FOCUS ON EUROPEAN ECONOMIC INTEGRATION

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Call for entries:
Olga Radzyner Award 2015

In 2000, the Oesterreichische Nationalbank (OeNB) established an award to commemorate Olga Radzyner, former Head of the OeNB's Foreign Research Division, who pioneered the OeNB's CESEE-related research activities. The award is bestowed on young economists for excellent research on topics of European economic integration and is conferred annually. In 2015, four applicants are eligible to receive a single payment of EUR 3,000 each from an annual total of EUR 12,000.

Submitted papers should cover European economic integration issues and be in English or German. They should not exceed 30 pages and should preferably be in the form of a working paper or scientific article. Authors shall submit their work before their 35th birthday and shall be citizens of any of the following countries: Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, FYR Macedonia, Hungary, Kosovo, Latvia, Lithuania, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia or Ukraine. Previous winners of the Olga Radzyner Award, ESCB central bank employees as well as current and former OeNB staff are not eligible. In case of co-authored work, each of the co-authors has to fulfill all the entry criteria.

Authors shall send their submissions either by electronic mail to *eva.gehringer-wasserbauer@oenb.at* or by postal mail – with the envelope marked "Olga Radzyner Award 2015" – to the Oesterreichische Nationalbank, Foreign Research Division, POB 61, 1011 Vienna, Austria. Entries for the 2015 award should arrive by September 4, 2015, at the latest. Together with their submissions, applicants shall provide copies of their birth or citizenship certificates and a brief CV.

For detailed information, please visit the OeNB's website at *www.oenb.at/en/About-Us/Research-Promotion/Grants/olga-radzyner-award.html* or contact Ms. Eva Gehringer-Wasserbauer in the OeNB's Foreign Research Division (write to *eva.gehringer-wasserbauer@oenb.at* or phone +43-1-40420-5205).

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The Oesterreichische Nationalbank (OeNB) invites applications from external researchers for participation in a Visiting Research Program established by the OeNB's Economic Analysis and Research Department. The purpose of this program is to enhance cooperation with members of academic and research institutions (preferably 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.

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Applications (in English) should include
- a curriculum vitae,
- a research proposal that motivates and clearly describes the envisaged research project,
- an indication of the period envisaged for the research visit, and
- information on previous scientific work.

Applications for 2016 should be e-mailed to *eva.gehringer-wasserbauer@oenb.at* by November 1, 2015.

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

Studies

Business cycle synchronization between the Western Balkans and the European Union

Antje Hildebrandt,
Isabella Moder[1]

This paper investigates the degree of business cycle synchronization (BCS) between the Western Balkans and the European Union. While the degree of synchronization had been low or even negative before 2000, business cycles have clearly converged ever since. Since 2010, in particular, BCS with the EU has been high for all Western Balkan countries. In addition, this paper empirically tests which factors were responsible for the convergence process. Using a period-by-period correlation index for the time span from 1994 to 2013, we find that foreign trade is the most important positive contributor to business cycle convergence. Although fiscal differences are associated with negative BCS in the same year, our results suggest that they have a positive influence in subsequent periods. In contrast, we find that financial flows lead to business cycle decoupling because of their procyclical behavior in the respective domestic economy. The same relationship applies, according to our analysis, to remittances, whose impact on BCS is an underresearched topic in the empirical literature. We find that remittances from the EU to the Western Balkans behave similarly to financial flows, which supports the hypothesis that remittances are sent home to take advantage of favorable economic conditions.

Four of the seven Western Balkans economies[2] follow a monetary policy that is very closely linked to that of the euro area, either through the use of the euro as their official currency (Montenegro and Kosovo) or through fixed exchange rate regimes (euro-based currency board in Bosnia and Herzegovina, euro peg in FYR Macedonia). Although Albania, Croatia and Serbia operate under a managed, or rather free-floating, exchange rate regime, respectively, in practice they also face substantial monetary policy constraints, given the high asset and liability euroization in their banking systems.

According to the optimum currency area (OCA) theory developed by Mundell (1961), McKinnon (1963) and Kenen (1969), one prerequisite for the efficient use of a common currency or for following the monetary policy of another country or currency area is that the business cycles of the countries involved are sufficiently synchronized. Otherwise – if output patterns are divergent – monetary policy cannot bring about optimal reactions for each country at the same time. When evaluating the economic costs of a country's lack of, or tight constraint on, independent monetary policy, it is therefore important to know the degree of BCS of the respective country with the euro area (and, in a broader, forward-looking sense, with prospective euro area countries).

This paper is structured as follows. Section 1 provides an overview of the relevant literature. In section 2, we investigate the degree of BCS between the Western Balkan countries and the EU-25 aggregate to find out which countries exhibit higher or lower BSC and whether a convergence process can be identified. Section 3

discusses the main drivers and transmission channels of BCS and the choice of explanatory variables. Subsequently, we employ a regression model for analyzing what factors drive the development of BCS over time. Finally, in section 4, we draw conclusions from our analysis.

1 Literature overview

The degree of BCS between countries is driven by two main factors: on the one hand, it depends on the presence and dominance of common transnational shocks over idiosyncratic (i.e. country-specific) shocks. On the other hand, idiosyncratic shocks by themselves can be spread across countries through certain transmission channels. Drivers of BCS are a well-researched topic in the empirical literature. Focusing mainly on industrial countries (e.g. Frankel and Rose, 1998; Darvas et al., 2005; Artis et al., 2008; Inklaar et al., 2008), the literature finds that trade is one of the main transmission channels of BCS. The evidence for other factors like industrial specialization or fiscal and monetary policy, which have been proposed by theoretical literature and investigated empirically, is mixed (De Haan et al., 2008). Prompted by the accession of ten Central, Eastern and Southeastern European (CESEE) countries to the EU in the 2010s, several studies also investigated the patterns and drivers of synchronization between the industrialized and transition countries in Europe (e.g. Artis et al., 2008; Babetskii, 2005; Crespo Cuaresma et al., 2011). Their results suggest that the determinants of BCS between emerging markets and industrialized countries seem to be similar to those that dominate BCS between industrial countries. Distinguishing between industrial and developing countries, Calderón et al. (2007) find, however, that the impact of trade integration is higher for BCS between industrial countries than for BCS between developing countries or between "mixed" pairs. Another strand of business cycle literature is concerned with the endogeneity of OCA criteria, as pointed out first by Frankel and Rose (1998). This endogeneity implies that a country is more likely to fulfill the OCA criteria after having joined a currency union than before accession (see Gächter and Riedl, 2014, for a discussion).

Only a few studies so far have covered the degree of BCS of the Western Balkan economies with the euro area or the European Union (EU). Velickovsky (2013) investigates shock synchronization between selected Western Balkan countries (Albania, Croatia, Macedonia and Serbia) and the euro area by two approaches. First, he calculates correlation coefficients between the four Western Balkan countries and the euro area and finds that output correlation is highest between Croatia and the euro area and between FYR Macedonia and the euro area whereas correlation between Albania and Serbia vis-à-vis the euro area is comparably low. Second, the author estimates time-varying coefficients of shock symmetry (both supply and demand shocks) between the Western Balkans and the euro area in a vector autoregressive (VAR) framework. Gouveia (2014) uses a data set of eight Balkan economies (including Croatia, FYR Macedonia and Serbia from the Western Balkans) and compares various measures of trade intensity and BCS between these countries and the euro area average. For Croatia and Serbia, the degree of BCS is found to be moderate and well below the average of intra-euro area correlation, while FYR Macedonia exhibits higher output synchronization with the euro area. With respect to output volatility, the author concludes that the volatility of business cycles is substantially higher in the Balkan countries than in the euro area.

To the best of our knowledge, there is no study on BCS that covers all Western Balkan countries nor one that investigates the determinants of business cycle convergence between the Western Balkans and the euro area or the EU. This paper aims to fill this gap in the empirical literature, i.e. to identify the degree of synchronization between the Western Balkans and the EU, to find how BSC has changed since the beginning of transition and to identify the main drivers of business cycle convergence.

More precisely, our analysis covers the EU-25, i.e. all EU Member States with the exception of Croatia, which joined the EU only in mid-2013 (and is covered here in the group of Western Balkan countries), and Denmark and the United Kingdom, which have been granted an opt-out clause and are thus not required to participate in Stage Three of Economic and Monetary Union (EMU). All other EU Member States are required to join the euro area once they fulfill the convergence criteria, as 19 of them have done so far. We investigate BCS between the Western Balkans and the current euro area as well as all EU Member States (except Croatia) that are obliged to adopt the euro and thus are the relevant counterpart for the Western Balkans' future business cycle convergence and economic integration. A further advantage of this approach is that, by doing so, we obtain a larger data set, which is particularly helpful in underpinning the robustness of our results regarding the determinants of BCS.

In our analysis, we make use of some recent advances in the business cycle literature. First, we use a new time-varying correlation index developed by Cerqueira and Martins (2009) and Cerqueira (2013) to analyze the convergence process on a yearly basis. As can be seen in the results in the subsequent sections, using a time-varying correlation index considerably improves the measurement of BCS, as synchronization varies greatly over time and this variation could not be captured by a single correlation coefficient spanning the whole observation period. Additionally, we obtain a panel data set instead of a cross-sectional sample for the regressions, which allows us to explore the full-time variability of the data. Most studies that identify determinants of BCS use a two-step instrumental variables approach; however, we employ the system Generalized Method of Moments (GMM) estimator developed by Blundell and Bond (1998) as it offers several advantages (see below). To identify the determinants of BSC, we start by looking at well-known factors identified in the literature (trade, specialization, fiscal policy) but extend the choice of variables by adding other potential channels that might be relevant especially for the Western Balkans. We incorporate common monetary policy and financial flows in the regressions. In addition, we include remittances as they constitute a large part of income in the Western Balkan countries, are less volatile than other financial flows to the region (Petreski and Jovanovic, 2013) and, as already argued by Barajas et al. (2012), constitute an important BCS channel. According to the World Bank, remittances amounted to more than 16% of GDP in Kosovo and to more than 10% of GDP in Bosnia and Herzegovina in 2013. The inflow of remittances was quite substantial also in Albania, Montenegro and Serbia (between about 6% to 8% of GDP). Only Croatia and FYR Macedonia registered inflows of below 4% in 2013.

2 Business cycle synchronization

2.1 Measurement issues

In the business cycle literature, a variety of indicators of economic activity – like GDP (in levels or first differences), industrial production or consumption measures – have been used to identify the cyclical component of economy activity (see Darvas and Szapáry, 2008, for a comparison and discussion). Since the Western Balkans underwent a process of de-industrialization particularly at the beginning of the transition period in the 1990s and since industrial production does not include all sectors of the economy, we do not consider industrial production a good indicator of economic activity. We therefore make use of annual GDP data (year on year), as quarterly GDP data do not provide long time series and are not even available for some of the countries covered. Instead of using growth rates, we use the logs of real GDP data in levels as these are better suited for heterogeneous samples of countries at different stages of economic development (see Gächter and Riedl, 2014).

To separate the cyclical component (i.e. the output gap) from the trend component (i.e. potential output), we use the Hodrick-Prescott (HP) filter as it is the standard method and easy to implement. Moreover, the resulting cyclical components are similar to those of the band-pass filter (Belke and Heine, 2006; De Haan et al., 2008). Following the Ravn-Uhlig rule, the smoothing parameter is set to 6.25 as proposed for yearly data. One drawback of the HP filter is that it delivers suboptimal results at the end of the sample (see e.g. Mise et al., 2005). To overcome this problem, we complement the time series for each country by forecasts from the IMF World Economic Outlook until 2019. The filtered cyclical components are tested for stationarity with the augmented Dickey-Fuller unit root test including a constant. With the exception of the cyclical component for Greece, all cyclical components in the sample are stationary at a 5% confidence level.

Most studies on this issue are affected by the nonavailability of a year-by-year index for BCS, which is why they had to investigate the topic on a cross-sectional basis. To account for at least some time variability, most studies use moving averages, sample period splits and other methods. The lack of year-by-year BCS indices can be overcome by using the period correlation index developed by Cerqueira and Martins (2009):

(I)

$$\rho_{ij,t} = 1 - \frac{1}{2}\left(\frac{d_{j,t} - \bar{d}_j}{\sqrt{\frac{1}{T}\sum_{t=1}^{T}\left(d_{j,t} - \bar{d}_j\right)^2}} - \frac{d_{i,t} - \bar{d}_i}{\sqrt{\frac{1}{T}\sum_{t=1}^{T}\left(d_{i,t} - \bar{d}_i\right)^2}} \right)^2$$

Here, d_i and d_j denote any two time series and $\bar{d}_j$, $\bar{d}_i$ denote the respective averages over time. The index thus measures the correlation between d_i and d_j at each point in time *(t = 1, …, T)*. Taking the average of $\rho_{ij,t}$ equals the linear correlation index ρ_{ij} conventionally used in cross-sectional studies. The index is of an asymmetric nature with *max($p_{ij,t}$) = 1* and *min($p_{ij,t}$) = 3 – 2T* (see Cerqueira, 2013).

2.2 Data sample and descriptive results

GDP data (in euro) at constant prices are extracted from the IMF World Economic Outlook Database. Our country sample comprises 25 EU Member States

(EU-25, i.e. all current members excluding Croatia, Denmark and the United Kingdom) and the Western Balkan countries (Albania, Bosnia and Herzegovina, Croatia, Kosovo,[3] FYR Macedonia, Montenegro and Serbia). The business cycle measures are calculated for the maximum period from 1989 to 2013.[4]

Table 1 summarizes the yearly measures of correlation between the Western Balkans and the EU-25 aggregate for different subperiods. When comparing the development of this synchronization index over the four subperiods (transition period, precrisis period, crisis peak and crisis aftermath), we can indeed identify a convergence process. Except in the crisis peak subperiod, the correlation index has clearly increased since the transition period.

The different subperiods are characterized by specific global and country-specific shocks. During the transformation period from 1989 to 1995, the Western Balkans were marked by the break-up of former Yugoslavia, trade interruptions and the Balkan Wars. The latter also led to EU financial and economic sanctions against Montenegro and Serbia (World Bank, 2004). Also in this period, Albania started to ease its isolation policy. These country-specific shocks of the 1990s make the analysis of BCS of the Western Balkans a difficult task. After 1995, the region saw some economic and political stability but experienced transformational recession. In addition, the limited availability of GDP data for this period also puts limits on the interpretation of business cycle correlations.

From 2001 to 2008, BCS with the EU-25 increased in particular in Bosnia and Herzegovina, Croatia, FYR Macedonia and Montenegro. In this period, the EU integration process started in all Western Balkan countries, but it progressed at different speeds. Supposedly, closer ties with the EU and increasing trade relations have had a positive impact on business cycle co-movements. At the Thessaloniki

Table 1

Synchronization of the Western Balkans with the EU-25 aggregate in different subperiods[1]

Country[2]	Transition period	Precrisis period	Crisis peak	Crisis aftermath	Overall
	(until 2000)	(2001–08)	(2009)	(2010–13)	(first year available: 2013)
Montenegro	×	0.860	−0.668	0.871	0.760
Croatia	0.401	0.765	−0.778	0.909	0.572
FYR Macedonia	0.473	0.669	−1.383	0.871	0.532
Bosnia and Herzegovina	0.313	0.720	−1.615	0.832	0.526
Serbia	−1.381	0.568	−0.869	0.839	0.181
Kosovo	×	0.195	−3.072	0.908	0.175
Albania	−0.073	0.287	−2.424	0.850	0.096

Source: Authors' calculations.

[1] To be consistent with the empirical part of our paper, table 1 displays the aggregate of the EU-25 and not that of the euro area. However, synchronization between the Western Balkan countries and the euro area aggregate is very similar.

[2] Sorted by overall synchronization level.

Note: Data are available from 1989 for Albania, from 1992 for Croatia and FYR Macedonia, from 1998 for Bosnia and Herzegovina as well as Serbia, and from 2000 for Kosovo and Montenegro.

[3] Due to data limitations, Kosovo is included in the descriptive analysis of BCS but not in the empirical part.

[4] For most Western Balkan countries, GDP data series start later than 1989.

European Council summit in 2003, the EU confirmed that the future of the Western Balkans lies within the EU and granted potential EU candidate status to the Western Balkan countries (European Council, 2003). For FYR Macedonia, however, an agreement on trade and trade-related matters had already entered into force in 2001, and the Stabilisation and Association Agreement (SAA) became effective in 2004. In the remaining countries of our sample, the SAA became effective at a later stage (European Commission, 2015).[5]

For Albania, Kosovo and Serbia, synchronization with the EU-25 was much weaker and more volatile. Kosovo strongly decoupled from the EU-25 aggregate in 2006, and Albania in 2007. Kosovo showed pronounced cyclical movements over this period, posting very high GDP growth (more than 8%) in 2007, while growth was much lower in the years before 2007 and afterward. This helps explain the large fluctuations of Kosovo's BCS. Albania experienced no strong cycle movement over time. However, in 2007, growth was relatively weak in Albania compared with a booming EU-25, which is mirrored in a low co-movement of the respective business cycles.

In 2009, the economic and financial crisis hit the EU countries hard, as reflected in the slump of the cyclical component of the EU-25 aggregate and eventually in the decoupling of the business cycles of all Western Balkan countries from the EU-25. The Western Balkans also experienced some economic downturn, but it occurred later and was less pronounced than in the EU-25. According to Bonetto et al. (2009), the Western Balkan countries were partially protected from the economic and financial crisis of 2009 as they had a low exposure to international financial markets and the foreign banks active in the region were strongly capitalized. Albania and Kosovo even overcame the crisis years without dipping into a recession.

From 2010 to 2013, convergence of the business cycles of the EU-25 and the Western Balkans increased. Even the group of Western Balkan countries recording less synchronized cycles exhibited a high degree of synchronization in that period.

As discussed above, studies which also analyze the degree of BCS between the EU and the Western Balkans generally come to similar results: FYR Macedonia shows relative strong co-movements with the EU whereas EU correlations with Albania and Serbia are comparatively low. Results for Croatia are ambiguous. Furthermore, Gouveia (2014) also shows that business cycle correlation has in general increased over time between the Western Balkan countries and the EU.

3 Determinants of business cycle synchronization

The result of our descriptive analysis, namely that the business cycles of the Western Balkans have clearly converged with the EU business cycle over the past 15 years, leads to the question which factors drove this convergence process. We therefore proceed to empirically test the determinants of BCS.

3.1 Empirical model
In order to investigate determinants of BCS between the EU and the Western Balkans, we use the following model:

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[5] *So far, no SAA has been signed between the EU and Kosovo, however the European Commission adopted an SAA proposal for Kosovo in April 2015 (European Commission, 2015).*

(II)

$$Correl_{ij,t} = \alpha + \beta Correl_{ij,t-1} + Z'_{ij,t}\gamma + \mu_{ij} + \lambda_t + v_{ij,t}$$

where $Correl_{ij,t}$ denotes the bilateral correlation index of BCS between countries i and j in year t[6]. $Z'_{ij,t}$ is a matrix consisting of the potential determinants of BCS such as bilateral trade, asymmetry of production, fiscal differences, common monetary policy, FDI, bank flows and remittances. Data are available yearly in an unbalanced panel for 162 country pairs with a maximum time span from 1989 to 2013. To control for autocorrelation, the one-period lagged BCS $Correl_{ij,t-1}$ is included in the model. Additionally, we control for country-pair fixed effects μ_{ij} to account for specific unobservable country-pair factors, and time effects λ_t to account for common global shocks. Our main interest lies in the signs and magnitudes of vector γ, which indicates what drives BCS between the EU and the Western Balkans. While some authors (Imbs, 2006, and Dées and Zorell, 2011) investigate the determinants of BSC with a system of equations to account for indirect effects as well, we focus on a single equation approach. However, future research on this topic might expand our approach into a multi-equation system.

