

Has private sector credit in CESEE approached levels justified by fundamentals? A post-crisis assessment

We analyze private sector credit developments in CESEE EU countries by calculating the credit-to-GDP ratios that are in line with macroeconomic and financial fundamentals and by comparing them with actual levels. In contrast to previous work in this area, we add cross-border credit to domestic bank credit and take care of global factors and cross-country spillovers. We derive three main findings from our analysis: First, countries featuring positive credit gaps at the start of the global financial crisis (GFC) have managed to adjust their credit ratios downward toward levels justified by fundamentals, but the adjustment is apparently not yet complete in all countries. Second, in most countries characterized by credit levels close to or below the “fundamental” levels of credit at the start of the GFC, negative credit gaps have emerged or widened. Third, the inclusion of cross-border credit matters considerably for credit gap assessments as it results in larger gaps in most cases. As part of the policy discussion, we also relate our findings to recent efforts in setting countercyclical capital buffers depending on credit gaps.

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JEL classification: C33, E44, E51, G01, G21, O16

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Before the 2008–2009 global financial crisis (GFC), the question whether rapidly rising credit levels in most Central, Eastern and Southeastern European (CESEE) countries reflected the emergence of credit bubbles rather than representing convergence-related financial deepening was addressed in a number of papers (Boissay et al., 2005; Duenwald et al., 2005; Égert et al., 2006; Kiss et al., 2006 – to name only a few). With the benefit of hindsight, a consensus has emerged that pre-crisis private sector credit development was on an excessive path at the time in several CESEE countries (see for instance the discussion in IMF, 2015a). In the wake of the GFC, the volume of nonperforming loans increased in CESEE, but to very different extents across countries. Moreover, credit growth slowed down remarkably in some countries while turning negative in others (before recovering or accelerating again more recently). Certainly, it should also be kept in mind that some CESEE countries entered the GFC with private sector credit levels that were assessed to be below levels justified by fundamentals – a finding our analysis confirms. Against this backdrop, our paper addresses the question whether private sector credit levels (measured in relation to GDP, i.e. credit-to-GDP ratios) have since approached levels that are indeed justified by macroeconomic and financial fundamentals or whether under- or overshooting tendencies continue to be an issue.

Our study thus complements a series of papers that have applied an (behavioral) equilibrium approach to the analysis of credit in CESEE, thereby studying the

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deviation of observed credit levels from long-run equilibrium levels. The latter are usually calculated based on estimates of so-called fundamental credit determinants. While earlier work relied on out-of-sample approaches to account for undershooting in the initial years of transition (e.g. Égert et al., 2006; Geršl and Seidler, 2015), more recent work – thanks to longer available time series – switched to in-sample approaches (Stojanović and Stojanović, 2015; Jovanovic et al., 2017). In terms of the applied econometric methodology, both static and dynamic panel data models (addressing either credit levels or credit growth rates) have been applied.

There are several areas where our paper can add value to the existing literature in our opinion. First, while previous work focused only on domestic bank credit to the private sector, we adopt a more comprehensive definition of credit that includes both domestic and cross-border credit, since cross-border credit is an important source of (corporate) financing in CESEE. In the remainder of this study, we will refer to the aggregate of these two debt components as “total credit,” although this term differs from the even wider definition of total credit introduced by the BIS (for more detailed information see BIS, 2018). Second, the role of foreign credit determinants has so far been disregarded. Given the strong openness of the region in terms of trade and banking and given the potential role of global “supply push” factors in determining credit (Bruno and Shin, 2015), we add foreign variables to our set of credit determinants. Third, while there are several candidate models for estimating fundamental credit levels, a truly convincing attempt to account for panel heterogeneity has not been made so far. We rely on the comparison of different estimation approaches in Comunale et al. (2018) and implement a static panel model accounting for heterogeneous coefficients, cross-sectional dependence, nonstationarity and cointegration.

