaking at 60.9% in April 2015, inflation trended downward to 8.4% in August 2016, which helped real wages to recover. Moreover, disinflation allowed the central bank to cut its key policy rate in several steps to 15% in September 2016 from 22% at end-2015. Despite the difficult economic environment, the fiscal deficit has declined markedly in recent years. Including the deficit of the state-owned energy company Naftogaz, the deficit fell to 2.1% of GDP in 2015 from 10% in 2014. Now that gas and heating tariffs have been adjusted upward to cost recovery levels since the first half of 2016, Naftogaz will no longer be a drag on public finances.

Fiscal consolidation and energy sector reforms are part of the economic program agreed with the IMF in the framework of the Extended Fund Facility (EFF). Progress has also been made in other areas, such as banking sector reforms and, to some extent, the fight against corruption. Hence, the second review could be finalized – with a one-year delay – in September 2016. The IMF points out that notwithstanding the overall headway made in implementing the program, political resistance slowed down the progress in tackling corruption, privatizing state-owned enterprises and advancing the pension reform. The conclusion of the second review enabled the disbursement of the third tranche amounting to USD 1 billion, bringing total outlays under the EFF to about USD 7.6 billion (out of USD 17.5 billion). Moreover, Ukraine issued a USD 1 billion U.S. guaranteed Eurobond in September 2016.

As a result, foreign currency reserves rose to USD 15.6 billion (equivalent to 3.9 months of imports) in September 2016, after having remained remarkably stable in the absence of IMF disbursements in the preceding months. The impact of the worsening in the current account balance in the first eight months of 2016 (full-year figure projected at –1.5% of GDP by the IMF) was overcompensated by net inflows in the financial account. The trade balance showed a greater decline in exports than in imports from January to August 2016. The weak export performance was partly related to the tightening of trade restrictions by Russia. Whereas goods exports to Russia continued to shrink, exports to the EU augmented in the first half of 2016. The improvement in the financial account was to a large extent driven by the accelerated reduction of foreign currency cash holdings outside banks.

Since a de-escalation of the conflict in parts of Eastern Ukraine had been achieved in the course of 2015, the situation has remained broadly unchanged, with regular ceasefire violations along the contact line occurring in 2016. Most recently, the OSCE Special Monitoring Mission (SMM) observed a decline in violence after the two sides had renewed their commitment to the ceasefire in early September. Yet SMM monitors have continued to be confronted by freedom-of-movement restrictions, particularly in areas not controlled by the Ukrainian government. Furthermore, hardly any progress has been made in the implementation of the Minsk II agreement, which comprises the aim to achieve a complete ceasefire as well as further steps to settle the conflict.

# Outlook for selected CESEE countries:

Steady growth in CESEE-6 after temporary dip in early 2016 – trough reached in Russia<sup>1,2</sup>

Economic growth in the CESEE-6 region<sup>3</sup> will reach 3.0% per annum in 2016 and 3.1% in 2017, thus weakening somewhat compared to 2015. In 2018 growth will pick up to 3.3%. This outlook reflects a downward revision compared to our April 2016 projection. In the first half of 2016, investments declined beyond expectations – especially so in Hungary and Poland – following the phasing out of the previous EU funding period. For 2017, we also lowered our expectations for investments in Poland. Alongside solid external demand, domestic demand and in particular private consumption will be the main drivers of growth across the region. Consumption growth will amount to 4.5% in 2016 – 1.2 percentage points above the 2015 outcome – and decelerate somewhat over the projection horizon. Except in Poland and Romania, export growth will weaken across the region in 2016 compared to 2015 but will regain momentum in 2017 and 2018 in accordance with the external assumption on euro area import growth. The growth differential between CESEE and the euro area will amount to 1.3 percentage points in 2016 and will widen to 1.5 and 1.7 percentage points in 2017 and 2018, respectively.

Table 1

## GDP and import projections for 2016 to 2018

	GDP				Imports			
	Eurostat/ Rosstat	OeNB/BOFIT forecasts			Eurostat/ Rosstat	OeNB/BOFIT forecasts		
	2015	2016	2017	2018	2015	2016	2017	2018
Year-on-year growth in %								
CESEE-6	3.5	3.0	3.1	3.3	7.3	8.1	8.0	8.1
Bulgaria	2.8	2.3	2.5	2.8	4.5	4.1	4.0	4.3
Croatia	1.6	2.2	2.3	2.5	9.9	5.2	7.2	7.2
Czech Republic	4.3	2.5	2.6	2.8	9.9	5.2	7.2	7.2
Hungary	2.9	1.8	3.0	3.1	7.8	6.9	7.9	9.7
Poland	3.6	2.9	3.2	3.4	6.0	8.8	8.4	8.8
Romania	3.8	4.8	3.7	3.7	8.7	11.4	9.6	7.8
Russia	-3.7	-1.0	1.0	1.5	-26.0	-7.0	5.0	5.0

Source: OeNB-BOFIT October 2016 forecast, Eurostat, Rosstat.

Note: 2015 figures based on seasonally adjusted data.

<sup>1</sup> Compiled by Antje Hildebrandt with input from Stephan Barisitz, Elisabeth Beckmann, Sebastian Beer, Martin Feldkircher, Mathias Lahnsteiner, Thomas Reiningger, Caroline Stern and Zoltan Walko.

<sup>2</sup> Cut-off date for data underlying this outlook: September 19, 2016. The projections for the CESEE-6 countries were prepared by the OeNB, those for Russia were prepared by the Bank of Finland in cooperation with the OeNB. All projections are based on the assumption of a continued recovery in the euro area in line with the September 2016 ECB staff macroeconomic projections for the euro area. This implies real annual GDP growth of 1.7% in 2016, 1.6% in 2017 and 1.6% in 2018.

<sup>3</sup> CESEE-6: Bulgaria, Croatia, the Czech Republic, Hungary, Poland and Romania.

We forecast Russian GDP to decrease by 1% in 2016, implying an upward revision by 2 percentage points compared to our previous forecast. This is attributable to a higher oil price and a weaker real exchange rate of the ruble than previously assumed. With economic growth at 1%, Russia will move out of recession in 2017. For 2018, we expect the Russian economy to expand by 1.5%. Private consumption is expected to increase somewhat whereas investment activity will still be subdued largely because of great uncertainties regarding the overall economic situation. With an expected moderate increase of the oil price, we see export growth gaining some speed. After weakening in 2016, import growth will revive over the projection horizon. We assume that oil prices will rise steadily over the projection horizon from an average of below USD 45 per barrel in 2016 to USD 55 per barrel in 2018.<sup>4</sup>

### 1 CESEE-6: recovery of investments and exports over the projection horizon

In annual terms, GDP in CESEE-6 accelerated by just 3.0% in the first half of 2016 compared with 3.5% over the same period of 2015. Economic growth was below expectations, in particular in Hungary and Poland. For the second half of 2016, we expect the pace of growth to stay relatively unchanged in Croatia, Poland and Romania compared to the first half of 2016. In Bulgaria and the Czech Republic economic growth is projected to lose steam. In both countries, private consumption growth will gain some speed in the second half of 2016. However, this will not compensate for a lower contribution of net exports, the result of weaker export growth and accelerating import growth largely related to stronger private consumption. After very weak growth in the first half of 2016, growth in Hungary will considerably gain speed driven largely by the pickup of private consumption benefiting from further fiscal stimulus measures in the course of 2016.

Leading indicators suggest that private consumption will remain an important growth pillar in 2016. In September 2016 economic sentiment moved strongly upward in almost all CESEE-6 countries, apart from Hungary and Romania. The capacity utilization rate increased in the third quarter of 2016 in all countries in annual terms compared to the same period of 2015 (from 77.7% to 78.3% referring to an unweighted average). Only in the Czech Republic – the country with the highest capacity utilization – the rate continued to decrease in this period.

The monetary conditions are still favorable for economic growth. Interest rates are historically low; Hungary even lowered its key interest rates further in the second quarter of 2016. Prices have continued to decline in most countries in the region since our last forecast. Only the Czech Republic observed some moderate price increases in this period. Credit growth showed a mixed picture across the region. In some countries – e.g. in Bulgaria, Hungary and Croatia – the deleveraging process is still going on. Notably, deleveraging has been cushioned by the cleaning up of banks' balance sheets in Bulgaria and by a credit support scheme for SMEs in Hungary. Also in the light of positive developments on the labor markets, we expect lending to gain momentum over the projection horizon. In the Czech Republic, the abolition of the exchange rate floor might, eventually, affect the

Favorable lending conditions in CESEE-6 countries

<sup>4</sup> The oil price assumption used by the Bank of Finland is based on the Brent future price of September 15, 2016.

growth performance. However, the Czech National Bank has reiterated its commitment to maintain the floor as long as necessary.

Strikingly, the CESEE-6 labor markets continue to be constrained by a labor shortage, in particular in the medium- to high-skill sectors, as shown for instance in increasing vacancy rates in all CESEE-6 countries in the second quarter of 2016 compared to one year before. The strongest rise was observed in the Czech Republic, the country already posting the second highest vacancy rate among the EU-28 countries (after Malta). Unemployment rates are well below the EU-28 average of 8.6% (July 2016) and even declining further in the region, with the exception of Croatia. Similarly, employment rates are moving up. Only Romania recorded a small decline in the employment rate in the first half of 2016. The labor shortage continues to show in the economy, putting further pressure on wages, in addition to higher minimum wages in some countries. In the short- to medium-term, this will be supportive of private consumption growth.

Unemployment rates well below EU-28 average

Loose fiscal policy measures in some countries are expected to push up private consumption in 2016 and 2017. This is particularly the case in Hungary, Poland and, most notably, in Romania. As elections will be held in Romania in 2016 and in Hungary in 2018, we expect a phasing out of fiscal stimulus measures in these countries afterward. Croatia needs to implement fiscal consolidation measures under EU fiscal rules. Other CESEE-6 countries are constrained by limited fiscal space: Bulgaria will follow a budget consolidation path over the projection horizon. For Poland and Romania, the spring forecast 2016 of the European Commission projects budget deficits to breach the 3% threshold in 2017, which calls for fiscal consolidation measures.

Fiscal policy supportive of economic growth

Undoubtedly, domestic demand will remain the main growth driver in all CESEE-6 countries over the entire projection period. The contribution of domestic demand is expected to decelerate until 2018 only in Romania. Private consumption growth – the main pillar of domestic demand – will come down from 4.5% year-on-year growth in 2016 to 3.7% in 2018. Household consumption will lose speed in Bulgaria, Hungary and particularly in Romania. Here consumption growth will halve to 4.9% by 2018 compared to 2016 because we expect a phasing-out of generous government support after the parliamentary election in December 2016. In the Czech Republic and Poland, private consumption growth is projected to increase supported by the consumption-enhancing environment. Public consumption adds only marginally to economic growth in the CESEE-6 countries (below 0.5 percentage points over 2016 to 2018). Poland is an outlier in this context; here the contribution of public consumption will amount to 0.7 percentage points in 2016, largely related to fiscal support for families. However, the contribution will drop over the projection horizon.

Private consumption will remain strong

2015 marked a boom year in the drawing of EU funds under the 2007 to 2013 multiannual financial frameworks, as reflected in outstanding investment activity. In CESEE-6, gross fixed capital formation accelerated by more than 5% on average in 2015. The drop to –1.9% in annual terms in the first half of 2016 came as a surprise. Hungary and Poland were most affected by the phasing-out of the financial framework whereas Croatia and Romania were unaffected. After the unexpected slump in 2016, gross fixed capital formation will recover quickly in 2017 and 2018 as the new EU funding framework for the period 2014 to 2020 is expected to show a higher utilization rate in 2017 than in the year before. After an

New EU funding framework brings back investment growth

**Export growth to recover over the projection horizon**

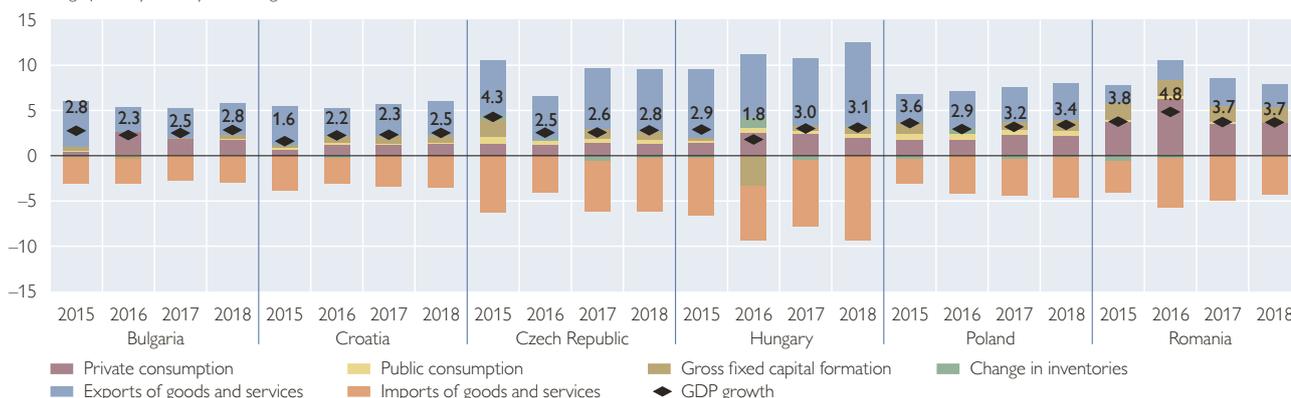
expected, yet surprisingly strong deceleration by  $-0.6\%$  in 2016, we see gross fixed capital formation moving up to  $4.5\%$  in 2017 and to  $5.2\%$  in 2018.

After a dip of export growth in all countries except for Poland and Romania in 2016, we expect exports to gain momentum over the projection horizon. These developments are in line with the external assumptions on import demand in the euro area, the main trading partner of the CESEE-6 region. We expect export growth to rebound from an annual increase of  $6.9\%$  in 2016 and 2017 to  $7.3\%$  in 2018. Turning to imports, we expect import growth to remain strong over the projection period, running in parallel with private consumption growth. Only in Romania import growth will decelerate in 2017 and 2018, reducing the net contribution of exports to GDP growth to  $-1.7$  percentage points in 2018 after  $-3.4$  percentage points in 2016. Also in Poland we see a negative contribution in 2017 and 2018, as strong export growth will not keep pace with import growth. In the rest of the CESEE-6 region, the contribution of net exports will range between 0 and 1 percentage point in 2017.

Chart 1

**GDP and GDP components (realized data for 2015, projections for 2016 to 2018)**

Percentage points, year-on-year GDP growth in %



Source: Eurostat, OeNB.

**Risks to growth in the CESEE-6 countries stem from uncertainties in the political environment and are skewed to the downside**

The downside risks to growth in CESEE-6 are mostly of a political nature. In the European context, the most apparent risk is related to the political impact the Brexit vote might have over the next two years until a new relationship between the EU and the U.K. is established. The decision of one major EU country to leave the union has caused considerable loss of trust in the EU. Eventually this could weigh on business and consumer confidence over the projection horizon, which might constrain investment decisions. Moreover, we see some risks that nationalist sentiment and political populism, which have gained ground with the large movements of refugees seen recently, could receive further impetus from the Brexit debate in the EU in general and in some CESEE-6 countries in particular. Apart from political factors, the more tangible risks of Brexit are related to trade, capital flows, migration and the EU budget. The impact of these channels on individual CESEE-6 countries will differ depending on their economic ties with the U.K. and are expected to materialize only after 2018. For instance, Poland and, albeit to a lesser extent, Bulgaria and Romania, are likely to be most strongly

affected by stricter rules for entering the U.K. labor market or rules that may even force workers to leave the U.K. That said, the return of migrants from the U.K. would increase labor supply in their home countries, possibly implying some relief to the strained CESEE-6 labor markets, depending on the qualification of returning migrants. However, remittances sent from the U.K. to migrant workers' home countries would decline. In this regard, Croatia, Hungary and Romania would be most strongly affected, as they are those countries among the CESEE-6 showing the highest ratio of remittances as a share of GDP that originate in the U.K. Other negative effects through trade (the Czech Republic, Hungary and Poland are the CESEE countries with the strongest trade links with the U.K.), capital flows (Bulgaria and Hungary have so far recorded relatively large FDI and portfolio inflows from the U.K.) and the EU budget (all CESEE-6 are net recipients of EU transfers) depend on the exit arrangement between the EU and the U.K. and would materialize only after the end of our projection horizon.

Furthermore, the U.K.'s leaving the EU will have strong repercussions for the euro area, as the U.K. is its second largest export market. A stronger-than-expected impact of Brexit on the euro area and an impact on global growth that turns out to be larger than already incorporated in the external assumptions marks a major downside risk for the CESEE-6 given that the euro area is the main trading partner for the region.

Apart from the uncertainties related to Brexit, a growth performance of the euro area that is more modest than expected presents a key downside risk to the CESEE-6 countries. Similarly, a slowdown of global growth in emerging markets and, consequently, global trade would have negative consequences for the region. Additionally, the outcome of the U.S. presidential election is seen as a tail risk to global growth. A more protectionist stance of the U.S.A. would presumably have negative repercussion for global trade and thus negatively affect the CESEE-6 countries. The effects of a deterioration of the external environment are likely to be stronger for Bulgaria, the Czech Republic and Hungary, which are all small, open economies. Poland and Romania, in contrast, are likely to benefit from the larger size of their home markets whereas Croatia – a less open economy – is less exposed to a worsening of the external environment.

One further risk to the region emanates from the unresolved geopolitical tensions resulting from the conflict between Ukraine and Russia, the situation in the Middle East and, more recently, also in Turkey. The latter implies a major downside risk in particular for Bulgaria, while Croatia is benefiting from tourists that may prefer a holiday destination that seems safer than Turkey.

Inflationary pressures have been contained for more than two years. Increasing wage pressures and higher oil prices could feed through inflation in the CESEE-6 region, leading to a less accommodative monetary policy stance. In some countries, in particular in Croatia and Poland, ongoing discussions regarding the conversion of foreign currency loans constitute some downside risk to investor confidence. In the case of Hungary, however, the conversion of Swiss franc-denominated loans into local currency in 2015 somewhat reduced the country's economic vulnerabilities.

There are also some upside risks to our assessment. Stronger-than-expected growth in the euro area would certainly be beneficial to economic growth in CESEE-6. Also, should the implications of Brexit prove less pronounced than an-

anticipated, this would present an upside risk to our forecast. Brexit could even become a chance for implementing more decisive reforms in the EU. Far-reaching reforms and stronger integration among the EU countries can provide a growth stimulus. However, this positive impetus would materialize most likely at the end or after our projection horizon. Furthermore, a peaceful resolution of current political conflicts would certainly support economic performance in CESEE-6.

## 2 Projections for Bulgaria, Croatia, the Czech Republic, Hungary, Poland and Romania

**Bulgaria: economic activity mainly driven by private consumption**

At 2.9%, Bulgaria's annual GDP growth was robust in the first half of 2016. For year-end 2016 we expect GDP growth to slow down to 2.3%, however. This development will continue in 2017, before GDP growth will be lifted in 2018 by positive effects of the new EU financial framework. Overall economic activity will remain robust over the next years mainly on the back of private consumption.

Given a continuously positive employment environment, increasing wages and positive consumer sentiment, we expect private consumption to play the main role in economic activity. Strong employment growth for four consecutive years coupled with a continuous increase in wages while price pressure has remained low has resulted in a noticeable increase in real incomes. Supported by the rise in minimum wages at the end of 2015, strong wage growth is expected to continue in 2016. Both employment and wage gains were particularly pronounced in the high-skills segment of the private sector, reflecting strong economic activity in business and IT services. Both consumer and business confidence indicators have shown improvements recently. In contrast to these bright prospects for household incomes and private consumption growth, we expect the growth contribution of public consumption to be limited in view of the government's commitment to follow the budget consolidation path described in the convergence program for the period 2016 to 2019.

Turning to gross fixed capital formation, we still forecast a negative contribution to GDP growth for 2016. With the start of the new EU funding program, investment growth will gain ground but remain weak over the projection period. Recent adverse developments in Turkey have affected investor confidence, leading to suppressed investment dynamics.

Reduced import demand from the euro area will dampen the recent positive export developments. In combination with higher Bulgarian imports due to stronger private consumption growth, net exports will not have a positive contribution to economic growth. However, with the expected recovery of the euro area, the contribution of net exports to GDP growth should be positive in 2017 and 2018. Keeping in mind that Turkey is the most important non-EU export market for Bulgaria there is some downside risk to this forecast.

**Croatia: recovery gaining traction, driven mainly by domestic demand**

At 2.1%, Croatian GDP growth in the first half of 2016 was higher than expected. As a consequence, we revised our GDP forecast for 2016 upward to 2.2% compared to 1.8% expected in our previous forecast. The recovery in 2016 is projected to gradually gain traction in 2017 and 2018, while remaining moderate overall, with all components of aggregate demand contributing to growth (public consumption only marginally, though).

The recovery of private consumption is set to continue at a pace of 2.2% to 2.3% over the projection horizon, supported by a recovering labor market and

subdued inflation. Public consumption will continue to grow modestly despite the need for consolidation under the fiscal rules of the EU. While the budget deficit is expected to fall below 3% of GDP in 2016 and to decline somewhat further in subsequent years, additional structural adjustment is needed to safely achieve the medium-term budgetary objective and, in particular, the debt reduction benchmark under EU rules. Thus, our projection assumes a gradual further consolidation, which will constrain public consumption going forward. It will be up to the new government, which is to be formed after the parliamentary elections held in mid-September 2016, to continue with consolidation efforts in order to bolster fiscal sustainability over the medium and long term.

The year 2016 will mark a strong improvement in gross fixed capital formation. We expect this development to be stable over the forecast horizon. This is related to a better absorption of EU funds but also to a mild recovery of private investment. Private investment growth turned positive in 2015 and is likely to remain so as business confidence indicators show a continuation of the mild recovery. Investment activity is likely to be supported by the improved lending capacity of banks provided that the incipient resolution of the currently high level of NPLs continues or even accelerates.

We expect a positive but declining contribution of net exports over the projection horizon. Strong tourism exports will remain an important driver of GDP growth especially against the background of continuing geopolitical tensions in several other Mediterranean tourist regions. Export growth will also benefit from an improvement in euro area import growth and a continuation of positive trends in the export of ships, oil and refined petroleum products as well as medicinal and pharmaceutical products. We expect a leveling out of growth rates of exports in goods and services toward the end of the projection horizon. However, together with private consumption, imports will strengthen, therefore moderating the positive contribution of net exports to GDP growth.

The Czech Republic has returned to a more modest but solid growth trajectory following the EU-funded boom in 2015. We expect real GDP to rise by 2.5% in 2016. Renewed dynamics in private and public consumption will stimulate the economy over the forecast horizon, pushing real growth to 2.8% in 2018. Based on higher-than-expected capital formation, our projections are slightly more optimistic than in the spring forecast.

Czech Republic:  
solid growth  
backed by private  
consumption

Private consumption remains the key driver of economic activity. Benign wage and employment developments will likely strengthen this position in the short run. Rising inflation, as foreseen by the Czech National Bank, and the ensuing rise in interest rates will dampen private spending over the projection horizon. In line with these dynamics, we project household consumption growth to peak at 2.9% in 2017 and to move to 2.8% thereafter. Public consumption, on the other hand, is expected to rise more steadily at around 2.2% annually in 2016 to 2018. Combined, we expect private and public consumption to account for roughly two-thirds of total growth over the next few years.

The rising capital stock is another critical ingredient in our growth projection. Growth of gross fixed capital formation decreased notably in the first half of 2016, largely owing to the start of a new EU funding cycle. However, the decline was less pronounced than initially expected. We thus revise our investment projections accordingly: At growth rates of 4.6% and 3.4% in 2017 and 2018, respec-

tively, growth of gross fixed capital formation will, on average, contribute around 1 percentage point to annual real growth.

The positive growth contribution of net exports will weaken over the coming years. While export growth will still outpace the rise in imports in 2016, this trend is set to reverse in 2017. We expect exports to grow by 6.8% and imports by 7.2% in 2017. The removal of the exchange rate floor, potentially coming about in late 2017, poses additional downside risks to growth in the Czech exporting sector. However, the existing excess of exports over imports ensures that the net growth effect of international trade will remain positive: we predict growth contributions of 0.2 percentage points and 0.4 percentage points in 2017 and 2018, respectively.

**Hungary: GDP growth to pick up after temporary setback**

Hungarian GDP growth halved to 1.4% year on year during the first half of 2016 from 2.9% in 2015. We reckon that the economic cycle hit bottom in mid-2016, overcoming temporary factors, and will gradually gain strength over the forecast horizon. Nonetheless, given the weaker-than-expected performance during the first half of 2016, we have scaled down our GDP estimate for 2016 to 2.1% (from 2.5%). Correspondingly, we now expect a slightly stronger rebound in 2017 (to 3.0%) and a growth rate of 3.1% in 2018.

Private consumption should continue to benefit from improving income developments (also due to the cut in the personal income tax rate at the beginning of 2016, selected public sector wage increases and the step-wise expansion of family tax benefits in 2016 and 2017), employment gains, contained inflationary pressures over the medium-term (partly due to VAT reductions at the beginning of 2016 and 2017), historically high consumer sentiment and improving credit developments. Nonetheless, we expect a gradual deceleration of growth over the forecast horizon from the 2016 peak. Considering a potential re-election drive by the government, which faces elections in the summer and early autumn of 2018, additional selective fiscal stimuli remain an upside risk, though.

Public consumption will likely remain supportive of the growth outlook well into 2018, given fiscal leeway created by better-than-expected budgetary developments during the first half of 2016 and the targeted fiscal loosening in 2017. It should gradually decelerate from late 2018, following elections and a refocusing on deficit and debt reduction.

Following the remarkable temporary setback during the first half of 2016, investment activity should gradually recover from the second half of 2016 onward. Public investment should recover as EU funds inflows are picking up again (the government intends to draw a substantial part of the funds available in the 2014–2020 programming period already by 2018). Private investment activity should benefit from the additional expansion of housing subsidies in 2017 (on top of measures already implemented at the beginning of 2016), comparably high capacity utilization rates in industry, brightening export prospects, the central bank's recently expanded SME credit support schemes and a gradual recovery in market-based lending activity (supported also by the low interest rate environment and the additional cut in the bank tax in 2017).

We expect export growth to gather momentum over the forecast horizon as import demand by the main trading partner, the euro area, is strengthening. However, as the recovery of domestic demand will fuel import growth to a greater

extent, we expect the contribution of net real exports to gradually melt down and turn slightly negative in 2018.

In Poland, GDP growth will gather pace compared to the first half of 2016, resulting in a full-year growth rate of 2.9% in 2016, and further accelerate to 3.2% in 2017 and 3.4% in 2018. Our projection shows a strong downside revision in 2016 and 2017 by 0.8 and 0.6 percentage points, respectively, due to slumping gross fixed capital formation, which was only partly compensated for by stronger private consumption. We expect gross fixed capital formation to stabilize and recover over the projection horizon. The contribution of domestic demand to GDP growth will increase whereas the contribution of net exports will turn negative in 2017.