Frankel and Rose (1998) pointed out that endogeneity plays an important role in the relationship between trade integration and BCS. They argue that countries with stronger trade integration and countries with similar output patterns are more likely to join a currency union, and joining a currency union in turn increases trade integration and business cycle correlation. Following this argument, several endogeneity issues with respect to BCS have been discussed in the literature, not only with respect to trade integration but also regarding financial integration (De Grauwe and Mongelli, 2005) or remittance flows (Frankel, 2011). Most studies tackle the endogeneity issue by using two-step instrumental variable approaches. However, we follow Cerqueira and Martins (2009) and make use of a two-step system GMM estimator developed by Blundell and Bond (1998), which offers several advantages. First, it allows us to draw a large number of instruments from within the data set by instrumenting endogeneous variables with their own lagged values. Second, additional time-invariant instruments can be included in the regression (in contrast to the difference GMM estimator used by Arellano and Bond, 1991). Additionally, the present data set is a small T, large N panel data set, for which the estimator is well suited as it controls for the dynamic panel bias (Roodman, 2009).

3.2 Choice of explanatory variables

In this section we briefly describe the set of variables identified in the literature as important determinants of business cycle convergence. There is a broad consensus that trade integration is an important driver of BCS. It is argued that the elimination of trade barriers results in a stronger transmission of demand shocks and

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[6] As pointed out by Cerqueira (2013), one shortcoming of the index (I) is that it is asymmetric, which could lead to biased results when used in regressions. Thus, for the purpose of the regressions, we use the following transformation developed by Cerqueira (2013): $\rho_{ij,t} = \frac{1}{2}ln\left(\frac{1+\frac{\rho_{ij,t}}{2T-3}}{1-\rho_{ij,t}}\right)$ that yields a nonbounded index with a symmetric support around 0 and a symmetric range between $-\infty$ and $+\infty$.

eventually higher business cycle co-movement (Frankel and Rose, 1998). For testing the impact of trade on BCS between the EU-25 and the Western Balkans, we use the IMF's database "Direction of Trade Statistics" (DOTS). DOTS provides data for the calculation of bilateral trade intensities between individual countries of the EU-25 and the Western Balkans. We calculate bilateral trade intensity as follows:

(III)

$$BTI_{ij,t} = \left(\frac{Exports_{ij,t} + Imports_{ij,t}}{Trade_{i,t} + Trade_{j,t}} \right)$$

$BTI_{ij,t}$ is obtained by dividing the sum of bilateral trade flows between i and j by the sum of total trade of country i, $Trade_{i,t}$, $Trade_{j,t}$ and j, respectively, at time t. In the literature, it is common to use either this approach or to scale the sum of total trade by the sum of both countries' GDP. However, as argued in Frankel and Romer (1999), countries with higher income are possibly more active in trading. Therefore, using bilateral trade as a percentage of GDP as a determinant of BCS could lead to biased results as our country sample is very heterogeneous with respect to income levels.

As discussed above, the endogeneity of the relationship between trade integration and BCS has been widely acknowledged in the literature. To tackle this issue, we follow e.g. Calderón et al. (2007), Frankel and Rose (1997) or Frankel and Romer (1999) by instrumenting bilateral trade intensity with a gravity model variable. As an instrument, we use the log of the distance between the capital cities of each country pair, which is taken from the CEPII's database on geographical variables.[7]

Another commonly used variable is the degree of economic specialization, which could affect the impact of trade on BCS. In this case, we follow Calderón et al. (2007) and Barajas et al. (2012) and calculate a simple asymmetry of production index

(IV)

$$ASP_{ij,t} = \frac{1}{k} \sum_{k=1}^{3} \left| v_{ki,t} - v_{kj,t} \right|$$

where $ASP_{ij,t}$ denominates the mean[8] of absolute differences of the value added share in the total production of each country v of sector k for each country pair in each year. Like Barajas et al. (2012), we focus on three sectors, namely agriculture, industry and services.

Fiscal policy is another possible determinant of BCS. On the one hand, fiscal policy can be used as a stabilizer at the national level to help smoothing the business cycle but on the other hand, fiscal policy can by itself be the source of idiosyncratic shocks. To account for the role of fiscal policy, usually the difference between a country pair's budget balances is used for measuring fiscal differences between country pairs; but as the budget balance itself is affected by the business cycle, the issue of endogeneity has to be tackled to avoid reverse causality issues. In

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[7] The CEPII database does not provide individual data for Serbia and Montenegro. Therefore, we use the same measure for both countries.

[8] Instead of using the sum of absolute differences as in Barajas et al. (2012), we use the mean given that data points are missing in some sectors.

this paper, we follow a popular approach by using the difference of the cyclically adjusted budget balances between each country pair i and j in each year t.

(V)

$$FD_{ij,t} = \left| CAB_{i,t} - CAB_{j,t} \right|$$

For the EU countries, the cyclically adjusted budget balance is available from the European Commission's annual macro-economic (AMECO) database. Estimates of the cyclically adjusted budget balance do not exist for the Western Balkan countries, however.[9] Therefore, we use the budget balance reported for each country in the Vienna Institute for International Economic Studies (wiiw) database and adjust it using the method employed by the European Commission (see Mourre et al., 2014).[10]

The role of common monetary policy in BCS has entered the discussion mainly with respect to the question whether the business cycles of members of currency areas tend to synchronize – either because currency areas boost trade, which in turn increases output synchronization, or because there is a currency union effect *per se* (see Gächter and Riedl, 2014). Belke and Zenkic (2007) argue that the choice of exchange rate regime plays an important role in making the Western Balkan countries' transition process, and eventually their further EU integration, a success.[11] In the regression, common monetary policy is accounted for by using a bilateral dummy variable. It takes the value of 0 at all points in time for Albania, Croatia and Serbia, since these countries – at least *de jure* – do not fix their exchange rates. For the remaining Western Balkan countries, the dummy variable is set to 1 vis-à-vis Germany, starting from the year in which their currencies were pegged to the Deutsche mark (1995 for FYR Macedonia, 1998 for Bosnia and Herzegovina, 1999 for Montenegro). Following the euro cash changeover in 2002, the dummy variable takes the value of 1 vis-à-vis the 12 original euro area countries. Subsequently, the dummy variable for Bosnia and Herzegovina, FYR Macedonia and Montenegro changes to the value of 1 vis-à-vis Slovenia (2007), Cyprus and Malta (2008), Slovakia (2009) and Estonia (2011).

To test for the impact of financial flows, we follow Artis et al. (2008) and use FDI flows scaled by both countries' GDP, compiled from the United Nations Conference on Trade and Development (UNCTAD) FDI database and the wiiw database:

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[9] *Croatia's cyclically adjusted budget balance has been available on AMECO only since 2001; in our paper, we therefore treat Croatia like the other Western Balkan economies.*

[10] *Following the European Commission, we calculate the cyclically adjusted budget balance by*

$$CAB_{i,t} = \frac{B_{i,t}}{Y_{i,t}} - \varepsilon * \frac{(Y_{i,t} - Y_{i,t}^p)}{Y_{i,t}^p} \quad \text{where} \quad \frac{B_{i,t}}{Y_{i,t}} \text{ denotes the nominal budget balance in terms of country } i\text{'s GDP at year } t,$$

ε stands for budgetary semielasticity, which is a measure of the budget balance's reaction to the level of the output gap $\frac{(Y_{i,t} - Y_{i,t}^p)}{Y_{i,t}^p}$. To calculate the output gap, we take the potential output $Y_{i,t}^p$ obtained from the HP filter described in section 2.1; for ε we assume a semielasticity of 0.42, which is the unweighted average of the budgetary semielasticities of the individual countries that joined the EU after 2004.

[11] *The authors would like to point out that other factors such as legal and institutional reforms are relevant as well. However, these factors are largely time invariant and have already been incorporated in the regression by country-pair dummies.*

(VI)

$$FDI_{ij,t} = \left(\frac{FDI_{ij,t}^{I}}{Y_{i,t} + Y_{j,t}} \right)$$

Because only data on inward FDI are available for some Western Balkan countries, we use bilateral net inward FDI flows between the countries i (EU country, sender) and j (Western Balkan country, recipient), scaled by the sum of both countries' GDP. We do not expect that excluding outward FDI flows will bias our results as the available data show that outward FDI flows from the Western Balkans to the EU are negligible.

Another proxy for financial flows is taken from the Bank for International Settlement (BIS) locational[12] banking statistics database, which provides data on international financial claims and liabilities of bank offices residing in the BIS reporting countries vis-à-vis the country of residence of the bank's respective counterparty. However, reporting countries neither include the CESEE EU Member States nor Malta, which substantially constraints the observations. In a manner analogous to the construction of the trade and FDI variable, we define

(VII)

$$BF_{ij,t} = \left(\frac{A_{ij,t} + L_{ij,t}}{Y_{i,t} + Y_{j,t}} \right)$$

where bank flows between two countries i and j, $BF_{ij,t}$, are measured as the sum of exchange rate-adjusted flows in assets A_{ij} and liabilities L_{ij} divided by the sum of both countries' GDP.

Remittances are an important source of income in most Western Balkan countries. To take account of the importance of these flows to the Western Balkans, we investigate the effect remittances on BCS between the sending and the recipient country. No data are available on bilateral remittances that fully cover our country sample and time period. However, the World Bank provides data on the aggregate remittance flows the Western Balkan countries received from the EU in a specific year. We use these data for calculating proxies for bilateral flows of remittances.[13] Bilateral migration data are provided by UNCTAD:[14]

(VIII)

$$R_{ij,t} = \frac{M_{ij,t}}{M_{j,t}^{EU}} * R_{i,t}^{EU}$$

Remittances R sent from country i to country j at time t are calculated by dividing the number of migrants M of home country j living in host country i at time t by the total number of migrants of the home country (migration share), which is multiplied by total remittances originating from the EU. It has to be noted that, by

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[12] We use the locational instead of the consolidated banking statistics because they include lending to subsidiaries and affiliates, which would be netted out otherwise.

[13] As inflows of remittances to the home country are significantly correlated with the degree of migrants living in the migrants' host country (see e.g. IMF, 2005, and Lueth and Ruiz-Arranz, 2008), we assume that the amount remitted to a Western Balkan country from a certain EU country depends on the number of migrants living in the EU host country as a share of the total number of migrants living in the EU.

[14] Bilateral migration flows are only available for the years 1990, 2000, 2010, 2012 and 2013. For missing years, we approximate the values by calculating moving averages.

construction, business cycles of the respective EU countries are not reflected in the constructed variable. However, there is empirical evidence that cyclical output developments of the sending country are more or less irrelevant for the propensity to remit (Akkoyunlu and Kholodilin, 2008; Sayan and Tekin-Koru, 2012; Vargas-Silva, 2008).

For estimation[15] we use a system GMM estimator developed by Blundell and Bond (1998), which allows us to instrument endogenous variables with their own lags. Additionally, we employ one external instrument (distance between capital cities) for all regressions. Asymmetry of production, fiscal differences, quasi-common monetary policy and the distance between capital cities are considered exogenous control variables or instruments, while the other variables are treated as endogenous variables because they are correlated with past and possibly current realizations of the error term. Because the two-step estimation typically yields standard errors that are downward biased, we choose the more efficient Windmeijer's finite sample correction for the two-step covariance matrix.

3.3 Regression results

Table 2 shows the estimation results of the regressions performed. In addition to the obtained coefficients, we show the results of the Arellano-Bond tests for autocorrelation as, by construction, in first differences an autoregressive [AR](1) pro-

Table 2

Regression results

Variable/model	(1)	(2)	(3)	(4)	(5)
Lagged bilateral business cycle synchronization	0.080*** (0.028)	0.085*** (0.028)	0.071** (0.030)	−0.013 (0.046)	0.038 (0.030)
Bilateral trade	0.046* (0.024)	0.038* (0.021)	0.075*** (0.028)	−0.020 (0.035)	0.044** (0.020)
Asymmetry of production	0.003 (0.007)	0.005 (0.007)	−0.003 (0.009)	−0.016 0.012	0.012 (0.007)
Fiscal differences	−0.018** (0.009)	−0.018** (0.008)	−0.028*** (0.009)	0.006 (0.012)	−0.020** (0.008)
Common monetary policy		0.065 (0.071)			
Bilateral FDI			−0.009** (0.004)		
Bilateral bank flows				−0.011** (0.004)	
Bilateral remittances					−0.015* (0.008)
Constant	1.006** (0.514)	1.102*** (0.214)	0.598*** (0.177)	0.365 (0.670)	0.759*** (0.227)
Arellano-Bond test AR(1)	−8.16***	−8.20***	−7.40***	−4.33***	−7.58***
Arellano-Bond test AR(2)	1.24	1.32	0.89	−0.31	0.75
Hansen p-value	0.989	0.991	0.956	0.997	0.966
Number of instruments	205	206	192	135	192
Observations	2,245	2,245	1,994	994	1,905

Source: Authors' calculations.

*Note: Dependent variable: bilateral BCS. Standard errors are reported in parentheses. *, **, *** indicate a significance level of 10%, 5% and 1%, respectively. Out-of-sample instrument included: logdistcap. In-sample instruments: up to 4 lags. Time dummies are included but not reported. Maximum time span: 1994–2013.*

[15] *Our estimation was carried out in STATA, using the xtabond2 environment developed by Roodman (2009).*

cess is expected but autocorrelation of AR(2) should not be present because that would indicate that the second lags of endogeneous variables are poor instruments. We also include the p-values of the Hansen test for overidentifying restrictions. Column (1) reports the results from the "baseline" regression that includes bilateral trade, asymmetry of production and fiscal differences. Columns (2) to (5) add several variables, one at a time, to the baseline model, namely common monetary policy (3), bilateral FDI flows (4), bilateral bank flows (5) and bilateral remittances (6). The results of the Arellano-Bond tests confirm that the lags used as instruments are valid and the Hansen p-values indicate that the results are robust to overfitting.

The results of the baseline regression are in line with the findings of empirical literature. The coefficient of bilateral trade is positive as expected. As pointed out above, some authors have argued that the trade effect for uneven country pairs is usually negligible. The magnitude of the trade coefficient in our baseline regression does not support this hypothesis; however, it can be noted that the coefficient obtained is only one-third of the size of the trade coefficient identified in Gächter and Riedl (2014), who use a similar econometric model but estimate the determinants of BCS between countries within the EU. The asymmetry of the production index yields no significant result; thus we conclude that economic specialization did not play a role in the business cycle convergence process between the Western Balkans and the EU in the observation period. In the baseline regression we also test the effect of fiscal differences; the resulting negative coefficient is in line with the majority of earlier studies (see e.g. Darvas et al., 2005; or Crespo-Cuaresma et al., 2011) which argued that fiscal policy was the source of idiosyncratic shocks and thus led to greater business cycle divergence.

In the next step (2), we add a dummy variable for common monetary policy as described above. However, using the dummy variable does not yield any statistically significant result, meaning that *ceteris paribus* a Western Balkan country that uses the euro as its currency or nominal anchor does not exhibit higher business cycle correlation with the euro area countries than other Western Balkan countries.

In column (3) we add FDI to test for the effect of financial flows on BCS. The result confirms the negative impact of financial flows found by Kalemli-Ozcan et al. (2009) and García-Herreo and Ruiz (2008). Our result points to the argument that FDI flows are procyclical and thus reduce BCS between the Western Balkans and the EU. Although the coefficient seems small, it is rather large when we look at standardized coefficients, which is useful when the regressors are scaled differently (Wooldridge, 2009), as is the case for trade and FDI in our sample. The standardized coefficient[16] is 0.130 for trade and −0.182 for FDI; thus, an increase in the standard deviation of FDI has a stronger effect on BCS than an increase in the standard deviation of trade. A comparison of the coefficient of trade in model (3) with the coefficient obtained in the baseline model (1) supports the argument

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[16] *The standardized coefficient is calculated by multiplying the derived coefficient by the standard deviation of the respective independent variable and dividing it by the standard deviation of the dependent variable (i.e.*

BCS). The transformation of trade is thus obtained by $0.075 * \frac{2.028}{1.174} \approx 0.130$; *the transformation of FDI by*
$-0.009 * \frac{23.689}{1.174} \approx -0.182$.

brought forward by Dées and Zorell (2011) that FDI has an indirect positive effect on BCS via trade.

In model (4) we attempt to test whether the negative correlation coefficient of FDI obtained in model (3) holds when another measure of financial flows is used, namely the flows of bank assets and liabilities between two countries. Unfortunately, because data are not available for all CESEE EU countries and for Malta, about half of the observations have to be dropped in the regression, which causes almost all indicators to become insignificant. However, the coefficient of bank flows is significant, negative and about the same size as the coefficient of FDI in model (3), which tends to confirm the negative impact of financial flows on BCS.

Column (5) reports the regression results obtained when taking into account bilateral remittance flows. In contrast to the results of Barajas et al. (2012), the obtained coefficient is negative, indicating that remittance flows from the EU to the Western Balkans decrease BCS. To the best of our knowledge, no theoretical or empirical research apart from Barajas et al. (2012) has so far included the role of remittances in BCS. However, there is literature that investigates the relationship between remittances and the business cycle of the recipient country.[17] There are two hypotheses on the motives behind remittances (Chami et al., 2008). On the one hand, when sent in order to take advantage of high returns or favorable economic conditions, remittances could exhibit procyclical properties (see Sayan and Tekin-Koru, 2012, for Turkey; Isokovic and Ilgun, 2015, for Bosnia and Herzegovina; Lueth and Ruiz-Arranz, 2006, for a global data set). If this was the case, remittance flows would have a negative effect on BCS by enhancing the size of the business cycle of the recipient country, similar to financial flows. On the other hand, remittances could be used to compensate recipients for unfavorable economic conditions and thus help smooth their consumption patterns. This hypothesis would imply anticyclical behavior with respect to the business cycle (see e.g. Frankel, 2011; Sayan, 2006) and a positive impact of remittances on BCS between the sending and the receiving country.[18] Our result suggests that remittances from the EU to the Western Balkans exhibit procyclical behavior with respect to the business cycle in the Western Balkan economies. Standardizing the coefficient of remittances yields a value of 0.036, while the standardized coefficient of trade in this regression is 0.076.[19] Thus, the effect of an increase in a standard deviation of remittances on BCS is about half the size of the effect of a decrease in a standard deviation of trade.

According to the literature, it may be possible that idiosyncratic shocks are transmitted with lags; if this was the case, explanatory variables in one period would affect BCS mainly in the subsequent period. To test this assumption and to put additional restrictions on reverse causality issues at the same time, the most

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[17] *As discussed above, empirical evidence points to the fact that cyclical output developments of the sending country are more or less irrelevant for the propensity to remit.*

[18] *Motives behind remittances do not necessarily have to be congruent with their final use; microeconomic evidence suggests that the majority of remittances is often used for consumption, but that a significant part of remittances also goes into saving or investment (Chami et al., 2008).*

[19] *The transformation of trade is obtained by* $0.044 * \dfrac{2.028}{1.174} \approx 0.076$ *; the transformation of remittances by*
$-0.015 * \dfrac{2.790}{1.174} \approx -0.036.$

important regressions provided in table 3 are re-estimated by lagging all explanatory variables by one period (the lagged bilateral dependent variable is kept at the lag of one period).

Performing a robustness test by lagging the explanatory variables by one year yields rather interesting results. The signs of the coefficients of trade, FDI and remittances do not change; instead, the magnitude of the coefficient of trade and of the coefficient of remittances even grows. This leads to the conclusion that idiosyncratic shocks are indeed transmitted with lags. In contrast to the other explanatory variables, the coefficient of fiscal differences becomes positive, larger in magnitude and more significant. The regression results presented in table 3 show that fiscal differences are negatively correlated with BCS in the same year. Thus, we argued that fiscal differences are the result of idiosyncratic shocks.

Table 3

Regression results when lagging explanatory variables

Variable/model	(1)	(3)	(5)
Lagged bilateral business cycle synchronization	0.070** (0.028)	0.046 (0.028)	0.041 (0.030)
Lagged bilateral trade	0.049** (0.020)	0.076*** (0.024)	0.059*** (0.022)
Lagged asymmetry of production	−0.001 (0.007)	−0.013 (0.009)	0.003 (0.007)
Lagged fiscal differences	0.042*** (0.013)	0.046*** (0.015)	0.048*** (0.011)
Lagged bilateral FDI		−0.009*** (0.003)	
Lagged bilateral remittances			−0.024* (0.013)
Constant	0.989 (0.762)	0.367** (0.182)	1.647** (0.651)
Arellano-Bond test AR(1)	−8.11***	−7.33***	−7.35***
Arellano-Bond test AR(2)	0.82	0.05	0.20
Hansen p-value	0.957	0.934	0.944
Number of instruments	196	182	182
Observations	2,127	1,878	1,760

Source: Authors' calculations.