The remainder of the paper is structured as follows: Section 1 discusses private sector credit developments in CESEE since the start of the GFC, emphasizing the importance of cross-border credit. In section 2 we introduce the benchmark econometric framework to come up with credit levels determined by fundamentals. Section 3 presents the estimation results and the gaps between actual and fundamental credit levels. Section 4 concludes and raises policy-relevant issues.

1 Credit developments since 2008 and the role of cross-border credit

The start of the GFC in 2008 marked a turning point in credit developments in CESEE EU countries. The slowdown, stabilization or contraction of credit levels that emerged in the years after the collapse of Lehman Brothers went hand in hand with a slowdown or contraction in economic activity in CESEE economies. Ensuing economic recoveries or growth accelerations turned out to be creditless or accompanied by only modest credit growth, at least until recently.

A more detailed assessment of changes in domestic banks’ credit to the resident nonbank private sector over three-year intervals in individual CESEE countries² reveals the following (see chart 1): The three years before the GFC were completely different from the post-GFC years for all CESEE countries. Up to the watershed

² We focus on the 11 CESEE countries that have joined the EU, i.e. Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia (referred to as CESEE-11 below). Data series for (potential) EU candidate countries as well as for Russia and Ukraine were also accessed but found to be insufficiently complete in most cases.

year of 2008, domestic credit growth rates ranged from elevated (in Croatia, the Czech Republic, Hungary and Slovakia) or high (in Estonia, Latvia, Lithuania, Poland and Slovenia) to very high (in Bulgaria and Romania). In the wake of the GFC, most countries in the region experienced periods of declines in the domestic private sector credit stock, albeit to different extents. Thereafter, the sovereign debt crisis in some euro area countries seems to have entailed a further downward adjustment in the subperiod of 2011–2014. Moreover, a banking crisis emerged in Slovenia in this period that inter alia entailed the transfer of assets from banks to an asset management company, which explains part of the considerable decline in the domestic credit stock (see IMF, 2015b).

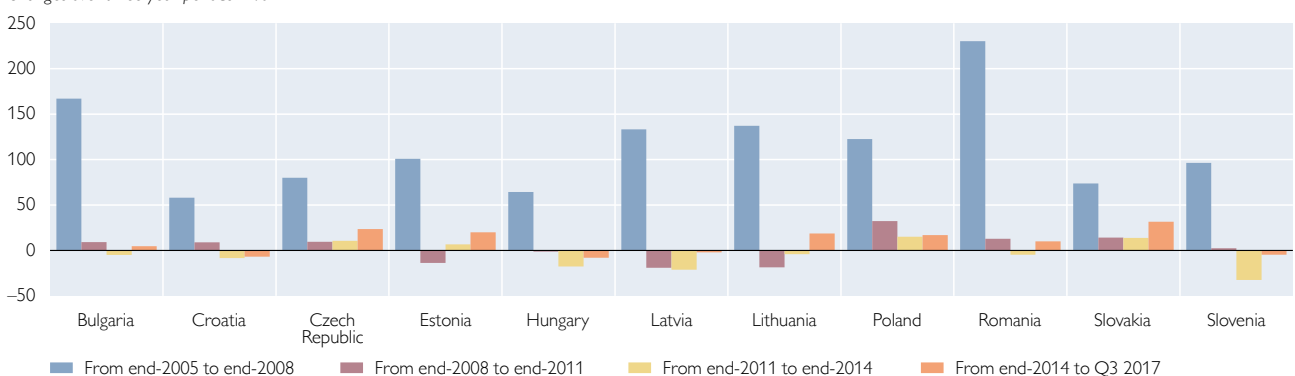
In contrast, there are only three countries (the Czech Republic, Poland and Slovakia) that witnessed a gradual increase of domestic credit stocks – albeit at a much slower pace than before the GFC – from end-2008 until the end of the observation period (Q3 2017). These three countries had entered the GFC with comparably moderate credit levels, which might explain the divergence of credit developments after 2008. Moreover, the Czech Republic and Slovakia had faced banking crises in the late 1990s and early 2000s, which entailed bank restructuring and transfers of assets to bad banks, resulting in a downward level shift already some years before the GFC. More recently, domestic credit growth has been picking up across the region (see OeNB, 2017).