Poland: domestic demand growth will accelerate, while export growth remains strong

Private consumption growth will accelerate to 4.0% in 2017 as a result of the strong rise of households' real disposable income on the back of (1) strong wage and (gradually declining) employment growth, (2) a large increase in child benefits in particular for lower-income households in the second quarter of 2016 and larger general tax allowances, as well as (3) a persistent supply side-driven low-inflation environment. In addition, improved consumer sentiment and higher growth of loans for consumption purposes will underpin private consumption expenditure. Public consumption will slow moderately, given a partial wage freeze in the public sector.

Overall, we expect gross fixed capital formation to stabilize and start recovering in the second half of 2016, but this will not be sufficient to avoid a negative sign in the year as a whole (−0.5%). However, fixed-investment growth will gather pace to reach 4.5% in 2017 and 5.7% in 2018. Corporate fixed investment will benefit from stronger domestic consumption demand and foreign demand, relatively high capacity utilization and a favorable internal financing situation. Constraining factors are higher uncertainty related to the domestic economic policy stance and the impact of the bank tax on loan supply. Housing investment will continue to expand at a slightly lower pace, given not only the bank tax impact but also tighter supervisory regulations, while income growth and the state-subsidized housing program for young people remain supportive factors. Public investment will recover over the whole forecasting period in line with an increasing absorption of funds under the new EU medium-term budget. The inventory build-up will provide a sizeable positive contribution to growth in 2016, thus compensating partly for the weak performance of fixed investment, but will slow down afterward so that its contribution will become negative in 2017.

The recently high pace of growth of real goods and services exports will moderate. However, it will remain strong at a rate of roughly 8%, as the stronger expansion of euro area and in particular German import demand in 2017 and 2018 will provide substantial support. Robust export growth, recovering investment growth and accelerating consumption growth will lift the growth rate of real imports of goods and services by more than that of exports. Thus, the contribution of net exports to GDP growth will turn slightly negative in 2017 and 2018.

As a consequence of higher-than-expected GDP growth rates in the first half of 2016, we revise our GDP forecast for Romania upward for the current year to 4.8%. We expect full-year GDP growth to come in slightly below the growth rate recorded in the first half of 2016. This is attributable to base effects and high-frequency indicator readings at the start of the second half of this year. In particu-

Romania: GDP growth expected to moderate from next year

lar, there was a moderate deceleration of growth in retail sales, real wages and industrial production. We continue to expect growth to level off in 2017 and 2018, as the effects of procyclical fiscal and wage policies will abate following the parliamentary elections in December 2016. Accordingly, domestic demand, while remaining the growth driver, will lose some steam over the forecast horizon.

The private consumption boom will have reached its peak in 2016, growing by almost 10%. Carry-over effects from the package of fiscal and wage policy measure taken in the second half of 2015 will taper off in the second half of 2016. Yet, in the course of this year additional steps were taken (19% minimum wage hike in May, 10% wage increase in the health and education sectors in August) that will further spur private consumption growth. Tightening labor market conditions, as evidenced by an increasing job vacancy rate, will keep wage growth at elevated levels. The upward trend in consumer loans represents a further supporting factor. While further fiscal stimulus ahead of parliamentary elections cannot be excluded, we expect some reorientation in economic policy afterward (no more or at least more modest minimum wage hikes and public sector wage increases). Therefore, we expect private consumption to moderate in 2017 and 2018.

Investment will continue its recovery over the forecast horizon supported by the government's "first home" program, which comprises state guarantees for a part of the housing loans taken out by people buying their first house, improved lending capacities of banks (clean-up of bank balance sheets) and low credit costs, as well as a better EU funds absorption rate.

Romanian export growth will benefit from accelerating euro area import growth. While increasing ULC in the manufacturing sector will dampen exports, investment activity will result in increased export capacities. Alongside decelerating domestic demand, import growth will also come down from its currently high levels. Net exports will continue to provide a negative contribution to growth, which will decline over the forecast horizon, however.

### 3 Russia: moving out of recession toward slow growth

The Russian economy contracted by less than 1% in the first half of 2016 compared to a year earlier, showing some signs of bottoming out lately. This more favorable development than we had expected in our previous forecast of April 2016 can be explained by two factors: First, the oil price – although considerably lower on average in the first half of 2016 year-on-year – has been following an upward path since the beginning of this year and is substantially (about USD 3) higher than previously assumed. Second, after falling in 2014 and 2015, the ruble's real exchange rate has been notably weaker year on year in the first half of 2016, even weaker than in the 2009 recession. The real exchange rate is currently at the level of 2005. Therefore, Russia's imports have plummeted unusually strongly relative to the decline of GDP.

World economic growth and trade are expected to gain some momentum over the forecast period. After less than USD 45 per barrel in average annual terms in 2016 (17% lower than in 2015 and 55% lower than in 2014), the oil price is assumed to rise moderately to below USD 55 in 2018. We forecast that Russian GDP will shrink by 1% in 2016 and recover in 2017 and 2018.

The weak ruble will keep Russia's imports this year about 7% below last year's level. As the slowly rising oil price is lifting Russia's export income and sparking a

revival of the economy and as the ruble's real exchange rate will gradually appreciate, imports will recover moderately in 2017 and 2018.

Demand for Russia's exports is expected to recover from this year's dip but to increase only slowly (in real terms). Private consumption will revive from the large fall of 2015 and 2016 as disinflation will support purchasing power. Investments are anticipated to recover only slowly, which is partly due to continuing uncertainties in and around the economy. Government expenditure will continue to decline in real terms in 2017 and 2018, though considerably less steeply than in 2016, even if Russia's government sticks to its target of narrowing the budget deficit. While monetary policy will probably not directly and substantially contribute to the economy's revival, the Central Bank of Russia's firm disinflationary stance will likely continue to stabilize expectations, check uncertainty, and thus support growth over the medium and long term.

Risks to the forecast for Russia remain large and more or less balanced. The oil price may depart to either direction from the gradually rising path that has been assumed. Geopolitical risks may intensify or ease. Such deviations as well as other events that could increase uncertainty would of course have an impact on the ruble, inflation, domestic demand, imports, and economic growth. Like before, the effects stemming from such changes especially on the ruble, inflation and imports may materialize quickly. Imports may recover more than anticipated, if the revival is similar to Russia's performance after previous recessions. On the other hand, Russia may further increase its import restrictions, which have already been tightened gradually. For example, import restrictions in procurements made by companies majority-owned by the state will come into force at the start of next year.

A notable upside risk stems from a possible strengthening of developments seen this year: The growth of loans to households has picked up slightly and households have saved a little less than during last year's shift to precautionary savings. Such a change would considerably improve the prospects for private consumption and imports. Another upside risk is that the Russian government feels some political pressure over declining living standards. This may lead to a more gentle development of government expenditures than currently foreseen, which would support the economy for a while.



Studies

# On the optimal number of indicators – nowcasting GDP growth in CESEE

David Havrlant,  
Peter Tóth,  
Julia Wörz<sup>1</sup>

*We employ principal components and dynamic factor models for nowcasting GDP growth in selected Central, Eastern and Southeastern European (CESEE) economies. Our estimation sample extends from the first quarter of 2000 to the second quarter of 2008, our evaluation period from the third quarter of 2008 to the third quarter of 2014. For this period, we produce quasi out-of-sample forecasts of past-, current- and next-quarter GDP growth for seven CESEE economies. The models differ with respect to the estimation method, model specification, and the number of short-term indicators used. We find, first of all, a clear gain in predictive accuracy from using a nowcasting model with monthly indicators compared to the naïve benchmark. Furthermore, for our sample of small, open economies, we find that models using a smaller set of carefully selected indicators yield lower prediction errors on average than models based on larger information sets. Finally, we identify a clear gain in forecast performance from including foreign or euro area indicators.*

*JEL classification: C52, C53, E37*

*Keywords: nowcasting, dynamic factor models, principal components, Central, Eastern and Southeastern Europe*

One of the most important indicators of economic activity – GDP – is reported with a considerable time lag and at a rather low frequency. In the EU, a first, so-called “flash” estimate of GDP is not released until six weeks after the end of a quarter; the second estimate (including information on the components of GDP as well) is announced with a delay of almost one quarter (11 weeks). The resulting information gap can be filled by making use of higher frequency indicators in the time between the end of the reporting period and the publication of official GDP figures.

For large economies (U.S.A., the U.K. and the euro area), large-scale models have been developed to make use of this high-frequency information. Since the pioneering work of Evans (2005), Nunes (2005) and Giannone et al. (2008), it has become common to rely on computational estimates of GDP in real time. The menu of available model classes ranges from single-indicator, regression-based bridge equations to highly complex, multi-indicator dynamic factor models (DFMs).

Yet, for Central, Eastern and Southeastern European (CESEE) economies, considerably fewer indicators have traditionally been available, and the transition history of shorter time series has often precluded the use of such computationally intensive models. For instance, Rünstler et al. (2009) report that models for three Eastern European EU Member States (Lithuania, Hungary and Poland) performed rather badly with respect to naïve benchmarks in their analysis. They used data

<sup>1</sup> European Commission, david.havrlant@ec.europa.eu; Národná Banka Slovenska Research Department, peter.toth@nbs.sk; Oesterreichische Nationalbank, Foreign Research Division, julia.woerz@oenb.at (corresponding author). The opinions expressed by the authors of this study do not necessarily reflect the official viewpoints of the European Commission, the Eurosystem, Národná Banka Slovenska or the Oesterreichische Nationalbank. None of the afore-mentioned institutions or any person acting on their behalf may be held responsible for the use which may be made of the information contained in this publication, or for any errors that may remain. The authors would like to thank Sebastian Beer, Martin Feldkircher, two anonymous referees, participants of the May 2016 Joint Annual Meeting of the Austrian Economic Association and the Slovak Economic Association (NOeG-SEA) in Bratislava and participants of the June 2016 CESEEnet workshop on Macroeconomic Forecasting in Vienna for helpful comments and valuable suggestions.

starting in January 1995, 1997 and 1998, respectively, and ending in July or August 2006. Hence, they could not assess whether this bad performance resulted from the short dataset or other characteristics specific to the catching-up experience of these countries.

In time, such restraints eased. As a result of EU accession roughly ten years ago and the associated Eurostat reporting commitments, the set of high-frequency indicators that are available for a reasonable time period for these small and open economies has grown rapidly, opening up new possibilities for estimating the current level or growth rate of GDP.

In a related paper, Feldkircher et al. (2015) explored small-scale models ranging from bridge equations to dynamic factor models for nowcasting real GDP growth in selected CESEE economies. The analysis was based on a handful of time series that were selected from all available monthly indicators using both very simple and highly sophisticated selection procedures varying from picking the “usual suspects,” such as industrial production or Eurostat’s Economic Sentiment Indicator (ESI), to applying a Bayesian model averaging approach to narrow down the set of short-term indicators to fewer than 10. The results suggested that a small dynamic factor model based on about six to eight indicators carefully selected according to their correlation with GDP consistently outperformed the benchmark autoregressive model AR(1).

Factor models are powerful tools for extracting relevant information from large datasets. Large factor models allow researchers to include all potentially important information from a data-rich environment (see Barhoumi et al., 2013, for a survey of dynamic factor models). Yet, it is not clear whether enlarging the number of time series also results in a better forecasting performance. Boivin and Ng (2006) find that a smaller number of time series (40 of a maximum of 147 series available to them) can yield better results in a real-time forecasting exercise. This result arises when idiosyncratic errors show cross-correlations in large datasets or when a highly informative factor dominates a small dataset but is dominated in a larger dataset. Proposing different methods to identify relevant or efficient predictors, Bai and Ng (2008) show that forecasting performance improves when factors are estimated using fewer but informative predictors.

Given the discussion on factor models in the literature, the main focus of this paper lies on exploring the optimal number of predictors to be used in a factor model for forecasting the GDP growth of selected CESEE economies. Hence, our horse race is between different dataset classes distinguished by the number of high-frequency indicators. In the present analysis, we focus on two types of factor models, namely principal component models, or approximate factor models, in the spirit of Stock and Watson (2002a, 2002b) and mixed frequency dynamic factor models for large datasets following Bańbura and Modugno (2014). Both types of models have been applied to Czech data before (see Arnořtová et al., 2011, and Rusnák, 2016) and performed well.

We apply those models to estimate GDP growth with a very short-term horizon (last, current and next quarter) for seven CESEE countries: Bulgaria, the Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia.<sup>2</sup> To ensure full comparability with Feldkircher et al. (2015), we assess relative forecasting performance over the period 2008 to 2014. Hence, our evaluation period covers the global financial crisis and the subsequent recovery. In contrast to most euro area economies that experienced a double-dip recession during those years, some CESEE economies, in particular Poland, where there was no recession at all, recovered quickly and posted rather sound growth rates, especially toward the end of our observation period. Hence, we cover a period including both recessions and expansions, which is preferable for evaluating the quality of a forecast. In general, both principal component models and dynamic factor models tend to outperform our benchmark AR(1) model. While we cannot distinguish easily between the forecasting performance of different model classes and model specifications, we observe a consistently better performance of models relying on a smaller set of 9 to 14 carefully selected indicators.

Section 1 describes the two competing models. Section 2 defines the different indicator sets and the data sample. Section 3 reports the results for individual models and section 4 concludes.

## 1 Our horses: principal component models v. dynamic factor models

In our analysis, we rely purely on computational methods to predict GDP growth from higher frequency indicators. More specifically, we use factor models. This type of model makes use of timing properties of the higher frequency indicators and can broadly be attributed to one of two model classes.

Principal component models, also called approximate factor models, make use of static factors. The monthly dataset is first rebalanced by lagging some of the time series appropriately to deal with ragged edges in the data. Principal components are extracted either from the monthly time series or after having aggregated monthly indicators to quarterly frequency. In a second step, the principal components are bridged to GDP in a simple ordinary least squares (OLS) equation. To sum up, the principal components approach requires rebalancing the monthly series by lagging and aggregating them (or their common factors) to the quarterly frequency. However, the process of lagging and aggregating may neglect the true dynamic relationships between the monthly series, their common factors and GDP growth.

The latest generation of dynamic factor models (DFMs) can deal with both mixed frequencies and unbalanced datasets without the need to rebalance and aggregate data. The monthly DFM is cast in a state-space framework and is estimated in an iterated fashion. The starting values of the common factors are initialized by principal components from the balanced subsample of the indicators. Then the next steps iterate between estimating parameters conditional on the factors and estimating the factors conditional on the parameters from previous iterations. Once the estimates converge, the missing values of the indicators and monthly

<sup>2</sup> Given our focus on obtaining good nowcasts for CESEE countries that are relevant from the viewpoint of the Oesterreichische Nationalbank, we do not include the Baltic states in our sample. We also excluded Croatia, as we encountered some problems in using exactly the same set of indicators due to its late EU accession.

GDP are estimated via the Kalman smoother until the end of the forecast horizon. This procedure takes into account all available information on the uneven edges of the dataset.

### 1.1 Principal component models

Forecasting output growth by principal components, or by the approximate factor model, was inspired by the work of Stock and Watson (2002a, 2002b). The authors use such a model to forecast four U.S. macroeconomic variables with more than 200 predictors. The four variables forecast are industrial production, personal income, manufacturing sales and employment, which are all available on a monthly basis. Their approach has been applied also to forecasting GDP. For a European cross-country study, see e.g. Rünstler et al. (2009).

Our principal component model can be described by the following equations:

$$x_{it}^Q = \lambda_i PC_t^Q + \omega_{it} \quad (1)$$

$$y_t^Q = \Phi_h PC_{t-h}^Q + \psi_t \quad (2)$$

where  $x_{it}^Q$  is the quarterly aggregate of monthly indicator  $i$  and  $y_t^Q$  is the quarterly growth rate of real GDP. The quarterly aggregates are transformed to be stationary, have zero means and unit variances. The issue of uneven endpoints of the  $x_{it}^Q$  series due to differences in publication lags is resolved by shifting each series appropriately. This means rebalancing the panel of indicators so that the last observations of  $x_{it}^Q$  and  $y_t^Q$  correspond. Vector  $PC_t^Q$  contains  $J$  common factors estimated by principal components analysis, and  $\lambda_i$  is a vector of  $J$  factor loadings specific to each indicator  $i$ . The number of factors  $J$  is set to one, two or three in alternative specifications. The principal components are estimated either at a monthly frequency (PC-M model) using the balanced indicator set  $x^{it}$  only, or at a quarterly frequency, including both  $x_{it}^Q$  and  $y_t^Q$  (PC-Q model) in the estimation of  $PC_t^Q$ . Once the  $PC_t^Q$  series has been estimated, equation (2) is fitted by OLS to obtain the vector of  $J$  coefficients  $\Phi_h$ . Given the static nature of principal components, we need to lag  $PC_t^Q$  in equation (2) by  $h$  periods to forecast GDP growth on the horizon of  $h$  quarters ahead.

The remaining terms in the equations,  $\omega_{it}$  and  $\psi_t$ , are idiosyncratic shocks, which may be serially correlated. The identification of  $PC_t^Q$  requires further that the cross-correlations across  $\omega_{it}$  are not “too strong” when the sample size (in terms of the number of indicators and the time dimension) is large (see Stock and Watson, 2002a). In other words, including many predictors may come at the cost of increasing the cross-correlations of idiosyncratic shocks<sup>3</sup> for some series. Therefore, careful variable selection may improve the identification of the common factors and, potentially, the forecasting performance of the model.

To sum up, we use different model specifications that vary by frequency aggregation and the number of principal components that we extract. According to our choice of frequency aggregation, we distinguish between a monthly principal components and a quarterly principal components specification. We consider

<sup>3</sup> In practice, the shocks could be correlated for some sectoral disaggregates of the same series, turnover versus production indexes for the same sector, export and import turnover for small open economies, different labor market indicators, etc.

models with one, two and three factors. Hence, we obtain six versions of the static factor model for each country, each forecast horizon and each indicator set.

## 1.2 Dynamic factor models

Dynamic factor models extract signals from all available information even when several indicators are highly correlated. The first generation of DFMs was estimated by maximum likelihood or Kalman filters and can handle data irregularities, but is limited to using a set of few variables (see Engle and Watson, 1981). The next generation of models estimates the factors by nonparametric principal components (Chamberlain and Rothschild, 1983; Forni and Reichlin, 1998; Forni et al., 2000; Stock and Watson, 2002a, 2002b). While these models can handle short time series in large cross sections, they cannot deal with ragged ends in the data. The third generation of DFMs again approximates factors by principal components and utilizes them in a state-space framework (see Giannone et al., 2008; Rünstler et al., 2009). These models can handle large datasets with data irregularities that are present in a real-time forecasting setting. Finally, the latest generation of DFMs uses an expectation-maximization algorithm to obtain ML estimates of large models that are able to deal with unbalanced datasets (Schumacher and Breitung, 2008; Bańbura and Modugno, 2014). We follow the approach of Bańbura and Modugno (2014) and use a mixed-frequency DFM for large datasets. Rusnák (2016) applied the same model to Czech data.

Our model is specified for monthly variables, where the indicators  $x_{it}$  are transformed to stationary processes with zero means and unit variances. Quarterly GDP growth,  $y_t^Q$ , is assumed to be observable only in the third month of each quarter, while its values in the first two months are treated as missing. Using the approximation<sup>4</sup> of Mariano and Murasawa (2003), we can decompose  $y_t^Q$  as its lagged (unobserved) monthly growth rates  $y_t$  as follows:

$$y_t^Q = y_t + 2y_{t-1} + 3y_{t-2} + 2y_{t-3} + y_{t-4} \quad (3)$$

The monthly DFM is specified in a state-space form as a set of measurement equations:

$$x_{it} = \Lambda_i f_t + \varepsilon_{it} \quad (4)$$

$$y_t^Q = \Lambda_y (f_t + 2f_{t-1} + 3f_{t-2} + 2f_{t-3} + f_{t-4}) + u_t + 2u_{t-1} + 3u_{t-2} + 2u_{t-3} + u_{t-4} \quad (5)$$

where the second line comes from (1) and the expression below:

$$y_t = \Lambda_y f_t + u_t \quad (6)$$

where  $f_t$  are the unobserved common factors for the indicators and GDP growth,  $\Lambda_i$  and  $\Lambda_y$  are the respective factor loadings, and  $\varepsilon_{it}$  and  $u_t$  are idiosyncratic shocks, which may be autocorrelated and weakly cross-correlated.

<sup>4</sup> This follows from assuming that the level of real GDP in quarter  $\tau$  ( $Y_t^Q$ ) equals the geometric mean of its (unobserved) monthly levels ( $Y_t$ ). Taking logs, the quarterly first difference of this expression becomes  $d \log Y_t^Q = 1/3 (\log Y_t + \log Y_{t-1} + \log Y_{t-2} - \log Y_{t-3} - \log Y_{t-4} - \log Y_{t-5})$ . Adding and subtracting different lags of  $\log Y_t$  in the above parentheses results in expression (3).

Finally, the state equation defines the dynamics of the common factors as an AR(p) process:

$$f_t = A_1 f_{t-1} + A_2 f_{t-2} + \dots + A_p f_{t-p} + v_t \quad (7)$$

where  $v_t$  is an idiosyncratic shock.

Again, we employ different model specifications, which vary by the assumption we make on the idiosyncratic component  $v_t$  (serially uncorrelated versus the AR(1) specification) and by the number of extracted factors  $f_t$  (up to four). Hence, we obtain eight different model specifications of the dynamic factor model for each country, forecast horizon and indicator set.

## 2 Horse feed and race track: data sample and forecast horizon

Our set of available indicators comprises 69 country-specific indicators and 6 foreign indicators. The domestic indicators comprise information for the total economy and individual subsectors on industrial production, turnover, business and consumer surveys, economic sentiment, energy supply, prices, unemployment and international trade. The foreign indicators are the ECB commodity price index, the index of world market prices of the Hamburg Institute of International Economics (HWWI), the HWWI crude oil price index, production in euro area industry, the Markit PMI<sup>TM</sup> (Purchasing Managers' Index<sup>TM</sup>) for the euro area and the CES-Ifo Export Expectations index). All these indicators are at monthly frequency. Overall, a set of 75 indicators is available for each country model. Guided by the consideration that small indicator sets may prove useful also for DFMs when the time series dimension is short (and hence asymptotic properties do not hold) and that the variability of idiosyncratic components is small, and recalling the satisfactory forecasting performance of the small DFMs reported by Feldkircher et al. (2015) for the same dataset, we run the estimation on five different sets of indicators that vary by coverage. Our large indicator set comprises all 75 indicators. Our medium set contains only selected indicators from the main categories (production, turnover, consumer sentiment, etc.). This set includes 31 indicators. Moreover, we use one variant of the medium-sized set that excludes all foreign variables, reducing it to 26 indicators. Finally, we diminish the number of indicators even further based on their correlation with GDP, using the same standard set of indicators for all countries. The small indicator set contains 14 indicators. Again, we differentiate between a small set including foreign variables and a small domestic set based on nine country-specific indicators. Detailed information on the indicator sets is given in annex table A1.

Our sampling period extends from the first quarter of 2000 to the third quarter of 2014. We discarded data prior to 2000 to be able to work with a meaningful number of indicators readily available from Eurostat. In mid-1995, only 7 indicators are available from this data source; in mid-1996, this number jumps to 27, at the beginning of 1998 to 37, in January 2000 to 50 and to finally to 68 in mid-2002. As is standard in the literature, we focus on indicators reflecting real economic activity and economic sentiment and do not include financial or capital flow

data.<sup>5</sup> All models are estimated for the period from the beginning of the sample to the second quarter of 2008. Our evaluation period runs from the third quarter of 2008 to the end of the sample period. For this period, we obtain so-called “quasi out-of-sample” forecasts. We measure forecasting accuracy by the root mean square error (RMSE).

Different frequencies for the explanatory variables and the dependent variable result in a total of eight forecast horizons. For every month in a quarter, we produce a backcast for the GDP of the previous quarter, a nowcast of the current quarter’s GDP growth and a forecast of the next quarter as represented in table 1.

Table 1

### Forecast horizons

Month in which forecast is made	Month 1			Month 2			Month 3	
Quarter for which GDP is predicted	$Q_{t-1}$	$Q_t$	$Q_{t+1}$	$Q_{t-1}$	$Q_t$	$Q_{t+1}$	$Q_t$	$Q_{t+1}$
Label of forecast horizon	Back_1	Now_1	For_1	Back_2	Now_2	For_2	Now_3	For_3

Source: Authors’ compilations.

Note that we extract monthly data in the middle of every month. We define calendar months according to their position within a quarter, such that January, April, July and October are labeled “month 1.” Hence, in the first and second months of a quarter, we do not even know GDP growth of the previous quarter. Therefore, for these months, we predict a backcast, a nowcast and a forecast, respectively. We accordingly label the predictions obtained from information in month 1 Back\_1, Now\_1 and For\_1. For example, a prediction of first-quarter GDP growth made in April is called Back\_1, while the prediction of second-quarter GDP growth made in the same month is Now\_1. Likewise, in month 2 we obtain the predictions Back\_2, Now\_2 and For\_2. Continuing the above example, the “forecast” (or better backcast) of first-quarter GDP growth which we obtain in May is labeled Back\_2, while the estimate of second-quarter GDP growth in May is called Now\_2, and so on. In month 3, we already have an official GDP estimate for the previous quarter. Hence, we do not estimate a backcast in these months. This implies that in month 3, we predict only current and next-quarter GDP growth (horizons Now\_3, For\_3).

### 3 The race: forecast accuracy of competing models

Having laid out all these preliminaries, we are now ready in this section to report the results. We estimate three different models for each of the seven countries and each indicator set. Beside the principal component model and the DFM, we also estimate a simple AR(1) model of GDP growth for each country; it serves as our benchmark. Furthermore, we run different specifications of each model, as explained in section 1. In total, we obtain 15 model specifications (6 for the prin-

<sup>5</sup> Moreover, information on financial or capital flows would not be available from a common data source, which would render a frequent and automatized updating routine complicated. As the aim of this analysis is to provide a sound basis for implementing a nowcasting tool at the OeNB, we opted for harmonized and common data sources across all countries.

principal components, 8 for the DFM and one benchmark model) for 7 countries and 5 indicator sets. From each of these roughly 500 model specifications, we obtain a prediction for each of the 8 horizons.<sup>6</sup>

We report the forecasting accuracy of the best-performing model specification for each country, indicator set and forecast horizon in chart 1.<sup>7</sup> Forecasting accuracy is measured by the RMSE relative to the benchmark AR(1) model. Since real-time GDP data series are not available for some of the countries in our sample, we use the latest available GDP growth figures to calculate forecasting errors. Thus, in measuring forecasting accuracy of our quasi out-of-sample forecasts, we ignore the impact of different data vintages on the results.

Chart 1 distinguishes between the results obtained by the two model classes, principal component models and DFMs. The results suggest that both models outperform the naïve benchmark, which models GDP as a simple autoregressive process of order 1. Hence, model-based predictions using higher frequency indicators pay off by producing higher forecasting accuracy. This result is in line with Rünstler et al. (2009). However, relative model performance varies by country. Picking the best-performing specification for each estimation method, we obtain the lowest forecast error on average for Bulgaria, followed by the results for the Czech Republic, Romania and Slovenia. Model performance is worst for Poland and Slovakia.