Note: Dependent variable: bilateral BCS. Standard errors are reported in parentheses. *, **, *** indicate a significance level of 10%, 5% and 1%, respectively. Out-of-sample instrument included: logdistcap. In-sample instruments: up to 4 lags. Time dummies are included but not reported. Maximum time span: 1995–2013.

However, the outcome of lagging the explanatory variables suggests that fiscal differences actually lead to *higher* BCS in the following year. The positive sign of the coefficient even holds when the fiscal difference variable is lagged by two years.[20] As argued above, while we cannot instrument fiscal differences, we use the cyclically adjusted budget balance to correct the cyclical component of fiscal spending. However, regressing the fiscal differences on the BCS of the same year does not completely solve the issue of reverse causality. If policymakers anticipated a recession (boom) during the current year or even before the year begins, they could increase (decrease) public consumption or investment to smooth the business cycle. Under the assumption that anticyclical policy needs some time to become effective, such a policy reaction would suggest a negative relationship between BCS fiscal differences in the same year, but as soon as the anticyclical measures unfold, fiscal differences would lead to higher synchronization in subsequent years. To conclude, the changing sign of fiscal differences suggests that fiscal policy is used as an economic stabilizer to help smoothing the business cycle rather than being the source of idiosyncratic shocks.

Moreover, to rule out that the results obtained are driven by the dynamics of one country we run the regressions of table 2 again, excluding one Western Balkan country at a time. The estimated coefficients prove to be robust in the sense that the signs do not change.[21] However, some of the coefficients become insignificant, which can be traced back to the loss of observations (25 country

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[20] For brevity reasons, results are not reported here but are available from the authors upon request.

[21] See footnote 20.

pairs multiplied by the available time span) in each regression. Similarly, we also estimate each of the models in table 2 with a smaller data set that comprises only the current 19 euro area countries instead of the EU-25. Again, our results do not change qualitatively.

4 Conclusions

This paper fills several gaps in the literature. It is the first that investigates the business cycle synchronization (BCS) of *all* Western Balkan economies with the EU-25, i.e. the EU excluding Denmark, Croatia and the U.K., and the first that empirically identifies the determinants of BCS between the two regions. For this purpose, we use a period-by-period correlation index to analyze the convergence process on a yearly basis. Because BCS estimations are prone to endogeneity problems, we employ a system GMM estimator that instruments potentially endogenous variables with their own lagged values.

We clearly identify a process of business cycle convergence between the Western Balkan economies and the EU-25 aggregate from the early transition phase in the 1990s up to the year 2013. While prior to 2009, convergence was higher for Bosnia and Herzegovina, Croatia, FYR Macedonia and Montenegro than for the other Western Balkan countries, after the 2009 crisis year BCS has been high for all Western Balkan countries. Thus, in recent years, the lack or narrow limits of independent monetary policy in the Western Balkans seem not to have been very costly from the perspective of business cycle developments. However, it remains to be seen whether the high degree of business cycle convergence will continue in the longer term. Moreover, it should be recalled that in this study we only examine one of the multiple OCA criteria.

With respect of the determinants of BCS between the Western Balkans and the EU, we find that foreign trade is the most important positive factor. This result is in line with earlier studies that used different regional or global samples. Another variable that is usually tested for in the BCS literature are the fiscal differences between two countries. Here, our results differ somewhat from the findings of other papers. While we also find a negative coefficient of fiscal differences for BCS in the same year, the sign of the coefficient becomes positive in the subsequent years. It therefore seems that fiscal policy is used as an economic stabilizer to help smooth the business cycle rather than being a source of idiosyncratic shocks as has been argued in earlier studies.

We also include two possible determinants of BCS that are less frequently used in the literature but which we assume to be very important in our specific country sample. One is FDI inflows, which poured into the Western Balkans especially in the years preceding the crisis. While empirical studies have not delivered a definite answer on the effect of financial flows on BCS so far, our results show that in the case of the Western Balkans, FDI has led to business cycle divergence. We explain this outcome by the procyclical nature of FDI.

There is hardly any literature on the impact of remittance flows on BCS. One study discovered a positive impact of remittances on BCS. Our results are to the contrary, as we find that remittances sent from EU countries to the Western Balkans actually lead to business cycle decoupling. This supports the hypothesis that remittances exhibit procyclical properties with respect to the receiving economy, similarly to FDI flows.

References

Arellano, M. and S. Bond. 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. Review of Economic Studies 58(2). 277–297. April.

Akkoyunlu, S. and K. A. Kholodilin. 2008. A link between workers' remittances and business cycles in Germany and Turkey. Emerging Markets Finance and Trade 44(5).

Artis, M.J., J. Fidrmuc and J. Scharler. 2008. The transmission of business cycles. The Economics of Transition 16(3). 559–582.

Babetskii, I. 2005. Trade integration and synchronization of shocks. The Economics of Transition 13(1). 105–138.

Barajas, A., R. Chami, C. Ebeke and S.J.A. Tapsoba. 2012. Workers' remittances: An overlooked channel of international business cycle transmission? IMF Working Paper 12/251. October 1.

Belke, A. and J. Heine. 2006. On the endogeneity of an exogenous OCA-criterion: Specialization and the correlation of regional business cycles in Europe. Empirica 34/1. 15–47.

Belke, A. and A. Zenkic. 2007. Exchange-rate Regimes and the Transition Process in the Western Balkans. Intereconomics: Review of European Economic Policy. Springer 42(5). 267–280. September.

Blundell, R. and S. Bond. 1998. Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics 87(1). 115–143.

Bonetto, F., S. Redzepagic and A. Tykhonenko. 2009. Balkan countries: catching up and their integration in the European financial system. Panoeconomicus 2009(4). 475–489.

Calderón, C., A. Chong and E. Stein. 2007. Trade intensity and business cycle synchronization: Are developing countries any different? Journal of International Economics 71. 2–21.

Cerqueira, P.A. 2013. A closer look at the world business cycle synchronization. International Economics and Economic Policy 10(3). 349–363.

Cerqueira, P.A. and R. Martins. 2009. Measuring the determinants of business cycle synchronization using a panel approach. Economic Letters 102 (2). 106–108.

Chami, R., A. Barajas, T. Cosimano, C. Fullenkamp, M. Gapen and P. Montiel. 2008. Macroeconomic consequences of remittances. IMF Occassional Paper 259. Washington, D.C.: IMF.

Crespo-Cuaresma, J., M. Pfaffermayr, O.Fernández Amador and C. Keppel. 2011. Macroeconomic aspects of European integration: Fiscal policy, trade integration and the European business cycle. FIW Research Reports III-004. FIW.

Darvas, Z., A.K. Rose and G. Szapáry. 2005. Fiscal divergence and business cycle synchronization: Irresponsibility is idiosyncratic. NBER Chapters. NBER International Seminar on Macroeconomics 2005. National Bureau of Economic Research Inc. 261–298.

Darvas, Z. and G. Szapáry. 2008. Business cycle synchronization in the enlarged EU. Open Economies Review 19(1). 1–19. February.

De Grauwe, P. and F.P. Mongelli. 2005. Endogeneities of optimum currency areas: what brings countries sharing a single currency closer together? ECB Working Paper Series 0468. European Central Bank.

De Haan, J. R., R. Inklaar and R. Jong-A-Pin. 2008. Will business cycles in the Euro Area converge? A critical survey of empirical research. Journal of Economic Surveys 22(2). 234–273. April.

Dées, S. and N. Zorell. 2011. Business cycle synchronisation: disentangling trade and financial linkages. ECB Working Paper Series 1322. European Central Bank.

European Commission. 2015. European Neighborhood Policy and Enlargement and Enlargement Negotiations. Enlargement Policy – Check Current Status. Retrieved in June 2015 from: http://ec.europa.eu/enlargement/countries/check-current-status/index_en.htm.

European Council. 2003. General affairs and external relations. 2518th Council Meeting. Luxembourg. June 16. Retrieved in June 2015 from:
http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressdata/en/gena/76201.pdf.

Frankel, J.A. and D. Romer. 1999. Does trade cause growth? American Economic Review 89(3). 379–399.

Frankel, J.A. and A.K. Rose. 1997. Is EMU more justifiable ex post than ex ante? European Economic Review 41(1997). 753–760.

Frankel, J.A. and A.K. Rose. 1998. The endogeneity of the optimum currency area criteria. The Economic Journal 108(449). 1009–1025.

Gächter, M. and A. Riedl. 2014. One money, one cycle? The EMU experience. Journal of Macroeconomics 42 (2014). 141–155.

García-Herreo, A. and J.M. Ruiz. 2008. Do trade and financial linkages foster business cycle synchronization in a small economy? Banco de España. Working Papers 0810.

Gouveia S. 2014. Business cycle correlation between the euro area and the Balkan countries. International Journal of Economic Sciences and Applied Research 7 (1). 22–49. April.

IMF. 2005. Chapter II – Two current issues facing developing countries. WEO April 2005. Washington, D.C.: IMF.

Imbs, J. 2006. The real effects of financial integration. Journal of International Economics 68 (2006). 296–324.

Inklaar, R., Jong-A-Pin, R. and J. de Haan. 2008. Trade and business cycle synchronization in OECD countries – A re-examination. European Economic Review, Elsevier 52(4). 646–666. May.

Isokovic, N. and E. Ilgun. 2015. Cyclical properties of workers' remittances: Evidence from Bosnia and Herzegovina. International Journal of Economics and Financial Issues 5(1). 172–187.

Kalemli-Ozcan. S., E. Papaioannou and J.L. Peydró. 2009. Financial integration and business cycle synchronization. CEPR 7292. C.E.P.R. Discussion Papers.

Kenen, P. 1969. The theory of optimum currency areas: An eclectic view. In: R. Mundell and A. Swoboda (eds.). Monetary Problems in the International Economy. Chicago: University of Chicago Press.

Lueth, E. and M. Ruiz-Arranz. 2006. A gravity model of workers' remittances. IMF Working Paper. WP/06/290.

Lueth, E. and M. Ruiz-Arranz. 2008. Determinants of bilateral remittance flows. The B.E. Journal of Macroeconomics 8(1). Article 26.

McKinnon, R. 1963. Optimum currency areas. American Economic Review 53. 717–724. September.

Mise, E., T.-H. Kim and P. Newbold. 2005. On suboptimality of the Hodrick-Prescott filter at time series endpoints. Journal of Macroeconomics 27 (2005). 53–67.

Massmann, M. and J. Mitchell, J. 2004. Reconsidering the evidence: are Eurozone business cycles converging? Money Macro and Finance (MMF) Research Group Conference 2003 (67). Money Macro and Finance Research Group.

Mourre, G., C. Astarita and S. Princen 2014. Adjusting the budget balance for the business cycle: the EU methodology. European Economy. Economic Papers 536. November.

Mundell, R. 1961. A theory of optimum currency areas. American Economic Review 51 (4). 657–665.

Petreski, M. and B. Jovanovic. 2013. Do remittances reduce poverty and inequality in the Western Balkans? Evidence from Macedonia. MPRA Paper No. 51413. Retrieved in June 2015 from: http://mpra.ub.uni-muenchen.de/51413/.

Roodman, D. 2009. How to do xtabond2: An introduction to difference and system GMM in Stata. Stata Journal 9(1). 86–136.

Sayan, S. and A. Tekin-Koru. 2012. Remittances, business cycles and poverty: The recent Turkish experience. International Migration 50 (S1). 151–176. February.

Vargas-Silva, C. 2008. Are remittances manna from heaven? A look at the business cycle properties of remittances. The North American Journal of Economics and Finance 19(3). 290–303. December.

Velickovski, I. 2013. Assessing independent monetary policy in small, open and euroized countries: evidence from Western Balkan. Empirical Economics 45(1). 137–156. August.

World Bank. 2004. Serbia and Montenegro: An Agenda for Economic Growth and Employment. Washington, D.C.: World Bank.

Wooldridge, J.M. 2009. Introductory Econometrics. Fourth edition. Mason, Ohio: Thomson/ South Western.

Annex

Table A1

Data sources

Variable	Source
Real GDP	WEO
Trade	IMF DOTS database
Gravity variable (distcap)	CEPII
Asymmetry of production	WDI
Cyclically adjusted budget balance	Ameco, wiiw
FDI	UNCTAD FDI, wiiw
Bank flows (BF)	BIS statistics
Remittances	World Bank
Migration data	UNCTAT

Source: Authors' compilation.

Table A2

Descriptive statistics

Variable	Number of observations	Mean	Standard deviation	Minimum	Maximum
BCS	2,801	1.037	1.174	−1.289	7.991
Log(trade)	2,402	−8.101	2.028	−16.888	−2.694
Asymmetry of production	2,986	9.122	6.157	0.047	38.139
Fiscal differences	2,554	3.579	3.473	0	51.149
Monetary policy	3,750	0.141	0.348	0	1
Log(FDI)	2,146	−34.846	23.689	−57.565	−4.501
Log(bank flows)	1,244	−35.229	23.829	−57.565	−3.766
Remittances	2,275	0.842	3.007	0	27.745

Source: Authors' calculations.

Current risks in the CESEE residential property market: evidence from the OeNB Euro Survey

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After a pronounced boom-bust cycle during the global financial crisis, house prices in Central, Eastern and Southeastern Europe (CESEE) are now recovering but still remain below precrisis levels. Evidence from the OeNB Euro Survey of households shows that every third household considers finding a new residence difficult, with the perceived difficulty being particularly high in areas of low bank penetration and among low income households and households whose highest level of education is primary education. Foreign currency mortgage holders are found to be more frequently in arrears in Hungary and Serbia than in other CESEE countries; the exchange rate and interest rate differential risks of foreign currency mortgages have increased in several countries, however. Loan arrears are high in general, and households in arrears are at their financial limits. At the same time, demand for housing loans is found to be increasing again.

Strong fluctuations of house prices can have major repercussions on the financial position of households and eventually on the risk-bearing capacity of borrowers. Cesa-Bianchi et al. (2015) show that house prices in emerging markets grow faster and are more volatile than in advanced economies, and that global liquidity shocks have a stronger impact on house prices and consumption in emerging markets. During the crisis, Central, Eastern and Southeastern Europe (CESEE)[2] experienced a pronounced boom-bust cycle of both house prices and credit growth. Empirical evidence shows that the rise of house prices in CESEE in the run-up to the crisis had no longer been justified by economic fundamentals, which eventually resulted in a sharp price correction (Ciarlone, 2012; Huynh-Olesen et al., 2013; Égert and Mihaljek, 2007). Recently, house prices in CESEE have recovered but have not reached precrisis levels.[3]

Prior to the crisis, the overall improvement of borrowing conditions strongly pushed up demand for housing loans in CESEE,[4] which was particularly amplified by funding provided by foreign banks to their local subsidiaries (Huynh-Olesen et al., 2013). Given the massive inflow of capital to CESEE, foreign currency lending (in particular denominated in euro and Swiss franc) became a widespread phenomenon that also boosted the asset price boom (ECB, 2012).

Chart 1

Nonperforming loans in CESEE

% of total loans
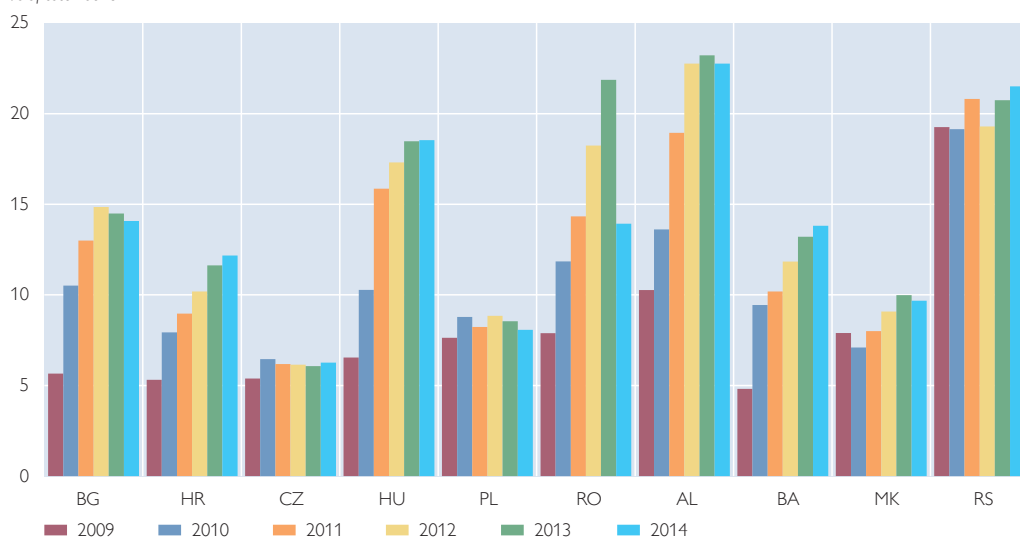
Source: National central banks.

The CESEE economies were hit particularly hard by the global financial crisis, with private consumption declining on average in seven out of ten countries and real income stagnating or even decreasing between 2009 and 2013 (EBRD, 2011; Corti and Scheiber, 2014). In combination with the house price bust, this has left most CESEE countries with a high share of nonperforming loans (NPLs) in total loans (chart 1).[5]

Against this background, this paper interlinks developments in CESEE residential property markets as seen from a macroeconomic perspective with unique evidence from the OeNB Euro Survey of CESEE households. In particular, we address the following questions: What are the most prominent structural features of CESEE residential property markets and how are these related to demand for housing and, more specifically, housing finance? What are the characteristics of current mortgagers and of existing mortgages, and how vulnerable are mortgagers? Finally, looking at the high percentage of NPLs, we examine which households are in loan arrears and provide some indication on the chances for an improvement in the financial situation of mortgage-holding households.

The next section describes the data source used, i.e. OeNB Euro Survey data. Section 2 discusses specific structural aspects of CESEE housing markets which impact the demand for housing finance. Section 3 zooms in on housing finance, analyzing the risk-bearing capacity of current mortgagers and the outlook for resolving NPLs. In the last section, we summarize our results and discuss some policy implications.

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[5] *For most countries, data on NPLs are only available as the NPL share in total loans, while for Croatia, Hungary, Poland and Serbia disaggregated data are available as well. Except in Hungary, NPLs of households have a lower share in total loans than NPLs of nonfinancial corporations.*

1 The OeNB Euro Survey

The data source we use is the OeNB Euro Survey of households, which has been carried out on commission of the OeNB in Albania, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, FYR Macedonia, Hungary, Poland, Romania and Serbia on a semiannual basis since fall 2007. The latest survey wave took place in fall 2014. In each survey wave, a representative sample of 1,000 individuals is polled in each country in a multi-stage stratified random sampling procedure. The sample is representative of the country's population with regard to age, gender and region. The target population comprises residents aged 15 years or older. Interviews are carried out face-to-face at the respective respondent's home. The survey collects information on households' loan and saving decisions as well as their economic sentiments and expectations and focuses on the role of the euro in households' portfolios. We specifically utilize the data collected during the survey wave of fall 2014, which included a number of questions related to the housing market and, in particular, to housing finance.[6]

2 Housing markets in CESEE

Generally, CESEE housing markets are strongly heterogeneous, given the different strategies countries followed during the transition process (OECD, 2002). However, they also exhibit some common characteristics.[7] One well-known but striking feature of residential property markets in CESEE is the dominance of owner-occupied housing: on average 80% of households (according to the OeNB Euro Survey) own their primary residence[8], compared with 67% in the euro area (according to Eurostat). Mostly, the high levels of owner-occupied housing in CESEE go back to the privatization or restitution process at the beginning of transition (for more details, see Hildebrandt et al., 2012) but they also result, in part, from a lack of rental housing (Amann and Bezgachina, 2013). In addition, mortgage financing is not very widespread in general, but more prevalent in the CESEE EU Member States than in the Western Balkan countries, possibly because credit markets are more developed there.