Domestic credit stocks were influenced by sales of nonperforming loans to nonbank investors and write-offs in several CESEE countries. Since we consider both sales and write-offs to be part of the toolbox for (downward) adjusting credit stocks, it makes sense to leave this information in the data. Furthermore, credit levels were also affected by exchange rate valuation effects as the foreign currency component increased due to depreciation of local currencies vis-à-vis the currencies in which foreign currency loans had been granted (mainly EUR and CHF). Exchange rate developments caused domestic credit stocks to rise particularly in Hungary, Poland and Romania. These effects cannot be seen as purely statistical as they de facto raised repayment volumes measured in local currency. In turn, our data were also affected by policy measures with regard to foreign currency loans (see box 1 in Beckmann, 2017). To summarize, we deal with the given credit

Chart 1

Changes in domestic private sector credit stocks

Changes over three-year periods in %



Source: National central banks.

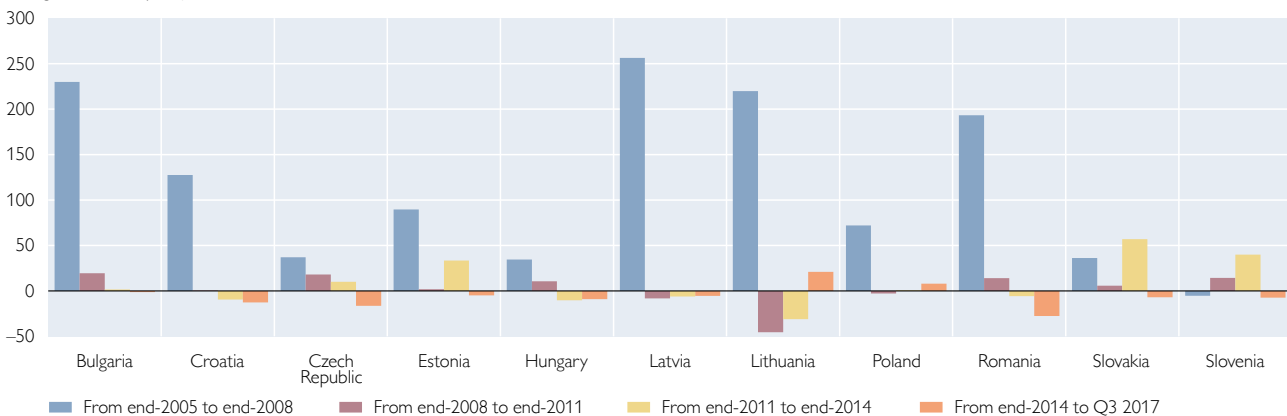
levels at each point in time, irrespective of whether the level changed due to exchange rate valuation effects, policy measures or credit transactions.

To some extent, domestic credit also reflects external funding intermediated by domestic banks, thus providing a channel for spillovers from abroad. In the same vein, spillover effects may occur through credit that borrowers obtain directly from foreign creditors. Direct cross-border credit has emerged as an important (corporate) funding source in CESEE and constitutes a close substitute for domestic bank credit,³ which is why we included corresponding data in our calculations. We approximate cross-border credit using international investment position data, more specifically data on the external debt of the nonbank private sector, excluding intercompany loans and trade credits.⁴ Taking most recent observations, about one-fifth of the total private sector credit stock consists of direct cross-border credit across the CESEE-11 on average, ranging from just 7% in Lithuania to more than 30% in Bulgaria and Croatia (see also chart 3). Chart 2 shows the development of direct cross-border credit over time. Besides the two countries that experienced very high domestic credit growth rates prior to the GFC – Bulgaria and Romania – also Croatia, Latvia and Lithuania recorded sizeable pre-crisis increases in cross-border credit. 2008 was a watershed year, as direct cross-border credit stocks declined or underlying growth rates slowed down markedly in all countries but Slovakia and Slovenia. Slovakia and Slovenia represent exceptions from this general trend, as direct cross-border credit showed noticeable increases in the period from end-2008 until end-2014 followed only by a relatively small decline afterwards.