At the same time, forecast accuracy varies considerably across forecast horizons. Not very surprisingly, backcasts show on average smaller RMSEs, while forecasts exhibit the highest RMSEs. For Hungary, Poland, Slovenia and Slovakia, the AR(1) model even outperforms our best model specification for some horizons. Inferior model performance – indicated by a value greater than one in the chart – is observed for forecasts produced by the DFM for Hungary (for horizons For\_1 and For\_2), for Poland (all nowcasts, For\_1 and For\_2) and Slovenia (For\_1 and For\_2). For Slovakia, model performance is rather poor in general; only the small and medium-sized principal component model as well as the small DFM manage to outperform the AR(1) model for some horizons.

<sup>6</sup> Note that not every DFM specification could be estimated for each country because data availability varied across countries. Thus, the total number of predictions for all countries, indicator sets and horizons is 3,569.

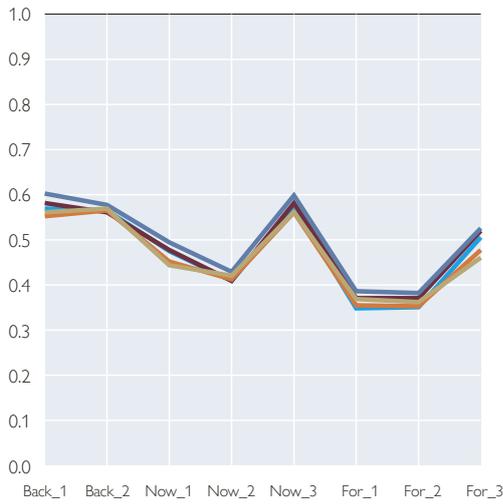
<sup>7</sup> Detailed information on all model specifications is available from the authors on request. The best-performing model was chosen as that with the lowest prediction error.

**Relative forecast accuracy by country and model specification**

**Bulgaria**

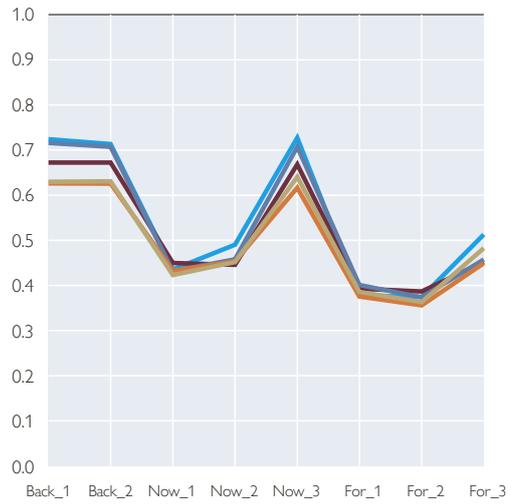
**Principal component models**

*RMSE relative to AR(1) model*



**Dynamic factor models**

*RMSE relative to AR(1) model*



**Czech Republic**

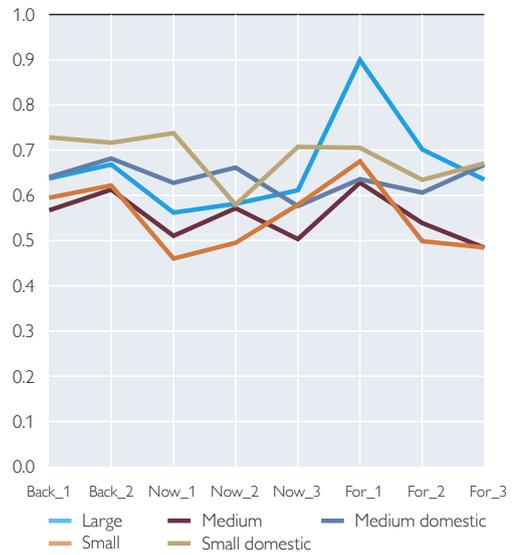
**Principal component models**

*RMSE relative to AR(1) model*



**Dynamic factor models**

*RMSE relative to AR(1) model*



Source: Authors' calculations.

Chart 1 (continued)

**Relative forecast accuracy by country and model specification**

**Hungary**

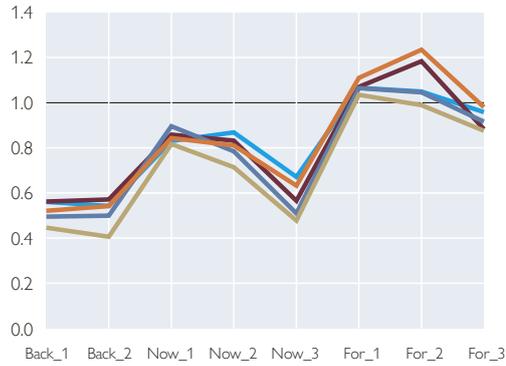
**Principal component models**

*RMSE relative to AR(1) model*



**Dynamic factor models**

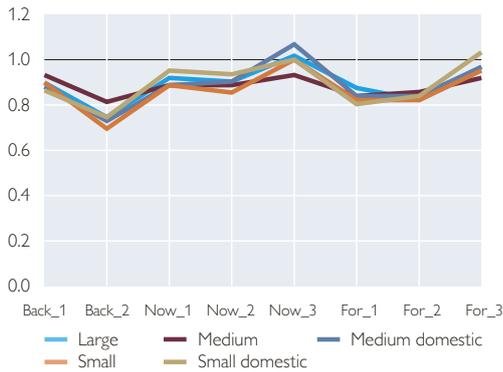
*RMSE relative to AR(1) model*



**Poland**

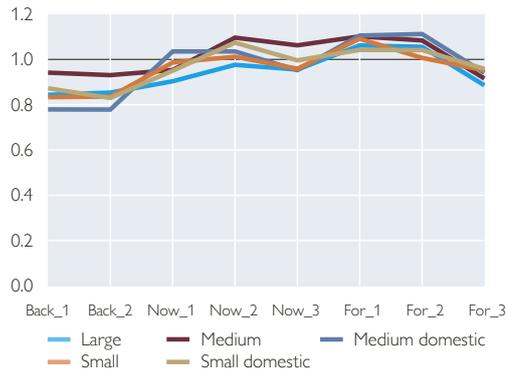
**Principal component models**

*RMSE relative to AR(1) model*



**Dynamic factor models**

*RMSE relative to AR(1) model*



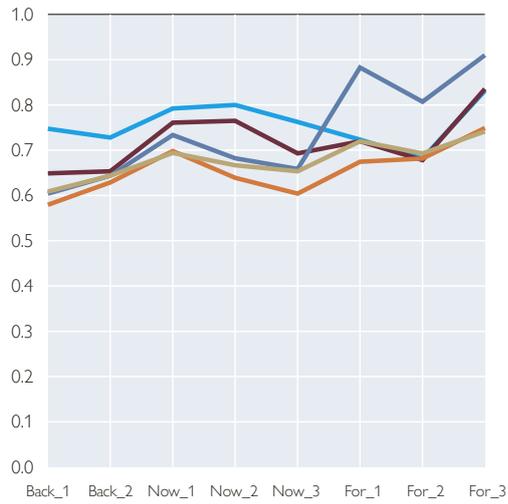
Source: Authors' calculations.

**Relative forecast accuracy by country and model specification**

**Romania**

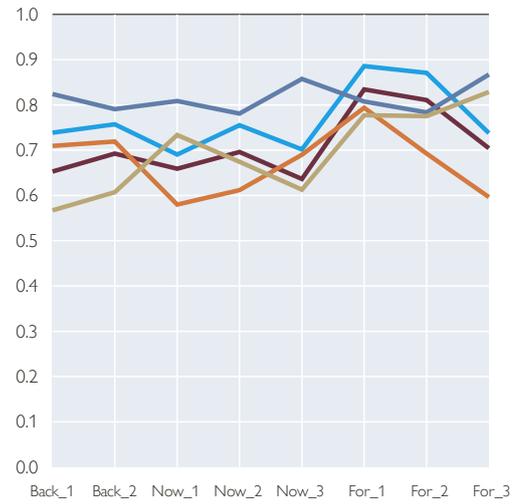
**Principal component models**

*RMSE relative to AR(1) model*



**Dynamic factor models**

*RMSE relative to AR(1) model*



**Slovenia**

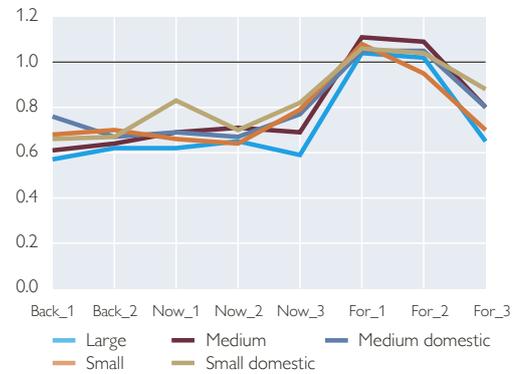
**Principal component models**

*RMSE relative to AR(1) model*



**Dynamic factor models**

*RMSE relative to AR(1) model*



Source: Authors' calculations.

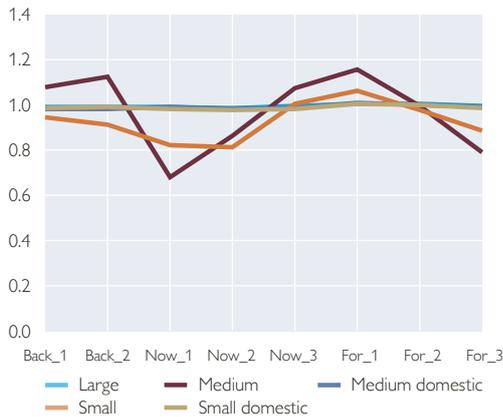
Chart 1 (continued)

## Relative forecast accuracy by country and model specification

### Slovakia

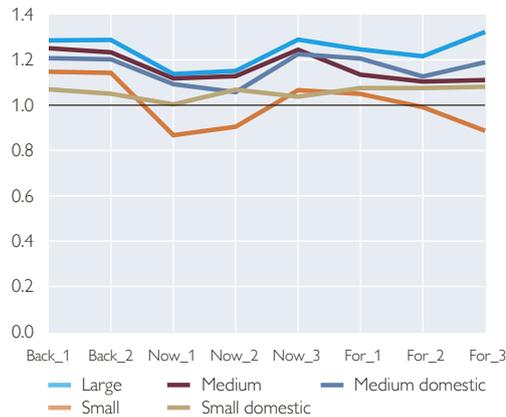
#### Principal component models

RMSE relative to AR(1) model



#### Dynamic factor models

RMSE relative to AR(1) model



Source: Authors' calculations.

While we clearly observe differences in model performance across countries and horizons, the match between our two models is less clear-cut. In some cases, especially in Bulgaria, Poland, Romania and Slovakia, the principal component model yields lower RMSEs on average than the DFM. In the Czech Republic and Hungary, the DFM predictions exhibit lower RMSEs, while the results are unclear for Slovenia.

For the practitioner who is confronted with producing a prediction for each country on a monthly basis, the most interesting distinction lies in differences across indicator sets. But knowing whether including more information improves forecast accuracy or rather just adds noise to the forecast is important not just because it has an impact on the amount of data work but also for theoretical reasons. As mentioned above, under certain assumptions,<sup>8</sup> more information always results in more accurate forecasts. However, these assumed conditions are often not met in practice. Chart 1 suggests that the gains in forecast accuracy from varying the size of the indicator set are modest. Eyeball inspection even suggests a slightly better performance of the smallest indicator set of 14 indicators including foreign variables.

We tested this observation by applying a Wald test on the equality of RMSEs across indicator sets. In order to obtain a reasonable test setting, we regressed the absolute RMSE of each model specification on a set of dummy variables, including dummies for the size of the indicator set. Equation 8 reports our test regression:

$$RMSE_{i,c,h,m} = \sum_I \alpha_i DIND_i + \sum_C \beta_c DCOUNTRY_c + \sum_H \gamma_h DHOR_h + \sum_M \delta_m DMODEL_m + \varepsilon_{i,c,h,m} \quad (8)$$

<sup>8</sup> These assumptions mean that asymptotic properties of the indicators must hold, i.e. time series must tend to infinity in terms of number and length. Furthermore, idiosyncratic components must not be strongly correlated, and the variability of the common component needs to be large.

We include the following dummy variables (labeled D combined with a descriptor for the respective variable) to control for variation in the RMSE that arises from differences in horizon, country, method and model specification. The DIND dummies capture the indicator set used, whereby subscript  $i$  stands for the size of the variable set (large, medium, medium domestic, small, and small domestic). DCOUNTRY is a set of dummies for each of the seven countries in our sample. DHOR is a set of dummies for each of the eight horizons. Finally, the dummies DMODEL capture the model specification (i.e. six dummies for each variant of the PC model and eight dummies for the DFM models). Equation 8 is estimated by least square dummy variables (LSDV). We then apply Wald tests on

Table 2

**Comparison of model RMSEs**

		Coefficient	Robust standard error	t-value	P> t	95% confidence interval		
						lower bound	upper bound	
Indicator set	large	-0.190	0.089	-2.13	0.033	-0.364	-0.015	
	medium	-0.281	0.089	-3.16	0.002	-0.456	-0.107	
	medium domestic	-0.223	0.088	-2.53	0.011	-0.395	-0.050	
	small	-0.369	0.089	-4.14	0.000	-0.543	-0.194	
	small domestic	-0.267	0.089	-2.99	0.003	-0.442	-0.092	
Country	BG	0.356	0.018	19.88	0.000	0.321	0.391	
	CZ	-0.345	0.011	-31.80	0.000	-0.366	-0.323	
	HU	-0.296	0.012	-24.08	0.000	-0.320	-0.272	
	PL	-0.815	0.012	-65.69	0.000	-0.839	-0.790	
	RO	0.587	0.017	35.60	0.000	0.555	0.620	
	SK	1.095	0.019	57.62	0.000	1.058	1.132	
Horizon	Back_1	1.536	0.082	18.66	0.000	1.375	1.697	
	Back_2	1.505	0.082	18.27	0.000	1.343	1.666	
	Now_1	1.822	0.084	21.82	0.000	1.659	1.986	
	Now_2	1.797	0.083	21.55	0.000	1.634	1.961	
	Now_3	1.590	0.082	19.32	0.000	1.429	1.752	
	For_1	1.947	0.085	22.84	0.000	1.780	2.115	
	For_2	1.917	0.085	22.44	0.000	1.750	2.085	
	For_3	1.913	0.084	22.90	0.000	1.749	2.077	
PC model specification	m1	0.177	0.037	4.73	0.000	0.104	0.251	
	m2	0.088	0.034	2.57	0.010	0.021	0.156	
	m3	0.078	0.036	2.19	0.028	0.008	0.147	
	q1	-0.224	0.030	-7.37	0.000	-0.284	-0.165	
	q2	-0.204	0.031	-6.50	0.000	-0.266	-0.143	
	q3	-0.212	0.033	-6.46	0.000	-0.276	-0.147	
DFM model specification	id11	0.006	0.042	0.15	0.878	-0.076	0.088	
	id12	- omitted -						
	id22	-0.088	0.032	-2.76	0.006	-0.151	-0.026	
	id32	-0.128	0.032	-3.97	0.000	-0.191	-0.065	
	id42	-0.103	0.033	-3.11	0.002	-0.168	-0.038	
	sm22	-0.043	0.031	-1.39	0.164	-0.104	0.018	
	sm32	-0.089	0.031	-2.86	0.004	-0.150	-0.028	
	sm42	-0.100	0.032	-3.16	0.002	-0.161	-0.038	
	no. of obs.	3,496						
	R <sup>2</sup>	0.974						

Source: Authors' calculations.

Note: OLS regression on dummy variables for different models (AR(1), dynamic factor, principal components), model specifications, countries, horizons and indicators sets, dependent variable = RMSE, robust standard errors.

restrictions, including the coefficients of the dummy variables for the five indicator sets, to test for statistically significant differences between the RMSEs based on the large, medium or small set of predictors. Since we also include the AR(1) results in the regression, the significance of the DIND dummies in the LSDV regression directly indicates whether any of the models including monthly indicators outperforms the AR(1) benchmark.

Table 2 reports the results of the LSDV regression including all specifications using both broad model classes and the benchmark. The models for Slovenia are omitted in the regression below, as is the DFM specification based on the assumption of an AR(1) idiosyncratic component, extracting one factor and using 2 lags (“id12”). Since we estimate without a constant, we can read the average RMSE for each horizon from the coefficients of the DHOR dummies. The negative and significant coefficients on the dummies for the five indicator sets clearly demonstrate the superiority of model-based predictions using monthly indicators over the AR(1) model.

In the next step, we test the restriction that  $\alpha_j = \alpha_k$  for any  $j, k \in I, j \neq k$  against the alternative that the difference between the two coefficients is greater than zero. The Wald tests in table 3 in combination with the regression results above show that the small indicator set including foreign variables yields the best forecasting accuracy.

Table 3

#### Wald test on the equality of coefficients for indicator sets

	Large	Medium	Medium domestic	Small
Medium	42.700 <i>0.000</i>			
Medium domestic	5.620 <i>0.018</i>	18.750 <i>0.000</i>		
Small	161.910 <i>0.000</i>	41.000 <i>0.000</i>	115.510 <i>0.000</i>	
Small domestic	25.290 <i>0.000</i>	0.850 <i>0.358</i>	8.910 <i>0.003</i>	45.080 <i>0.000</i>

Source: Authors' calculations.

Note: F-values of a two-sided test on the equality of coefficients for different indicator sets are reported, p-values in italics, based on robust standard errors.

Even though we consider the dummies for country, horizon and model specification mainly as control variables, it is interesting to take a quick look at the coefficients of these dummies as well. Supported also by the results of the bilateral Wald tests of all combinations of coefficients (not reported here), we can clearly reject the hypothesis that forecasting performance for different horizons is equal and, in line with our impression from chart 1, we conclude that forecasting performance is significantly better for backcasts, followed by nowcasts. This is also reflected in the low coefficients of the dummies for backcasts, followed by those for nowcasts in table 2. Forecasts show the largest RMSE on average. In addition, while we can clearly distinguish between the respective quarters for which a prediction is made, we do not always find a significant difference between the months in which the prediction is made. The coefficients of the three forecasts made in different months of a quarter are not statistically different from each other. Like-

wise, the nowcast in the first month cannot be distinguished from the nowcast in the second month of a quarter. Yet the nowcast in the third month is significantly better than in the previous two months. Finally, the distinction between models is less clear-cut, similar to the results in Rünstler et al. (2009). We cannot identify a superior forecasting performance of either the principal component model or the DFM, as the results depend strongly on the specification used. Yet we see that the principal component model based on quarterly aggregation consistently yields the lowest RMSEs controlling for all other factors of variation.

#### 4 Conclusions

We tested the performance of different computational estimates of GDP growth for selected CESEE EU Member States using two competing analysis methods, namely principal component models, also called approximate factor models or static factor models, and dynamic factor models. We use a wide range of 75 monthly indicators to provide an automated real-time solution to predicting past-, current- and next-quarter GDP growth. We put special emphasis on the effect of varying the size of the indicator set for forecasting performance. More specifically, we distinguish between large indicator sets (comprising all 75 indicators including also some foreign variables), medium-sized sets (including only the main component of each indicator) and small sets of 14 indicators that we identify based on careful selection of indicators according to their historic correlation with GDP. For the latter two set types, we also explore whether including indicators that trace foreign economic developments (i.e. global prices and economic activity in the euro area) improves forecast accuracy.

Our results show that forecasting performance – measured by the root mean square error relative to the prediction obtained by the AR(1) model we use as our naïve benchmark – varies significantly between countries, forecast horizons and model specifications. As a first and important result, we are able to obtain more precise forecasts based on computationally intensive models using monthly indicators than a simple extrapolation of GDP using an AR(1) model yields. This holds true for all countries with the exception of Slovakia. Not surprisingly, holding all other factors constant, backcasts are on average more precise than nowcasts, while forecasts are least precise. Interestingly, the precision of one-quarter-ahead forecasts does not improve significantly when new information becomes available during the three months of a quarter, whereas we see a significant gain from the second to the third month for nowcasts and from the first to the second month for backcasts.

More importantly, we can identify a clear gain in forecasting accuracy from selecting indicators based on their lagged and contemporaneous correlation with GDP. Our results suggest that for the CESEE economies in our sample, the inclusion of variables capturing economic developments abroad greatly improves forecasting performance. This is likely to be grounded in the fact that these economies are small and open and hence strongly dependent on external demand and global price developments. Furthermore, we obtain better results when we reduce the set of indicators, even though factor models are generally known for extracting reliable information from large sets of variables. In line with the literature on variable selection in factor models (such as Boivin and Ng, 2006; Bai and Ng, 2008) we attribute this finding to the fact that our large indicator set contains a range of

variables from the same category (production in different sectors, different variants of consumer and business sentiment, etc.). Hence, we conclude that the basic conditions that need to be in place for factor models to extract orthogonal factors from the dataset are not met when using the large indicator set for our sample. This may be grounded in a violation of the weak orthogonality assumption as well as in the relative shortness of the time series for these countries. Reducing the set of indicators to fewer indicators clearly improves forecast accuracy.

We thus suggest basing nowcasting models for GDP growth in CESEE economies on carefully selected indicators, including information on foreign economic developments, rather than simply using all available indicators.

## References

- Arnoštová, K., D. Havrlant, L. Růžička and P. Tóth. 2011.** Short-Term Forecasting of Czech Quarterly GDP Using Monthly Indicators. In: *Czech Journal of Economics and Finance (Finance a úvěr)* 61(6). 566–583.
- Bai, J. and S. Ng. 2008.** Forecasting economic time series using targeted predictors. In: *Journal of Econometrics* 146(2). 304–317.
- Bańbura, M., D. Giannone and L. Reichlin. 2010.** Nowcasting. ECB Working Paper 1275. Frankfurt: European Central Bank.
- Bańbura, M. and M. Modugno. 2014.** Maximum likelihood estimation of factor models on datasets with arbitrary pattern of missing data. In: *Journal of Applied Econometrics* 29(1). 133–160.
- Barhoumi, K., O. Darné and L. Ferrara. 2013.** Dynamic factor models: A review of the literature. In: *OECD Journal: Journal of Business Cycle Measurement and Analysis* 2013(2). 73–107.
- Boivin, J. and S. Ng. 2006.** Are more data always better for factor analysis? In: *Journal of Econometrics* 132(1). 169–194.
- Chamberlain, G. and M. Rothschild. 1983.** Arbitrage, Factor Structure, and Mean-Variance Analysis on Large Asset Markets. In: *Econometrica* 51(5). 1281–1304.
- Engle, R. and M. Watson. 1981.** A One-Factor Multivariate Time Series Model of Metropolitan Wage Rates. In: *Journal of the American Statistical Association* 76(376). 774–781.
- Evans, M. D. D. 2005.** Where Are We Now? Real-Time Estimates of the Macroeconomy. In: *International Journal of Central Banking* 1(2). 127–175.
- Feldkircher, M., F. Huber, J. Schreiner, M. Tirpák, P. Tóth and J. Wörz. 2015.** Bridging the information gap: small-scale nowcasting models of GDP growth for selected CESEE countries. In: *Focus on European Economic Integration* Q2/15. 56–75.
- Forni, M., M. Hallin, M. Lippi and L. Reichlin. 2000.** The Generalized Dynamic-Factor Model: Identification and Estimation. In: *The Review of Economics and Statistics* 82(4). 540–554.
- Forni, M. and L. Reichlin. 1998.** Let's get real: a factor analytical approach to disaggregated business cycle dynamics. In: *The Review of Economic Studies* 65(3). 453–473.
- Giannone, D., L. Reichlin and D. Small. 2008.** Nowcasting: The real-time informational content of macroeconomic data. In: *Journal of Monetary Economics* 55(4). 665–676.
- Mariano, R. and Y. Murasawa. 2003.** A New Coincident Index of Business Cycles Based on Monthly and Quarterly Data. In: *Journal of Applied Econometrics* 18. 427–443.
- Nunes, L. C. 2005.** Nowcasting quarterly GDP growth in a monthly coincident indicator model. In: *Journal of Forecasting* 24(8). 575–592.
- Rünstler, G. 2016.** On the Design of Data Sets for Forecasting with Dynamic Factor Models. In: E. Hillebrand and S. J. Koopman (eds). *Dynamic Factor Models (Advances in Econometrics 35)*. Emerald Group Publishing Limited. 629–662.

- Rünstler, G., K. Barhoumi, S. Benk, R. Cristadoro, A. Den Reijer, A. Jakaitiene, P. Jelonek, A. Rua, K. Ruth and C. Van Nieuwenhuyze. 2009.** Short-term forecasting of GDP using large datasets: a pseudo real-time forecast evaluation exercise. In: *Journal of Forecasting* 28(7). 595–611.
- Rusnák, M. 2016.** Nowcasting Czech GDP in real time. *Economic Modelling* 54(C). 26–39.
- Schumacher, C. and J. Breitung. 2008.** Real-time forecasting of German GDP based on a large factor model with monthly and quarterly data. In: *International Journal of Forecasting* 24(3). 386–398.
- Stock, J. H. and M. W. Watson. 2002a.** Forecasting Using Principal Components From a Large Number of Predictors. In: *Journal of the American Statistical Association* 97(460). 1167–1179.
- Stock, J. H. and M. W. Watson. 2002b.** Macroeconomic Forecasting Using Diffusion Indexes. In: *Journal of Business & Economic Statistics* 20(2). 147–162.