The high degree of homeownership in CESEE prompts the question whether there is actually any significant demand for housing and housing finance in the region. While the OeNB Euro Survey shows that most respondents are very satisfied with their current residence, housing deprivation[9] is considerably higher in CESEE than for the EU-28 average (Eurostat, 2012). The low quality of the CESEE housing stock is largely attributable to underinvestment during socialist times and also to the high share of poor homeowners who obtained their homes in the course

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[6] Further details on the OeNB Euro Survey are summarized by Brown and Stix (2015), and selected results can be found at www.oenb.at/en/Monetary-Policy/Surveys/OeNB-Euro-Survey.html.

[7] For an overview of the main structural features of housing markets, refer to Hildebrandt et al. (2012), Mihaljek and Subelyte (2014) and IIBW (2013).

[8] All averages for the entire sample of countries included in the Euro Survey are weighted by sampling weights and each country's population size.

[9] According to Eurostat, severe housing deprivation is defined as the percentage of the population living in a home which is considered overcrowded while also exhibiting at least one of a set of specific housing deprivation measures. Housing deprivation is a measure of poor amenities and is calculated by referring to homes with a leaking roof, no bath or shower and no indoor toilet, or a home that is considered too dark. For more details, see ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Severe_housing_deprivation_rate.

Table 1

Demand elasticity of homeowners, mortgagers and non-owners

Answers to the Euro Survey question: "I strongly prefer to stay in the area of the town/village where I currently live and would cut back on other expenses rather than consider a move."

	Homeowners	Mortgagers	Non-owners	Null hypothesis:	Null hypothesis:
	(a)	(b)	(c)	a=b	a=c
	%			p-value	
Bulgaria	63	64	33	0.90	0.00
Croatia	50	42	35	0.01	0.00
Czech Republic	43	48	31	0.29	0.00
Hungary	41	36	22	0.64	0.00
Poland	41	38	34	0.58	0.18
Romania	54	42	33	0.07	0.00
Albania	53	77	45	0.09	0.89
Bosnia and Herzegovina	42	33	32	0.33	0.00
FYR Macedonia	50	54	41	0.61	0.10
Serbia	54	49	37	0.60	0.01

Source: OeNB Euro Survey, fall 2014.

Note: EU countries and non-EU countries in alphabetical order.

of the privatization or restitution process but are not able to cover maintenance costs (IIBW, 2013). This view is substantiated if one compares the socioeconomic characteristics of homeowners with those of non-owners. We find that the percentage of unemployed respondents is higher among homeowners.[10]

Sinai and Souleles (2005) argue that if the owner-occupation rate is high (and the rental rate low), a large share of the population is well-hedged against house price volatility. Indeed, apart from featuring high ownership rates, CESEE housing markets are also marked by low transaction levels. According to OeNB Euro Survey evidence, between 5% (Hungary) and 29% (FYR Macedonia) of respondents have never moved house in their lives.

Table 1 suggests that demand elasticity is also lower among homeowners than among non-owners. Interestingly, in this respect there is no significant difference between homeowners and mortgagers. However, macrodata evidence suggests that the stabilizing effect of high ownership rates is small.

3 Housing finance

While housing loans are higher than consumption loans (Lahnsteiner, 2013), the percentage of CESEE households holding a mortgage is fairly low at 5% on average across the countries covered by the OeNB Euro Survey – in particular when compared with the euro area, where this rate stands at 23% (ECB, 2013). As discussed in the introduction, foreign currency loans are widespread in CESEE. On average, 35% of households with a mortgage have a foreign currency mortgage. In contrast to Austria, where foreign currency loans are almost exclusively used to finance real estate (Albacete and Lindner, 2015), foreign currency loans in CESEE are also used to finance consumption: 44% of households with a foreign currency loan

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[10] This result may also indicate that the residential property market puts a strain on labor mobility, but investigating this question in more detail is beyond the scope of this paper.

Chart 2

Mortgages in CESEE

% of respondents

Denominated in foreign currency   Denominated in local currency
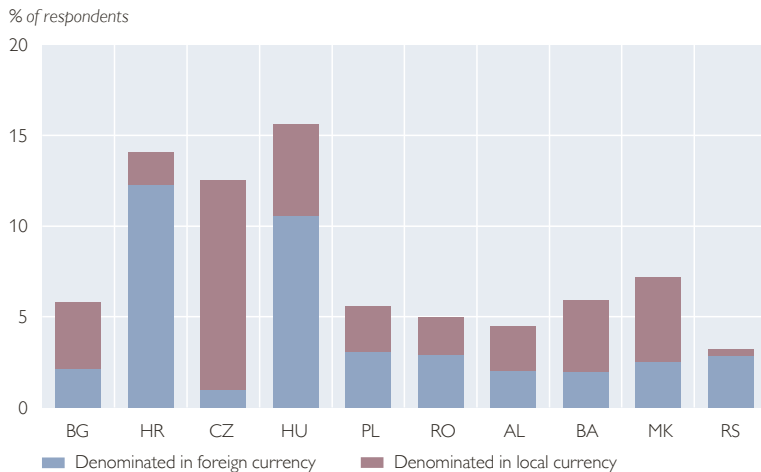
Source: OeNB Euro Survey, 2010–14.

hold this loan for consumption purposes, 56% hold it to finance a house or apartment.

The low participation in taking out housing credit in CESEE may partly be explained by the high percentage of homeownership. However, on average every fourth respondent states that it would be difficult to find a new apartment or house if they wanted to move. Chart 3 shows that the perceived difficulty is particularly high in areas with low bank branch density (except in Bosnia and Herzegovina). Respondents with a low educational level, with low income or unemployed respondents are also significantly more likely to say that finding a new home is difficult.

Chart 3

Perceived difficulty to find a new residence

%

Nearest bank perceived to be far away   Nearest bank not perceived to be far away

Source: OeNB Euro Survey, fall 2014.

Note: Results are based on the Euro Survey question "Please tell me whether you agree or disagree with the following statement: In my country, it is easy to find a new apartment/house if you want to move." Values show the percentage of respondents who disagree or strongly disagree with this statement. The perceived bank distance is based on the Euro Survey question "Please tell me whether you agree or disagree with the following statement: For me it takes quite a long time to reach the nearest bank branch."

Turning to demand for mortgages itself (chart 4), we observe that the share of households that applied for a mortgage between 2000 and 2014 differs considerably between countries. Linking mortgage applications with information on perceived bank distance, we find that in Bulgaria, Croatia and Romania the percent-

Chart 4

Mortgage applications and rejections in CESEE since 2000

% of respondents

Applied but was rejected   Not rejected
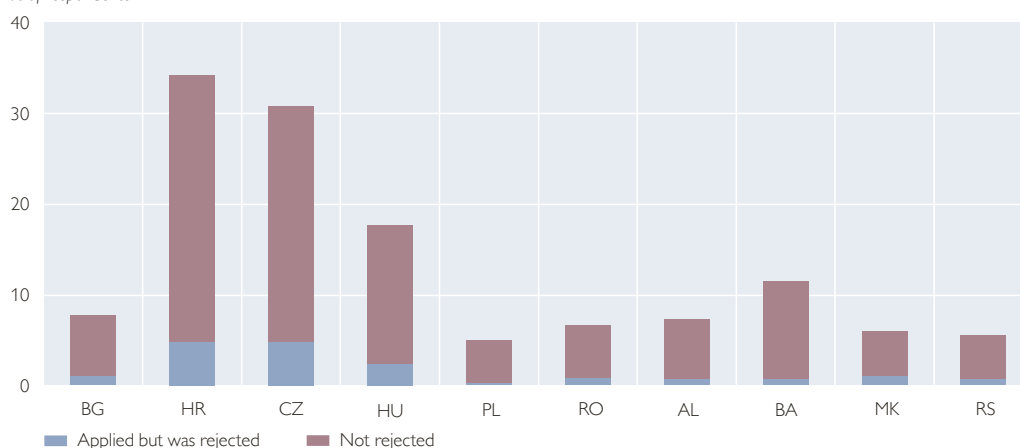
Source: OeNB Euro Survey, fall 2013.

Note: Results are based on the following Euro Survey questions: "Since the year 2000, have you or any member of your household ever contacted a bank with a view of obtaining a loan?" If respondents reply "yes," the following question is asked: "What was the purpose of the loan(s) for which you contacted your bank?" Possible answers are: "To finance a house or apartment/for consumption goods/to finance a car/for education/for other purposes." The chart only shows the responses of respondents who answered "to finance a house or apartment." Loan rejection rates are based on the question: "Since the year 2000, has a bank ever discouraged you from applying for a loan or ever refused a loan?"

age of mortgage applications is significantly lower among households in areas with low bank penetration.

Chart 4 also shows the share of households whose mortgage application was rejected, with the rejection rate for households that applied for a loan ranging from 7% in Poland and Bosnia and Herzegovina to 18% in FYR Macedonia. In line with expectations based on macrodata evidence, the rejection rate is found to have increased significantly after 2008 (from an average of 9% to 18%). Rejection rates are particularly high among respondents with only primary education, those with low incomes, and unemployed respondents. Together with the evidence on the perceived difficulty of finding a new home, this suggests that residential property

Table 2

Socioeconomic characteristics of mortgagers in CESEE

	Homeowners	Mortgagers	Non-mortgagers
	% of respondents		
Household size			
One person	15	7	15
Two persons	31	23	32
Three or more persons	54	70	53
At least one child living in the household	32	55	30
Monthly household income after taxes			
1–33 income percentile	28	16	29
34–66 income percentile	24	27	24
67–100 income percentile	23	36	22
Information on income refused	25	21	26

Source: OeNB Euro Survey, 2011–14.

market policies should address possible obstacles to access to housing finance in particular for the socioeconomically vulnerable.

At the same time, this observation also indicates that when granting mortgage loans, banks selected households with better risk-bearing capacities. This is confirmed in table 2, which compares mortgagers to other homeowners and shows that mortgages, on average, are held by larger, higher-income households in urban areas.[11] Comparing households holding a foreign currency mortgage to households holding a local currency mortgage, we do not find that the basic indicators of risk-bearing capacity differ significantly.[12]

As to mortgage characteristics, the Euro Survey shows that the majority of mortgages in CESEE EU Member States were taken out before the global financial crisis, unlike in the Western Balkans, where the majority of mortgages were taken out after 2008. The latter may be related to the fact that these countries were hit by the global financial crisis slightly later than more advanced economies in CESEE. The same regional division holds when we look at maturities, which are much shorter in the Western Balkans. Households' ability to repay mortgages, of course, also depends on the characteristics of the mortgage itself. Table 3 shows that in four out of ten countries the majority of mortgagers hold mortgages with fixed interest rates; in the remaining countries, the majority of mortgagers are exposed to interest rate changes.

Combining the information on the year loans were taken out with data on average interest rates from the respective national central banks, table 3 also shows that the initial interest rates on mortgages denominated in local currency ranged from 5% in the Czech Republic to 22% in Serbia, compared with a maximum of 9% in FYR Macedonia for mortgages denominated in foreign currency. The bottom panel of table 3 shows that at the time loans were taken out the interest rate differential between local and foreign currency loans was sizeable – e.g. up to 18 percentage points in Serbia. However, in all countries surveyed, the interest rate differential has decreased; in Romania it is now zero and in Bulgaria it is even negative.[13] Thus, for holders of foreign currency loans with a flexible exchange rate, the cost advantage has declined.

In addition to declining interest rate advantages, foreign currency borrowers in some CESEE countries had to face substantial depreciations of their local currencies. Table 4 shows the percentage change in the exchange rate for euro-denominated loans between the year the loan was taken out and 2014. Even though table 4 does not take into account swings in the exchange rate between the year the loan was taken out and 2014, which may also have been to the advantage of mortgagers, it shows that on average the exchange rate is now less advantageous for borrowers than at the time the loans were taken out.

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[11] *Income, in particular, is correlated with education and labor market status – mortgagers are more frequently employed and have secondary or tertiary education (detailed results are available from the authors upon request).*

[12] *This is in line with Beckmann et al. (2015), who show that in terms of socioeconomic characteristics the most pronounced differences exist between creditors of domestically owned banks and creditors of foreign-owned banks. Detailed results are available from the authors upon request.*

[13] *This calculation does not take into account interest rate swings between the year the loan was taken out and 2014.*

Table 3

Interest rates and interest rate differential

Type of interest rate	Fixed rate loans	Variable rate loans		Number of observations
% of respondents holding a mortgage				
Bulgaria	63	38		106
Croatia	41	59		307
Czech Republic	36	63		255
Hungary	35	65		266
Poland	55	45		92
Romania	50	50		104
Albania	81	19		79
Bosnia and Herzegovina	80	18		154
FYR Macedonia	63	37		113
Serbia	48	50		56

Initial interest rate	Median rate		Maximum rate	
	Local currency loans	Euro-denominated loans	Local currency loans	Euro-denominated loans
%				
Bulgaria	8.305	7.845	10.086	8.6
Croatia	10.033	5.468	15.455	7.742
Czech Republic	4.992	. .	5.514	. .
Hungary	10.952	4.467	13.002	7.813
Poland	6.59	5.045	8.032	6.948
Romania	8.726	6.393	11.185	6.69
Albania	12.537	7.995	13.671	8.442
FYR Macedonia	13.013	8.979	14.303	9.397
Serbia	21.64	5.62	21.69	5.62

Interest rate differential local versus foreign currency loan	At the time the loan was taken out			In 2014
	Minimum	Median	Maximum	Median
Percentage points				
Bulgaria	0.37	0.93	1.49	−0.43
Croatia	3.59	4.78	7.71	4.37
Hungary	2.14	5.55	8.81	1.06
Poland	0.10	1.08	2.52	2.13
Romania	2.31	2.74	5.75	0.00
Albania	3.40	5.08	6.66	1.84
FYR Macedonia	2.61	3.71	5.32	2.61
Serbia	12.01	16.02	17.72	11.12

Source: OeNB Euro Survey, national central banks.

Note: The percentage of variable versus fixed rate loans is based on Euro Survey results. The intial interest rate is obtained by combining information from the Euro Survey about the year in which the loan was taken out with data from the respective national central banks on the interest rate of housing loans. The interest rate differential is calculated only for foreign currency loans as the difference between the rate on local currency loans minus the rate on foreign currency loans (obtained from the national central banks) at the time the loan was taken out and in 2014. Central bank data on interest rates are not always available for the year in which the loan was taken out. In such cases, the earliest available interest rate is used. Bosnia and Herzegovina is excluded as interest rate data have only been available since 2012. EU countries and non-EU countries in alphabetical order.

Amid unfavorable developments for holders of foreign currency mortgages, however, CESEE households in general were hit particularly hard by the global financial crisis, with private consumption declining on average in seven out of ten countries and real income stagnating or even decreasing between 2009 and 2013 (EBRD, 2011; Corti and Scheiber, 2014). Chart 5 illustrates that the effect of the

Table 4

Exchange rate developments affecting households holding mortgages in euro

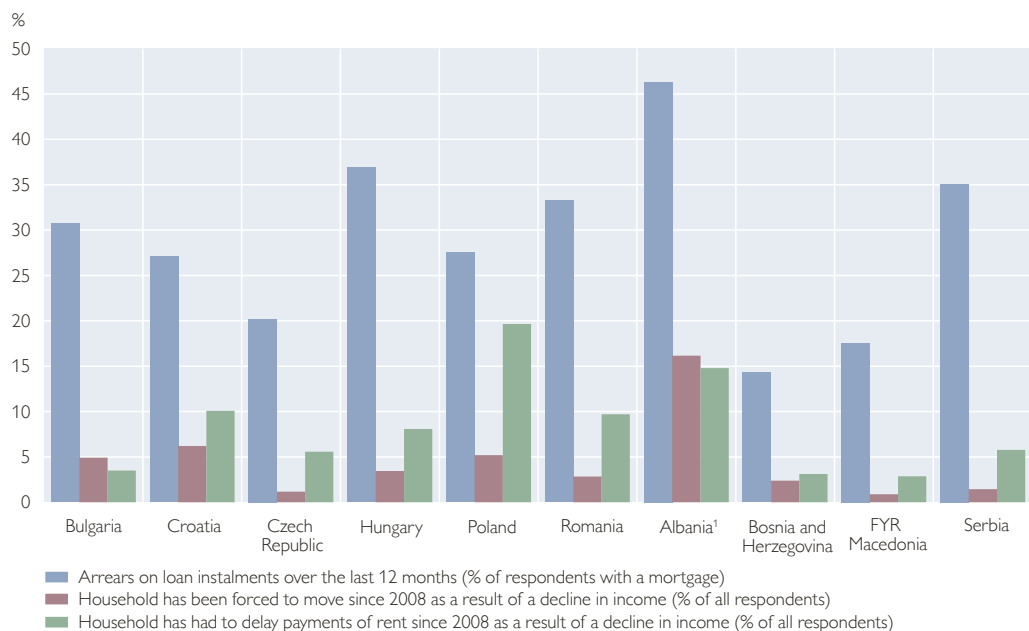|	Mean	Minimum	Maximum
	Percentage change since mortgage was taken out		
Croatia	3.20	−0.12	12.22
Hungary	20.13	10.04	24.46
Poland	7.03	4.02	10.61
Romania	20.74	−0.31	123.08
Albania	8.47	−1.61	14.06
FYR Macedonia	0.41	0.07	0.71
Serbia	27.82	3.69	60.74

Source: OeNB Euro Survey.

Note: The values show the percentage change in the average annual exchange rate from the year the euro-denominated loan was taken out to 2014. Positive values indicate a depreciation of the local currency against the euro. Bulgaria and Bosnia and Herzegovina are not shown as they operate a currency board. In the Czech Republic, there are no euro-denominated mortgages.

crisis on CESEE households also affected the housing market. Looking at all survey respondents, including those who do not hold a mortgage, between 1% (FYR Macedonia) and up to 16% (Albania) state they have had to move house since 2008, and up to 20% (Poland) of respondents say they have been late with rent payments as a result of a decline in income.

Regarding mortgages, survey results on loan arrears are, of course, not directly comparable to aggregate results on NPLs (chart 1). Chart 5 shows that up to 29% (Hungary) of respondents with a mortgage had been in arrears on loan repayments during the year prior to the Euro Survey interview. Unlike the analysis of aggregate data, our analysis of survey results also shows whether repayment difficulties are higher for holders of foreign currency mortgages. We find that loan arrears on mortgages in foreign currency are significantly higher than loan arrears on local currency mort-

Chart 5

Households' financial difficulties

%

- Arrears on loan instalments over the last 12 months (% of respondents with a mortgage)
- Household has been forced to move since 2008 as a result of a decline in income (% of all respondents)
- Household has had to delay payments of rent since 2008 as a result of a decline in income (% of all respondents)

Source: OeNB Euro Survey.

[1] For Albania, data on arrears are for fall 2014 only.

Note: Data on arrears represent the average of values from fall 2010 to fall 2014. Data on the categories "forced to move" and "delayed rent payment" are for fall 2013. Results are based on the following Euro Survey questions regarding loan arrears: "Has your household been in arrears on loan repayments once or more during the last 12 months on account of financial difficulties?" Values show the percentage of mortgagers who replied "Yes, once" and "Yes, twice or more." For the phrasing of the remaining two questions, see notes to table 5. EU countries and non-EU countries in alphabetical order.

Table 5

Mortgagers: financial situation and outlook

Mortgagers…	In arrears	Not in arrears
	% of mortgage-holding households	
…reduced the amount spent on everyday expenses	89	79
…reduced or postponed larger expenditures	87	70
…reduced money set aside for savings	59	55
…utilized savings or sold possessions	55	33
…delayed payment of other bills	67	17
…received financial help from family or friends	48	22
…borrowed money from another source	33	11
…increased working hours or took up additional work	47	29
…had to take more than seven financial measures to cope with the crisis	48	9
…could borrow a significant amount from family/friends	43	52
…expect financial situation of their household to improve	42	46

Source: OeNB Euro Survey.