Chart 2

Changes in direct cross-border credit stocks (excl. intercompany loans and trade credit)

Changes over three-year periods in %



Source: IMF, national central banks.

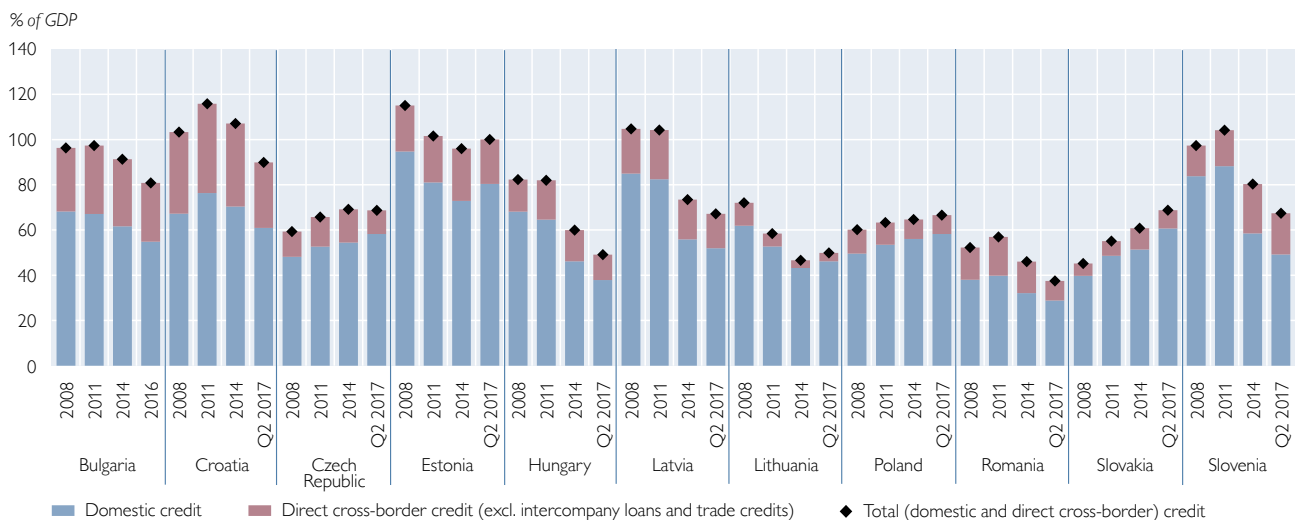
³ Another substitute, at least for corporates, could be bond financing. Our data capture bonds held by the domestic banking sector and bonds held by foreign investors, but not bonds held by the domestic nonbank sector. However, according to financial accounts data, bond financing is not yet considerably relevant in the CESEE countries under review.

⁴ Even though intercompany loans are quite sizeable in the investigated CESEE countries, we prefer a narrow definition of cross-border credit as, among others, intercompany loans capture both debt and equity instruments. Moreover, narrow and broad definitions of cross-border credit show a rather similar degree of variation over time. In a robustness check we also used the broader classification and the results remained qualitatively unchanged.

How did these changes in the credit stocks – together with nominal GDP developments – translate into total (i.e. domestic plus cross-border) private sector credit-to-GDP ratios? In most countries, the credit-to-GDP ratio was lower in mid-2017 than at end-2008, but total credit ratios did not decline steadily in some countries (chart 3). Only in the Czech Republic, Poland and Slovakia were the total credit-to-GDP ratios higher in mid-2017 than at end-2008.