## Annex

Table A1

## List of monthly indicators and indicator sets

Indicator	Seasonal adjustment	Source	Publication lag (weeks)	Indicator set in which indicator is included		
				small	medium	large
<b>Production in industry</b>						
Industry total		SCA Eurostat	6	x	x	x
Mining and quarrying		SCA Eurostat	6			x
Manufacturing		SCA Eurostat	6			x
Electricity, gas, steam and air conditioning supply		SCA Eurostat	6			x
<b>Turnover in industry</b>						
Mining and quarrying		SCA Eurostat	6			x
Manufacturing		SCA Eurostat	6	x	x	x
<b>Turnover in industry, domestic market</b>						
Mining and quarrying		SCA Eurostat	6			x
Manufacturing		SCA Eurostat	6			x
<b>Turnover in industry, nondomestic market</b>						
Mining and quarrying		SCA Eurostat	6			x
Manufacturing		SCA Eurostat	6			x
<b>Production in construction</b>						
Production in construction		SCA Eurostat	7	x	x	x
<b>Turnover in retail trade</b>						
Retail trade, except of motor vehicles and motorcycles		SCA Eurostat	5	x	x	x
<b>Nights spent at tourist accommodation establishments</b>						
Nights spent at tourist accommodation establishments		SCA Eurostat	6			x
<b>Business and consumer surveys</b>						
<b>Consumers</b>						
Financial situation over the past 12 months		SA Eurostat	0			x
Financial situation over the next 12 months		SA Eurostat	0		x	x
General economic situation over the past 12 months		SA Eurostat	0			x
General economic situation over the next 12 months		SA Eurostat	0		x	x
Price trends over the past 12 months		SA Eurostat	0			x
Price trends over the next 12 months		SA Eurostat	0		x	x
Unemployment expectations over the next 12 months		SA Eurostat	0		x	x
The current economic situation is adequate to make major purchases		SA Eurostat	0			x
Major purchases over the next 12 months		SA Eurostat	0		x	x
The current economic situation is adequate for savings		SA Eurostat	0			x
Savings over the next 12 months		SA Eurostat	0			x
Statement on the financial situation of the household		SA Eurostat	0			x
Consumer confidence indicator		SA Eurostat	0		x	x
<b>Industry</b>						
Production development observed over the past three months		SA Eurostat	0		x	x
Employment expectations over the next three months		SA Eurostat	0			x
Assessment of order book levels		SA Eurostat	0		x	x
Assessment of export order book levels		SA Eurostat	0			x
Assessment of the current level of stocks of finished products		SA Eurostat	0			x
Production expectations over the next three months		SA Eurostat	0		x	x
Selling price expectations over the next three months		SA Eurostat	0			x
Industrial confidence indicator		SA Eurostat	0		x	x
<b>Construction</b>						
Building activity development over the past three months		SA Eurostat	0		x	x
Evolution of the current overall order books		SA Eurostat	0			x
Employment expectations over the next three months		SA Eurostat	0			x
Price expectations over the next three months		SA Eurostat	0			x
Construction confidence indicator		SA Eurostat	0		x	x
Factors limiting building activity – none		SA Eurostat	0			x
Factors limiting building activity – insufficient demand		SA Eurostat	0			x
Factors limiting building activity – weather conditions		SA Eurostat	0			x
Factors limiting building activity – shortage of labor		SA Eurostat	0			x
Factors limiting building activity – shortage of material and/or equipment		SA Eurostat	0			x
Factors limiting building activity – other		SA Eurostat	0			x
Factors limiting building activity – financial constraints		SA Eurostat	0			x
<b>Retail sale</b>						
Business activity (sales) development over the past three months		SA Eurostat	0			x
Volume of stocks currently held		SA Eurostat	0			x
Expectations of the number of orders placed with suppliers over the next three months		SA Eurostat	0			x
Business activity expectations over the next three months		SA Eurostat	0			x
Employment expectations over the next three months		SA Eurostat	0			x
Retail confidence indicator		SA Eurostat	0		x	x

Table A1 (continued)

**Monthly indicators (continued)**

Indicator	Seasonal adjustment	Source	Publication lag (weeks)	Indicator set in which indicator is included		
				small	medium	large
<b>Economic Sentiment Indicator</b>						
Economic Sentiment Indicator	SA	Eurostat	0	x	x	x
<b>Services</b>						
Business situation development over the past three months	SA	Eurostat	0		x	x
Evolution of demand over the past three months	SA	Eurostat	0			x
Expectation of demand over the next three months	SA	Eurostat	0			x
Evolution of employment over the past three months	SA	Eurostat	0			x
Expectation of employment over the next three months	SA	Eurostat	0			x
Services Confidence Indicator	SA	Eurostat	0		x	x
<b>Energy supply</b>						
Natural gas	NA	Eurostat	7		x	x
Electricity	NA	Eurostat	7		x	x
Motor spirit	NA	Eurostat	7			x
Diesel oil	NA	Eurostat	7			x
<b>Passenger car registrations</b>						
Passenger car registrations	SCA	ECB	2	x	x	x
<b>Prices</b>						
HICP	NA	Eurostat	2			x
Producer prices in industry	NA	Eurostat	5			x
<b>Labor market</b>						
Unemployment rate	SA	Eurostat	5	x	x	x
<b>International trade</b>						
Imports	NA	Eurostat	6	x	x	x
Exports	NA	Eurostat	6	x	x	x
<b>World commodity prices</b>						
ECB Commodity Price Index	NA	Eurostat	1			x
HWWI index of world market prices	NA	HWWI	1	x	x	x
HWWI index of world market prices, crude oil	NA	HWWI	1	x	x	x
<b>Foreign economic activity</b>						
Production in industry, euro area	SCA	Eurostat	6	x	x	x
Markit Eurozone Manufacturing Purchasing Managers Index (PMI®)	SA	Markit	0	x	x	x
Ifo Export Expectations, Industry	SA	CESifo	0	x	x	x

Source: Authors' compilations.

Note: Seasonal as well as seasonal and calendar-day adjustment of indicators is undertaken by national statistical institutes. SCA stands for seasonal and calendar-day adjusted, SA for seasonally adjusted, NA for not adjusted times series.

# Currency substitution in CESEE: why do households prefer euro payments?

Thomas Scheiber,  
Caroline Stern<sup>1</sup>

*This paper uses microdata from 2014 to examine the determinants of currency substitution in Central, Eastern and Southeastern European (CESEE) countries. To analyze the hysteresis of euroization in these countries, we combine the standard search-theoretic model of money demand with recent findings on the preference of CESEE households for saving in cash as well as with aspects of economic geography. In Southeastern Europe, unlike in Central and Eastern Europe, network externalities and lower trust in the local currency than in the euro are still important factors. Expectations that the local currency will depreciate, income in euro and the expectation of an official adoption of the euro are important explanatory factors for all CESEE countries. Despite the heterogeneity across the region, our results suggest that institutions and policies that foster trust are key to promote de-euroization.*

*JEL classification: E41, O16, D12, P34*

*Keywords: euroization, currency substitution, hysteresis, microdata, CESEE*

CESEE countries have a long history of currency substitution, i.e. using foreign currency as a secondary currency. Before the introduction of the euro, these secondary currencies were the Deutsche mark, Austrian schilling and U.S. dollar. Unofficial euroization emerged in times of high inflation, currency crisis or banking crisis, as foreign currencies were used as a store of value and then, if the crisis deepened (e.g. hyperinflation or confiscation of savings deposits) and lasted longer, also as a medium of exchange.<sup>2</sup> It is well established in the literature on dollarization that de-dollarization does not necessarily occur, at least not fully, once macroeconomic stabilization has been achieved (e.g. Feige et al., 2002, for Latin America and Feige and Dean, 2004, for CESEE and the Commonwealth of Independent States). Economic agents continue to use the foreign currency for both savings and transactions. Calvo and Vegh (1992) first examined this ratchet effect and identified two potential explanations for this phenomenon: The first relates to an expected loss of purchasing power of the domestic currency due to expected depreciation or expected high inflation. Dollarization persists because economic agents continue to have doubts in the future stability of the domestic currency even if the exchange rate is currently stable or inflation is currently low. The second explanation relates to network externalities, which reduce the transaction costs associated with using the foreign currency. Network externalities are endogenous to the level of currency substitution, as economic agents in a multi-currency environment prefer the currency which is already being widely used (Craig and Waller, 2004). Hence, if dollarization reaches sufficiently high levels during periods of macroeconomic crisis, it will persist after the crisis because the foreign currency has become a well-established medium of exchange. Both explanations are essentially rooted in a loss of trust. Once trust is lost, it returns only very gradually (Hosking, 2014).

<sup>1</sup> Oesterreichische Nationalbank, Foreign Research Division, [thomas.scheiber@oebn.at](mailto:thomas.scheiber@oebn.at) (corresponding author) and [caroline.stern@oebn.at](mailto:caroline.stern@oebn.at). The views expressed in this paper are exclusively those of the authors and do not necessarily reflect those of the OeNB. The authors would like to thank Peter Backé, Elisabeth Beckmann, Markus Eller, Anna Ragg, Aleksandra Riedl and Helmut Stix (all OeNB) and two anonymous referees for helpful comments and valuable suggestions.

<sup>2</sup> For a brief historical survey of how the euro came to the CESEE region, see Ritzberger-Grünwald and Scheiber (2012).

This paper contributes to examining the determinants of currency substitution in CESEE countries; in particular we aim to analyze the relative importance of the various explanations of why households prefer to receive certain payments in euro.

We do so by using microdata from the OeNB Euro Survey, a regularly conducted survey of individuals in CESEE. When comparing the results of the first wave of the OeNB Euro Survey in fall 2007 to 2014 data, we witness an ongoing decline in euro cash holdings per capita in Southeastern European (SEE)<sup>3</sup> countries. This decline is associated in part with a portfolio reshuffling as SEE households substitute foreign currency deposits (which are mainly denominated in euro) for euro cash and in part with a decline in CESEE households' trust in the euro due to the sovereign debt crisis in the euro area (ECB, 2013). The question arises whether this decline in euro cash in circulation in CESEE countries has an impact on the importance of the individual determinants underlying the persistence of currency substitution in CESEE. In particular, we wonder whether the influence of network externalities has weakened. Furthermore, to our knowledge, at least Bosnia and Herzegovina, Croatia, the FYR Macedonia, Romania and Serbia have legal acts in place to restrict the use of foreign currency as a means of payment in their countries,<sup>4</sup> which may have influenced the extent of euroization in these countries. There is also the possibility that survey data from these countries are distorted as respondents might not reveal their real preferences due to legal restrictions.

Our analysis is based on CESEE households' preference for receiving certain payments in euro rather than on information about their actual payment behavior, because asking people from a seller's perspective might reveal their real preference more reliably than asking them from a buyer's perspective (Valev, 2010). Camera et al. (2004) show that if a stable foreign currency is preferred over a risky local currency, people usually try to get rid of their local currency holdings and use this less trusted currency as much as possible for payments (*Gresham's Law*). In their model, the sellers of goods are reluctant to sell goods in exchange for risky currency, hence the prices of goods denominated in local currency will be higher, reflecting the risk assumed by the seller. Therefore we surveyed people's preference via a direct survey question: Respondents were asked what currency they prefer when they receive payments from a real estate sale, a car sale, a real estate rental agreement, and their salaries.<sup>5</sup> Our approach is along the lines of Valev (2010).

What distinguishes the euroization experience in the CESEE region from e.g. the dollarization phenomenon in Latin America is EU integration in both institutional and economic terms. The progressive development of European value chains and the free movement of people within the EU and in part also with (potential) candidate countries are possible reasons why CESEE residents receive an increasing share of their income in euro. In this context, the possible adoption of the euro

<sup>3</sup> Our sample comprises seven SEE countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, the FYR Macedonia, Romania and Serbia.

<sup>4</sup> Although restricted, there are explicit exemptions in most countries. For instance, Serbia allows the sale and lease of real estate in foreign currency, while Romania allows foreign currency transactions among residents for occasional operations.

<sup>5</sup> Note that the survey question does not explicitly refer to cash transactions. The preference for receiving euro for certain payments might include cashless transactions as well.

as legal tender when their country joins the euro area might have an impact on households' preferences, too. Hence one might ask whether EU integration and changes in economic geography do in fact add new momentum in the formation of households' preferences for receiving certain payments in euro.

Our contribution aims at complementing recent research on euroization and focuses on an analysis of the determinants of currency substitution in CESEE economies. The starting point of our analysis are the insights of Valev (2010), who examined currency substitution and hysteresis for Bulgaria using survey data from 2003. First, we expand his conceptual framework by introducing more differentiated controls for monetary expectations (backward- and forward-looking measures of purchasing power risk), network externalities and transaction costs. Second, we add explanatory variables to control for respondents' preference for saving in cash, income in euro, expected adoption of the euro and economic geography. Third, the rich set of socioeconomic variables which the Euro Survey covers allows us to control for various aspects of the standard search-theoretic models of money demand. Finally, the sample comprises 10 CESEE economies, which differ substantially with respect to their catching-up process, exchange rate regimes, historical experiences, public and private institutions and the extent of euroization.

This paper is structured as follows: Section 1 introduces the dataset and presents descriptive results on the use of the euro as a means of payment, while section 2 specifies the conceptual framework. Section 3 draws a line from theory to our hypotheses and describes the empirical strategy we used based on the available data. Section 4 discusses the estimation results, and section 5 concludes.

## 1 Dataset and descriptive results

### 1.1 Data

We employ data from the OeNB Euro Survey, which collects information from individuals about their euro cash holdings, saving behavior and debt positions and looks into respondents' economic opinions, expectations and experiences. The survey, which comprises six EU Member States (Bulgaria, Croatia, the Czech Republic, Hungary, Poland and Romania), three EU candidate countries (Albania, the FYR Macedonia and Serbia) and the potential candidate country Bosnia and Herzegovina, has been conducted semiannually since fall 2007. For this study, we use data from the fall 2014 wave, which focused on currency substitution. In each country face-to-face interviews were carried out with about 1,000 randomly selected individuals aged over 14 years. The sample is representative with respect to age, gender and regional distribution.<sup>6</sup> The annex provides a definition of the variables used (table A1) and summarizes the descriptive evidence by country (table A2).

### 1.2 Descriptive results: the euro as a means of payment in CESEE

Based on the results of the OeNB Euro Survey, we find that euro cash holdings are still widespread in CESEE countries. In Albania, Croatia, the Czech Republic, the FYR Macedonia and Serbia, euro cash holdings were quite common in fall 2014,

<sup>6</sup> See <https://www.oenb.at/en/Monetary-Policy/Surveys/OeNB-Euro-Survey.html> for details.

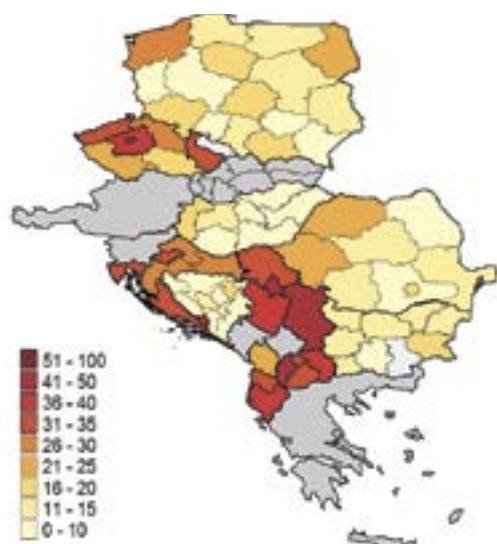
with an average share of above 24%. Furthermore, some regions that share a common border with euro area countries (e.g. some regions of the Czech Republic) or with Kosovo and Montenegro (both of which use the euro as legal tender), exhibit higher shares of euro cash holdings (see the left map of chart 1). However, the incidence of actual payments in euro is much lower across the CESEE region than euro cash holdings.<sup>7</sup>

Chart 1

### Cash holdings in euro are more frequent than actual payments in euro

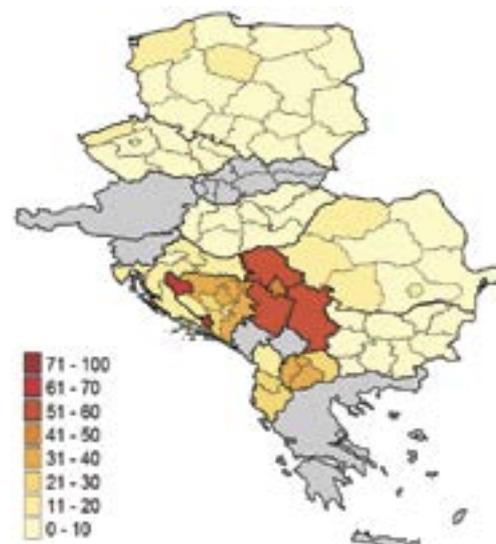
#### Cash holdings in euro

% of respondents



#### Actual payments in euro over last 6 months

% of respondents



Source: OeNB Euro Survey fall 2014.

Note: Regional averages calculated by the authors.

People in CESEE economies hold euro cash for a variety of reasons (chart 2). One main motive cited by respondents in all countries except the Czech Republic in fall 2014 was that they hold euro cash as a general reserve or as a precaution. Stix (2013) observed that people in CESEE countries generally have a preference for cash over interest-bearing assets. Besides hoarding, cash of course functions as a medium of exchange. Anecdotal evidence suggests that the euro is also used as a means of payment – e.g. real estate and cars are frequently paid for in euro. Some other purchases and rental prices are indexed to the euro. The salaries of employees at international companies are also regularly indexed to the euro (Ritzberger-Grünwald and Scheiber, 2012). According to Dvorsky et al. (2008), respondents in SEE mentioned that they occasionally use their euro cash hoardings for domestic payments while respondents in Central and Eastern Europe (CEE)<sup>8</sup>

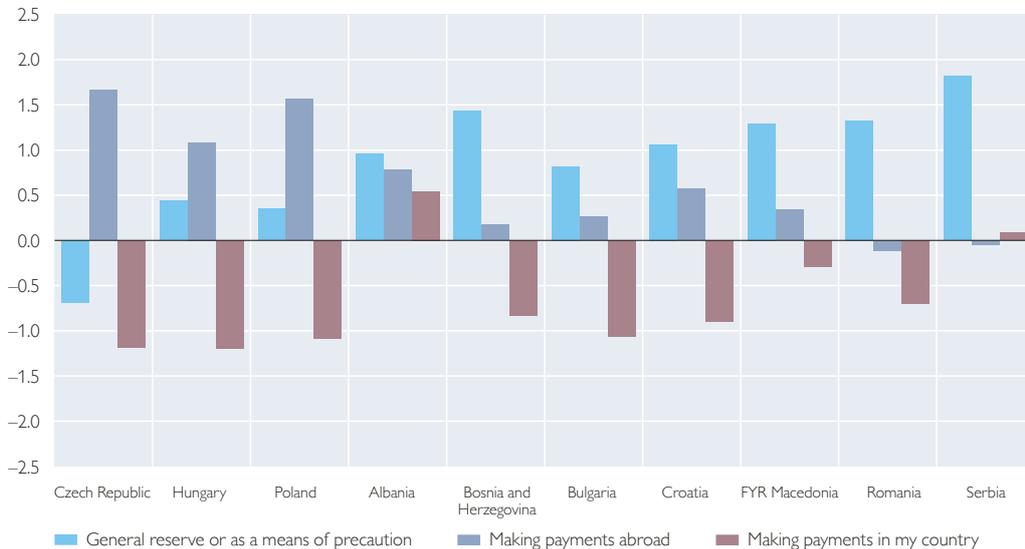
<sup>7</sup> Bosnia and Herzegovina is somewhat puzzling in this respect: While reported euro cash holdings are relatively low, payments in euro are relatively frequent. One explanation could be that respondents are reluctant to reveal their euro cash holdings. Cashless payments and the indexation of prices to the euro could be another reason for the high level of payments in euro.

<sup>8</sup> In this contribution, CEE refers to the Czech Republic, Hungary and Poland.

Chart 2

### Motives for holding euro cash

Normalized sample means per country (–2.5 fully disagree, 0 neutral, +2.5 fully agree)



Source: OeNB Euro Survey, fall 2014.

Note: Respondents were asked whether they agree or disagree on a scale from 1 (fully agree) to 6 (fully disagree) with the following statements: "I hold euro cash ... as a general reserve or as a means of precaution," "...to make payments in [my country]" or "...to make payments abroad, for holidays." Respondents answering "don't know" or who gave no answer are excluded.

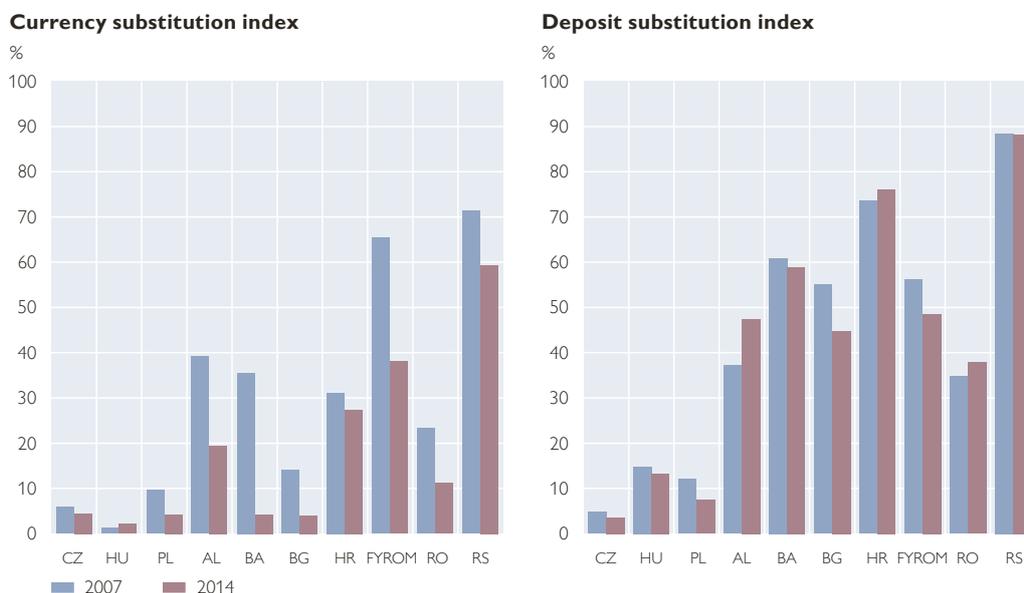
reported that they plan to spend their euro cash mainly abroad (data for 2007 and 2008). Since then, the motive of holding euro cash for domestic payments has become somewhat less important in SEE countries except for Albania.<sup>9</sup>

To highlight the change in importance of foreign currency on a macroeconomic scale, we draw on the currency substitution index and the deposit substitution index for CESEE introduced by Scheiber and Stix (2009). The currency substitution index is calculated as the ratio of euro cash divided by euro cash plus national currency in circulation, whereas the deposit substitution index is the ratio of foreign currency deposits to total deposits of the household sector. Chart 3 contrasts the index values of both indices for each country at two points in time (2007 and 2014).

The currency substitution index shows that currency substitution decreased significantly from 2007 in almost all countries under review. However, Serbia, the FYR Macedonia and Croatia still experience a high level of currency substitution. In Serbia the index value was still above 50% in 2014. Turning to the deposit substitution index in SEE, in 2014 the share of deposits denominated in foreign currency ranged from 37% in Romania to 88% in Serbia. Compared with 2007, deposit substitution increased substantially in Albania but decreased in the FYR Macedonia and particularly in Bulgaria; in the other SEE countries the deposit substitution index remained virtually unchanged. In Bulgaria and Bosnia and Herzegovina, which have a currency board against the euro, currency substitution decreased significantly from 2007 but deposit substitution is still substantial.

<sup>9</sup> Due to space limitations, we did not include an additional chart on this issue. See Dvorsky et al. (2008) for 2007 and 2008 data.

### Currency and deposit substitution indexes show different pictures



Source: OeNB Euro Survey, national central banks.

Note: Currency substitution index = ratio of euro cash to euro cash plus national currency in circulation (average of October and November).

Deposit substitution index = ratio of foreign currency deposits to total deposits of the household sector (annual average). For details see Scheiber and Stix (2009).

A different picture emerges for the CEE countries, where both the currency substitution index and the deposit substitution index are comparatively low. In particular the deposit substitution index draws a clear line between CEE and SEE countries in terms of usage of the euro.

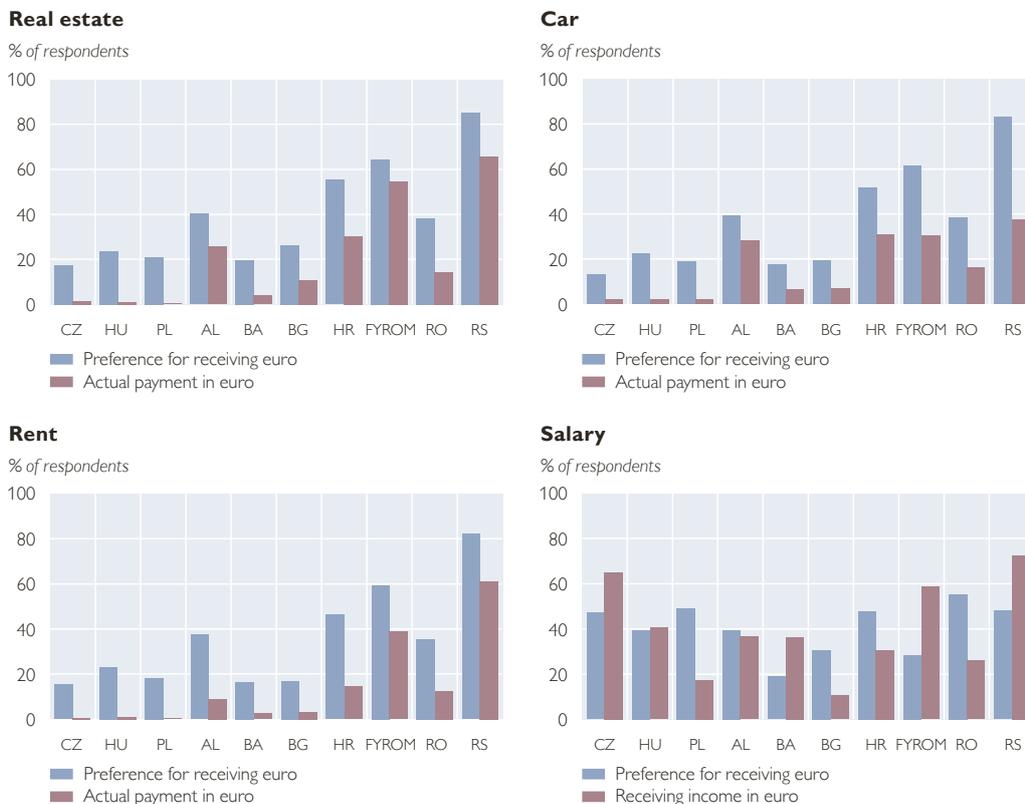
The OeNB Euro Survey provides us with information on the extent to which the euro is used as a means of payment in CESEE (chart 4). We find that payment practices differ between the ten countries under review and between CEE and SEE countries. In Serbia and the FYR Macedonia more than 50% of respondents state that they use the euro as a means of payments and that they prefer to receive euro when they e.g. sell real estate. In other countries (Czech Republic, Poland, Hungary and Bosnia and Herzegovina), less than 5% of respondents indicate that they actually pay in euro. However, in almost all countries and for all kind of payments (real estate and car sale, rental income and salary) the preference for receiving payments in euro is much higher than the incidence of actual payments in euro. There are a few exceptions with regard to salary, though: In the Czech Republic, Bosnia and Herzegovina, the FYR Macedonia and Serbia, the actual incidence of payments surpasses the preference for salaries in euro.

In addition, the OeNB Euro Survey allows us to differentiate between types of transactions (real estate sale, rental income, car sale and salary). We expect the results for transactions that are performed quite frequently, e.g. rental income or salary, to differ from those for rare transactions, e.g. real estate or car sale.

In light of the differences in motives for holding euro cash across countries and the overall level of euroization we decided to split the countries in two groups (CEE and SEE) for the regression analysis.

Chart 4

**Preference for receiving euro for certain transactions vs. actual payment behavior**



Source: OeNB Euro Survey, fall 2014.

Note: The panels reflect answers to the questions if respondents prefer to receive payments in euro and in which areas they actually made payments in euro during the last six months. In the salary panel the binary information on receiving income in euro is derived from the reported share of total household income that the household received in euro over the last 12 months. All panels exclude respondents who answered "Don't know" or who gave no answer as well as respondents who indicated that they did not make such payments. Number of observations see annex A2.