Note: Results are based on the Euro Survey question "Since the outbreak of the economic crisis in 2008, has your household had to take any of the following measures as a result of a decline in income or other economic difficulty? Please name all that apply." Respondents could choose from a list of 15 different possible reactions. Values given under "…had to take more than seven financial measures to cope with the crisis" represent the percentage of respondents who named more than 7 reactions out of the total of 15. The category "…could borrow a significant amount from family/friends" is based on the question "Generally speaking, would you have the possibility to borrow a significant amount of money from the family or a friend?" Values represent the percentage of respondents who answered "Yes, almost certainly" or "Yes, probably." The category "…expect financial situation of their household to improve" is based on the following question: "Please tell me whether you agree or disagree with the following statement: Over the next 12 months, I expect the financial situation of my household to get better." Values represent the percentage of respondents who agree with this statement.

gages in Serbia and Hungary; in the remaining countries there is no significant difference.

However, while we find that the percentage of mortgages held with foreign-owned banks is roughly equal to that held with domestically owned banks (34% versus 35%), we find that arrears on mortgages held with domestically owned banks are significantly higher (27% versus 23%). This is in line with results presented by Beckmann et al. (2015) showing that foreign-owned banks have debtors with higher incomes.

One central question in the research on mortgage arrears is whether households strategically default on their mortgage (e.g. Guiso et al., 2013), especially when they expect that law enforcement is weak or that the government will bail them out. Table 5 provides descriptive evidence on the severity of households' loan arrears and expected income developments. It shows that mortgagers in loan arrears are significantly worse off than mortgagers who are not in arrears. At the same time, they do not expect their income situation to improve. According to the literature, households that default strategically will usually be able to meet other payments and also have access to informal sources of borrowing (Anderson et al., 2013). The descriptive evidence presented in table 5 suggests that in CESEE, mortgagers in loan arrears are genuinely unable to pay and that there is little indication of strategic default.

4 Conclusion

In this paper, we provide an update of macroeconomic developments in the residential property markets in Central, Eastern and Southeastern Europe (CESEE), complemented with unique evidence from the OeNB Euro Survey about CESEE

households' assessment of their current housing situation, demand for housing loans and the risk-bearing capacity of households holding a mortgage.

Many CESEE countries went through a pronounced boom-bust cycle of house prices during the financial crisis. Recently, there has been some indication that house prices are recovering but so far they have not returned to precrisis levels. Since the global financial crisis, housing loan growth has been very low or even negative in some CESEE countries.

Evidence from the OeNB Euro Survey confirms that the rate of homeownership remains high in CESEE and that the majority of CESEE households are satisfied with their current residence. At the same time, almost every third respondent states that finding a new residence would be difficult. The perceived difficulty of finding a new residence is particularly high in areas with lower bank penetration. Despite the strong precrisis growth in mortgage finance, participation in mortgages remains relatively low in CESEE compared with the euro area countries. This may indicate a need for improving access to loans in order to meet the demand for housing. However, better access to loans should be complemented by governments taking steps to improve the regulation of housing markets and housing finance systems.

We also find that the perceived difficulty in finding a new residence is particularly high among low income households and those whose highest level of education is primary education. Mortgage rejection rates are also particularly high among this group. Thus, other measures – especially with regard to the rental market – may be needed to address the demand for housing of socioeconomically vulnerable households. Supporting the development of the rental market may also help improve labor mobility, which is particularly important for the Western Balkan countries, which post very high (structural) unemployment rates.

Regarding the stock of existing mortgages, we find that mortgagers, in general, are more creditworthy and appear better equipped to bear adverse shocks. While the share of foreign currency loans remains high, however, it is now declining in the majority of CESEE countries following policy measures to curb foreign currency lending. We find that the risks emanating from both the exchange rate and the interest rate differential for households holding a foreign currency mortgage have increased. At the same time, the percentage of loan arrears is higher among holders of foreign currency mortgages than among holders of local currency mortgages only in Hungary and Serbia.

In general, the ratio of nonperforming loans (NPLs) to total loans is high and increasing in most countries analyzed. Looking in more detail at the financial position of households in loan arrears, we do not find evidence that households are defaulting strategically. Instead, we find that they are at their financial limits, and that focusing on restructuring foreign currency loans only will not suffice to resolve the NPL problem.

This is particularly important as survey evidence shows that demand for mortgages is growing again in CESEE. If banks do not meet this rising demand, households may resort to informal, unregulated sources of borrowing.

References

Albacete, N. and P. Lindner. 2015. Foreign currency borrowers in Austria – evidence from the Household Finance and Consumption Survey. In: Financial Stability Report 29. 90–109.

Amann, W. and K. Bezgachina. 2013. Implications of housing privatization for Europe. In: Housing Finance International – The Quarterly Journal of the International Union of Housing Finance. Winter.

Anderson, F., S. Chomsisengphet, D. Glennon and F. Li. 2013. The changing pecking order of consumer defaults. Journal of Money, Credit and Banking 45(2–3). 251–275.

Beckmann, E., A. Roitner and H. Stix. 2015. A Local or a Foreign Currency Loan? – Evidence on the Role of Loan Characteristics, Preferences of Households and the Effect of Foreign Banks. Focus on European Economic Integration Q1/15. 24–48.

Brown, M. and H. Stix. 2015. The Euroization of Bank Deposits in Eastern Europe. Economic Policy 30(81). 95–139.

Cesa-Bianchi, A., L. F. Cespedes and A. Rebucci. 2015. Global liquidity, house prices and the macroeconomy: evidence from advanced and emerging economies. Working Paper No. 522. Bank of England.

Ciarlone, A. 2012. House price cycles in emerging economies. Banca d'Italia Working Paper 863.

Corti, M. and T. Scheiber. 2014. How Did CESEE Households Weather the Crisis? Evidence from the OeNB Euro Survey. In: Focus on European Economic Integration Q2/14. 76–87.

EBRD. 2011. Transition Report 2011: Crisis and Transition – The People's Perspective. London.

ECB. 2012. Financial stability challenges for EU acceding and candidate countries: Making financial systems more resilient in a challenging environment. ECB Occasional Paper 135. September.

ECB. 2013. The Eurosystem household finance and consumption survey. Results from the first wave. Statistics Paper Series No 2. April.

Égert, B. and D. Mihaljek. 2007. Determinants of house prices in central and eastern Europe. BIS working paper No 236.

Guiso, L., P. Sapienza and L. Zingales. 2013. The determinants of attitudes toward strategic default on mortgages. The Journal of Finance 68(4). 1473–1515.

Hildebrandt, A., R. Martin, K. Steiner and K. Wagner. 2012. Residential Property Markets in CESEE EU Member States. In: Focus on European Economic Integration Q1/12. 8–30.

Huynh-Olesen, D., K. Steiner, A. Hildebrandt and K. Wagner. 2013. Residential Property Prices in Central, Eastern and Southeastern European Countries: The Role of Fundamentals and Transition-Specific Factors. In: Focus on European Economic Integration Q2/13. 52–76.

IIBW. 2013. Housing review 2013 on 23 countries in the Europe and Central Asia region. IIBW Institute for Real Estate, Construction and Housing, Vienna. Austria.

Lahnsteiner, M. 2013. Private Sector Debt in CESEE EU Member States. In: Focus on European Economic Integration Q3/13. 30–47.

Mihaljek, D. and A. Subelyte. 2014. Do we understand what drives house prices? In: E. Nowotny et al. (eds.). Financial cycles and the real economy: lessons for CESEE countries. Edward Elgar. 147–170.

OECD. 2002. Housing finance in transition economies. Paris: OECD.

Sinai, T. and N. Souleles. 2005. Owner-occupied housing as a hedge against rent risks. Quarterly Journal of Economics 120. 763–789.

Annex

House prices in CESEE (in real terms)

CESEE EU Member States

Index, 2010=100
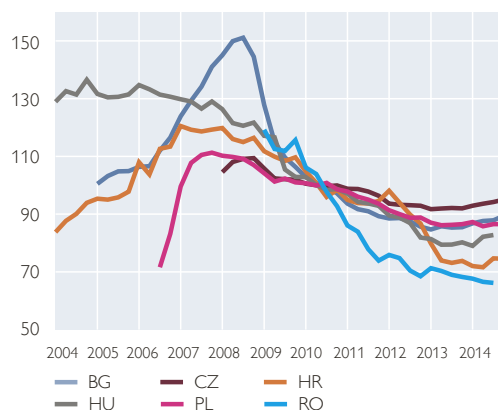
Western Balkan countries

Index, 2010=100
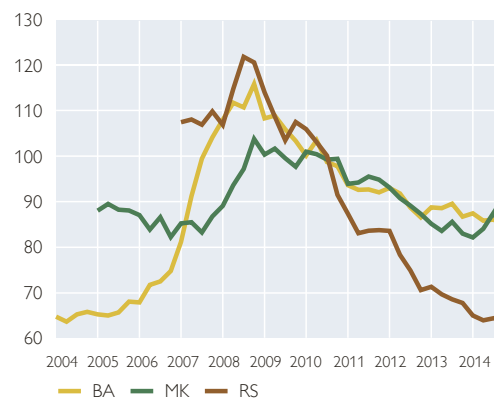
Source: BIS, Eurostat, FHB (www.fhbindex.com/FHB-Index), national central banks, National Mortgage Insurance Corporation (www.nkosk.rs), wiiw. For Albania, data are not publically available.

Note: House price data cover different areas. Bulgaria: large cities; Croatia, Czech Republic, Hungary and Romania: whole country; Poland: large and medium-sized cities; Bosnia and Herzegovina: capital city (three city municipalities) and three other regional centers (Tuzla, Mostar and Zenica); FYR Macedonia and Serbia: capital city.

Growth of housing loans in CESEE

%, exchange rate adjusted
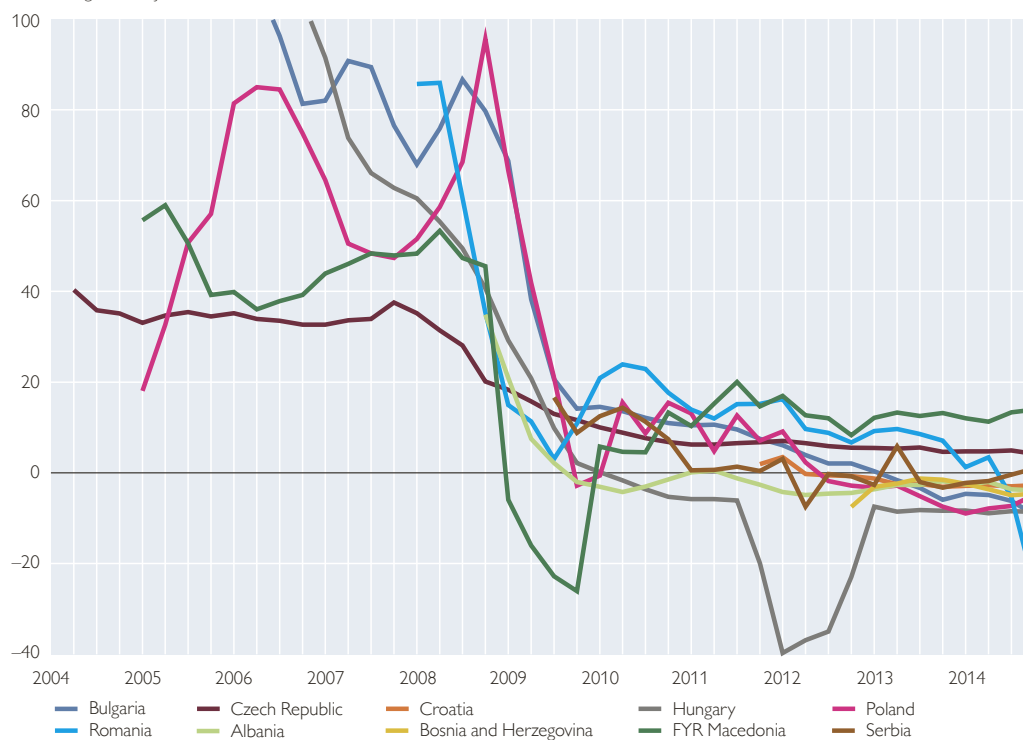
Source: ECB, national central banks, OeNB.

Internal capital markets and crisis transmission: evidence from foreign bank subsidiaries in CESEE

The aim of this paper is to analyze the impact of European bank deleveraging on the asset growth of European banks' CESEE subsidiaries. Our estimation of the effects of parent bank funding on subsidiaries' asset growth relies on the instrumental variables strategy, instrumenting for intragroup flows with exposure to the sovereign debt of Ireland, Greece, Spain and Portugal. The novelty of this analysis is the differentiation between equity and nonequity intragroup flows and the inclusion of a significant number of countries in the sample. Previous studies in this area either did not analyze the role of equity flows or focused on one country only. The present study finds that intragroup flows have a significant effect on subsidiaries' asset growth. A 1 percentage point increase in equity flows leads to a 6.1 percentage point increase in assets; the same increase in nonequity flows leads to a 1.7 percentage point increase in assets. This finding has significant policy implications for the regulation of domestic banks and cross-border regulatory cooperation.

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Foreign banks play a dominant role in Central, Eastern and Southeastern Europe (CESEE). According to Claessens and Van Horen (2014), the share of foreign bank assets in total banking sector assets in CESEE is higher than 50% while in countries like Bosnia and Herzegovina or Lithuania it is even above 90%. A strong presence of foreign banks has its advantages and disadvantages. The major benefit of being part of a multinational banking group is easy access to internal capital and credit markets and to cheap funds from abroad. This proved beneficial for credit growth in CESEE in the precrisis period. By relying on parent funding, foreign banks financed domestic investment and consumption to a much higher extent than would have been possible using just domestic sources. Some countries, like Hungary and Estonia, experienced a mortgage lending boom and a house price bubble in the early 2000s and in the run-up to the 2008 crisis, as households borrowed heavily in what was considered to be "cheaper" foreign currency to finance housing. However, the 2008 financial crisis and especially the subsequent euro area sovereign debt crisis brought to light the negative aspects of this model and revealed many imbalances that had accumulated in the previous period. Concerns arose that foreign parent banks would withdraw funds from their international subsidiaries in order to cover their own losses and meet higher regulatory capital requirements at home. In that way, financial contagion would spread from markets where parent banks are headquartered to markets where subsidiaries operate, leading to a slowdown in credit growth and economic activity.

The aim of this paper is to describe and analyze the effects of the deleveraging process during the euro area sovereign debt crisis that started at the end of 2009 when concerns arose that Greece would not be able to service its mounting public

debt. Market panic spread to the other countries under stress: Ireland, Spain and Portugal. Rating downgrades, increases in credits spreads and decreases in these countries' sovereign bond prices had a negative impact on the profits of the banks that kept such bonds on their balance sheets. Thus, exposure to stressed countries' sovereign debt was a negative liquidity shock to the parent banks. This paper looks at the effects of such exposures on the functioning of subsidiaries' internal capital markets. In particular, it analyzes whether negative shocks to Western European parent banks led to the withdrawal of funds from their CESEE subsidiaries. Both equity and nonequity (assets and liability) flows were used to measure the withdrawal of funds. Equity flows include share issues, share repurchases and dividends paid. Nonequity flows include all other claims on and liabilities to the rest of the group – loans, deposits, borrowing, securities purchased and sold, and the like. In a second step, this paper examines the impact of the withdrawal of funds on the subsidiary's credit activity. Unfortunately, loan growth could not be used as a dependent variable because loans to the parent bank and to other related parties are included in the total amount of loans reported on the balance sheet, and very few banks report the breakdown of loans by related and nonrelated parties. Most banks report just total related party assets instead. That is why this paper looks at the growth of the subsidiary's balance sheet after deducting claims on the rest of the group as a measure of banks' credit activity. This measure represents the change in assets that nonrelated parties owe to the bank, i.e. the change in nonrelated party assets. The paper also analyzes whether equity or nonequity flows have a higher impact on the growth of the subsidiary's nonrelated party assets. While this is the first study that examines nonrelated party assets as a variable, the size of the balance sheet is a good proxy for financial intermediation activity of the subsidiary and has been often used in the literature as a measure of bank performance. One recent example is Cornett et al. (2010), who compare the performance of private banks with that of state-owned banks and who use asset growth as a dependent variable. To control for credit demand, country fixed effects are added in this study. Thus, it compares the change in the nonrelated party assets of two subsidiaries that operate in same country but whose parent banks have different amounts of sovereign exposure to countries under stress.

The author finds that the higher exposure of the parent bank to countries under stress is associated with the higher withdrawal of intragroup funds from the subsidiary. Moreover, this withdrawal of funds caused the subsidiary's balance sheets to shrink as the subsidiary could not substitute intragroup funds with external funds. As expected, equity flows are found to have a greater effect on the subsidiary's balance sheet than nonequity flows.

The rest of the paper is organized as follows. Section 1 introduces the reader to the relevant literature and defines the contribution this paper makes. Section 2 provides an overview of the euro area sovereign debt crisis and the bank deleveraging process. Section 3 presents the data and the estimation strategy and section 4 provides a discussion of the results and robustness checks. The paper concludes with section 5, acknowledging some limitations of this study, making suggestions for further research and discussing policy implications.

1 Literature review

The role of banks' internal capital markets in the international transmission of shocks is a relatively new area in economics literature, and most contributions are empirical. First studies aimed at finding indirect evidence of the operation of internal capital markets because data on intragroup transactions were unavailable. Thus, these studies tried to establish correlations between some measure of the shock to the parent bank and the outcome at the subsidiary level, usually loan growth. The assumption was that the withdrawal of intragroup funds from the parent was the link between shock and outcome. Examples of this literature include Houston et al. (1997, 1998). These papers are based on a sample of banks that operate in the U.S.A. and find that bank holding companies indeed operate internal capital markets. Subsidiaries' lending is less sensitive to their own cash flows and more responsive to local conditions than the lending of independent banks that rely only on external funds. Thus, members of holding companies can rely on the internal capital market in case they need additional funds to seize new profit opportunities. Peek and Rosengren (1997, 2000) take an international perspective and analyze the lending behavior of branches of Japanese banks in the U.S.A. They find that the branch's lending is correlated with the risk-based capital ratio of the parent. Peek and Rosengren (2000) expand on their previous research and look at the consequences of the drop in Japanese bank lending for real economic activity. They find that areas more strongly penetrated by Japanese banks experienced a stronger decline in construction activity after the Japanese real estate and equity bubble burst in the early 1990s.

More recent contributions based on the correlation between parent bank shocks and subsidiary lending are those of De Haas and van Lelyveld (2010, 2014). Using a rich sample of 45 multinational banks from 18 home countries with 194 subsidiaries across 46 host countries, they find that the financial strength of the parent positively influences the lending growth of the subsidiary. They also find that foreign banks do not have to rein in their credit supply during a financial crisis in the host country while domestic banks do. However, when the crisis hits the home country – the country in which the headquarters of the parent are located – foreign banks experience lower credit growth than domestic banks.

The main limitation of the studies mentioned above is that they do not observe the flows of intragroup funds within a bank holding group, so they cannot rule out other channels of shock transmission such as e.g. trade linkages between two countries. The first paper to address this limitation, albeit at the country level, was Cetorelli and Goldberg (2011). Using BIS data on cross-border loans, they find that there was a significant decrease in cross-border lending to emerging markets from developed countries as a consequence of the 2007–08 financial crisis. Cetorelli and Goldberg (2012a, 2012b) use a regulatory reporting data set that contains data on financial transactions as well as borrowing and lending between branches and parent banks. Using exposure to asset-backed commercial paper (ABCP) as a negative liquidity shock to the parent, they find (2012a) that parent banks with a higher ABCP exposure withdrew more funds from their subsidiaries than parents that were less exposed to ABCP. This withdrawal of funds in turn led to a decrease in subsidiaries' lending supply. Cetorelli and Goldberg (2012b) examine how banks that are registered in the U.S.A. and have branches abroad manage liquidity across the whole banking group. They find that parent banks that

were hit harder by the 2007–08 crisis withdrew more funds from their subsidiaries than banks that were more immune to the crisis. Moreover, the withdrawal of funds was not linear across all subsidiaries. Fewer funds were withdrawn from subsidiaries that are important generators of revenues and more funds were withdrawn from subsidiaries that could fund themselves externally in a local market.