**2 Conceptual framework**

Our aim is to model people’s preference for receiving certain payments in euro, and we propose a simple conceptual framework to help us choose the right explanatory variables. This framework combines findings from search-theoretic models of money demand, which stress the role of purchasing power risk, transaction cost and associated network externalities in explaining the hysteresis of currency substitution, with recent findings on the preference of CESEE households for saving in cash (Stix, 2013). Furthermore, our framework controls for the geographical dimension of economic activity in the region, which might give rise to additional factors driving the euroization of transactions in CESEE not captured so far in the theoretical models of currency substitution.<sup>10</sup>

<sup>10</sup> Although we present the three elements of the model framework as separate, they are closely connected. Money serves as a medium of exchange and as a store of value. The latter function connects people’s payment behavior with the two saving decisions taken by households in a dollarized economy. While Stix (2013) examined the decision of cash vs. bank deposits, Brown and Stix (2015) look at the households’ currency choice regarding their savings deposits, which is again strongly influenced by monetary expectations and network externalities. Developing a fully-fledged model which incorporates all these elements in a unified framework is beyond the scope of this paper.

### The role of purchasing power risk, transaction costs and associated network externalities

Tandon and Wang (2003), Craig and Waller (2004), Camera et al. (2004) and Engineer (2000) apply search-theoretic considerations to model the demand for money in a dual-currency economy. In these models two main factors explain the extent of the dollarization of transactions: the purchasing power risk associated with using the local currency and the transaction costs associated with using the foreign currency.<sup>11</sup> Accepting the local currency in transactions is perceived as risky because it might lose its value before it can be exchanged for goods.<sup>12</sup> Therefore, persistent expectations of currency depreciation lead to a persistent dollarization of transactions. However, the local currency does not disappear completely in these models but remains a viable medium of exchange because using the foreign currency entails transaction costs (e.g. non-zero time cost of holding money, shoe leather cost, conversion cost, counterfeit risk or information cost). Hence, multiple equilibria are possible if people's beliefs about the value of a currency as a store of value and medium of exchange affect its actual use (Craig and Waller, 2000; Camera et al., 2004). This theoretically derived partial acceptance of currencies reflects a widely observed feature in many developing and transition economies with dual currencies, in particular if the use of the foreign currency is illegal (Craig and Waller, 2000).

Interestingly, de-dollarization might not occur automatically after credible macroeconomic stabilization.<sup>13</sup> Uribe (1997) argues that due to network externalities, the cost of transacting in foreign currency decreases with a rise in the level of currency substitution. The foreign currency can become widely used because economic agents believe it is useful as a medium of exchange. Similarly, Craig and Waller (2004) argue that the more often a currency is used, the more likely it will be accepted in transactions, thereby increasing its appeal as a medium of exchange. As a result, its use as a medium of exchange essentially becomes a social convention. Feige et al. (2002), Feige (2003), Feige and Dean (2004), Reding and Morales (2004), Oomes (2005), Kumamoto and Kumamoto (2008) and Valev (2010) provide empirical evidence of the hysteresis of dollarization by showing for various countries that network externalities are one key factor explaining why a foreign currency will continue to be used long after the episode of instability has ended.

Summing up, the empirical literature confirms two independent effects which can contribute to the hysteresis of dollarization: First, the history of exchange rate instability or high inflation in a country feeds into expectations of future instability. Second, network externalities decrease the transaction cost associated with using the foreign currency, i.e. the foreign currency will be preferred if it is already being widely used.

<sup>11</sup> An increase in purchasing power risk leads to greater currency substitution and hence stronger demand for foreign currency. For a given level of currency risk, an increase in transaction cost lowers the level of currency substitution and hence leads to weaker demand for foreign currency.

<sup>12</sup> For example, Craig and Waller (2004) and Camera et al. (2004) model purchasing power risk as a random government tax on domestic money holdings.

<sup>13</sup> For example, when the exchange rate has been re-pegged successfully, even if the peg is fully credible (Bulgaria), or after a successful transition from inflation taxation to inflation targeting (Croatia, Serbia); also, deposit substitution and currency substitution may follow different paths (see chart 3).

### Preference for saving in cash

Money serves as a store of value and as a medium of exchange. Hence currency substitution also impacts savings decisions. Engineer (2000) analyzed the role of transaction costs in an economy with competing fiat currencies. The model predicts that the low-transaction-cost currency (domestic currency) is used for everyday purchases, whereas the low-growth-rate currency (foreign currency) fills the precautionary demand for money and has a lower velocity of circulation, i.e. foreign currency is hoarded as a store of value and used to make occasional large payments. In his analysis of why CESEE households hold sizeable shares of their assets in cash at home rather than at banks, Stix (2013) finds that a lack of trust in banks, memories of past banking crises and weak tax enforcement are important factors in explaining respondents' preference for saving in cash. Moreover, the preference for cash is stronger in dollarized economies where a "safe" foreign currency serves as a store of value.

### Controlling for economic links with the euro area

Our dataset comprises six EU Member States and four (potential) candidate countries. The very close economic links between the CESEE region and the euro area might give rise to additional factors that drive currency substitution in CESEE but have not been captured in theoretical models of currency substitution so far. Respondents who live in relatively close proximity to the euro area, Kosovo or Montenegro (both of which have unilaterally introduced the euro as their sole legal tender), are more likely to be involved in cross-border economic activities such as travelling, temporary labor migration, or cross-border commuting. The OeNB's Euro Survey data confirm that 8.2% of respondents receive all or parts of their household income in euro. Balance of payments statistics underpin the importance of remittances and factor incomes from abroad. Although there is no strong theoretical justification to do so, we expect that these cross-border activities will have a positive influence on respondents' preference for receiving certain payments in euro. Additionally, we presume that respondents who expect their country to adopt the euro as legal tender within the next decade will have a higher preference for payments in euro.

## 3 Empirical hypotheses, definition of explanatory variables and empirical strategy

### 3.1 Purchasing power risk

Against the background of the findings of Brown and Stix (2015) we refine Valev's "hypothesis 2" on the role of purchasing power risk. Brown and Stix show that deposit euroization in the CESEE region is strongly related to individual monetary expectations and network effects. In particular households that expect a depreciation of the local currency over the next year or have little trust in the long-term stability of the local currency are more likely to prefer foreign currency deposits. Moreover, deposit euroization in the CESEE region has been strongly influenced by past financial crises as well as current policies and institutions. Hence, the monetary expectations that drive euroization exhibit both a forward- and a backward-looking dimension. Drawing on these findings, we formulate the following two hypotheses.

Hypothesis 1a along the lines of Valev (2010): *The euro will be preferred by economic agents who expect the local currency to depreciate (forward-looking approach).*

We use respondents' expectations regarding the depreciation of the local currency vis-à-vis the euro over the next five years as a measure of the forward-looking dimension of purchasing power risk.

Hypothesis 1b: *The euro will be preferred by economic agents who place higher trust in the euro than in their respective domestic currency (backward-looking).*

According to Beckmann and Scheiber (2012, table 4), the variable of relative trust in the euro is significantly correlated to respondents' memory of past periods of high inflation. Hence, it mainly captures the backward-looking component of purchasing power risk.

### 3.2 Transaction costs

Valev (2010) showed that people in small villages are more likely to face binding trade frictions and therefore appreciate the comparatively lower transaction costs of the local currency. Therefore, we derive two hypotheses on the transaction costs associated with using the foreign currency.

Hypothesis 2a: *The euro will be less preferred by economic agents who face higher trade frictions, i.e. who live in places that lack basic banking and payment infrastructures.*

Hypothesis 2b: *If the economy is already highly euroized, then a rise in conversion costs will increase the demand for foreign currency (Craig and Waller, 2000).*

Our rich dataset allows us to control for different kinds of transaction costs or dimensions of payment and banking infrastructures.

First, similarly to Valev (2010), we can control for trade frictions by employing data on whether the respondent resides in a small town. Alternatively, as a proxy for a possible lack of a basic financial infrastructure at the place of residence, we employ information gathered by the interviewer or the survey institute about whether an ATM is available at a specific primary sampling unit. If there is no ATM available at the place of residence, we presume a higher likelihood of binding trade frictions.

Second, access to basic banking services has improved in CESEE countries over the last decade, even in rural places. According to our survey data, an average 70% of respondents owned a current account in fall 2014. Still, there are substantial differences in the incidence of current accounts among CESEE countries, ranging from only 30% in Albania to 95% in Croatia. A current account should essentially reduce transaction costs compared with cash hoarding, which would imply a negative relation with respect to the dependent variable.<sup>14</sup>

Third, foreign currency deposits essentially shield the respondents' savings against currency risk. We expect a positive correlation between the preference for receiving payments in euro and foreign currency deposits – people who hold foreign currency deposits are both concerned about exchange rate risk and prepared to receive euro payments.

Fourth, we can employ a direct measure of conversion costs.

Fifth, access to banking services also comprises a subjective component of distance to the nearest bank branch. Respondents were asked how much they

<sup>14</sup> We are drawing on the stylized fact that households' current accounts are predominantly denominated in the local currency.

agree with the statement “For me it takes quite a long time to reach the nearest bank branch” using a six-point Likert scale. Stix (2013) found a significant positive effect of respondents’ subjective distance to the nearest bank on their preference for saving in cash.

### 3.3 Network externalities

Drawing on the literature and in particular on the empirical study by Valev (2010) on the hysteresis of currency substitution in Bulgaria, we can formulate two hypotheses regarding the impact of network externalities on economic agents’ preference for receiving certain payments in euro. First, hypothesis 3a, which is analogous to Valev’s hypothesis 1: *The [euro] will be preferred by economic agents who believe that the [euro] is already widely used [for domestic payments] in the economy.*

In order to test hypothesis 3a, we use a subjective measure of network externalities, which relies on a direct survey question. Respondents were asked how much they agree with the statement “In my country it is very common to make payments in euro.” on a six-point Likert scale. Beliefs are important in motivating behavior. Yet Brown and Stix (2015), who use the same survey question for measuring network externalities, argue that the measure based on individual beliefs is an imperfect proxy for network effects for two reasons. First, the reference group in the question is not the relevant peer group of the respondent’s potential trading partners. Second, the responses may be influenced by a self-serving bias because people are inclined to infer from their own behavior what others will do. Therefore we refine hypothesis 3a into hypothesis 3b: *The euro will be preferred by economic agents who live in neighborhoods where the euro is already widely used for domestic payments.*

In order to overcome these shortcomings, we constructed an alternative and more objective measure of network effects based on the actual behavior of a narrower reference group. To this end, we used the geographic coordinates of the primary sampling units to construct a spatial weights matrix according to the *k nearest neighbors* concept (LeSage and Pace, 2009) with *k* equal to 20. Then we calculated the first order spatial lag of the frequency of actual payment in euro of the *k* nearest neighbors.<sup>15</sup> The average distance between the 20<sup>th</sup> neighbor and the respondents amounts to 60 km, which seems to be a plausible distance for defining a relevant peer group of potential trading partners.<sup>16</sup> Note that, by definition, the respondents’ own payment behavior is excluded from the calculation of the spatial weights matrix, in order to clearly separate network effects on the dependent variables from respondents’ own actual payment behavior. We also control for the latter effect (cf. variable of actual payments in euro).

The objective network effects variable is an index which increases both with the number of neighbors who reported domestic payments in euro over the past six months and with the frequency of domestic payments in euro, which is operationalized in three categories. Therefore the index ranges from 0 to 60, where the

<sup>15</sup> We used the Stata module *spwmatrix* (Jeanty, 2010b) to generate the spatial weights matrix and the Stata module *spagvar* (Jeanty, 2010a) to generate the spatially lagged variables.

<sup>16</sup> Primary sampling units are selected via a multistage stratified random sample procedure, which implies that the sample is representative with respect to the regional and sub-regional distribution of the population as well as with respect to the distribution between rural and urban areas. Hence any variations in average distances for each observation to the 20 nearest neighbors should capture the true variation in distances in each country.

upper bound implies that all 20 neighbors report the highest frequency. The empirical sample range is from 0 to 37. For reasons of presentation, we rescaled the variable into an index ranging from 0 to 100. Chart 5 illustrates the subjective and objective measures of network externalities calculated as the mean over each region.

Chart 5

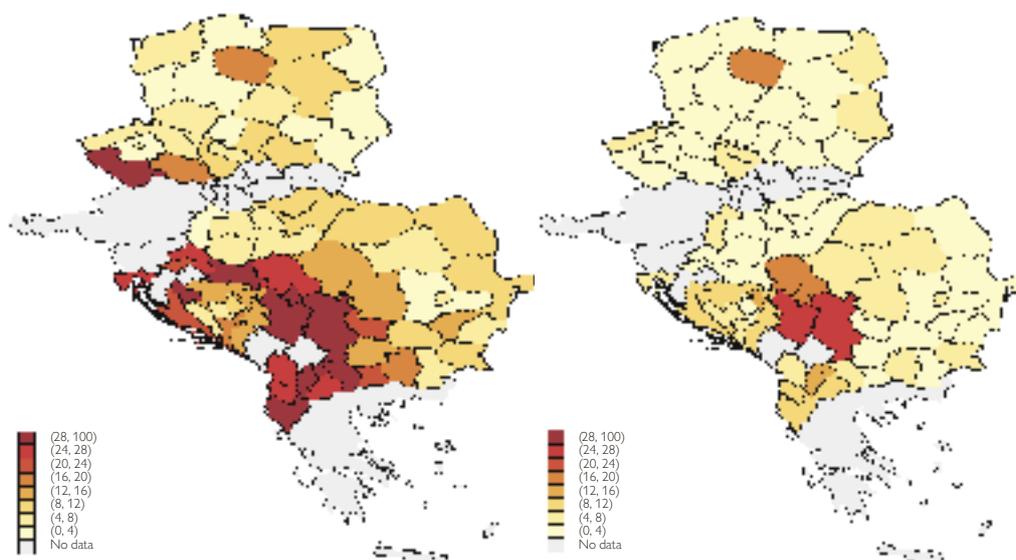
### Measures of network externalities

#### Subjective measure based on individual beliefs

% of respondents (common to pay in euro)

#### Objective measure based on actual payment behavior of 20 nearest neighbors

Index=100



Source: OeNB Euro Survey fall 2014.

Note: Regional averages calculated by the authors.

### 3.4 Preference for cash

In order to control for respondents' preference for saving in cash, we use a direct survey question which served as a dependent variable in the analysis of the preference for saving in cash by Stix (2013). According to Stix, the variable captures the lack of trust in banks, memories of past banking crises and weak institutions. In addition we explicitly control for weak tax enforcement, as payments in foreign currency might also be motivated by tax evasion considerations.

### 3.5 Economic geography and economic links with the EU

The following three variables control for different aspects of economic geography and economic links with the EU. The first variable is the distance from the respondent's place of residence<sup>17</sup> to the border of the nearest country which uses the euro as legal tender, i.e. the countries of the euro area as well as Kosovo and Montenegro. The second variable is income in euro,<sup>18</sup> which encompasses all kinds of labor and capital income, pension payments, as well as remittances; and the third variable is respondents' expectations regarding the adoption of the euro in their respective country.

<sup>17</sup> Specifically, the geographic coordinates of the primary sampling unit to which the respondent belongs.

<sup>18</sup> Note that the variable covers income in euro from both domestic sources and abroad.

### 3.6 Socioeconomic variables

In addition to the theoretically informed variables, the Euro Survey allows us to control for household-level socioeconomic characteristics which are likely to affect the demand for foreign currency. With regard to the search-theoretic models of money demand, we control for income level, education, financial literacy, age and gender. With regard to transaction and precautionary demand, we additionally control for household size, the respondent's employment status, wealth,<sup>19</sup> whether the respondent is in charge of household finances and risk aversion based on self-assessment. The definitions and summary statistics of all control variables are presented in the annex (table A1 and A2).

### 3.7 Empirical strategy

We estimate probit regressions with four variables of preference for receiving certain payments in euro as the dependent variable.

Our sample is characterized by strong regional heterogeneity. We control for potentially important institutional variables which describe between-country differences by including country-specific fixed effects. This focuses our analysis on regional as well as interpersonal differences in the preference for receiving certain payments in euro.

The dataset contains 1,214 primary sampling units. All reported estimation results are based on standard errors which account for clustering at the level of the primary sampling units.

## 4 Results

### 4.1 SEE economies

Table 1 presents the average marginal effects of the determinants of respondents' preference for receiving certain payments in euro. Columns 1 to 4 refer to the specification which uses the subjective measure of network externalities (which, in turn, is based on direct responses to the question whether it is very common to make payments in euro). Columns 5 to 8 refer to the specification which uses the objective measure of network externalities based on the actual payment behavior of the respondents' 20 closest neighbors. Our results for the socioeconomic variables of age, gender and income assemble the stylized facts from the empirical literature on euroization and in particular on currency substitution (e.g. Valev, 2010; Stix, 2013; Brown and Stix, 2015).

<sup>19</sup> The dataset does not include a direct measure of household wealth. As an alternative, we use a proxy variable which relies on the interviewer's assessment of the condition of the respondent's house compared to houses in the neighborhood. For details, see table A1 in the annex.

Table 1

**Determinants of preferences for receiving certain payments in euro – Southeastern European economies**

	I	II	III	IV	V	VI	VII	VIII
	Real estate	Car	Rent	Salary	Real estate	Car	Rent	Salary
Actual payments in euro	0.154*** (0.023)	0.152*** (0.021)	0.143*** (0.020)	0.094*** (0.017)	0.145*** (0.021)	0.143*** (0.020)	0.137*** (0.020)	0.078*** (0.016)
Subjective measure of network externalities	0.064*** (0.018)	0.057*** (0.017)	0.065*** (0.017)	0.051*** (0.015)				
Objective measure of network externalities					0.002 (0.001)	0.002* (0.001)	0.002 (0.001)	0.003*** (0.001)
Expected depreciation	0.046*** (0.017)	0.045*** (0.016)	0.063*** (0.017)	0.068*** (0.015)	0.047*** (0.017)	0.045*** (0.016)	0.061*** (0.016)	0.063*** (0.014)
Relative trust: euro vs. local currency	0.072*** (0.015)	0.071*** (0.015)	0.072*** (0.015)	0.068*** (0.014)	0.074*** (0.015)	0.071*** (0.014)	0.072*** (0.015)	0.069*** (0.014)
Relative trust: don't know/no answer	0.035 (0.021)	0.032 (0.021)	0.001 (0.022)	0.034* (0.020)	0.029 (0.020)	0.029 (0.020)	-0.003 (0.021)	0.030 (0.019)
Cash preference	-0.000 (0.010)	-0.004 (0.010)	0.002 (0.010)	-0.011 (0.009)	0.000 (0.009)	-0.004 (0.009)	0.002 (0.009)	-0.011 (0.009)
Cash preference: don't know/no answer	-0.025 (0.039)	-0.007 (0.039)	-0.018 (0.036)	-0.097*** (0.034)	-0.027 (0.038)	-0.003 (0.037)	-0.027 (0.035)	-0.089*** (0.031)
Expensive conversion	0.047*** (0.017)	0.035** (0.017)	0.050*** (0.017)	0.027* (0.015)	0.045*** (0.017)	0.033* (0.017)	0.050*** (0.016)	0.027* (0.015)
No ATM in town	-0.036 (0.024)	-0.049** (0.024)	-0.053** (0.025)	-0.056** (0.024)	-0.040* (0.024)	-0.052** (0.023)	-0.056** (0.024)	-0.061*** (0.023)
Current account and/or debit card	0.007 (0.018)	0.009 (0.018)	0.008 (0.018)	-0.030* (0.018)	0.011 (0.017)	0.009 (0.017)	0.009 (0.017)	-0.026* (0.015)
Foreign currency deposits	0.097*** (0.031)	0.078*** (0.029)	0.065** (0.027)	0.074*** (0.025)	0.096*** (0.030)	0.077*** (0.029)	0.065** (0.027)	0.077*** (0.024)
Subjective distance to nearest bank	0.006 (0.005)	0.010** (0.005)	0.007 (0.005)	0.002 (0.005)	0.005 (0.005)	0.009* (0.005)	0.006 (0.005)	0.003 (0.005)
Common to pay cash to avoid tax	0.020 (0.017)	0.023 (0.017)	0.030* (0.018)	0.009 (0.017)	0.024 (0.018)	0.026 (0.017)	0.032* (0.018)	0.011 (0.017)
Common to pay cash to avoid tax: don't know/no answer	0.004 (0.032)	0.018 (0.032)	0.003 (0.033)	-0.003 (0.027)	0.008 (0.030)	0.035 (0.029)	0.012 (0.030)	0.011 (0.026)
Distance to nearest euro border incl. KO, ME	-0.005*** (0.002)	-0.004** (0.002)	-0.003* (0.002)	0.001 (0.002)	-0.004** (0.002)	-0.004** (0.002)	-0.003 (0.002)	0.001 (0.002)
Income in euro	0.088*** (0.023)	0.101*** (0.023)	0.109*** (0.022)	0.082*** (0.021)	0.087*** (0.023)	0.099*** (0.022)	0.105*** (0.021)	0.072*** (0.020)
Expected euro adoption	0.036** (0.015)	0.033** (0.015)	0.026* (0.015)	0.050*** (0.014)	0.038** (0.015)	0.033** (0.015)	0.027* (0.015)	0.047*** (0.014)
Age (decades)	0.087*** (0.028)	0.048* (0.027)	0.093*** (0.028)	0.001 (0.027)	0.083*** (0.027)	0.047* (0.026)	0.089*** (0.027)	-0.017 (0.027)
Age squared	-0.011*** (0.003)	-0.007** (0.003)	-0.011*** (0.003)	-0.002 (0.003)	-0.011*** (0.003)	-0.007** (0.003)	-0.011*** (0.003)	-0.000 (0.003)
Female	-0.030** (0.012)	-0.042*** (0.012)	-0.024* (0.012)	-0.041*** (0.011)	-0.032*** (0.012)	-0.042*** (0.012)	-0.026** (0.012)	-0.041*** (0.010)
High income	0.096*** (0.024)	0.077*** (0.023)	0.048** (0.022)	0.057*** (0.021)	0.095*** (0.023)	0.077*** (0.022)	0.051** (0.022)	0.058*** (0.020)
Medium income	0.060*** (0.021)	0.045** (0.020)	0.042** (0.020)	0.026 (0.018)	0.051** (0.020)	0.039* (0.020)	0.039* (0.020)	0.022 (0.018)
Income: don't know/no answer	0.067*** (0.023)	0.063*** (0.023)	0.056** (0.023)	0.063*** (0.022)	0.068*** (0.023)	0.063*** (0.022)	0.061*** (0.022)	0.062*** (0.021)
House in better condition	0.022 (0.016)	0.029* (0.016)	0.027* (0.016)	0.026* (0.015)	0.025 (0.016)	0.033** (0.015)	0.028* (0.015)	0.030** (0.014)
House in poorer condition	-0.000 (0.025)	-0.008 (0.025)	-0.013 (0.025)	0.012 (0.022)	0.006 (0.025)	-0.001 (0.025)	-0.008 (0.025)	0.023 (0.021)
Other controls	Yes							
Country fixed effects	Yes							
Log likelihood	-2,902.5	-2,868.8	-2,840.6	-2,747.4	-3,033.6	-3,001.6	-2,969.4	-2,873.8
Pseudo-R2	0.19	0.20	0.20	0.11	0.19	0.21	0.20	0.11
Wald Chi2(44)	647.53	707.50	619.09	407.65	662.91	724.09	656.56	412.24
Number of observations	5,150	5,201	5,155	5,402	5,404	5,464	5,413	5,694
P(DepVar=1)	0.51	0.48	0.45	0.26	0.50	0.47	0.44	0.25

Source: Authors' estimations.

Note: Average marginal effects from probit models; standard errors are adjusted for potential clustering at the level of the primary sampling unit and reported in parentheses. \*\*\*, \*\*, \* denote that the marginal effect is statistically different from zero at the 1%, 5% and 10% level, respectively. For a definition of the main variables, see annex table A1. P(DepVar=1) denotes the unconditional sample probability of the respective dependent variables. All regressions include country fixed effects. Dummies for education, risk aversion, head of household finances, household size, children, and employment status as well as the indicator variable for financial literacy are not shown. The sample for Southeastern Europe comprises Albania, Bosnia and Herzegovina, Bulgaria, Croatia, the FYR Macedonia, Romania and Serbia.

### Network externalities

First, respondents' actual payment behavior over the past six months shows a significant positive link with their preferences in both specifications. It turns out to be a key explanatory variable and underlines that actual behavior tends to be consistent with preference. Of course, the endogeneity issue with respect to this variable impedes causal interpretation, since preference might also impact actual behavior.

Second, regarding the subjective measure of network externalities, reported experience has a strong, positive and significant effect on respondents' preferences. These results are in line with the findings of Valev (2010) for Bulgaria and confirm hypothesis 3a. The average marginal effects of network externalities have about two-fifths to one-half the strength of the marginal effects of respondents' actual behavior. Interestingly, the variation between the four different dependent variables is rather small. A discrete switch of the subjective measure from 0 to 1 increases the probability of a preference for payments in euro by about 5 to 7 percentage points on average.<sup>20</sup> These results seem to rebut the prediction by Engineer (2000), who stated that network externalities will be smaller for everyday purchases (regular transactions) than for the occasional sale of high-value goods.

Third, the objective measure of network effects based on the actual behavior of the geographically closest 20 neighbors exhibits a significant positive effect on people's preference for both frequent transactions (salary) and occasional car sales but not for rental income and real estate sales. These results confirm hypothesis 3b for two items but disprove Engineer (2000) again, as the network effects for smaller everyday transactions are not smaller than those for occasional sales of high-value goods.

At first sight, the size of the average marginal effect looks small. For reasons of comparison, it is more informative to calculate the conditional marginal effect at the mean. For instance, for the dependent variable of the car sale, we obtain an objective network effect at the mean of individual responses of roughly 8. Doubling the index score to 16 would increase the preference for receiving the revenue of a car sale in euro by about 8 percentage points, which is about two-fifths the size of the conditional actual payment effect of 20 percentage points.<sup>21</sup> Hence estimation results for both specifications confirm that there are still significant network externalities at play in the SEE countries.<sup>22</sup>

Country dummies in both specifications indicate high heterogeneity across the group of euroized countries. *Vis-à-vis* the base category Bulgaria, especially Croatia, the FYR Macedonia, Romania and Serbia exhibit significant positive country fixed effects. An analysis of the variance of the objective network effect variable shows that between-country variation is significantly larger than within-country variation. This dominance of the between variation in a pooled estimation framework implies that country-specific differences in the objective network effect variable will be partly captured by country fixed effects rather than

<sup>20</sup> Conditional marginal effects at the mean range between 6% and 10% with overlapping confidence intervals.

<sup>21</sup> For real estate sales and rental income, the respective probability would increase by 8 percentage points; for salary, the increase in probability would be weaker at about 3 percentage points.

<sup>22</sup> The results of a simple linear model with the same specifications give confidence that the results do not rely on the choice of marginal effects.

by the explanatory variable alone. Hence estimating the actual extent of network externalities for each country individually seems to be appropriate for deriving policy advice.<sup>23</sup>

#### Purchasing power risk

Looking at hypotheses 1a and 1b on purchasing power risk, we find a significant positive impact of both factors, i.e. the rather forward-looking expectations of local currency depreciation and the rather backward-looking measure of relative trust in the euro vis-à-vis the local currency. Furthermore, the average marginal effects across both specifications are of similar size. Concerning the first specification (columns 1 to 4), the sums of the marginal effects of both explanatory variables of purchasing power risk are still smaller than the average marginal effect of the actual payment behavior variable, except for salary.