On a related topic, the study by Hameter, Lahnsteiner and Vogel (2012), which examines cross-border lending of Austrian banks to CESEE, is also noteworthy. They find that during the crisis, Austrian banks' lending to their subsidiaries was more stable than lending to other CESEE that were not affiliated with the respective banking group. They explain this phenomenon with lower within-group information asymmetry and the willingness of parent banks to support the business of their subsidiaries abroad.

Aiyar (2012) makes further contribution to the literature. Besides using data on intragroup lending between parents and subsidiaries, the main innovation of his paper is an attempt to disentangle credit demand effects from credit supply effects. The previous literature had partially left open the question whether the decrease in lending by subsidiaries was due to a decrease in the parents' funding or whether parent banks withdrew funding because subsidiaries faced lower credit demand from firms and households. Aiyar tackles this issue by instrumenting for credit demand using banks' exposure to different sectors (households, businesses, other banks, other financial institutions). An even better estimation strategy for disentangling credit demand from credit supply is provided by Schnabl (2012), who studies exposure to the 1998 Russian default as a negative shock to the parent bank and looks at its transmission to Peru through bank-to-bank lending of the exposed international banks. To isolate credit demand, Schnabl analyzes firms that borrow from several banks. He finds that banks that were more exposed to a negative liquidity shock reduced their lending more than other banks that were lending to the same firm but were hit less hard by the liquidity shock.

One more study related to this paper is by Allen, Gu and Kowalewsky (2013). In their descriptive paper, the authors use data of a similar nature but on a limited sample of banks, so they are not able to conduct a rigorous statistical analysis. The study argues that corporate governance at the subsidiary level might be partially responsible for financial contagion that occurred during the crisis, as the management boards of subsidiaries have only few independent members, which means that they represent the interests of the parent bank rather than those of the subsidiary.

All in all, the literature has found that transactions between parent banks and their international subsidiaries provide a mechanism for the transmission of financial shocks from one economy to another. Moreover, after a shock, subsidiaries are not able to compensate for drops in internal funds by relying more on external capital markets or by attracting more deposits. Thus, they curb lending to domestic firms and households, which leads to a drop in overall economic activity.

This paper differs from the previous literature in several ways. First, it accounts not only for lending and borrowing as a way to transfer funds within a group, but also for changes in equity: share issues and dividends paid. Previous papers looked just at lending to, and borrowing from, the parent bank, which may have left some transfers in the form of equity uncaptured. This paper also tries to establish whether equity and nonequity group funding have a different impact on the balance

sheet and intermediation activity of the subsidiary. It is reasonable to expect that equity increases have higher multiplier effects, as they loosen regulatory capital constraints on bank lending. Moreover, depositors might perceive well-capitalized banks as less risky and may decide to increase their deposits with the subsidiary, which leads to a further increase in the banks's lending potential. This is consistent with the finding of Forbes and Warnock (2012) that most episodes of extreme capital flow movements over the world are led by debt rather than by equity flows.

The other novelty of this study is its substantial international dimension, as it covers subsidiaries located in 19 CESEE countries. De Haas and Van Lelyveld (2010, 2014) use data from even more countries, but they are not able to observe intragroup transactions. On the other hand, studies that do have data on intra-group flows are focused on the outcome in a particular country – the U.K., U.S.A. or Peru. Focusing on several countries allows for the use of country fixed effects that partially control for changes in credit demand. The final distinction from the previous literature is the outcome variable. This paper uses "change in total bank assets after deducting claims to the rest of the group" as an outcome variable, while most of the other studies used "lending at subsidiary level" as the dependent variable. The issue with that approach is that lending to the parent and to the rest of the group is included and represents a significant part of the subsidiary's lend-ing. This means one might misinterpret an increase in loans as an increase in banks' credit activity when in fact it represents a withdrawal of group funds. This can be seen from Allen, Gu and Kowalewski's analysis (2013) and from banks' financial reports. Thus, using the total lending of a subsidiary as an outcome variable might be flawed, as an increase in lending might represent an increase in lending to the parent bank instead of lending to domestic banks and households.

2 Background on the euro area sovereign debt crisis and deleveraging

In the precrisis period before 2008, Western banks were eager to enter CESEE markets. After the fall of communism, these countries were undergoing restruc-turing, experienced high growth rates and had good growth prospects. Moreover, their financial sectors were underdeveloped, with very low levels of household and firm leverage. These factors, together with the ongoing political and economic in-tegration of Europe, provided a great growth opportunity for Western European banks operating in saturated markets where there was little room for expansion.

In their expansion toward CESEE, most banks relied on the following business model: The first step was to buy some formerly state-owned bank in the process of privatization or to build a subsidiary from scratch. Next, parent banks would bor-row wholesale in the West, where interest rates were low, and would transfer these funds to their CESEE subsidiary by extending loans or increasing equity. The CESEE subsidiary could then use these relatively cheap funds jointly with more expensive and insufficient funds raised locally to extend loans to local customers. To hedge the exchange rate risk, as the wholesale funds are usually euro- or U.S. dollar-denominated, the lion's share of these loans is denominated in, or indexed to, foreign currency. In this way banks were able to make signifi-cant profits on the interest rate differential between significantly higher interest rates in CESEE and lower interest rates in the Western European home market.

However, the advent of the 2007–08 subprime mortgage crisis and subse-quently the euro area's sovereign debt crisis made this business model unsustain-

able. Wholesale markets froze, bank credit default swap (CDS) spreads increased, and investors withdrew money from European banks (see e.g. Chernenko and Sunderam, 2014). Thus, the banks were not able to roll over their short-term liabilities and were faced with funding problems. Banks with a high exposure to the sovereign debt of Greece and other stressed countries were especially affected. With public finances deteriorating, investors perceived these countries as unable to service their public debt, which led to an increase in sovereign CDS spreads and a decrease in the price of sovereign bonds. Banks that had these bonds on their balance sheets had to recognize losses. Due to high leverage and reliance on whole-sale markets before the crisis, this recognition had a negative impact on their leverage and equity ratios. In order to calm the markets and restore financial stability, regulators in Western Europe increased regulatory capital requirements, and the preparations for the introduction of Basel III started. Moreover, the European Banking Authority (EBA) conducted stress tests in 2010 and 2011 to examine the ability of banks to endure various market scenarios. Thus, banks had to find a way to increase their capital ratios to meet new, tighter capital standards and to pass the stress tests.

Banks had the following two main options to increase solvency ratios: They could either sell part of the assets on their balance sheet and use the proceeds to increase equity, i.e. deleverage, or they could increase equity by issuing new shares. However, not many investors, except the state, were ready to subscribe for new shares, so banks had to cut down on their assets. This led to the concern that banks might decide to withdraw their funds from CESEE subsidiaries or to shut down their CESEE operations completely. Most CESEE subsidiaries were well capitalized, partly also due to relatively more stringent regulation in the host countries. Also, the crisis in the euro area, CESEE most important trading partner and investor, reduced the growth prospects of the CESEE countries, bringing down demand for credit, too. In some cases, like that of Belgium's KBC Bank N.V., the explicit condition on which state help was granted was that they sell off some CESEE subsidiaries and focus on core European markets.

Policymakers and international financial and development organizations immediately recognized the danger of financial contagion spreading to CESEE through relations between parent banks and subsidiaries. Their response was to organize the "Vienna Initiative,"[2] a joint framework for safeguarding the stability of CESEE. In the first phase, in early 2009, the European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB) Group, and the World Bank Group provided over EUR 33 billion in support for the banks and economies of CESEE in 2009 and 2010. Above and beyond this financial support, the Vienna Initiative facilitated the coordination of national support packages and a policy dialogue involving other key stakeholders in the region and conducted in close cooperation with the International Monetary Fund (IMF) and the European Commission. Participation of banks and countries was voluntary, and more details on the setup and the results of the program can be found in De Haas et al. (2014). Later on, the Vienna Initiative focused more on providing a platform for policy

[2] See http://vienna-initiative.com.

coordination and for the exchange of experience and information, as well as at collecting data and monitoring the deleveraging process.

3 Data and estimation strategy

This analysis is based on a unique hand-collected data set on intragroup flows between CESEE subsidiaries and the rest of their respective banking groups. The data were collected from the subsidiaries' annual financial statements. Two variables were constructed to measure intragroup transactions, one that captures nonequity flows, and one that captures equity flows.

Measures of nonequity flows come from the section of the financial statements that reports transactions with related parties. This section includes all claims – loans, deposits, interest receivable and securities – of the subsidiary on the parent and other members of the group (related party assets). In a similar vein, all liabilities – current accounts, loans received and subordinated loans – owed to the parent and fellow subsidiaries are reported (related party liabilities). Subtracting related party assets from related party liabilities results in net related party liabilities. If positive, this measure represents the net amount the subsidiary owes to the rest of the group and if negative, it represents the net claims of the subsidiary on the rest of group. To measure nonequity flows, the author looked at the change in net related party liabilities between two given years. If this change is positive, it means that the subsidiary received more funds from the group than it gave to the parent bank and other subsidiaries. And conversely, if it is negative, the funds were withdrawn from the subsidiary and the subsidiary was a net creditor of the group. To illustrate this point, table 1 presents an excerpt from the financial statement of UniCredit Romania, the Romanian subsidiary of UniCredit. Notes to table 1 contain a calculation of the change in net related party liabilities, i.e. nonequity flows, based on the data from this excerpt. The fact that the change in net related party liabilities was positive shows that the subsidiary received additional funding from the parent group in 2012.

Equity flows consist of transactions that affect equity and are equal to inflows from share issues minus outflows from dividends paid and share repurchases. Data on these transactions may be found in the section of the financial statements that reports changes in equity. It is important to differentiate between equity and nonequity flows because of their different maturity and regulatory implications. Equity does not have a fixed maturity and has an almost unlimited life. Therefore, it is not subject to bank runs and cannot be easily withdrawn, as dividends can be paid out only if the subsidiary has made a profit, the amount of dividends cannot be greater than the amount of profit made, and dividends can only be paid out on certain dates when the profit is declared; moreover, the amount of dividends is limited by the amount of profit made. On the other hand, banking is a strictly regulated activity and banks' lending is constrained by the amount of capital banks possess. Increases in equity lead to a decrease in regulatory constraints and make it possible to expand lending.

The change in nonrelated party assets serves as an outcome variable and a proxy for banks' credit activity. The author defined nonrelated party assets as the difference between total assets and related party assets, so this variable represents the claims the subsidiary has on entities outside its parent company. Most of the related literature uses loan growth as an outcome variable, but this method is not

Table 1

Illustration of the calculation of nonequity flows

The following transactions were carried out with UniCredit Italiano S.p.A, UniCredit Bank Austria AG and their subsidiaries:

	December 31, 2012	December 31, 2011
	RON	*RON*
Derivative assets at fair value through profit and loss	27,295,492	33,210,703
Current accounts and deposits to banks	189,721,240	627,699,734
Loans to customers	27,632,921	22,983,107
Other assets	13,263,837	20,796,322
Total assets (related party assets)	257,913,490	704,689,866
Derivative liabilities at fair value through profit and loss	130,454,608	99,832,352
Derivatives used for hedging	94,235,076	58,812,857
Current accounts	96,377,729	96,829,119
Deposits attracted	2,562,769,544	3,084,839,289
Loans received	7,557,103,200	7,500,461,670
Subordinated liabilities	598,474,296	498,124,892
Other liabilities	28,707,574	14,767,868
Total liabilities (related party liabilities)	11,068,122,027	11,353,668,047

Source: Financial statements for 2012 of UniCredit Țiriac Bank.

Note: Net related party liabilities are equal to RON 10,810,208,537 (=11,068,122,027–257,913,490) in 2012 and to RON 10,648,987,181 (=11,353,668,047–704,689,866) in 2011, so the change in net related party liabilities is RON 161,230,356 (=10,810,208,537–10,648,987,181).

viable in this setting because loans reported on the balance sheet include loans to the rest of the group, so that one could erroneously conclude that banks are increasing lending while they are actually tunneling funds abroad to the rest of the group. However, nonrelated party assets are a good measure of financial interme-diation activity, as it makes no substantial difference whether a bank issues a loan to a company, buys a company's corporate bonds or directly invests in a company's equity. All these transactions increase financing available to firms. Before running regressions, the author converted all amounts to euro using end-of-year exchange rates and standardized all variables by dividing them by beginning-of-period as-sets. If the purchasing power parity holds, this currency translation should also correct for the effects of inflation on amounts reported in financial statements. The regression equation aims to capture the effect of group funding (equity, non-equity and total flows) on the change in nonrelated party assets of subsidiary *i* that operates in the country *c*. It has the following form:

$$\frac{\Delta nonrelated\_party\_assets_{i,c,\,11-09}}{L.assets_{i,c,09}} = \alpha + \beta * \frac{group\_funding_{i,\,c,11-09}}{L.assets_{i,c,09}} + \quad (1)$$

$$+ controls_{ic} + country\_dummy_c + \varepsilon_{i,c}$$

Where:
nonrelated_party_assets = assets – related party assets
group_funding = equity flows or nonequity flows or total flows = equity + non-equity flows
equity_flows = share issues – share repurchases – dividends paid
nonequity flows = Δnet related party liabilities = Δ(related party liabilities – related party assets).
L.assets$_{i,c,09}$ = total assets of subsidiary *i* in country *c* as at end-2009

The time period covered is from 2009, when the crisis started to unfold in CESEE, to 2011, when most of the adjustment occurred. Thus, all variables in differences represent the difference between stock amounts as in 2011 and at end-2009, while flow variables, for instance share issues, are the sum of flows during 2010 and 2011. All values were converted to euro using year-end exchange rates, and all variables are standardized by dividing them by the value of bank assets as at end-2009. Converting values to euro makes sense because most parent banks are located in the euro area and because most cross-border lending was denominated in euro. Moreover, as mentioned above, foreign subsidiaries were heavily engaged in foreign currency lending. If values in domestic currencies were used, one would wrongly interpret the effects of inflation and exchange rate depreciation as growth in bank assets. This growth would just be in nominal but not in real terms. On the other hand, converting noneuro-denominated assets to euro might introduce a similar bias if purchasing power parity does not hold, so that the exchange rate depreciation is greater than the inflation differential. This is what probably occurred, as most of the floating CESEE currencies depreciated sharply during the crisis. Thus, converting domestic currency-denominated assets underestimates the growth of those assets. However, a look at subsidiaries' balance sheets shows that the majority of assets are denominated in euro, part is denominated in domestic currencies, and a minor share is denominated in Swiss francs or in U.S. dollars. Therefore, converting values into euro introduces the smallest exchange rate valuation bias.

Controls include the bank's return on assets (the ratio of net profit to assets), the liquidity ratio (the ratio of cash plus balances with the central bank to assets), the solvency ratio (the ratio of equity to assets) and riskiness (the ratio of provisions for loan losses to assets). All these controls are averaged over the 2009 to 2011 period.

The issue with estimating equation (1) is that the amount of intragroup funding might be correlated with the error term and thus be endogenous because the subsidiary usually gets intragroup funds when it can invest them profitably. This makes establishing the direction of causation difficult. Do nonrelated party assets increase because more intragroup funding is available, or do intragroup funds increase because clients' credit demand is high? To isolate the effect of the demand for and supply of intragroup funds, the author applied an instrumental variable (IV) regression, instrumenting for the supply of intragroup funds. The exposure of parent banks to the euro area sovereign debt crisis served as an instrument. The measure of crisis exposure was constructed by dividing holdings of stressed country (Ireland, Greece, Spain and Portugal) sovereign debt as at December 31, 2010, by the parent bank's core tier 1 capital. Thus, the exposure captures what percentage of the core capital would be lost if the stressed countries defaulted completely on their sovereign debt. The data on sovereign debt exposures are taken from the results of the EBA's EU-wide stress test[3] in 2011. The exposure to stressed countries represents a good instrument because (1) it is correlated with intragroup funding, as parent banks that experienced higher sovereign losses are less able to support their subsidiaries and might even withdraw funds from abroad to cover losses at home, and (2) the decision of the parent on how much to invest in stressed country sovereign debt should not be too strongly correlated with the credit

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[3] *For further details, see http://www.eba.europa.eu/risk-analysis-and-data/eu-wide-stress-testing/2011/results.*

demand of its international subsidiaries. The author allowed for a nonlinear effect of exposure to stressed country sovereign debt and therefore also included the squared term at the first stage of the instrumental variable (IV) estimation.

Chart 1

Scatterplot of stressed country exposure and total flows from 2009 to 2011

Total flows (% of 2009 assets)

Stressed country exposure (holdings of stressed country sovereign debt as at December 31, 2010, in % of parent bank's core tier 1 capital)

◆ Alpha Bank	✛ Crédit Agricole	✕ KBC	▣ Piraeus Bank
■ Banco Comercial Português	▬ DNB Bank	✖ Marfin Popular Bank	▲ Rabobank
▲ Banco Popolare	▬ EFG	● NBG	✕ Raiffeisen
✕ BayernLB Group	◆ Erste Bank	✛ Nordea	✳ SEB Group
✳ BNP Paribas	▣ ING	▬ Nova KBM	● Société Générale
● Commerzbank	▲ Intesa Sanpaolo	▬ NLB	✛ Swedbank
	◆ OTP		▬ UniCredit

Source: EBA, annual financial statements from 2009 to 2011 of all banks considered in this study.

Table 2

Overview of bank holding groups and countries

	Banking group	Home country	Number of subsidiaries	Host countries
1	Alpha Bank	Greece	4	AL, MK, RS, UA
2	BNP Paribas	France	2	PL , RS
3	Banco Comercial Português	Portugal	1	PL
4	Banco Popolare	Italy	1	HR
5	BayernLB Group	Germany	2	BG, HU
6	Commerzbank	Germany	1	PL
7	Crédit Agricole	France	4	AL, BG, RO, RS
8	DNB Bank	Norway	2	LV, LT
9	EFG	Greece	3	BG, RS, UA
10	Erste Bank	Austria	9	BA, HR, CZ, ME, RO, RS, SK, SI, UA
11	ING	Netherlands	1	PL
12	Intesa Sanpaolo	Italy	9	AL, BA , HR , HU, RO, RS, SK, SI, UA
13	KBC	Belgium	3	CZ, PL, RS
14	Marfin Popular Bank	Cyprus	1	RS
15	NBG	Greece	4	BG, MK , RO , RS
16	Nordea	Sweden	1	PL
17	Nova KBM	Slovenia	1	RS
18	NLB	Slovenia	3	BA , MK, RS
19	OTP	Hungary	7	BG, HR, ME, RO, RS, SK, UA
20	Piraeus Bank	Greece	3	AL, BG, RS
21	Rabobank	Netherlands	1	PL
22	Raiffeisen	Austria	10	AL, BA, BG, HR, CZ, HU, KS, RO, SK, SI
23	SEB Group	Sweden	2	EE, LV
24	Société Générale	France	8	AL, BG, CZ, MK, ME , RO, RS, SI
25	Swedbank	Sweden	3	EE, LV, LT
26	UniCredit	Italy	11	BA, BG, HR, CZ, LV, PL, RO, RS, SK, SI, UA

Source: Annual financial statements from 2009 to 2012 of all banks considered in this study, author's calculations.

Note: The countries in column 4 are cited using ISO codes.

Table 3

Summary statistics

	Mean	Median	Standard deviation	Count
Assets2011 (EUR thousands)	4,796,813	1,897,812	6,783,208	97
Equity2011 (EUR thousands)	530,111	248,844	728,404	97
Net_related_party_liabilities 2011 (EUR thousands)	527,594	150,682	1,020,609	97
Δnon_related_party_assets 2011–2009 (% of assets2009)	8.22	6.12	23.95	97
roa_average 2011–2009 (%)	−0.11	0.51	1.83	97
liquidity_average 2011–2009 (%)	11.93	10.91	8.47	97
solvency_average 2011–2009 (%)	12.75	11.52	7.14	97
riskiness_average 2011–2009 (%)	5.11	4.16	3.40	97
total_flows 2011–2009 (% of assets2009)	0.58	−1.59	17.00	97
equity_flows 2011–2009 (% of assets2009)	2.00	0.00	5.01	97
non_equity_flows 2011–2009 (% of assets2009)	−1.42	−2.04	15.06	97
Stressed countries (% of core tier 1 capital)	40.79	7.68	74.57	97

Source: Annual financial statements from 2009 to 2012 of all banks considered in this study, EBA.