Looking at the results for the expected depreciation variable, we observe higher magnitudes of average marginal effects for rent and in particular salary than for occasional sales of cars or real estate in both specifications. This seems plausible as rent and salary payments are typically more exposed to purchasing power risk than occasional sales of high-value goods. It fits our anecdotal evidence of rent indexing in some SEE countries, too.

By contrast, the marginal effects of the rather backward-looking measure of relative trust are of similar size across all four dependent variables in both specifications. Moreover, the marginal effects of the relative trust variable are larger than those of the respective expected depreciation variable, except for salary (column 4). The legacy of past financial crises still seems to exert a significant influence on the formation of currency preferences for transactions in SEE countries. This result confirms findings from the euroization literature on the importance of trust and crisis experiences in shaping saving behavior in the CESEE region (e.g. Brown and Stix, 2015; Stix, 2013; Mudd et al., 2010).

#### Transaction costs

The results highlight the role of conversion costs and of basic payment and banking infrastructures, which confirms hypotheses 2a and 2b. As expected, the lack of a basic payment infrastructure as measured by the “no ATM in town” dummy dampens the preference for receiving certain payments in euro, except for real estate sales. Similarly, higher conversion costs lead to a higher preference for receiving payments in euro, even for real estate sales. The magnitude of the marginal effects is rather small in both specifications. The preference for local currency turned out to be stronger for regular income streams, which are mainly used to finance everyday purchases. Comparing Valev’s estimates for 2003 with our estimates for 2014, we find that these relations have clearly weakened. The corresponding tables are available from the authors upon request.

Furthermore, owning a current account reduces the preference for receiving payments in euro only with respect to salary, while holding foreign currency deposits yields a positive and significant impact on the preference for euro for all dependent variables.

<sup>23</sup> Country-specific estimation results are available from the authors upon request. Although country estimates have fewer observations, the estimates remain relatively precise.

Finally, the measure of subjective distance to the nearest bank turns out to be almost irrelevant, which ties in with the stylized fact that the banking infrastructure has been expanded even into rural areas of CESEE. Overall, these results are in line with Brown and Stix (2015), who show that deposit euroization is largely demand driven and not a consequence of constrained access to banking services in local currency. Many CESEE households have access to banks and a broad range of savings products both in local and foreign currency, which weakens the role of transaction costs associated with using the foreign currency.

#### **No role for cash preference and tax avoidance, but economic geography matters**

In contrast to Stix (2013), we do not find evidence that the preference for saving in cash or weak tax enforcement influence the preference for receiving certain payments in euro.

Interestingly, though, all three explanatory variables controlling for aspects of economic geography seem to have an impact on respondents' preferences.

First, income in euro has a strong, positive and significant impact on the preference for receiving certain payments in cash. The average marginal effect ranges between 7 and 11 percentage points.

Second, we find evidence that the preference for receiving certain payments in euro decreases with the distance from the respondent's place of residence to the border of the nearest country that uses the euro as legal tender, which points to some importance of cross-border activities. The average marginal effect is up to -4 percentage points per 100 km distance for real estate and car sales; the results are mixed for rental income and no significant effect can be found for salary income.

Third, we confirm that respondents who expect their country to adopt the euro as legal tender within the next decade have a higher preference for receiving certain payments in euro (3 percentage points); for salary the marginal effect is somewhat stronger.

#### **Interaction of basic payment and banking infrastructure and depreciation expectations**

Valev (2010) finds for Bulgaria that expected devaluation decreases the preference for payments in Bulgarian lev only if respondents reside in small towns and villages.<sup>24</sup> Valev presumes that this effect is related to a lack of experience in using the foreign currency and to higher transaction costs due to missing payment and banking infrastructures. Including an interaction term of basic payment and banking infrastructure ("no ATM in town") and depreciation expectations in our specifications for SEE leads to the expected negative average marginal effect of the interaction term, reflecting the higher transaction costs (see table 2), yet the effect is not significant. Furthermore, the marginal effects of the expected depreciation variable remain highly significant, while the influence of the "no ATM in town" dummy disappears. These findings corroborate the prior conclusion that the prevailing currency substitution is mainly demand driven. Interestingly, the tests for the joint significance of the partial effect of expected depreciation and the

<sup>24</sup> Moreover, the results of the respective specifications show that respondents in small towns and villages prefer the local currency and that devaluation expectations have no significant effect on currency preference.

interaction effect turn out to be highly significant, indicating that depreciation expectations increase the preference for foreign currency, even in places lacking basic payment and banking infrastructures.

Table 2

### Interaction of depreciation expectations and basic payment and banking infrastructures – Southeastern European economies

	I	II	III	IV	V	VI	VII	VIII
	Real estate	Car	Rent	Salary	Real estate	Car	Rent	Salary
Actual payments in euro	0.153*** (0.023)	0.151*** (0.021)	0.142*** (0.020)	0.093*** (0.017)	0.144*** (0.021)	0.142*** (0.020)	0.136*** (0.020)	0.077*** (0.016)
Subjective measure of network externalities	0.064*** (0.018)	0.057*** (0.017)	0.065*** (0.017)	0.051*** (0.015)				
Objective measure of network externalities					0.002 (0.001)	0.002* (0.001)	0.002 (0.001)	0.003*** (0.001)
Expected depreciation	0.059*** (0.020)	0.056*** (0.019)	0.074*** (0.018)	0.081*** (0.017)	0.059*** (0.019)	0.055*** (0.018)	0.072*** (0.018)	0.075*** (0.017)
Interaction of expected depreciation * no ATM in town	-0.046 (0.038)	-0.044 (0.036)	-0.041 (0.036)	-0.052 (0.036)	-0.045 (0.037)	-0.039 (0.035)	-0.040 (0.036)	-0.049 (0.035)
No ATM in town	-0.018 (0.028)	-0.032 (0.027)	-0.037 (0.029)	-0.033 (0.026)	-0.023 (0.027)	-0.036 (0.026)	-0.040 (0.028)	-0.039 (0.025)
Other controls	Yes							
Country fixed effects	Yes							
Log likelihood	-2,901.2	-2,867.6	-2,839.5	-2,745.4	-3,032.3	-3,000.6	-2,968.3	-2,871.9
Pseudo-R <sup>2</sup>	0.19	0.20	0.20	0.11	0.19	0.21	0.20	0.11
Wald Chi <sup>2</sup> (40)	647.44	705.6	619.66	409.33	662.27	721.74	656.3	414.05
Number of observations	5,150	5,201	5,155	5,402	5,404	5,464	5,413	5,694
P(DepVar=1)	0.51	0.48	0.45	0.26	0.50	0.47	0.44	0.25
<b>Test for joint significance of coefficients of expected depreciation and the interaction term</b>								
Chi <sup>2</sup> (2)	9.02	9.21	16.55	23.82	9.19	9.18	16.22	21.74
Probability > Chi <sup>2</sup>	0.011	0.010	0.000	0.000	0.010	0.010	0.000	0.000

Source: Authors' estimations.

Note: Average marginal effects from probit models; standard errors are adjusted for potential clustering at the level of the primary sampling unit and reported in parentheses. \*\*\* \*\* \* denote that the marginal effect is statistically different from zero at the 1%, 5% and 10% level, respectively. For a definition of the main variables, see annex table A1. P(DepVar=1) denotes the unconditional sample probability of the respective dependent variables. All regressions include country fixed effects. "Other controls" comprises all the variables as in the specifications of table 1. The sample for SEE comprises Albania, Bosnia and Herzegovina, Bulgaria, Croatia, the FYR Macedonia, Romania and Serbia.

## 4.2 CEE economies

Table 3 presents the average marginal effects of the determinants of respondents' preference for receiving certain payments in euro for the CEE countries. Again, columns 1 to 4 refer to the specification based on the subjective measure of network externalities, and columns 5 to 8 refer to the specification using the objective measure of network externalities. As discussed in the introduction, CEE and SEE countries differ substantially with respect to the catching-up process, exchange rate regimes, historical experiences and public and private institutions as well as the extent of euroization. So do the drivers of currency substitution in the two regions.

Table 3

### Determinants of preferences for receiving certain payments in euro – Central and Eastern European economies

	I	II	III	IV	V	VI	VII	VIII
	Real estate	Car	Rent	Salary	Real estate	Car	Rent	Salary
Actual payments in euro	0.126*** (0.046)	0.132*** (0.039)	0.113*** (0.040)	0.087** (0.035)	0.126*** (0.040)	0.136*** (0.037)	0.119*** (0.039)	0.115*** (0.032)
Subjective measure of network externalities	0.077** (0.038)	0.062* (0.034)	0.071** (0.035)	0.023 (0.032)				
Objective measure of network externalities					0.001 (0.004)	-0.000 (0.002)	0.000 (0.003)	-0.004 (0.003)
Expected depreciation	0.060*** (0.023)	0.029 (0.021)	0.059*** (0.021)	0.026 (0.019)	0.066*** (0.022)	0.038* (0.021)	0.063*** (0.020)	0.034* (0.018)
Relative trust: euro vs. local currency	0.012 (0.023)	0.022 (0.021)	0.016 (0.022)	0.010 (0.018)	0.021 (0.022)	0.024 (0.020)	0.021 (0.021)	0.015 (0.018)
Relative trust: don't know/no answer	0.051 (0.032)	0.055* (0.030)	0.030 (0.030)	0.020 (0.027)	0.035 (0.030)	0.036 (0.028)	0.017 (0.029)	0.015 (0.025)
Cash preference	-0.018 (0.016)	-0.009 (0.015)	-0.023 (0.016)	-0.014 (0.014)	-0.018 (0.016)	-0.008 (0.015)	-0.023 (0.015)	-0.012 (0.014)
Cash preference: don't know/no answer	0.027 (0.069)	0.008 (0.065)	0.020 (0.066)	-0.056 (0.060)	0.001 (0.063)	-0.010 (0.061)	-0.001 (0.061)	-0.054 (0.053)
Expensive conversion	-0.007 (0.024)	0.010 (0.022)	-0.012 (0.019)	-0.009 (0.032)	-0.010 (0.023)	0.006 (0.021)	-0.014 (0.022)	-0.010 (0.019)
No ATM in town	0.003 (0.037)	0.010 (0.035)	0.016 (0.037)	-0.015 (0.032)	0.002 (0.037)	0.009 (0.035)	0.019 (0.036)	-0.025 (0.032)
Current account and/or debit card	-0.007 (0.033)	-0.006 (0.030)	-0.021 (0.031)	-0.021 (0.028)	-0.013 (0.032)	-0.001 (0.029)	-0.022 (0.030)	-0.024 (0.027)
Foreign currency deposits	0.043 (0.052)	0.020 (0.047)	-0.009 (0.051)	-0.000 (0.045)	0.050 (0.051)	0.025 (0.046)	-0.003 (0.050)	0.004 (0.045)
Subjective distance to nearest bank	0.004 (0.009)	0.004 (0.008)	-0.000 (0.009)	-0.002 (0.008)	0.004 (0.009)	0.004 (0.008)	-0.002 (0.009)	-0.001 (0.008)
Common to pay cash to avoid tax	0.009 (0.023)	0.011 (0.022)	-0.001 (0.022)	0.016 (0.021)	0.013 (0.023)	0.010 (0.022)	0.006 (0.021)	0.015 (0.021)
Common to pay cash to avoid tax: don't know/no answer	-0.014 (0.035)	-0.011 (0.033)	0.010 (0.035)	0.022 (0.029)	0.004 (0.034)	0.004 (0.031)	0.023 (0.033)	0.038 (0.028)
Distance to nearest euro border incl. KO, ME	-0.001 (0.002)	-0.001 (0.002)	-0.000 (0.002)	-0.002 (0.002)	-0.000 (0.002)	-0.001 (0.002)	0.000 (0.002)	-0.001 (0.001)
Income in euro	0.174*** (0.045)	0.184*** (0.046)	0.185*** (0.044)	0.175*** (0.038)	0.154*** (0.045)	0.167*** (0.044)	0.170*** (0.043)	0.169*** (0.038)
Expected euro adoption	0.055*** (0.021)	0.038** (0.019)	0.050** (0.020)	0.040** (0.017)	0.053*** (0.021)	0.039** (0.019)	0.050*** (0.019)	0.040** (0.016)
Age (decades)	0.026 (0.039)	0.019 (0.036)	0.009 (0.039)	-0.008 (0.034)	0.023 (0.039)	0.020 (0.036)	0.011 (0.038)	-0.007 (0.034)
Age squared	-0.005 (0.004)	-0.004 (0.004)	-0.003 (0.004)	-0.001 (0.004)	-0.004 (0.004)	-0.004 (0.004)	-0.003 (0.004)	-0.001 (0.004)
Female	-0.011 (0.018)	-0.017 (0.016)	-0.012 (0.017)	-0.016 (0.015)	-0.013 (0.018)	-0.022 (0.016)	-0.016 (0.017)	-0.018 (0.015)
High income	0.006 (0.032)	-0.001 (0.030)	0.034 (0.030)	0.019 (0.028)	0.016 (0.032)	0.010 (0.030)	0.043 (0.029)	0.027 (0.027)
Medium income	-0.024 (0.026)	-0.027 (0.025)	0.007 (0.026)	-0.033 (0.023)	-0.017 (0.026)	-0.021 (0.024)	0.010 (0.025)	-0.025 (0.022)
Income: don't know/no answer	-0.043 (0.039)	-0.030 (0.036)	-0.026 (0.037)	-0.021 (0.033)	-0.040 (0.037)	-0.025 (0.034)	-0.024 (0.036)	-0.017 (0.031)
House in better condition	-0.005 (0.024)	-0.021 (0.023)	-0.027 (0.023)	-0.008 (0.020)	0.000 (0.023)	-0.010 (0.023)	-0.022 (0.023)	-0.005 (0.020)
House in poorer condition	-0.034 (0.031)	-0.002 (0.030)	-0.013 (0.029)	-0.001 (0.026)	-0.039 (0.030)	-0.005 (0.030)	-0.021 (0.029)	-0.006 (0.026)
Other controls	Yes							
Country fixed effects	Yes							
Log likelihood	-995.6	-917.9	-955.3	-944.8	-1052.9	-971.6	-1001.0	-994.3
Pseudo-R2	0.07	0.09	0.07	0.07	0.07	0.08	0.07	0.07
Wald Chi2(40)	131.29	149.30	122.08	130.75	132.92	151.00	126.55	147.24
Number of observations	2,052	2,082	2,060	2,278	2,163	2,192	2,168	2,403
P(DepVar=1)	0.22	0.19	0.20	0.16	0.22	0.19	0.20	0.16

Source: Authors' estimations.

Note: Average marginal effects from probit models; standard errors are adjusted for potential clustering at the level of the primary sampling unit and reported in parentheses. \*\*\*, \*\*, \* denote that the marginal effect is statistically different from zero at the 1%, 5% and 10% level, respectively. For a definition of the main variables, see annex table A1. P(DepVar=1) denotes the unconditional sample probability of the respective dependent variables. All regressions include country fixed effects. Dummies for education, risk aversion, head of household finances, household size, children, and employment status as well as the indicator variable for financial literacy are not shown. The sample for Central and Eastern Europe comprises the Czech Republic, Hungary and Poland.

### Purchasing power risk still important but forward-looking depreciation expectations dominate

Hypothesis 1a is confirmed, a higher preference for the euro is related to forward-looking depreciation expectations. Compared with the results for the SEE countries, forward-looking depreciation expectations are now more dominant than the backward-looking and insignificant relative trust measure. We interpret this finding to mean that the influence of past experiences of financial crises on monetary expectations has vanished almost completely in the Czech Republic, Hungary and Poland. The fact that they were quicker to achieve macroeconomic stabilization after transition and that their catching-up process is more advanced than that of the SEE economies may have helped overwrite these collective memories. Furthermore, compared with the SEE countries, the importance of age as a significant explanatory factor has disappeared. This is also in line with the insignificant role of the backward-looking relative trust measure. Hence, we conclude that in the CEE countries memories of past crises no longer influence the formation of preferences.

### Economic geography

Interestingly, income in euro exhibits a positive and significant effect and turns out to be a key determinant, with average marginal effects of up to 18 percentage points. Yet, aggregate significance is limited, as only 3.2% of respondents in CEE indicate that they receive all or parts of their income in euro. Geographical proximity to the euro area seems to have no impact, whereas the expected adoption of the euro has a positive and significant effect.

### 4.3 Robustness of results

The country sample is rather heterogeneous with respect to the level of euroization, hence the grouping of countries clearly has an impact on the coefficients. In order to check the robustness of the results within the SEE and CEE groups, we apply the jackknife technique by systematically leaving out each country. For SEE, the results are robust for the main explanatory variables of actual payments in euro, the subjective measure of network externalities, expected depreciation and relative trust. The objective measure of network externalities in the case of car sales is somehow driven by Albania and Romania. Leaving out Croatia or Bosnia and Herzegovina would yield significant marginal effects for real estate sales and rental income, too. The significance of the marginal effect of high conversion costs on salary relies mainly on Croatia, while the significance of the marginal effect of “No ATM in town” for rental agreements relies on Serbia. For CEE, the results for actual payments in euro in the case of real estate sales or rental income are driven by the Czech Republic, while the results for the subjective measure of network externalities and for depreciation expectations in general are driven by Hungary. Finally, the significance of the marginal effect of euro adoption expectations relies on Poland. These results do not call into question the robustness of our results at large but serve as a reminder to pay attention to country-specific institutions before deriving policy advice.

Moreover, the pseudo R-squared and log-likelihoods of the CEE analysis are rather low compared with the SEE analysis. Running separate regressions for the network effects, cash preferences and geographic variables does little to improve

the explanatory power of the specifications. In line with the results of the jack-knife procedure above, the low explanatory power is probably driven by country differences. Country-specific regressions for CEE show contrasting patterns of the significance of the main explanatory variables and exhibit substantially higher values for the pseudo R-squared.

Concerning the robustness of the objective measure of network externalities, we varied the number of nearest neighbors, setting  $k$  to 10, 50, and 100. We find the typical pattern that the effects of the first order spatial lags wash out if the number of nearest neighbors increases (LeSage and Pace, 2009) but the other coefficients are left more or less unchanged.

## 5 Conclusions

This paper contributes to examining the determinants of currency substitution in CESEE countries. To analyze the hysteresis of euroization in these countries, we combine search-theoretic models of money demand with recent finding on the preference of CESEE households for saving in cash. In addition, we control for the geographical dimension of economic activity, which has not been captured in theoretical models of currency substitution so far.

We distinguish between two subgroups of countries: SEE with a medium to high level of euroization on the one hand and CEE with a low to nonexistent level of euroization on the other. Our results are based on survey data from the year 2014.

For SEE we find that actual payment behavior, network externalities and monetary expectations are still significantly associated with the formation of households' preferences for receiving certain payments in euro. In this region, relative trust in the euro versus the local currency (which is mainly related to past financial crises) turns out to be even more important than the forward-looking measure of depreciation expectations. With respect to the transaction costs associated with using the foreign currency, we confirm the theoretical prediction that the euro is less preferred by economic agents who face higher trade frictions, i.e. lack of basic banking and payment infrastructures, and who face low conversion costs. Overall, the results for SEE are in line with Brown and Stix (2015), who show that deposit euroization is largely demand driven and not a consequence of constrained access to banking services in local currency. Many CESEE households have access to banks and a broad range of savings products both in local and foreign currency, which weakens the role of transaction costs associated with using the foreign currency.

For CEE we find that only actual payment behavior and forward-looking depreciation expectations have a significant impact on the preference for receiving certain payments in euro. Based on the objective measure of network externalities, which utilizes the actual payment behavior of the geographically nearest 20 neighbors, the hypothesis on network externalities is rejected.

Moreover, we find for both country groups that income in euro is related substantially to the formation of preferences, yet only a minority of households receive part of their income in euro. More important at the aggregate level is the finding that the expected adoption of the euro within the next decade exerts a significant impact on households' preferences. Furthermore, the preference of SEE households for receiving certain payments in euro correlates negatively with

the distance to the euro area itself as well as Kosovo and Montenegro (both unilaterally euroized).

From a policy perspective, our results show that depreciation expectations are important in SEE and CEE countries. This means that for reducing the use of the euro as a means of payment, it is important for both country groups to follow stability-oriented macroeconomic policies, which help stabilize exchange rate trajectories vis-à-vis key currencies (especially the euro) and consequently exchange rate expectations.

Furthermore, it seems important for SEE countries to enhance trust in the local currency by establishing a track record of reliable economic policy and fiscal institutions. However, especially in countries which experienced periods of hyperinflation and/or currency crises, households need time to overcome their memories, and trust returns only very gradually – a fact that has been stressed by Brown and Stix (2015), too.

The mere prohibition of foreign currency as a means of payment usually does not lead to the desired outcome, as several attempts in Latin America have shown (see e.g. García-Escribano and Sosa, 2011) and may only be successful where this measure is embedded in a comprehensive framework of strengthening the reliability of institutions, sustainable economic growth and macroeconomic stability. The experience of CEE countries shows that it is possible to overcome currency substitution: Network effects and backward-looking monetary expectations are no longer associated with people's preferences. EU integration, including economic policy coordination and surveillance, may have helped speed up the process of re-establishing trust in the domestic currencies. In other words, reliable institutions and policies that foster trust are also key to promote de-euroization.

## References

- Beckmann, E. and T. Scheiber. 2012.** The Impact of Memories of High Inflation on Households' Trust in Currencies. In: Focus on European Economic Integration Q4/12. 80–93.
- Brown, M. and H. Stix. 2015.** The Euroization of Bank Deposits in Eastern Europe. In: Economic Policy 81. 95–139.
- Calvo, G. and C. Vegh. 1992.** Currency Substitution in Developing Countries: An Introduction. IMF Working Paper 92/40. (Munich Personal RePEc Archive, No. 20338).
- Camera, G., B. Craig and C. Waller. 2004.** Currency competition in a fundamental model of money. In: Journal of International Economics 64. 521–544.
- Craig, B. and C. Waller. 2000.** Dual-Currency Economies as Multiple-Payment Systems. In: Economic Review 2000/Q1. 2–13.
- Craig, B. and C. Waller. 2004.** Dollarization and currency exchange. In: Journal of Monetary Economics 51. 671–689.
- Dvorsky S., T. Scheiber and H. Stix. 2008.** The OeNB Euro Survey in Central, Eastern and Southeastern Europe – The 2008 Spring Wave Update. In: Focus on European Economic Integration 2/2008. 80–93.
- ECB. 2013.** The international role of the euro. July. 29–32.
- Engineer, M. 2000.** Currency Transaction Costs and Competing Fiat-Currencies. In: Journal of International Economics 52. 116–136.
- García-Escribano, M. and S. Sosa. 2011.** What is Driving Financial De-dollarization in Latin America? IMF Working Paper 2011/10.

- Feige, E. L., V. Šošić, M. Faulend and V. Šonje. 2002.** Unofficial Dollarization in Latin America: Currency Substitution, Network Externalities and Irreversibility. In: Salvatore, D., J. W. Dean and T. D. Willett (eds.). *The Dollarization Debate*. Oxford, UK, New York, NY: Oxford University Press. 46–71.
- Feige, E. L. 2003.** The Dynamics of Currency Substitution, Asset Substitution and De facto Dollarization and Euroization in Transition Countries. In: *Comparative Economic Studies* 45(3). 358–383.
- Feige, E. L. and J. W. Dean. 2004.** Dollarization and Euroization in Transition Countries: Currency Substitution, Asset Substitution, Network Externalities and Irreversibility. In: Alexander, V., J. Melitz and G. M. von Furstenberg (eds.). *Monetary Unions and Hard Pegs: Effects on Trade, Financial Development, and Stability*. Oxford University Press. 303–319.
- Hosking, G. 2014.** *Trust – A History*. Oxford University Press.
- Jeanty, P. W. 2010a.** SPLAGVAR: Stata module to generate spatially lagged variables, construct the Moran Scatter plot, and calculate Moran's I statistics. Statistical Software Components. Boston College Department of Economics.
- Jeanty, P. W. 2010b.** SPWMATRIX: Stata module to generate, import, and export spatial weights. Statistical Software Components. Boston College Department of Economics.
- Kumamoto, H. and M. Kumamoto. 2008.** Currency Substitution, Network Externalities and Hysteresis Effects. In: *Journal of Commerce, Economics and Economic History* 11(1). 1–13.
- LeSage, J. and K. Pace. 2009.** *Introduction to Spatial Econometrics*. Boca Raton, FL: Chapman & Hall/CRC.
- Mudd, S., K. Pashev and N. Valev. 2010.** The Effect of Loss Experiences in a Banking Crisis on Future Expectations and Behavior. In: *The B.E. Journal of Macroeconomics*. Bank 10. Heft 1.
- Oomes, N. 2005.** Money Demand and Inflation in Dollarized Economies: The Case of Russia. In: *Journal of Comparative Economics* 33(3). 462–483.
- Reding, P. and J. Morales. 2004.** Currency Substitution and Network Externalities. Working Paper. University of Namur.
- Ritzberger-Grünwald, D. and T. Scheiber. 2012** Euro Cash in Central, Eastern and South-eastern Europe. In: *Monetary Policy & the Economy* Q1/12. 41–55.
- Scheiber, T. and H. Stix (2009).** Euroization in Central, Eastern and Southeastern Europe – New Evidence On Its Extent and Some Evidence On Its Causes. OeNB Working Paper 159.
- Stix, H. 2013.** Why do people save in cash? Distrust, memories of banking crises, weak institutions and dollarization. In: *Journal of Banking & Finance* 37 (2013). 4087–4106.
- Tandon, A. and Y. Wang. 2003.** Confidence in Domestic Money and Currency Substitution. In: *Economic Inquiry* 41(3). 407–419.
- Uribe, M. 1997.** Hysteresis in a simple model of currency substitution. In: *Journal of Monetary Economics* 40(1). 185–202.
- Valev, N. T. 2010.** The hysteresis of currency substitution: Currency risk vs. network externalities. In: *Journal of International Money and Finance* 29. 224–235.