Chart 1 is a scatterplot of stressed country exposure and of total flows for all subsidiaries in the sample. The chart shows that Greek banks and one Portuguese bank have the largest stressed country exposure. This is as expected, because it is natural that banks invest mostly in sovereign bonds of their home country. Conversely, Swedbank, which is headquartered in Sweden, had no stressed country exposure at all, but still removed substantial funds from its Baltic subsidiary, probably due to the financial crisis that hit the Baltics.

The final data set consists of 26 multinational banking groups that operate a total of 97 subsidiaries in 19 CESEE countries. Table 2 shows an overview of the bank holding groups and countries. The Italian bank UniCredit is most heavily represented in the sample (11 subsidiaries), followed by the Austrian Raiffeisen banking group (10 subsidiaries) and Austria's Erste Bank (9 subsidiaries). The country with the largest number of parent banks is Greece, but each of these parent banks has only 3 or 4 subsidiaries, typically in Balkan countries. Scandinavian banks, in turn, do business mostly in the Baltic countries.

Table 3 shows summary statistics. Subsidiaries of foreign banks in CESEE relied heavily on internal capital markets, as these countries' capital markets were

Chart 2

Histogram of equity and nonequity flows

Frequency (number of banks)
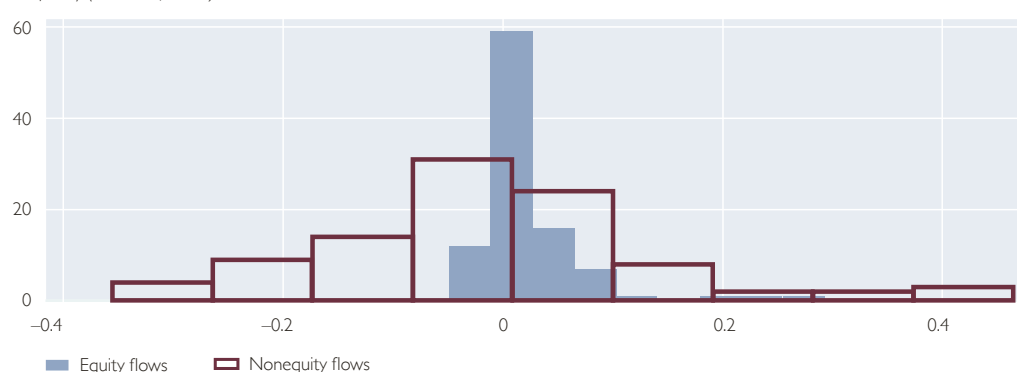
Source: Annual financial statements from 2009 to 2012 of all banks considered in this study.

underdeveloped and domestic savings were small. On average, net related party liabilities amounted to 10% of subsidiaries' total assets. Most of the subsidiaries did not receive any equity transfers, as the median value of equity transfers is zero, but those that issued new shares did so in significant amounts, pushing the mean to 2% of 2009 total assets. On average, nonequity flows were negative in the 2009 to 2011 period, with the mean equal to −1.42 % of subsidiaries' 2009 total assets. Thus, subsidiaries were net creditors for the rest of the group in this period. Chart 2 presents a histogram of equity and nonequity flows. The distribution of equity flows is centered around zero, which is the mode and the median, and has very slim tails. Nonequity flows are more evenly distributed over the entire range from −35% to 45%. Despite the crisis, subsidiaries expanded their balance sheet, as nonrelated party assets increased by 8.22 % on average.

4 Estimation results

Table 4 presents the estimation results of the impact of parent bank funding on the asset growth of subsidiaries. The coefficient on intragroup flows is positive, greater than 1 and statistically significant in all specifications. A 1 percentage point increase in total flows, as measured by the share of total flows in end-2009 assets, led to a 1.17 percentage point increase in nonrelated party assets over the 2009 to 2011 period, as measured by the share of total flows in end-2009 assets. The effect of equity flows is higher and equals 2.3 percentage points, while the impact of non-equity flows is 1.2 percentage points. The higher coefficient on equity is consistent with expectations and the reasoning in the previous section.[4] An increase in equity relaxes the regulatory constraints of the subsidiary, enhances depositors' confidence, making it easier for the subsidiary to attract deposits and expand lending.

After instrumenting for intragroup flows, the estimated coefficients further increase in absolute value to 1.34 percentage points for total flows, 6.14 percentage points for equity flows and 1.71 percentage points for nonequity flows. The difference in coefficient estimates, which is especially pronounced for equity flows, shows that ordinary least squares (OLS) estimates underestimated the effect of intragroup flows.

First-stage results shown in columns 2, 5 and 8 of table 4 show that stressed country exposure is an important determinant of intragroup funding, as the coefficients on stressed countries and squared-term stressed countries$^{\wedge 2}$ are statistically significant. The value the of the F-test of excluded instruments of 14.96 suggests that stressed country exposure is a strong instrument for total flows, as it has a value greater than 10 (Stock, Wright and Yogo, 2002). However, specifications with equity and nonequity flows reject the hypothesis that stressed countries and stressed countries$^{\wedge 2}$ are strong instruments, as the value of the F-test of excluded instruments is less than 10. Nevertheless, one needs to bear in mind that this test of excluded instruments was derived using asymptotic approximations and that the estimation in this study was conducted on a sample size of just 97 observations. Average marginal effects, assessed at the mean, of stressed country exposure are −0.22, −0.04 and −0.17 for total, equity and nonequity flows, respectively. Negative values of the coefficient estimate on stressed countries confirm

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[4] *In a statistical sense, a higher coefficient on equity flows is also due to a much lower variation in equity flows, as most of the distribution is concentrated around 0 (chart 2).*

Chart 3

Predicted values of total flows for various levels of stressed country exposure

Prediction of total flows, at means
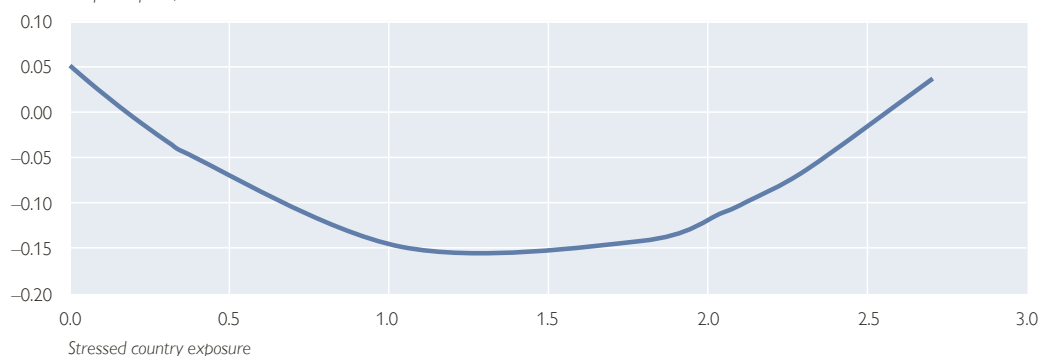
Source: Author's calculations.

Note: Prediction of total flows for various levels of stressed country exposure using estimates from the first stage regression (equation 2 in table 4). All other variables that enter the equation are at their means.

Table 4

Estimation results

	Group funding: total flows			Group funding: equity flows			Group funding: nonequity flows		
	OLS	FS	IV	OLS	FS	IV	OLS	FS	IV
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Stressed countries		−0.310***			−0.068**			−0.242**	
		(0.100)			(0.030)			(0.089)	
Stressed countries		0.113***			0.024**			0.089**	
		(0.039)			(0.011)			(0.035)	
Total flows	1.170***		1.344***						
	(0.084)		(0.320)						
Equity flows				2.303***		6.139**			
				(0.773)		(2.345)			
Nonequity flows							1.199***		1.705***
							(0.099)		(0.503)
ROA	3.021***	−5.205***	3.752**	3.517	−2.558***	12.540**	0.322	−2.647*	1.261
	(0.728)	(1.511)	(1.409)	(2.884)	(0.444)	(5.298)	(1.077)	(1.432)	(1.199)
Liquidity	−0.181	0.825**	−0.310	0.412	0.140	−0.040	−0.061	0.685*	−0.376
	(0.302)	(0.399)	(0.416)	(0.576)	(0.186)	(0.957)	(0.351)	(0.345)	(0.481)
Solvency	−0.303	0.463**	−0.345*	−0.141	0.105	−0.349	−0.245	0.358**	−0.341*
	(0.180)	(0.200)	(0.187)	(0.290)	(0.075)	(0.408)	(0.201)	(0.164)	(0.195)
Riskiness	−1.509*	−4.093***	−0.948	−3.759**	−0.843***	−1.215	−2.211**	−3.250***	−0.913
	(0.882)	(0.728)	(1.395)	(1.660)	(0.245)	(1.644)	(0.947)	(0.756)	(1.688)
Constant	0.293***	−0.058	0.301***	0.156	0.031	0.016	0.338***	−0.089	0.380***
	(0.089)	(0.064)	(0.088)	(0.138)	(0.024)	(0.191)	(0.091)	(0.077)	(0.094)
Country dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	97	97	97	97	97	97	97	97	97
R-squared	0.809	0.583	0.802	0.568	0.655	0.320	0.771	0.533	0.719

Source: Author's calculations.

Note: The table contains the regression results of estimating equation (1). In equations (1), (3), (4), (6), (7) and (9), the dependent variable is the change in nonrelated party assets from 2009 to 2011 divided by total assets at end-2009. Equations (1), (4) and (7) present ordinary least squares (OLS) estimates of the impact of total, equity and nonequity flows on the change in nonrelated party assets, respectively. Equations (3), (6) and (9) present estimates of the effects after instrumenting for intragroup flows with stressed country exposure. Equations (2), (5) and (8) show the first stage (FS) of instrumental variable (IV) estimation; hence, the dependent variable is one of the endogenous internal flows: total flows in equation (2), equity flows in equation (5) and nonequity flows in equation (8). Country dummies are included. Robust standard errors clustered by parent bank are given in parentheses; *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

that parent banks with higher sovereign exposure did indeed curtail intragroup funding to their international subsidiaries. A 10 percentage point increase in the sovereign exposure of stressed countries, as measured by the share in the tier 1 capital ratio, on average leads to a decrease of 2.2 percentage points in total flows, 0.4 percentage points in equity flows and 1.7 percentage points in nonequity flows. Given that the stressed country exposure varies widely from 0 in case of Swedbank to 270 in case of Piraeus Bank, this effect is economically significant as well. Chart 3 shows predicted values of total flows for various levels of stressed country exposure, while replacing all other regression variables with their mean values. We see that the relation between exposure and the withdrawal of funds is nonlinear, as posited by equation (1) and as can be deduced from chart 1. The issue here is that some banks, like Swedbank, deleveraged heavily although they did not have any exposure to stressed countries, while Greek banks were substantially hit by the shock but still kept most of their CESEE exposure. However, even if one imposes a linear instead of a nonlinear model,[5] the effect on stressed country exposure is still negative and statistically significant.

4.1 Discussion of estimates on control variables

Coefficient estimates on control variables show that there is a strong association between the performance of the subsidiary and intragroup flows. Unfortunately, in this setting one can only examine correlations, so it remains unclear whether the performance of the subsidiary is the determinant of intragroup flows or whether the increase in intragroup funds leads to better performance ratios of the subsidiary.

Table 4 shows that less profitable, more liquid, more solvent and less risky subsidiaries received more intragroup funds. This relation holds for all kinds of flows: equity, nonequity and total. A 1 percentage point increase in the return on assets is associated with a 5.2 percentage point decrease of total flows received in the period from 2009 to 2011. An explanation for this relation might be that more profitable subsidiaries generate more internal funds and thus have less of a need for funds from the parent group. Conversely, subsidiaries with more risky portfolios received fewer intragroup funds. A 1 percentage point increase in the ratio of loan loss provisions to total assets is associated with a 4 percentage point decrease in total flows. This result suggests that parent banks were cautious in providing funds to more risky subsidiaries. An alternative explanation is that subsidiaries with a bad credit portfolio have less of a need for funds, as they do not have good credit growth opportunities.

The results also provide some weak evidence that more profitable subsidiaries experienced higher growth in nonrelated party assets. Thus, bank growth seems to have been profitable, and subsidiaries did not have to sacrifice profitability in order to grow faster. Surprisingly, riskier subsidiaries grew more slowly. One might expect that the easing of credit standards and the provision of loans to subprime borrowers leads to faster asset growth. However, in this case, it seems that the negative effects of the recognition of losses and high regulatory requirements for loan loss provisions outweighed the positive effects of more loans on the balance sheet.

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[5] *This is part of the robustness checks described in section 4.2 below.*

4.2 Robustness checks

As a robustness check, specification (1) was estimated with year-on-year changes for 2010/09, 2011/10 and 2012/11. Furthermore, in the first stage of IV estimation, the square term was dropped and just the linear impact of stressed country exposure was allowed for. Table 5 presents the estimation results for the impact of total flows on the change in nonrelated party assets. As expected, the coefficients on total flows are positive across all specifications. IV estimates are higher than OLS estimates, but statistically significant just in 2010, suggesting that OLS estimates underestimated the effect of intragroup funding, like in the 2009 to 2011 results reported above. Moreover, OLS coefficient estimates are lower than 1, which implies that intragroup funds do not have a big multiplication effect. On the other hand, IV estimates are greater than 1, which suggests that there is complementarity between intragroup and external funds, so an inflow of EUR 1 of additional intragroup funds leads to an increase of more than EUR 1 in assets. The coefficient on stressed country exposure is negative in all specifications, but statistically significant just in 2010 and 2012. Thus, it seems that negatively affected parent banks withdrew most of the funds from subsidiaries in these two years. This is consistent with the assumption that budgets and plans for the next year are made at year-end and in line with the timing of negative market reactions: They were greatest in autumn 2009 and in summer 2011.

Table 5

Robustness checks using a regression specification with one-year total flows and linear effect of stressed country exposure

	2010			2011			2012		
	OLS	FS	IV	OLS	FS	IV	OLS	FS	IV
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Stressed countries		−0.031***			−0.003			−0.015**	
		(0.011)			(0.011)			(0.007)	
Total flows	0.720***		1.315**	0.776***		10.947	0.460**		1.207
	(0.129)		(0.514)	(0.146)		(34.777)	(0.178)		(1.002)
ROA	−0.283	−2.613**	1.341	2.057**	−0.925	11.283	0.747	−0.403	0.969
	(0.650)	(1.123)	(1.321)	(0.783)	(0.914)	(29.809)	(0.483)	(0.685)	(0.898)
Liquidity	0.077	0.249	−0.047	0.118	0.385	−3.765	0.223	−0.324	0.484
	(0.260)	(0.314)	(0.368)	(0.193)	(0.236)	(13.816)	(0.236)	(0.242)	(0.638)
Solvency	−0.044	0.155	−0.107	−0.128	0.132	−1.407	0.189	0.002	0.228
	(0.132)	(0.165)	(0.144)	(0.150)	(0.145)	(4.424)	(0.130)	(0.158)	(0.206)
Riskiness	−1.889***	−1.695**	−0.878	−0.729	−0.734**	6.679	0.118	−0.536	0.482
	(0.320)	(0.756)	(1.002)	(0.524)	(0.344)	(24.771)	(0.369)	(0.633)	(1.037)
Constant	0.147***	−0.063	0.156**	0.093	−0.077	0.537	−0.011	0.023	−0.064
	(0.049)	(0.082)	(0.063)	(0.059)	(0.048)	(1.608)	(0.054)	(0.077)	(0.139)
Country dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	97	97	97	102	102	102	100	100	100
R-squared	0.649	0.433	0.478	0.663	0.377	.	0.445	0.277	0.218

Source: Author's calculations.

Note: The table contains the regression results of estimating the effect of total flows on the change in nonrelated party assets in a one-year period. The dependent variable is the change in nonrelated party assets between 2010/09 (equations (1) and (3)), 2011/10 (equations (4) and (6)) and 2012/11 (equations (7) and (9)) standardized by the division by total assets at end-2009, end-2010 and end-2011. Equations (1), (4) and (7) are ordinary least squares (OLS) estimates. Equations (3), (6) and (9) present estimates after instrumenting for total flows with stressed country sovereign exposure in a linear way, i.e. without the squared term. Equations (2), (5) and (8) show the first stage (FS) of instrumental variable (IV) estimation, hence the dependent variable is total flows in 2010, 2011 and 2012, respectively. Robust standard errors clustered by parent bank are given in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

5 Conclusion

The analysis presented in this paper provides evidence of the importance of group funding in financing the asset growth of the subsidiaries of foreign banks that operate in CESEE. By distinguishing between equity and nonequity flows, the study shows that equity flows are more beneficial for the growth of the subsidiary than nonequity flows. Equity flows have a higher multiplier, and changes in equity flows are associated with higher growth in nonrelated party assets than changes of the same size in nonequity flows. However, in both cases, the multiplier is greater than 1, which implies that there is some complementarity between intragroup and external funds. It is easier for the subsidiary to attract external funds after it has received intragroup funds. By contrast, subsidiaries that are faced with the withdrawal of internal funds have difficulties in attracting external funds to compensate for this withdrawal. These results hold after instrumenting for group funding with the exposure of the parent bank to the sovereign debt of stressed countries. The first stage of the IV estimation shows that parent banks that were more exposed to the sovereign debt of stressed countries withdrew more funds from their CESEE subsidiaries than banks that had fewer stressed countries' sovereign bonds on their balance sheet. Thus, there is some evidence that the internal capital markets of foreign banks were indeed a transmission channel of the euro area sovereign debt crisis shock from Western Europe to CESEE.

The study has some limitations that could be overcome by using more detailed data on intragroup flows and the financing activities of subsidiaries. First, the analysis in this paper was based on yearly intragroup flows. However, many flows between parents and subsidiaries occur at intervals of less than one year or even daily. Next, the focus of the paper was on the balance sheet exposure of the subsidiary and the rest of the group. However, some transactions, like certain financial derivatives and the provision of credit guarantees and commitments, represent off-balance sheet exposures, whose effects are not accounted for in this paper. Last but not least, with matched data on lending between subsidiaries and firms, one could control neatly for credit demand, like Schnabl (2012) did. Unfortunately, due to the proprietary and confidential nature of the intragroup flow data and the need to gather data from several national credit registries, it is very unlikely that this kind of data would be made available for future research.

The results of the presented analysis have important policy implications. Even in 2014, five years after this crisis, most CESEE countries were still in recession. Although this problem is due partly to lower demand for CESEE exports in the West, weak public finances and the lack of structural reforms, one cannot deny that weak banking sectors are responsible as well. After years of credit expansion financed by inflows from the West, banks are now faced with high ratios of nonperforming loans as well as difficulties in obtaining funding from abroad, which made them retrench lending to sectors that needed it most. The lion's share of banks' portfolios consists of loans to governments and to big and established companies rather than to small and medium-sized enterprises.

With more coordination and resolute action by policymakers, a similarly hard landing could be avoided in the future. For example, regulators could limit the amount of funds a subsidiary can get from the group and in this way force the subsidiary to rely more on local funds. Alternatively, one could prescribe a minimum duration of the liabilities received from the parent to prevent sudden

outflows of parent funds. The drawback of these policies is that although they may prevent recession, they prevent expansion as well. One cannot deny that CESEE was growing quite fast during the precrisis period and that this growth was fueled by growth of credit financed from abroad. Whether the precrisis growth was enough to compensate for the postcrisis fall and whether the foreign banks did more good than harm remains a topic to be covered by future research.

References

Aiyar, S. 2012. From Financial Crisis to Great Recession: The Role of Globalized Banks. American Economic Review 102(3). 225–230.

Allen, F., X. Gu and O. Kowalewski. 2013. Corporate Governance and Intra-Group Transactions in European Bank Holding Companies during the Crisis. International Finance Review 14. 365–431.