Annex

Table A1

Data and variable description

Label	Description
Preference for receiving payments in euro – real estate, rent, car, salary	Derived from answers to the question “Suppose you could choose the currency in which you receive the following payments. Would you prefer to receive local currency, euro, U.S. dollar or another currency?”. Payments are: a) salary, b) payment from a car sale, c) payment from a real estate rental agreement and d) payment from a real estate sale. Dummy variable that takes the value 1 if respondent indicated that they prefer euro for the payments mentioned above, else zero. Each payment is a separate dependent variable.
Actual payments in euro	Derived from answers to the question “Did you make any payments in euro during the last six months in your country?”. Answers are 1) “no,” 2) “yes - several times per month,” 3) “yes - about once per month,” 4) “yes - less frequently,” d) “don’t know,” 6) no answer. Dummy variable: 1 if the respondent answered 2) to 4). Variable takes the value zero if respondent answered “no.”
Actual payments in euro – real estate, rent, car	Derived from answers to the question “And in which currencies do you usually make the following payments?”. Payments are for: a) daily shopping, b) furniture, household appliances, c) bills for home repair services (e.g. plumber), d) car purchase, e) house or apartment rent and f) house or apartment purchase. Dummy variable that takes the value 1 if respondents indicated that they make payments in euro for the payments mentioned above, else zero.
Subjective measure of network externalities	Dummy variable: 1 if the respondent strongly agreed or agreed to the statement “In my country it is very common to make payments in euro,” else zero.
Objective measure of network externalities	An index based on the actual payment behavior of the 20 nearest neighbors. The index ranges from 0 to 100 and increases with both, the number of neighbors who reported domestic payments in euro over the past six months and with the frequency of domestic payments in euro, which is operationalized in three categories.
Expected depreciation	Derived from answers to the question “How do you think will the exchange rate of the local currency against the euro develop over the next five years?”. Answers are “the local currency will lose value,” “will stay the same,” “the local currency will gain value,” “don’t know” and no answer. Dummy variable: 1 if the respondent answered “the local currency will lose value,” else zero.
Relative trust: euro vs. local currency	Subtraction of the values attributed to individual reactions to the statements “Over the next five years, the euro will be very stable and trustworthy” and “Over the next five years, the local currency will be very stable and trustworthy.” Answers are 1) “strongly agree,” 2) “agree,” 3) “somewhat agree,” 4) “somewhat disagree,” 5) “disagree,” 6) “strongly disagree.” Transformation into a dummy variable: 1 if relative trust in euro is higher (value of the above calculation > 0) than in the local currency, else zero.
Relative trust: don’t know/no answer	Dummy variable: 1 if the respondent answered “don’t know” or refused to answer, else zero.
Preference for cash	Derived from reactions to the statement “I prefer to hold cash rather than a savings account.” Variable is zero (weak) if answers are “disagree” or “strongly disagree,” 1 (medium) if answers are “somewhat agree” or “somewhat disagree” and 2 (strong) if answers are “strongly agree” or “agree”. Answers “don’t know” and “no answer” take the value zero.
Preference for cash: don’t know/no answer	Dummy variable: 1 if respondent said “don’t know” or refused to answer.
Expensive conversion	Derived from reactions to the statement “In my country it is expensive to convert local currency into euro.” Dummy variable: 1 if respondent strongly agreed, agreed or somewhat agreed, else zero.
Subjective distance to nearest bank	Variable between 1 (“strongly disagree”) and 6 (“strongly agree”) for the statement “For me, it takes quite a long time to reach the nearest bank branch.”
No ATM in town	Dummy variable: 1 if there is no ATM in town/village. Information provided by interviewer.
Current account and/or debit card	Derived from answers to a question on current account ownership. Note that respondents who own debit cards or wage cards (the latter are rather frequent in some countries; these cards are used to withdraw the salary or the pension at an ATM) are also included as current account owners. Dummy variable: 1 if the respondent has a current account and/or debit/wage card, else zero.
Foreign currency deposits	Dummy variable: 1 if the respondent has foreign currency deposits, else zero.
Common to pay cash to avoid tax	Dummy variable: 1 if respondent strongly agreed, agreed or somewhat agreed with the statement “It is very common that people pay cash to avoid taxes,” else zero.
Common to pay cash to avoid tax: don’t know/no answer	Dummy variable: 1 if respondent said “don’t know” or refused to answer.
Distance to nearest euro border incl. KO, ME	Distance of primary sampling unit to boarder of the next country which has the euro as a legal tender, including Kosovo and Montenegro.
Income in euro	Derived from answers to the question “Over the last 12 months: Which share of the total household income did your household receive in local currency, euro or another foreign currency?” Respondents should indicate (in %) how much they received in each currency. Dummy variable: 1 if the respondent indicated a positive percentage for income in euro.
Expected euro adoption	Dummy variable: 1 if the respondent expects an introduction of the euro within 10 years, else zero.
Age, age squared	Age of respondent divided by 10, age squared of respondent.
Female	Dummy variable that takes the value 1 if the respondent is female, else zero.
Income	Dummy variables; level of income (high, medium, low, don’t know/no answer). Omitted category: low income.
Education	Dummy variables; degree of education (high, medium, low). Omitted category: education low.
Financial literacy	Based on answers to three questions, one regarding real interest rates, one regarding exchange rates and one regarding risk diversification. Variable between zero and 3 (3 = all questions regarding financial literacy were answered correctly by the respondent).
Risk averse	Dummy variable, 1 if respondent strongly agreed or agreed to the statement “In financial matters, I prefer safe investments over risky investments”, else zero.
Risk averse: don’t know/no answer	Dummy variable: 1 if respondent said “don’t know” or refused to answer.
House in better condition	Variable takes the value 1 if the interviewer indicated that the dwelling is in a better condition than neighboring dwellings.
House in poorer condition	Variable takes the value 1 if the interviewer indicated that the dwelling is in a poorer condition than the neighbouring dwellings.
Manages household finances	Dummy variable: 1 if the respondent is in charge of managing household finances.
Household size	Dummy variables; number of persons who live permanently in the household (two persons, three or more persons). Omitted category: single person.
Children	Dummy variable: 1 if children (up to and including 18 years of age) live permanently in the household.
Employment	Dummy variables; employment status (self-employed, unemployed, retired, student). Omitted category: employed.

Source: OeNB Euro Survey.

Table A2

## Descriptive statistics

	Min./ max.	Number of observations	CZ	HU	PL	AL	BA	BG	HR	FY- ROM	RO	RS	Total
Preference for euro – real estate	0/1	8,722	0.18 (0.38)	0.25 (0.43)	0.21 (0.41)	0.44 (0.5)	0.21 (0.41)	0.29 (0.45)	0.55 (0.5)	0.64 (0.48)	0.43 (0.5)	0.88 (0.32)	0.41 (0.49)
Preference for euro – rent	0/1	8,726	0.15 (0.36)	0.24 (0.43)	0.19 (0.39)	0.40 (0.49)	0.18 (0.38)	0.18 (0.39)	0.47 (0.5)	0.59 (0.49)	0.39 (0.49)	0.84 (0.36)	0.37 (0.48)
Preference for euro – car	0/1	8,840	0.14 (0.34)	0.23 (0.42)	0.19 (0.39)	0.42 (0.49)	0.19 (0.4)	0.20 (0.4)	0.52 (0.5)	0.61 (0.49)	0.42 (0.49)	0.87 (0.34)	0.38 (0.49)
Preference for euro – salary	0/1	9,432	0.13 (0.33)	0.21 (0.4)	0.20 (0.4)	0.36 (0.48)	0.12 (0.33)	0.17 (0.38)	0.27 (0.45)	0.21 (0.4)	0.23 (0.42)	0.42 (0.49)	0.23 (0.42)
Actual payments in euro	0/1	10,103	0.06 (0.23)	0.04 (0.19)	0.07 (0.25)	0.17 (0.37)	0.15 (0.35)	0.04 (0.2)	0.10 (0.3)	0.21 (0.41)	0.08 (0.27)	0.48 (0.5)	0.14 (0.35)
Actual payments in euro – car	0/1	5,790	0.03 (0.16)	0.01 (0.12)	0.02 (0.15)	0.30 (0.46)	0.04 (0.2)	0.05 (0.22)	0.28 (0.45)	0.36 (0.48)	0.14 (0.35)	0.41 (0.49)	0.15 (0.36)
Actual payments in euro – rent	0/1	4,374	0.01 (0.1)	0.01 (0.12)	0.01 (0.07)	0.15 (0.36)	0.03 (0.16)	0.03 (0.17)	0.16 (0.36)	0.44 (0.5)	0.12 (0.33)	0.66 (0.48)	0.13 (0.34)
Actual payments in euro – real estate	0/1	4,102	0.02 (0.13)	0.01 (0.12)	0.01 (0.07)	0.35 (0.48)	0.04 (0.2)	0.12 (0.33)	0.28 (0.45)	0.54 (0.5)	0.14 (0.34)	0.70 (0.46)	0.19 (0.39)
Subjective measure of network externalities	0/1	9,130	0.12 (0.33)	0.06 (0.23)	0.06 (0.24)	0.28 (0.45)	0.16 (0.36)	0.14 (0.34)	0.25 (0.43)	0.32 (0.47)	0.09 (0.28)	0.28 (0.45)	0.18 (0.39)
Objective measure of network externalities	0/37	10,103	1.86 (2.78)	0.76 (1.52)	1.96 (4.1)	5.40 (4.91)	4.64 (4.88)	1.46 (1.73)	2.64 (3.18)	6.75 (5.64)	2.54 (2.54)	12.98 (8.56)	4.13 (5.59)
Expected depreciation	0/1	10,014	0.25 (0.43)	0.56 (0.5)	0.23 (0.42)	0.33 (0.47)	0.16 (0.36)	0.26 (0.44)	0.55 (0.5)	0.31 (0.46)	0.40 (0.49)	0.70 (0.46)	0.37 (0.48)
Relative trust: euro vs. local currency	0/1	10,103	0.30 (0.46)	0.57 (0.5)	0.33 (0.47)	0.50 (0.5)	0.34 (0.47)	0.35 (0.48)	0.49 (0.5)	0.48 (0.5)	0.40 (0.49)	0.52 (0.5)	0.43 (0.49)
Relative trust: don't know/no answer	0/1	10,103	0.12 (0.32)	0.16 (0.36)	0.18 (0.39)	0.12 (0.33)	0.06 (0.24)	0.37 (0.48)	0.12 (0.33)	0.11 (0.31)	0.17 (0.38)	0.20 (0.4)	0.16 (0.37)
Preference for cash	0/2	10,103	0.86 (0.69)	1.28 (0.66)	1.04 (0.72)	0.91 (0.77)	1.11 (0.72)	1.04 (0.85)	1.26 (0.83)	1.14 (0.84)	1.07 (0.74)	1.35 (0.78)	1.10 (0.78)
Preference for cash: don't know/no answer	0/1	10,103	0.02 (0.14)	0.01 (0.12)	0.04 (0.2)	0.02 (0.15)	0.05 (0.22)	0.08 (0.27)	0.01 (0.09)	0.02 (0.15)	0.06 (0.24)	0.09 (0.29)	0.04 (0.2)
Expensive conversion	0/1	8,906	0.60 (0.49)	0.83 (0.37)	0.68 (0.47)	0.68 (0.47)	0.54 (0.5)	0.66 (0.48)	0.72 (0.45)	0.47 (0.5)	0.74 (0.44)	0.87 (0.34)	0.67 (0.47)
Subjective distance to nearest bank	1/6	9,930	2.99 (1.28)	2.30 (1.3)	2.80 (1.42)	3.21 (1.67)	3.41 (1.58)	2.39 (1.52)	2.56 (1.67)	3.35 (1.94)	3.04 (1.52)	3.02 (1.7)	2.92 (1.62)
No ATM in town	0/1	10,103	0.32 (0.47)	0.08 (0.27)	0.20 (0.4)	0.30 (0.46)	0.47 (0.5)	0.15 (0.36)	0.17 (0.37)	0.35 (0.48)	0.31 (0.46)	0.26 (0.44)	0.26 (0.44)
Current account and/or debit card	0/1	10,022	0.90 (0.3)	0.78 (0.41)	0.84 (0.36)	0.30 (0.46)	0.59 (0.49)	0.71 (0.45)	0.95 (0.21)	0.76 (0.43)	0.46 (0.5)	0.75 (0.43)	0.70 (0.46)
Foreign currency deposits	0/1	10,103	0.02 (0.15)	0.05 (0.21)	0.03 (0.16)	0.06 (0.24)	0.03 (0.17)	0.04 (0.21)	0.15 (0.36)	0.08 (0.27)	0.03 (0.16)	0.06 (0.24)	0.06 (0.23)
Common to pay cash to avoid tax	0/1	10,103	0.57 (0.5)	0.44 (0.5)	0.53 (0.5)	0.68 (0.47)	0.55 (0.5)	0.67 (0.47)	0.65 (0.48)	0.67 (0.47)	0.68 (0.47)	0.59 (0.49)	0.61 (0.49)
Common to pay cash to avoid tax: don't know/no answer	0/1	10,103	0.14 (0.34)	0.14 (0.35)	0.16 (0.37)	0.05 (0.22)	0.06 (0.24)	0.19 (0.39)	0.09 (0.28)	0.05 (0.22)	0.11 (0.31)	0.16 (0.36)	0.11 (0.32)

Source: OeNB Euro Survey, fall 2014.

Note: Descriptive statistics are the means and standard deviations in brackets. "Total" is the average across countries that is not weighted by size.

**Descriptive statistics (continued)**

	Min./ max.	Number of observations	CZ	HU	PL	AL	BA	BG	HR	FY- ROM	RO	RS	Total
Distance to nearest euro border incl. KO, ME	0/53	10,103	5.98 (3.43)	6.90 (4.91)	18.09 (11.94)	5.81 (2.75)	10.94 (3.87)	13.69 (5.31)	8.13 (7.08)	2.87 (1.83)	31.29 (7.8)	13.60 (5.85)	11.15 (9.64)
Income in euro	0/1	10,103	0.04 (0.19)	0.02 (0.15)	0.04 (0.2)	0.14 (0.35)	0.07 (0.25)	0.08 (0.27)	0.15 (0.35)	0.11 (0.31)	0.06 (0.24)	0.16 (0.37)	0.09 (0.28)
Expected euro adoption	0/1	10,103	0.54 (0.5)	0.29 (0.45)	0.36 (0.48)	0.54 (0.5)	0.21 (0.4)	0.38 (0.49)	0.26 (0.44)	0.58 (0.49)	0.43 (0.5)	0.19 (0.39)	0.39 (0.49)
Age (decades)	1/9	10,103	4.59 (1.76)	4.61 (1.47)	4.40 (1.71)	3.74 (1.53)	4.33 (1.7)	4.48 (1.7)	4.53 (1.64)	4.49 (1.78)	4.73 (1.65)	4.17 (1.53)	4.39 (1.67)
Age squared	2/83	10,103	24.13 (16.74)	23.39 (14.21)	22.25 (16.24)	16.30 (12.77)	21.66 (15.87)	22.92 (16.17)	23.19 (15.31)	23.32 (16.99)	25.11 (15.91)	19.70 (13.33)	22.08 (15.61)
Female	0/1	10,103	0.49 (0.5)	0.60 (0.49)	0.52 (0.5)	0.55 (0.5)	0.49 (0.5)	0.48 (0.5)	0.53 (0.5)	0.56 (0.5)	0.52 (0.5)	0.50 (0.5)	0.52 (0.5)
High income	0/1	10,103	0.26 (0.44)	0.26 (0.44)	0.23 (0.42)	0.30 (0.46)	0.14 (0.35)	0.26 (0.44)	0.23 (0.42)	0.25 (0.43)	0.24 (0.43)	0.21 (0.4)	0.24 (0.43)
Medium income	0/1	10,103	0.37 (0.48)	0.21 (0.41)	0.32 (0.47)	0.32 (0.47)	0.18 (0.38)	0.25 (0.44)	0.22 (0.41)	0.29 (0.45)	0.18 (0.39)	0.24 (0.43)	0.26 (0.44)
Low income	0/1	10,103	0.35 (0.48)	0.27 (0.45)	0.30 (0.46)	0.24 (0.43)	0.16 (0.37)	0.26 (0.44)	0.26 (0.44)	0.33 (0.47)	0.26 (0.44)	0.26 (0.44)	0.27 (0.44)
Income: don't know/no answer	0/1	10,103	0.03 (0.17)	0.26 (0.44)	0.17 (0.38)	0.14 (0.35)	0.53 (0.5)	0.25 (0.43)	0.29 (0.45)	0.14 (0.35)	0.35 (0.48)	0.31 (0.46)	0.24 (0.43)
High education	0/1	10,084	0.12 (0.33)	0.16 (0.37)	0.14 (0.35)	0.24 (0.43)	0.09 (0.29)	0.21 (0.41)	0.13 (0.34)	0.21 (0.41)	0.24 (0.43)	0.23 (0.42)	0.18 (0.38)
Medium education	0/1	10,084	0.77 (0.42)	0.70 (0.46)	0.61 (0.49)	0.62 (0.49)	0.66 (0.47)	0.64 (0.48)	0.76 (0.43)	0.72 (0.45)	0.69 (0.46)	0.52 (0.5)	0.67 (0.47)
Low education	0/1	10,084	0.10 (0.31)	0.14 (0.35)	0.25 (0.43)	0.14 (0.35)	0.25 (0.43)	0.15 (0.35)	0.11 (0.32)	0.08 (0.26)	0.07 (0.26)	0.24 (0.43)	0.15 (0.36)
Financial literacy	0/3	10,103	1.82 (1.09)	1.97 (1.05)	1.32 (1.11)	1.15 (0.94)	0.87 (0.99)	1.91 (1.01)	1.92 (1.03)	1.40 (1.05)	1.44 (1)	1.95 (1.09)	1.57 (1.1)
Risk averse	0/1	10,103	0.63 (0.48)	0.48 (0.5)	0.50 (0.5)	0.53 (0.5)	0.46 (0.5)	0.59 (0.49)	0.61 (0.49)	0.85 (0.36)	0.49 (0.5)	0.79 (0.41)	0.60 (0.49)
Risk averse: don't know/no answer	0/1	10,103	0.02 (0.16)	0.07 (0.25)	0.05 (0.22)	0.06 (0.24)	0.12 (0.32)	0.13 (0.33)	0.05 (0.22)	0.02 (0.14)	0.12 (0.32)	0.03 (0.17)	0.06 (0.25)
House in better condition	0/1	10,071	0.23 (0.42)	0.16 (0.37)	0.17 (0.38)	0.27 (0.44)	0.31 (0.46)	0.27 (0.44)	0.25 (0.43)	0.29 (0.45)	0.28 (0.45)	0.22 (0.41)	0.25 (0.43)
House in poorer condition	0/1	10,071	0.14 (0.34)	0.07 (0.25)	0.08 (0.27)	0.08 (0.27)	0.10 (0.3)	0.07 (0.26)	0.08 (0.26)	0.13 (0.34)	0.06 (0.24)	0.11 (0.31)	0.09 (0.29)
Manages household finances	0/1	10,103	0.83 (0.37)	0.89 (0.32)	0.81 (0.39)	0.55 (0.5)	0.71 (0.46)	0.83 (0.38)	0.80 (0.4)	0.61 (0.49)	0.87 (0.34)	0.71 (0.46)	0.75 (0.43)
One-person household	0/1	10,103	0.13 (0.34)	0.23 (0.42)	0.18 (0.39)	0.02 (0.14)	0.09 (0.29)	0.15 (0.36)	0.12 (0.33)	0.07 (0.26)	0.22 (0.41)	0.07 (0.25)	0.13 (0.33)
Two-person household	0/1	10,103	0.36 (0.48)	0.33 (0.47)	0.27 (0.44)	0.14 (0.35)	0.19 (0.4)	0.30 (0.46)	0.27 (0.44)	0.20 (0.4)	0.34 (0.47)	0.17 (0.37)	0.25 (0.43)
Three-or-more-person household	0/1	10,103	0.52 (0.5)	0.48 (0.5)	0.58 (0.49)	0.84 (0.36)	0.72 (0.45)	0.57 (0.5)	0.63 (0.48)	0.74 (0.44)	0.47 (0.5)	0.77 (0.42)	0.64 (0.48)
Children	0/1	10,103	0.39 (0.49)	0.30 (0.46)	0.41 (0.49)	0.40 (0.49)	0.44 (0.5)	0.36 (0.48)	0.33 (0.47)	0.39 (0.49)	0.28 (0.45)	0.47 (0.5)	0.38 (0.49)
Employed	0/1	10,003	0.66 (0.47)	0.65 (0.48)	0.62 (0.49)	0.54 (0.5)	0.28 (0.45)	0.55 (0.5)	0.50 (0.5)	0.37 (0.48)	0.46 (0.5)	0.55 (0.5)	0.52 (0.5)
Self-employed	0/1	10,003	0.10 (0.31)	0.07 (0.26)	0.08 (0.28)	0.18 (0.38)	0.02 (0.16)	0.09 (0.28)	0.06 (0.23)	0.05 (0.22)	0.06 (0.23)	0.05 (0.22)	0.08 (0.27)
Unemployed	0/1	10,003	0.08 (0.27)	0.09 (0.28)	0.09 (0.29)	0.22 (0.41)	0.41 (0.49)	0.11 (0.32)	0.17 (0.37)	0.35 (0.48)	0.13 (0.33)	0.16 (0.37)	0.18 (0.39)
Retired	0/1	10,003	0.15 (0.36)	0.22 (0.41)	0.17 (0.38)	0.08 (0.28)	0.19 (0.39)	0.20 (0.4)	0.25 (0.43)	0.20 (0.4)	0.31 (0.46)	0.13 (0.34)	0.19 (0.39)
Student	0/1	10,003	0.08 (0.27)	0.03 (0.16)	0.06 (0.24)	0.15 (0.36)	0.08 (0.28)	0.07 (0.26)	0.07 (0.26)	0.08 (0.28)	0.05 (0.22)	0.13 (0.33)	0.08 (0.28)

Source: OeNB Euro Survey, fall 2014.

Note: Descriptive statistics are the means and standard deviations in brackets. "Total" is the average across countries that is not weighted by size.

## CESEE-related abstracts from other OeNB publications

The abstracts below alert readers to studies on CESEE topics in other OeNB publications. Please see [www.oenb.at](http://www.oenb.at) for the full-length versions of these studies.

### **The profitability of Austrian banking subsidiaries in CESEE: driving forces, current challenges and opportunities**

This study analyzes the driving forces behind the profitability of Austrian banking subsidiaries in Central, Eastern and Southeastern Europe (CESEE) from 2003 to 2015, with a particular focus on the aftermath of the global financial crisis, which marked a turning point for their risk-return characteristics. We start off with an analysis of operating income and expense trends and delve into an analysis of credit risk costs. Then we look at large extraordinary one-off cost items before summing up with a long-term revenue bridge and an analysis of the most recent risk-return metrics. Overall, we find that the subsidiaries generated substantial profits, which have to be seen in the light of significant writedowns of their book values at the parent level. Regarding current challenges, operating profits are under pressure from falling net interest margins and fading organic growth, while remaining foreign currency loans might lead to further one-off costs, which in the past offset efficiency improvements. Credit risk also remains high in some countries, but a positive trend has emerged over the past years and provisioning levels have improved. One lesson learned in this respect is that rapid credit growth before the crisis had typically led to high nonperforming loan (NPL) ratios, which now weigh on some subsidiaries' ability to lend. Looking forward, banks continue to face a challenging environment in the CESEE region with little low-hanging fruit, as the speed of macroeconomic catching-up has slowed and low interest rates have taken hold. Therefore, Austrian banks' subsidiaries should diversify their income base, maintain their operating cost discipline and continue to strive for risk-adequately priced products in order to keep their profitability on a sustainable footing.

Published in *Financial Stability Report 32*.

Stefan Kavan,  
Gernot Ebner,  
Eleonora Endlich,  
Andreas Greiner,  
Manuel Gruber,  
Günther Hobl,  
Martin Ohms,  
Vanessa Redak,  
Alexandra Schober-  
Rhomberg,  
Paul Stockert,  
Daniela Widhalm,  
Tina Wittenberger

### **Determinants of Credit Constrained Firms: Evidence from Central and Eastern Europe Region**

Based on survey data covering 6,547 firms in 10 Central and Eastern European countries we examine the impact of the banking sector environment, as well as the institutional and regulatory environment, on credit constrained firms. We find that small and foreign-owned firms are less likely to demand credit compared to audited and innovative firms. On the other hand, small, medium, publicly listed, sole proprietorship and foreign-owned firms had a higher probability of being credit constrained in 2008–2009 than in 2012–2014. The banking sector's environment analysis reveals that firms operating in more concentrated banking markets are less likely to be credit constrained. However, higher capital requirements, increased levels of loan loss reserves and a higher presence of foreign banks have a negative impact on the availability of bank credit. The evaluation of the institutional and regulatory environment in which firms operate shows that credit information sharing is negatively correlated with access to credit. Furthermore, we show that banking sector contestability can mitigate this negative effect. Finally, we find that in a better credit information sharing environment, foreign banks are more likely to provide credit.

Published as *OeNB Working Paper 207*.

Apostolos  
Thomadakis



Event wrap-ups and miscellaneous

# The OeNB's 79<sup>th</sup> East Jour Fixe: Capital Flows to CESEE – Impact on Macro-Financial Stability and Policy Responses<sup>1</sup>

Compiled by  
Stephan Barisitz,  
Markus Eller  
and Mathias  
Lahnsteiner<sup>2</sup>

The 79<sup>th</sup> East Jour Fixe hosted by the OeNB on November 4, 2016, focused on recent developments and driving factors of capital flows in CESEE countries, the impact of capital flows on macro-financial stability and the effectiveness of policy responses so far. After a keynote speech by Joshua Aizenman on international capital mobility, session 1 reviewed the driving forces behind the interaction of capital flows and the boom-bust cycles the CESEE region has experienced in the last two decades. Session 2 looked at international country experiences in coping with volatile capital inflows and reviewed the effectiveness of different capital flow management measures. Finally, a panel discussion completed the workshop and derived policy lessons for CESEE countries. This summary will highlight the most important statements and conclusions of each speaker.

In her welcome address and introductory statement, *Doris Ritzberger-Grünwald*, Director of the OeNB's Economic Analysis and Research Department, pointed out that the topic of capital flows to emerging economies has featured prominently in the global economic policy debate of recent years. Against the background of the crisis that followed the bankruptcy of Lehman Brothers in 2008, the general focus has shifted to the question which measures can be taken to mitigate risks and negative effects of capital flow dynamics. As a starting point, Ritzberger-Grünwald raised several questions of particular relevance: What are the benefits of capital flows? What are the implications of different types of capital flows? How do excessive capital flows translate into the buildup of macro-financial imbalances? To which extent are capital flows driven by local, regional and global factors? Subsequently, she reminded the audience of key stages of the boom-bust cycle CESEE economies have experienced since the early 2000s and highlighted current challenges arising for instance from search-for-yield flows.

Ritzberger-Grünwald then welcomed keynote speaker *Joshua Aizenman*, who serves as the Dockson Chair in Economics and International Relations and Chair of the Economics Department at the University of Southern California. His speech gave an overview of gains and costs arising from financial liberalization. One of Aizenman's key points was that gains from the financial liberalization of emerging markets tend to be front-loaded while the related costs are often hidden and rise with the buildup of balance sheet vulnerabilities, until a financial crisis eventually reveals them. With pre-existing distortions, the net gains may even be negative. Aizenman highlighted moral hazard as a prevalent distortion, when investors expect to be bailed out of bad investment by the taxpayers or other third parties. He reminded the audience that already the sudden stop crises of the 1990s had raised serious doubts about the welfare gains associated with the financial integration of emerging economies. Regarding developments in CESEE in the 2000s he stated that: "What seemed to be the exception to the Lucas Paradox morphed into

<sup>1</sup> The presentations and the workshop program are available at: <https://www.oenb.at/en/Calendar/terminarchiv-2016/2016/79th-OeNB-East-Jour-Fixe.html>.

<sup>2</sup> Oesterreichische Nationalbank, Foreign Research Division, [stephan.barisitz@oenb.at](mailto:stephan.barisitz@oenb.at), [markus.eller@oenb.at](mailto:markus.eller@oenb.at) and [mathias.lahnsteiner@oenb.at](mailto:mathias.lahnsteiner@oenb.at).

another falling domino in the row of sudden stop emerging market economies crises.” Aizenman derived the strongest argument in favor of financial opening from trade integration as the latter erodes the effectiveness of capital flow restrictions over time. He also pointed out that cross-border equity exposure is less risky than debt exposure. Focusing on prudential regulation, he expressed sympathy for regulations prohibiting or limiting FX mortgage funding, taxes on external borrowing in hard currency (as proposed by Hyun-Song Shin) or raising the capital ratio for banks to about 25% (as proposed by Anat Admati and Martin Hellwig) given that measuring leverage is usually much easier than measuring and controlling risk exposure.

After the keynote address, participants had a lively discussion about the costs and gains of capital flows in CESEE. It was pointed out that capital flows to CESEE prior to the global financial crisis (GFC) had also been beneficial, evidenced by the fact that no major commercial bank failed in CESEE in the course of the GFC. Aizenman countered that, in his view, CESEE was no exception to the rule that costs eventually outweigh gains and referred to bailouts via taxpayers. Asked about the role of FDI, Aizenman emphasized that, while debt-related FDI flows are rather risky, equity-related (greenfield) FDI flows are more beneficial as they strengthen international technology transfers. Finally, Aizenman concluded that a cyclical upswing in regulatory activity after or during a crisis is not sufficient to prevent a new crisis but, at least, some of the newly implemented measures (especially in the macroprudential area) should be helpful in minimizing the costs of the next crisis.

Session 1, chaired by *Ritzberger-Grünwald*, was devoted to current risks related to external funding and drivers of capital flows to the CESEE region. *Emil Stavrev*, Deputy Head of the Emerging Economies Division of the IMF's European Department, contributed to this session by presenting an update of the IMF's April 2014 Regional Economic Issues report on external funding patterns and risks in CESEE. He illustrated that the CESEE region is highly reliant on external funding, with FDI representing an important source and the private sector accounting for most of external debt. Both, the private and the public sectors are subject to foreign exchange risk, as a large part of their debt stock is denominated in foreign currency. Yet, it should be noted that the level of debt and the debt structure shows considerable heterogeneity across CESEE economies. Furthermore, Stavrev highlighted that Western banks' exposure to CESEE is showing signs of stabilization after a long period of deleveraging. He also warned that although external financing conditions are supportive at the moment, they could reverse at some point. Among remaining crisis legacies that still need to be resolved he mentioned high shares of nonperforming loans (NPLs) and private sector debt.

The second speaker in this session, *Markus Eller*, Principal Economist in the OeNB's Foreign Research Division, examined the drivers of capital flows to CESEE on the basis of a dynamic factor model. He started his presentation by pointing to the boom-bust cycle in CESEE and strong global co-movements in capital flows. Eller argued that global and regional factors explain most of the variance in gross capital flows to CESEE. More specifically, Eller identified the global financial cycle as the most important driving force, followed by the global real business cycle. He also stated that the growing role of idiosyncratic factors in CESEE in the pre-2008 boom period may be related to the strategic positioning of

Western banks in the region during that time. Regarding policy implications, Eller touched upon various issues such as spillover effects, costs and benefits of capital account restrictions, the effectiveness of macroprudential measures and the role international policy coordination could play.

Session 2, chaired by *Peter Backé*, Deputy Head of the OeNB's Foreign Research Division, reflected the recent focus on macroprudential policies (MPPs) and other capital flow management measures (CFMs) to cope with large and volatile capital inflows. The speakers of the session provided novel evidence on how effective such measures have actually been in smoothing cyclical capital flow fluctuations and in mitigating the related macroeconomic challenges and financial stability risks.

In his presentation, *John Beirne*, Economist in the ECB's International Policy Analysis Division, focused on the impact of MPPs, such as capital controls to the financial sector and/or FX-related prudential regulations. Based on a large panel of 75 advanced and emerging economies including data for the period 1999–2012, he showed that the structure of the domestic financial system plays an important role for the effectiveness of MPPs with respect to reducing bank-related gross capital inflows. In particular, better regulatory quality and a higher credit-to-deposit ratio increase MPP effectiveness, while a higher cost-to-income ratio has the opposite effect. The same holds if nonbank-related, other investment inflows are considered, which points to spillovers of MPPs across different asset classes within countries. At the same time, Beirne provided evidence for cross-country spillovers dependent on banking sector conditions: Better regulatory quality and higher credit-to-deposit ratios in neighboring countries apparently reduce the spillovers from the implementation of MPPs abroad.

In her presentation, *Deniz Igan*, Deputy Chief of the Macro-Financial Division in the IMF's Research Department, built a bridge between the analysis of credit booms and capital flows based on the empirical regularity that credit booms are often preceded by financial account liberalization and capital inflow surges. Based on a panel of about 30 countries covering the period 1980–2011, she was able to show that portfolio and especially other investment inflows boost credit growth and increase the likelihood of credit booms in both household and corporate sectors. Firm-level data corroborate these findings and indicate that other investment inflows are related to more rapid credit growth for firms with increasing equity and collateral values but also in the case of financially constrained domestic banks (e.g. banks with low capitalization or a high share of NPLs). This suggests that both demand- and supply-side factors play a role in explaining how capital flows translate into more credit. In terms of appropriate policy responses, Igan stressed that MPPs should be a first line of defense in dealing with financial boom-bust cycles, especially by targeting leverage and strengthening the balance sheets of banks. Preliminary empirical evidence on MPPs suggests that they are able to reduce the procyclicality of credit, but also that they are more successful in building up buffers than preventing a boom. Turning to CESEE economies, Igan concluded that MPPs that target capital adequacy and/or non-standard liquidity have apparently been particularly effective.

*Kiril Koshev*, Economist in the Investment Division of the OECD's Directorate for Financial and Enterprise Affairs, pointed out that currency-based capital flow management measures (CBMs, e.g. limits on FX lending) have become a prominent policy tool in the past few years, especially among emerging market

economies, and he referred to recent OECD evidence showing that CBMs have been effective in reducing cross-border bank flows. But he also stressed the tradeoff between economic growth and financial stability considerations when introducing CFMs. For instance, growth could be hampered if restrictions to capital flows resulted in limited access to finance for credit-constrained domestic enterprises. Moreover, referring to the previous speakers' evidence for cross-country spillovers, Kossev emphasized that it is important to implement CFMs in a non-discriminatory manner, i.e. by treating domestic and foreign investors equally. Potentially negative externalities affecting other economic partner countries call for the international coordination of CFM implementation. In this respect, the currently reviewed OECD Code of Liberalisation of Capital Movements (open to non-OECD adherents since 2012) could provide guidance on the least restrictive use of CFMs.

The concluding panel discussion was chaired by *Helene Schuberth*, Head of the OeNB's Foreign Research Division. She pointed out that boom-bust cycles of capital flows have indeed been more pronounced in CESEE than in other regions in recent years. The three panelists of the session focused on how governments in CESEE could manage these flows.

*Evžen Kočenda*, professor at Charles University in Prague, underlined that efforts to tame the capital flow cycle in CESEE are warranted because capital flows have increased vulnerability to external macroeconomic shocks and contributed to excessive credit growth. Possible domestic responses include structural and institutional reforms, exchange rate flexibilization, capital flow management, and macroprudential policies. However, as Kočenda added, internationally coordinated policies also need to be considered as capital flows are most likely to be driven by global factors, including spillovers from decisions made by the most important central banks (Fed, ECB, Bank of Japan), and the monetary policies of CESEE countries cannot be autonomous from such influences.

Russia's experience with capital flows was discussed by *Yaroslav Lissovolik*, Chief Economist at the Eurasian Development Bank. This experience includes extreme developments, e.g. record outflows of around USD 150 billion in 2014. With hindsight, Russia's pace of capital account liberalization was probably too high, and the introduction of exchange rate flexibility probably happened a bit too late. Today the political elite (but not necessarily the Bank of Russia itself) has a strong preference for a weak ruble, as this is seen to support oil companies' and the government's ruble revenues and to favor import substitution strategies. In recent years, the Bank of Russia has been very active in consolidating the banking system: In 2014–2015 about 200 credit institutions were closed, i.a. for overly risky behavior and money laundering. As Lissovolik emphasized this intervention has recently contributed to a substantial reduction of capital outflows from Russia.

*Thomas Richardson*, Director of the Joint Vienna Institute, agreed that global factors have indeed been responsible for increasing net capital outflows from emerging markets in the past few years. Among these factors, growth differentials between advanced and emerging economies are the main driver according to Richardson. While there are various possibilities to cope with volatile capital flows, including capital flow management measures or macroprudential policies, Richardson argued strongly in favor of better international coordination of domestic policies, even if difficult to achieve. Richardson suggested regular

reviews of national macroeconomic policies to the extent that they may have spillover effects. Such reviews could be carried out by international financial institutions. A second-best alternative for CESEE countries would be to pursue extremely prudent macroeconomic policies in order to reduce their vulnerabilities with respect to international capital flow swings; however, this alternative is saddled with growth costs.

The discussion that followed focused on exchange rate flexibilization and policy coordination. As Aizenman remarked, Russia's weak ruble bias may be a sensible response to the oil price collapse, but such an exchange rate strategy is not sufficient to modernize and diversify the economy. Franz Nauschnigg, Head of the OeNB's European Affairs and International Financial Organizations Division, contended that if a global coordination of policies cannot be sufficiently realized, regional saving nets, swap arrangements or firewalls might be worth considering.

Wrapping up the event, *Dubravko Mihaljek*, Head of Macroeconomic Analysis at the Bank for International Settlements (BIS), summarized that several speakers had expressed their concerns about the riskiness of capital flows to CESEE during the workshop and would thus be in favor of capital flow restrictions in one way or the other. Ironically, unrestricted capital flows are apparently viewed as problematic while free trade is seen as fine. Instead of discussing in general terms how capital flows could be restricted, Mihaljek advocated rethinking CESEE's growth model, discussing in greater depth the banking sector's role in the economy and thinking about ways to attract beneficial types of capital flows (such as flows into nontradable sectors to improve education, healthcare, utilities or services).

## Statistical annex

## Statistical annex

This section provides tables detailing selected economic indicators for Albania, Bosnia and Herzegovina, FYR Macedonia,<sup>1</sup> Kosovo, Montenegro, Serbia and Ukraine, i.e. CESEE countries not covered in the “Recent economic developments and outlook” section.

### Conventions used

x = No data can be indicated for technical reasons

. . = Data not available at the reporting date

Discrepancies may arise from rounding.

Table 1

### Gross domestic product

	2009	2010	2011	2012	2013	2014	2015
	<i>Annual real change in %</i>						
Albania	3.4	3.7	2.5	1.4	1.0	1.8	2.8
Bosnia and Herzegovina	-2.9	0.8	0.9	-0.9	2.4	1.1	3.0
Kosovo	3.6	3.3	4.4	2.8	3.4	1.2	4.0
FYR Macedonia	-0.4	3.4	2.3	-0.5	2.9	3.6	3.8
Montenegro	-5.7	2.5	3.2	-2.7	3.5	1.8	3.4
Serbia	-3.1	0.6	1.4	-1.0	2.6	-1.8	0.8
Ukraine	-15.1	4.1	5.4	0.2	0.0	-6.6	-9.9

Source: wiiv.

Table 2

### Industrial production

	2009	2010	2011	2012	2013	2014	2015
	<i>Annual real change in %</i>						
Albania	4.2	36.2	19.0	15.7	28.3	1.6	-5.0
Bosnia and Herzegovina	-6.5	4.3	2.4	-3.9	5.2	0.2	3.1
Kosovo <sup>1</sup>	-1.5	1.8	-5.7	14.9	6.5	-1.3	5.0
FYR Macedonia	-8.7	-4.9	6.9	-2.7	3.2	4.8	4.9
Montenegro	-32.2	17.5	-10.3	-7.0	10.6	-11.4	7.9
Serbia	-12.6	1.2	2.5	-2.2	5.4	-6.4	8.2
Ukraine	-21.9	11.2	8.0	-0.5	-4.3	-10.1	-13.0

Source: wiiv.

<sup>1</sup> According to gross value added data.

<sup>1</sup> Former Yugoslav Republic of Macedonia.

Table 3

**Average gross wages – total economy**

	2009	2010	2011	2012	2013	2014	2015
	<i>Annual change in %</i>						
Albania	5.2	-3.6	4.9	2.9	-3.2	1.8	2.9
Bosnia and Herzegovina	8.1	1.1	4.4	1.5	0.1	-0.1	0.0
Kosovo <sup>1</sup>	20.4	16.2	21.7	1.7	0.6	16.9	7.2
FYR Macedonia	14.1	1.0	1.2	0.2	1.2	1.0	2.7
Montenegro	5.6	11.2	1.0	0.7	-0.1	-0.4	0.3
Serbia	-3.3	7.5	11.1	8.9	5.7	1.2	-0.5
Ukraine	5.5	17.5	17.6	14.9	7.9	6.6	20.5

Source: wiiw.

<sup>1</sup> Average net monthly wages.

Table 4

**Unemployment rate<sup>1</sup>**

	2009	2010	2011	2012	2013	2014	2015
	%						
Albania	13.7	14.0	14.0	13.4	15.9	17.5	17.1
Bosnia and Herzegovina	24.1	27.2	27.6	28.0	27.5	27.5	27.7
Kosovo	45.4	45.1	44.8	30.9	30.0	35.3	32.9
FYR Macedonia	32.2	32.0	31.4	31.0	29.0	28.0	26.1
Montenegro	19.3	19.6	19.7	19.7	19.5	18.0	17.6
Serbia	16.1	19.2	23.0	23.9	22.1	18.9	17.7
Ukraine	8.8	8.1	7.9	7.5	7.2	9.3	9.1

Source: wiiw.

<sup>1</sup> Labor force survey, period average.

Table 5

**Industrial producer price index**

	2009	2010	2011	2012	2013	2014	2015
	<i>Period average, annual change in %</i>						
Albania	0.4	0.3	2.6	1.1	-0.4	-0.5	-2.1
Bosnia and Herzegovina	-3.4	1.0	5.5	0.3	-1.8	-0.5	0.6
Kosovo <sup>1</sup>	3.8	4.1	4.5	1.9	2.5	1.7	2.7
FYR Macedonia	-7.2	8.7	11.9	1.4	-1.4	-1.9	-3.9
Montenegro <sup>1</sup>	-3.9	-0.9	3.2	1.9	1.6	0.1	0.3
Serbia	5.6	12.7	12.7	6.8	2.7	1.3	1.0
Ukraine	6.5	20.9	19.0	3.7	-0.1	17.1	36.0

Source: wiiw.

<sup>1</sup> Kosovo, Montenegro: NACE 1 classification.

Table 6

**Consumer price index**

	2009	2010	2011	2012	2013	2014	2015
	<i>Period average, annual change in %</i>						
Albania	2.2	3.6	3.4	2.0	1.9	1.6	1.9
Bosnia and Herzegovina	-0.4	2.1	3.7	2.1	-0.1	-0.9	-1.0
Kosovo	-2.4	3.5	7.3	2.5	1.8	0.4	-0.5
FYR Macedonia	-0.8	1.6	3.9	3.3	2.8	-0.3	-0.3
Montenegro	3.4	0.5	3.3	4.0	1.8	-0.5	1.4
Serbia	8.6	6.8	11.0	7.8	7.8	2.9	1.9
Ukraine	15.9	9.4	8.0	0.6	-0.3	12.1	48.7

Source: wiiv.

Table 7

**Trade balance**

	2009	2010	2011	2012	2013	2014	2015
	<i>% of GDP</i>						
Albania	-26.6	-23.1	-24.2	-20.8	-20.6	-22.2	-22.4
Bosnia and Herzegovina	-30.8	-29.3	-30.8	-30.5	-27.4	-29.7	-26.0
Kosovo	-40.5	-39.6	-42.5	-40.5	-37.5	-37.0	-36.5
FYR Macedonia	-25.8	-21.6	-25.2	-26.5	-22.9	-21.7	-20.1
Montenegro	-44.3	-40.8	-40.4	-44.1	-39.5	-39.8	-40.4
Serbia	-16.5	-15.9	-16.4	-17.8	-12.1	-12.3	-11.9
Ukraine	-4.4	-6.8	-10.6	-12.0	-11.6	-5.3	-3.8

Source: wiiv.

Table 8

**Current account balance**

	2009	2010	2011	2012	2013	2014	2015
	<i>% of GDP</i>						
Albania	-15.4	-11.3	-13.2	-10.2	-10.9	-12.9	-10.8
Bosnia and Herzegovina	-6.4	-6.0	-9.5	-8.7	-5.3	-7.4	-5.7
Kosovo	-9.2	-11.7	-13.7	-7.5	-6.4	-7.8	-9.1
FYR Macedonia	-6.8	-2.0	-2.5	-3.2	-1.6	-0.8	-1.4
Montenegro	-27.9	-22.9	-17.7	-18.7	-14.5	-15.2	-13.3
Serbia	-6.6	-6.8	-10.9	-11.6	-6.1	-6.0	-4.7
Ukraine	-1.4	-2.1	-6.0	-7.9	-8.7	-3.4	-0.2

Source: wiiv.

Table 9

**Net FDI inflows**

	2009	2010	2011	2012	2013	2014	2015
	<i>% of GDP</i>						
Albania	8.3	8.8	6.8	6.9	9.8	8.7	8.7
Bosnia and Herzegovina	1.4	2.4	2.7	2.3	1.5	2.9	1.7
Kosovo	7.1	8.3	8.2	4.5	5.3	2.7	5.6
FYR Macedonia	2.1	2.3	4.6	1.5	3.1	2.4	1.7
Montenegro	36.9	18.4	12.3	15.2	10.0	10.8	17.4
Serbia	6.8	4.3	10.6	3.2	4.5	4.5	6.3
Ukraine	4.0	4.6	4.3	4.6	2.4	0.3	3.3

Source: wiiw.

Table 10

**Reserve assets excluding gold**

	2009	2010	2011	2012	2013	2014	2015
	<i>End of period, % of GDP</i>						
Albania	18.6	20.6	20.0	19.9	20.5	21.5	27.6
Bosnia and Herzegovina	24.8	25.2	23.9	24.2	25.8	28.0	29.5
Kosovo	14.2	14.4	11.9	16.6	15.0	13.4	14.9
FYR Macedonia	21.1	20.9	23.9	25.3	22.1	25.9	22.6
Montenegro	13.3	13.3	9.3	10.9	12.6	15.8	18.6
Serbia	33.5	32.1	34.4	32.5	31.3	28.1	29.3
Ukraine	20.5	23.6	19.4	12.1	9.5	5.4	13.9

Source: wiiw.

Table 11

**Gross external debt**

	2009	2010	2011	2012	2013	2014	2015
	<i>End of period, % of GDP</i>						
Albania	41.5	45.6	53.5	57.5	66.2	69.5	74.8
Bosnia and Herzegovina	55.0	51.6	48.9	52.2	52.2	51.9	51.4
Kosovo	29.3	31.2	29.7	30.0	30.2	31.2	33.5
FYR Macedonia	55.9	57.8	64.2	68.2	64.0	70.0	69.4
Montenegro <sup>1</sup>	23.5	29.2	32.6	40.7	42.6	45.2	54.0
Serbia	72.7	79.0	72.2	80.9	74.8	77.1	78.8
Ukraine	82.8	83.1	80.5	71.9	71.7	102.6	133.0

Source: wiiw.

<sup>1</sup> Gross external public debt.

Table 12

**General government balance**

	2009	2010	2011	2012	2013	2014	2015
	% of GDP						
Albania	-7.1	-3.1	-3.5	-3.4	-5.0	-5.2	-4.0
Bosnia and Herzegovina	-4.3	-2.4	-1.2	-2.0	-2.1	-2.0	-0.2
Kosovo	0.1	-1.8	-1.1	-1.2	-2.5	-2.9	-1.9
FYR Macedonia	-2.7	-2.4	-2.6	-3.9	-4.0	-4.2	-3.4
Montenegro	-5.7	-4.8	-3.7	-4.3	-3.7	-3.0	-7.9
Serbia	-4.4	-4.6	-4.8	-6.8	-5.5	-6.6	-3.7
Ukraine	-3.9	-5.8	-1.7	-3.5	-4.2	-4.5	-1.6

Source: wiw.

Table 13

**Gross general government debt**

	2009	2010	2011	2012	2013	2014	2015
	% of GDP						
Albania	59.7	57.7	59.4	62.1	65.6	70.1	72.7
Bosnia and Herzegovina	36.2	39.3	40.8	43.6	41.6	44.8	45.0
Kosovo	6.1	5.9	5.3	8.1	8.9	10.5	13.0
FYR Macedonia	31.4	34.6	32.0	38.3	40.2	45.7	46.6
Montenegro	38.2	40.7	45.6	53.4	55.7	56.2	62.8
Serbia	32.8	41.8	45.4	56.2	59.6	70.4	74.6
Ukraine	33.6	38.6	35.1	35.3	38.4	69.4	79.4

Source: wiw.

Table 14

**Broad money**

	2009	2010	2011	2012	2013	2014	2015
	End of period, annual nominal change in %						
Albania	6.8	12.5	9.2	5.0	2.3	4.0	1.9
Bosnia and Herzegovina	2.2	7.2	5.8	3.4	7.9	7.3	8.0
Kosovo	11.2	12.9	8.8	7.1	17.3	-4.2	6.5
FYR Macedonia	4.0	8.4	7.5	0.5	0.2	7.2	7.6
Montenegro	-7.0	3.4	2.1	8.4	4.8	9.1	10.9
Serbia	21.5	12.9	10.3	9.4	4.6	7.6	6.6
Ukraine	-5.4	23.1	14.2	13.1	17.5	5.4	4.0

Source: wiw, European Commission.

Table 15

**Official key interest rate**

	2009	2010	2011	2012	2013	2014	2015
	<i>End of period, %</i>						
Albania (one-week repo rate)	5.25	5.00	4.75	4.00	3.00	2.25	1.75
Bosnia and Herzegovina <sup>1</sup>	x	x	x	x	x	x	x
Kosovo <sup>2</sup>	x	x	x	x	x	x	x
FYR Macedonia (CB bills) <sup>3</sup>	8.50	4.11	4.00	3.73	3.25	3.25	3.25
Montenegro <sup>2</sup>	x	x	x	x	x	x	x
Serbia (two-week repo rate)	9.50	11.50	9.75	11.25	9.50	8.00	4.50
Ukraine (discount rate)	10.25	7.75	7.75	7.50	6.50	14.00	22.00

Source: wiiv.

<sup>1</sup> Currency board.<sup>2</sup> Unilateral euroization.<sup>3</sup> Monthly weighted average interest rate on central bank bills auctions (28 days).

Table 16

**Exchange rate**

	2009	2010	2011	2012	2013	2014	2015
	<i>Period average, national currency per EUR</i>						
Albania	132.06	137.79	140.33	139.04	140.26	139.97	139.74
Bosnia and Herzegovina	1.96	1.96	1.96	1.96	1.96	1.96	1.96
Kosovo	x	x	x	x	x	x	x
FYR Macedonia	61.27	61.52	61.53	61.53	61.58	61.62	61.61
Montenegro	x	x	x	x	x	x	x
Serbia	93.95	103.04	101.95	113.13	113.14	117.31	120.76
Ukraine	10.87	10.53	11.09	10.27	10.61	15.72	24.23

Source: wiiv.



Notes

## Periodical publications

Starting from 2016, the OeNB's periodical publications are available in electronic format only. They can be downloaded at <https://www.oenb.at/en/Publications.html>. If you would like to be notified about new issues by e-mail, please register at <https://www.oenb.at/en/Services/Newsletter.html>.

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

German | annually  
English | annually

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

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

### **Inflation aktuell**

German | quarterly

This publication presents the OeNB's analysis of recent inflation developments in Austria and its inflation outlook for Austria for the current and next year. In addition, it provides in-depth analyses of topical issues.

### **Konjunktur aktuell**

German | seven times a year

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

<http://www.oenb.at/Geldpolitik/Konjunktur/konjunktur-aktuell.html>

### **Monetary Policy & the Economy**

English | quarterly

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

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

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

German | twice a year  
English | twice a year

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

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

### **Financial Stability Report**

English | twice a year

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

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

### **Focus on European Economic Integration**

English | quarterly

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

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

### **Statistiken – Daten & Analysen**

German | quarterly

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

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

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

German | irregularly  
English | irregularly

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

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

## Research Update

English | quarterly

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

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

## CESEE Research Update

English | quarterly

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

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

## OeNB Workshops Proceedings

German, English | irregularly

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

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

## Working Papers

English | irregularly

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

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

## Proceedings of the Economics Conference

English | annually

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

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

## Proceedings of the Conference on European Economic Integration

English | annually

The OeNB’s annual Conference on European Economic Integration (CEEI) deals with current issues with a particular relevance for central banking in the context of convergence in Central, Eastern and Southeastern Europe as well as the EU enlargement and integration process. For an overview see:

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

The proceedings have been published with Edward Elgar Publishers, Cheltenham/UK, Northampton/MA, since the CEEI 2001 ([www.e-elgar.com](http://www.e-elgar.com)).

## Publications on banking supervisory issues

German, English | irregularly

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

# Addresses

	Postal address	Telephone/Fax/E-mail
<b>Head office</b> Otto-Wagner-Platz 3 <b>1090 Vienna, Austria</b> Internet: <a href="http://www.oenb.at">www.oenb.at</a>	PO Box 61 1011 Vienna, Austria	Phone: (+43-1) 404 20-6666 Fax: (+43-1) 404 20-042399 E-mail: <a href="mailto:oenb.info@oenb.at">oenb.info@oenb.at</a>
<b>Branch offices</b>		
<b>Northern Austria Branch Office</b> CoulinstraÙe 28 <b>4020 Linz, Austria</b>	PO Box 346 4021 Linz, Austria	Phone: (+43-732) 65 26 11-0 Fax: (+43-732) 65 26 11-046399 E-mail: <a href="mailto:regionnord@oenb.at">regionnord@oenb.at</a>
<b>Southern Austria Branch Office</b> Brockmanngasse 84 <b>8010 Graz, Austria</b>	PO Box 8 8018 Graz, Austria	Phone: (+43-316) 81 81 81-0 Fax: (+43-316) 81 81 81-046799 E-mail: <a href="mailto:regionsued@oenb.at">regionsued@oenb.at</a>
<b>Western Austria Branch Office</b> Adamgasse 2 <b>6020 Innsbruck, Austria</b>	Adamgasse 2 6020 Innsbruck, Austria	Phone: (+43-512) 908 100-0 Fax: (+43-512) 908 100-046599 E-mail: <a href="mailto:regionwest@oenb.at">regionwest@oenb.at</a>
<b>Representative offices</b>		
<b>New York Representative Office</b> Oesterreichische Nationalbank 450 Park Avenue, Suite 1202 <b>10022 New York, U.S.A.</b>		Phone: (+1-212) 888-2334 Fax: (+1-212) 888-2515
<b>Brussels Representative Office</b> Oesterreichische Nationalbank Permanent Representation of Austria to the EU Avenue de Cortenbergh 30 <b>1040 Brussels, Belgium</b>		Phone: (+32-2) 285 48-41, 42, 43 Fax: (+32-2) 285 48-48