Cetorelli, N. and L. Goldberg. 2011. Global banks and international shock transmission: Evidence from the crisis. IMF Economic Review 59(1). 41–76.

Cetorelli, N. and L. Goldberg. 2012a. Follow the Money: Quantifying Domestic Effects of Foreign Bank Shocks in the Great Recession. American Economic Review 102(3). 213–218.

Cetorelli, N. and L. Goldberg. 2012b. Liquidity Management of U.S. Global Banks: Internal Capital Markets in the Great Recession. Journal of International Economics 88(2). 299–311.

Chernenko, S. and A. Sunderam. 2014. Frictions in Shadow Banking: Evidence from the Lending Behavior of Money Market Funds. Review of Financial Studies. Forthcoming.

Claessens, S. and N. Horen. 2014. Foreign banks: Trends and impact. Journal of Money, Credit and Banking. Supplement to 46(1). 295–326.

Cornett, M. M., L. Guo, S. Khaksari and H. Tehranian. 2010. The impact of state ownership on performance differences in privately-owned versus state-owned banks: An international comparison. Journal of Financial Intermediation 19(1). 74–94.

De Haas, R. and I. Van Lelyveld. 2010. Internal capital markets and lending by multinational bank subsidiaries. Journal of Financial Intermediation 19(1). 1–25.

De Haas, R. and I. Van Lelyveld. 2014. Multinational banks and the global financial crisis: Weathering the perfect storm? Journal of Money, Credit and Banking. Supplement to 46(1). 333–364.

De Haas, R., Y. Korniyenko, A. Pivovarsky and T. Tsankova. 2014. Taming the Herd? Foreign Banks, the Vienna Initiative and Crisis Transmission. Journal of Financial Intermediation. Forthcoming.

Forbes, K. J. and F. E. Warnock. 2012. Debt- and Equity-Led Capital Flow Episodes. NBER Working Paper 18329. Cambridge, MA.

Hameter, M., M. Lahnsteiner and U. Vogel. 2012. Intra-Group Cross-Border Credit and Roll-Over Risks in CESEE – Evidence from Austrian Banks. In: Financial Stability Report 23. 76–91.

Houston, J., C. James and D. Marcus. 1997. Capital market frictions and the role of internal capital markets in banking. Journal of Financial Economics 46(2). 135–164.

Houston, J. F. and C. James. 1998. Do bank internal capital markets promote lending? Journal of Banking & Finance 22(6) 899–918.

Peek, J. and E. S. Rosengren. 1997. The International Transmission of Financial Shocks: The Case of Japan. American Economic Review. 495–505.

Peek, J. and E. S. Rosengren. 2000. Collateral Damage: Effects of the Japanese Bank Crisis on Real Activity in the United States. American Economic Review. 30–45.

Schnabl, P. 2012. The International Transmission of Bank Liquidity Shocks: Evidence from an Emerging Market. Journal of Finance 67(3). 897–932.

Stock, J. H., J. H. Wright and M. Yogo. 2002. A Survey of Weak Instruments and Weak Identification in Generalized Method of Moments. Journal of Business and Economic Statistics 20(4). 518–529.

UniCredit Ţiriac Bank. 2013. Financial Statements for 2012. In: Annual Report 2012. 75. http://gss.unicreditgroup.en/sites/default/files/markets/documents/AR_2012_UCTB.pdf (retrieved on June 21, 2015).

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Ukraine: struggling banking sector amid substantial uncertainty

The situation of banks in Ukraine is exceptionally challenging for a number of reasons. First of all, banks had not managed to recover from the 2008–09 crisis before being hit again in 2014. Hence, the deep Ukrainian recession and the hryvnia's plunge – together with strong exposure to geopolitical tensions – tipped the banking sector again deeply into the red. Amid an environment of persistent uncertainty, many foreign-owned banks have left the country. In addition to chronic structural shortcomings, such as weak rule of law, excessively high corruption, opaque ownership structures and connected lending, the most significant problems currently plaguing the sector include high and growing credit risk and high exchange rate risk. The country faces a dramatic credit crunch and even more alarming deposit outflows. Financial intermediation has practically collapsed, with the number of insolvent banks rising quickly. The major shock-absorbing factor is the IMF's and the international community's commitment to financially assist Ukraine.

Published in *Financial Stability Report 29.*

Stephan Barisitz, Zuzana Fungáčová

Event wrap-ups and miscellaneous

77th East Jour Fixe: Russia – economic turmoil and policy options

Compiled by
Stephan Barisitz[1]

The 77th East Jour Fixe organized by the OeNB on May 29, 2015, focused on a highly topical issue: the economic crisis that struck Russia due to geopolitical tensions (Crimea, Eastern Ukraine), subsequent Western sanctions (mostly from mid-2014) as well as the plunge of the oil price (in late 2014, even if followed by a slight recovery in the first half of 2015). Given the many aspects covered by this crisis and by the authorities' crisis-response measures – fiscal, monetary and exchange rate policies, banking sector and structural measures as well as trade and financial diversification efforts –, the East Jour Fixe not only delivered a number of interesting findings but also gave rise to new questions.

In her welcome address and introductory statement, *Doris Ritzberger-Grünwald,* Director of the OeNB's Economic Analysis and Research Department, pointed out that Russia, in the years prior to 2014, had boasted some impressive macro-economic achievements but that the country at the same time remained saddled with a chronically weak investment climate, pervasive corruption, and other structural shortcomings. Russia is moreover often seen as a "Dutch disease patient," whose manufacturing sector has lost competitiveness and substance on account of the overwhelming economic impact of resource extraction. In this ambiguous situation, which had already set off a considerable slowdown in economic momentum in mid-2013, the country experienced a double shock – namely from the sanctions and oil price slump, which pushed it into recession in 2015. However, continued Ritzberger-Grünwald, so far the recession has been somewhat milder than expected, which also appears to be attributable to the authorities' multifold policy reaction, including the introduction of exchange rate flexibility, the tightening of monetary policy, bank recapitalizations, and limited fiscal loosening. Still, clear downside risks prevail, relating to possible new oil price declines and a possible flare-up of geopolitical tensions in Eastern Ukraine.

The keynote speaker, Professor *Jacques Sapir,* Director of the Paris-based Centre d'Études des Modes d'Industrialisation (CEMI) of the École des Hautes Études en Sciences Sociales (EHESS), delivered his address on "Russia in troubled times." In his view, Russian monetary policy has recently de facto switched from inflation targeting – still the official guideline – to a greater orientation toward the real exchange rate and to combating recession. The general policy thrust has been evolving over time from a liberal direction to a stronger industrial policy aim, which is by no means unfamiliar to Russian historical experience. In other words, the manufacturing industry is to be supported by an undervalued exchange rate. The economy's (partial) eastward reorientation had already started several years before the Ukrainian conflict, not least because the Russian authorities had understood that the euro area was set to face a protracted crisis. Thus, the Customs Union of Belarus, Kazakhstan and Russia had already been established in 2010, and was subsequently transformed, enlarged and renamed into Eurasian Economic Union (EAEU) in 2015. Also, the BRICS group of nations (comprising Brazil, Russia, India, China and South Africa) was founded in 2010 (South Africa joined in 2011); BRICS aims at the emancipation of emerging markets from international

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[1] *The 77th East Jour Fixe was co-organized by Stephan Barisitz, Birgit Riedler and Thomas Gruber (Oesterreichische Nationalbank, Foreign Research Division).*

dominance of the IMF, the World Bank and the U.S. dollar. In the ensuing discussion, Professor Sapir added that an often overlooked dimension of the EAEU is that it strengthens the spatial link between Russia and China, which creates a vast territory open to large infrastructural investment projects, e.g. the revamping of transcontinental railroad and energy connections, which in turn could render overland transportation and transmission across Eurasia more competitive.

Session I, chaired by *Helene Schuberth,* Head of the Foreign Research Division of the OeNB, focused on the issue where Russia stands with respect to structural reforms and attracting investment. Schuberth pointed out that Russia's "old" growth model, founded on steadily rising oil prices and thus improving terms of trade, appears to have reached its limits. Therefore, she emphasized, Russia urgently needs a new model – just which one, remains to be seen.

Yaroslav Lissovolik, Chief Economist and Member of the Managing Board of Deutsche Bank, Moscow, presented his view on Russia's reform needs and its quest for a new industrial policy. At the very outset, he expressed his concerns about the authorities' apparent infatuation with a weak ruble and top-down industrial policy. He added that import substitution has lately become a catch phrase, an essential paradigm. However, Russia's growth malaise triggered by diminishing returns from previously high oil prices clearly predates the Ukrainian crisis. A key problem is the differential between relatively high real wage growth (until most recently) and rather low productivity growth. While Russia's investment climate has improved in recent years, as measured by the World Bank/IFC Ease of Doing Business indicators – the country had climbed from rank 124 in 2011 to rank 92 in 2014 and then further improved its position slightly in 2015 –, there does not appear to be much demand from the population for in-depth structural reforms. At the same time, according to polls, the public trusts the government more than business and the mass media. Lissovolik concluded by pointing to some promising and dynamic regions (e.g. Kaluga, Ulyanovsk, Krasnoyarsk and the Republic of Tatarstan – which are, interestingly, neither major urban metropolitan centers nor resource-rich territories) as a possible source of hope for structural change.

Birgit Niessner, Head of Country Analysis of Raiffeisen Bank International AG, Vienna, focused on Russia's investment climate and policy and on how conducive they are for growth. She agreed that the Russian economy had already slowed down before the Western sanctions hit the country. She expressed concern that the high interest rates triggered by the sanctions could lead to a shortage of investment funds and that there will be no "rocket-like" recovery next year. In her opinion, Russia should orient itself toward Western countries because it cannot get all the technology it needs from non-Western countries. Despite undeniable improvements in the investment climate, achieving a level playing field between state-owned enterprises and small companies still is – figuratively speaking – a major construction site. While overall foreign direct investment (FDI) in Russia is above average OECD levels in relative terms, a large part of FDI inflows actually constitutes round-tripping of Russian capital. Moreover, FDI outflows from Russia often exceed inflows. Niessner also pointed to the regional factor, focusing on the Kaluga Oblast (southwest of Moscow), where a number of reform-minded top politicians and civil servants seem to have made a difference, rendering the region attractive for investors. She wondered whether Kaluga is the exception that proves

the rule or whether it is a bottom-up example of "good" growth spilling over to other regions.

The authorities' monetary policy and banking sector stability were dealt with in session II, chaired by *Peter Backé,* Deputy Head of the Foreign Research Division of the OeNB. As he pointed out, recent months have seen a slight stabilization of the monetary and financial situation: After having reached a low point in January 2015, the ruble's exchange rate, supported by the turnaround of the oil price, again recovered somewhat. This allowed the Central Bank of the Russian Federation (Bank of Russia) to reduce its key interest rate – in three steps from the crisis-triggered height of 17% to 12.5% in May 2015[2] – against the background of inflationary pressures that are judged to have passed their peak.

More details and an assessment of the current monetary policy stance of the Bank of Russia were given by *Riikka Nuutilainen,* Research Economist at the Bank of Finland Institute for Economies in Transition (BOFIT), Helsinki. While the Bank of Russia has, under conditions of free capital movements, gradually adopted inflation targeting (IT), Nuutilainen showed that according to the Taylor monetary policy rule, the Russian central bank has, from 2002 to 2015, reacted to inflation, the exchange rate, the oil price and changes in output growth in a statistically significant manner. In Russia's shock-triggered current recession, which also features spiking prices (end-March 2015: 16.9% increase year on year) and uncertainties, the IT strategy of the Bank of Russia has become off-track. The monetary authority moreover also had to re-focus (at least temporarily) on combating the output decline. The Bank of Russia officially retains its medium-term inflation goal of 4%, but this goal has been repeatedly pushed into the future, with the current target being end-2017. Yet, given that the population identifies inflation as one of its main economic concerns, it would be advisable, in Nuutilainen's view, to take inflation targeting more seriously.

Lubomir Mitov, Chief Economist for Central and Eastern Europe and Managing Director of UniCredit in London, gave a presentation on Russia's banking sector, which is facing increased vulnerabilities and challenges. Prior to the current crisis, Russian banks had made important progress in lending to households, to the point where a credit boom emerged, which was then reined in by the Bank of Russia. Against the backdrop of banks' traditional dependence on foreign financing, both the sanctions and strong capital outflows have triggered widespread liquidity shortages. While "pocket banking" and "related-party lending" – with banks functioning as de facto extended financial departments of beneficiary owners – still exist, the Bank of Russia has been actively combating this phenomenon as well as money laundering. Following the authorities' recapitalization of some of the largest banks, the sector's overall capital adequacy appears sufficient for the moment. However, given the recessionary prospects for this year, which will bring rising nonperforming loans (NPLs), the sector (save the largest bank by far – Sberbank) will probably make losses. This will increase dependence on refinancing by the Bank of Russia and on bank recapitalization. Overall, while Mitov does not expect a systemic crisis, persistent lack of access to foreign funding, in his view, spells little hope for investment picking up soon.

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[2] *It was further cut to 11.5% in mid-June 2015.*

Session III shed some light on Russia's most recent steps to recalibrate its economic orientation, including import substitution initiatives and attempts to diversify economic relations toward non-Western partners. The session was chaired by *Thomas Gruber,* Head of the CESEE Analysis Unit in the Foreign Research Division of the OeNB. Gruber pointed out that both import substitution and regional re-orientation policies are phenomena that Russia had already experienced earlier or launched prior to the outbreak of the Ukrainian crisis in 2014. For instance, Russia had achieved a degree of – unexpected – success in substituting imports after the collapse of the ruble in the 1998 crisis.

The presentation by *Andreas Wörgötter,* Head of Division in the Economics Department of the Organisation for Economic Co-operation and Development (OECD) in Paris, centered on the prospects for successful Russian import substitution policy. He noted that an oil price fall of 50% would actually make for a recession of 5% to 10% in 2015, assuming an oil price-based growth equation and an estimated trend growth of 2% for Russia. But now the OECD (and other institutions) are converging to GDP growth forecasts of around –3% in 2015, and up to +1% in 2016. This may imply that import substitution, triggered by devaluation, is happening without too much top-down political intervention. Also "helped" by Russia's countersanctions, the food industry seems to have got back on its feet. Electrical and optical equipment, metallurgy and the production of finished metal products as well as the chemical and petrochemical industries have also been witnessing robust growth rates in recent quarters. However, in order to be sustainable, import substitution requires that the real exchange rate be held relatively low for a prolonged period (as was the case post-1998). Moreover, structural reforms, particularly the elimination of entry barriers (that often support oligarchic interests) are a sine qua non of sustained success – which invites a big question mark with respect to political feasibility.

Russia's policy options and efforts to reorient its economic relations away from the EU were covered by *Peter Havlik,* Research Economist of the Vienna Institute for International Economic Studies (wiiw) and Guest Research Scholar at the International Institute for Applied Systems Analysis (IIASA). Similar to a number of other speakers, Havlik observed that Russia had been "stuck in transition" for a couple of years already before the Ukraine crisis. Currently, in the regime of sanctions, their strained energy relations force both the EU and Russia to diversify their trade to reduce their mutual economic dependence. Russia's overall trade with China remained steady in 2014 as well as in the first months of 2015 (despite Russia's slide into recession), while its trade with the EU, although still dominant, declined substantially. China currently accounts for the highest of any country's share in pledged FDI in Russia. While a number of large Chinese projects launched in 2014 concerned Russian manufacturing, China appears more interested in its northern neighbor's extensive energy and natural resources. Russia also fits well into Beijing's "Silk Road Economic Belt" strategy. Havlik pointed to expectations of a major increase of energy flows from Russia to Asia in the coming years. As a "swing supplier," Russia could also redirect some hydrocarbon deliveries to Asia that may originally have been destined for the EU. In any case, a substantial increase of "clean" energy flows from Siberia will contribute to improving the pollution problem in China, which is still heavily dependent on "dirty" domestic coal as a prime energy source.

In the ensuing discussion, which focused on import substitution, opinions were divided on whether Russia will be able to muster the necessary reforms to make this a sustainable strategy. Overall, the event aroused much interest and was very well attended. The breadth of topics, discussions and opinions voiced provided much intellectual stimulus, included some areas (e.g. Russian-Asian relations) that are not so often dealt with in our part of the world but may gain more importance in the future, and sharpened views for opportunities, risks and challenges Russia is currently encountering in difficult waters and possibly at a crossroads in its (economic) history.

Recent research stays at the OeNB's Foreign Research Division

Riikka Nuutilainen (Bank of Finland Institute for Economies in Transition – BOFIT)

Under the exchange and cooperation framework of the OeNB's Foreign Research Division and the Bank of Finland Institute for Economies in Transition (BOFIT), Riikka Nuutilainen from BOFIT spent five weeks as a guest researcher at the OeNB from May 18 to June 16, 2015. During her research visit, she worked on a research project about contemporary monetary policy in Russia and the central bank's ongoing shift toward inflation targeting.

Her research utilizes the monetary policy rules literature to analyze the Bank of Russia's policy reactions. Nuutilainen finds that contrary to earlier literature findings, Taylor-type interest rate rules are better able to describe the current monetary policy in Russia than McCallum-type money supply rules. In addition, based on the estimation results, an evaluation of the relative trade-off between policy objectives can be carried out. This trade-off between inflation stabilization and output stabilization has changed over the estimation period from January 2002 to February 2015. In the earlier years of the sample, the central bank put more emphasis on inflation stabilization relative to output stabilization, whereas in the most recent years, output stabilization can be seen to have become the main concern also for the Bank of Russia.

Nuutilainen presented the empirical findings of her research and views about Russia's move from exchange rate policy toward inflation targeting at the OeNB's 77th East Jour Fixe "Russia: economic turmoil and policy options" held on May 29, 2015.

Riikka Nuutilainen joined BOFIT in 2014. The primary focus of her research is on the Chinese economy, especially monetary policy implementation and transmission in China. She is currently finalizing her PhD thesis.

Marcela Veselkova (Slovak Governance Institute)

Under the OeNB's Visiting Research Program, Marcela Veselkova, Research Fellow at the Slovak Governance Institute in Bratislava, spent three months as a guest researcher in the OeNB's Foreign Research Division from April 15 to July 15, 2015. During her stay, she estimated returns to education in Slovakia over the period 2009–2014 using a pseudo-panel approach. She shared first findings of her research at an internal OeNB seminar. In her analysis, Veselkova used a random sample from the dataset collected by Trexima, Bratislava. In the final quarter of 2014, the sample covered approximately 45% of all employees in Slovakia. The returns to education were estimated using standard Mincerian wage equations, which regress log nominal wages on the years of schooling, experience and experience squared. The results show that private returns to schooling are positive and the sample average is around 9% per year of schooling. Estimated returns to schooling are higher for women than for men and they are heavily influenced by occupation and industry. These findings are in line with previous literature.

Marcela Veselkova is currently a Research Fellow at the Slovak Governance Institute in Bratislava, where she has contributed to two European Commission-funded research projects on labor markets.

Notes

Periodical publications

See *www.oenb.at* for further details.

Geschäftsbericht (Nachhaltigkeitsbericht)
Annual Report (Sustainability Report)

German | annually
English | annually

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

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

Konjunktur aktuell

German | seven times a year

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

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

Monetary Policy & the Economy

English | quarterly

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

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

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

German | twice a year
English | twice a year

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

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

Financial Stability Report

English | twice a year

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

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

Focus on European Economic Integration

English | quarterly

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

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

Statistiken – Daten & Analysen

German | quarterly

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

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

Statistiken – Daten & Analysen: Sonderhefte   German | irregularly
Statistiken – Daten & Analysen: Special Issues   English | irregularly

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

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

Research Update   English | quarterly

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

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

CESEE Research Update   English | quarterly

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

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

OeNB Workshops Proceedings   German, English | irregularly

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

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

Working Papers   English | irregularly

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

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

Proceedings of the Economics Conference   English | annually

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

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

Proceedings of the Conference on
European Economic Integration   English | annually

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

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

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

www.e-elgar.com

Publications on banking supervisory issues   German, English | irregularly

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

See *www.oenb.at* for further details.

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

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