Chart 3

Domestic and direct cross-border credit to the nonbank private sector



Source: National central banks, Eurostat, IMF.

2 Calculating credit levels determined by fundamentals

We use a static heterogeneous panel model to analyze the impact of financial and macroeconomic fundamentals on credit over GDP in CESEE.⁵ The estimated coefficients are used to calculate the fundamentals-based credit ratios so as to then assess the actual values. Our method allows us to look at the country-specific contributions of each fundamental in driving the ratios over time. Starting with the estimation of the fundamentals' coefficients, we found that the panel experiences cross-sectional dependence, nonstationarity and cointegration. With this in mind, in our static framework with heterogeneous coefficients, the best possible choice given the presence of cointegration is the group mean-fully modified OLS (GM-FMOLS) estimator, which is built as the average of the FMOLS estimator over the cross-sectional dimension (Pedroni, 2000).⁶ To allow for comparison with the results of previous studies, we also apply the fixed effects (FE) estimator (though with Driscoll-Kraay correction to account for cross-sectional dependence). Moreover, given the presence of cross-sectional dependence

⁵ The background working paper (Comunale et al., 2018) also applies a dynamic setup (for growth rates). Moreover, it documents for both the static and dynamic frameworks all the necessary pre-estimation diagnostic tests, the comparison of different eligible estimators as well as the results of a broad range of robustness checks.

⁶ The FMOLS is a semi-parametric correction to the ordinary least squares (OLS) estimator which eliminates the second-order bias induced by the endogeneity of the regressors. In our panel we applied the group-mean (GM) version of this estimator to keep as much heterogeneity as possible and to correct for cointegration. For a more detailed discussion of this estimator and its properties see the appendix in Comunale (2017).

and the fact that cross-border credit enters our dependent variable, we also add foreign variables as regressors.

As a result, the equation for our preferred model is the following:

$$\left(\frac{\text{credit}}{\text{GDP}}\right)_{i,t} = \beta_{1i}X_{i,t-1} + \beta_{2i}G_{t-1} + \beta_{3i}S_{i,t-1} + \mu_i + \varepsilon_{i,t}, \quad (1)$$

where $\beta = (\beta_{1i}, \beta_{2i}, \beta_{3i})'$ is the cointegrating vector of slope parameters.⁷ X is a vector of cointegrated series consisting of the domestic (CESEE countries') fundamentals: GDP per capita in purchasing power parity USD, domestic banks' credit to the general government (% of GDP), the producer price index (PPI) inflation rate and the spread of lending rates over deposit rates. Furthermore, we add two foreign variables (also as cointegrated regressors): G is the common global factor taken as the seasonally adjusted global GDP⁸ and S is a country-specific, time-varying variable for spillovers in total credit. The latter is calculated as the trade-weighted average of trading partners' total private sector credit-to-GDP ratios.⁹ These global "supply push" factors may be important in determining credit and particularly cross-border credit (Bruno and Shin, 2015). Furthermore, credit in CESEE can be affected by other countries' performance, given the strong economic interlinkages, for instance via the banking sector (see Fadejeva et al., 2017). Lastly, μ_i is the country fixed effect. The error terms $\varepsilon_{i,t}$ are not assumed to be cross-sectionally independent.¹⁰

For the estimations we apply an in-sample approach, so our panel covers the 11 CESEE EU countries presented in the previous section. In general we try to use quarterly series from the mid-1990s until end-2016. But given that for some countries data for cross-border credit are available only from the late 1990s or early 2000s onward, we have an unbalanced panel for total credit estimations. Our main data sources are Eurostat (nominal GDP for CESEE countries), the IMF World Economic Outlook database (GDP per capita), the IMF International Financial Statistics (interest rates, PPI and nominal GDP for partner countries), statistics from the national central banks (credit variables for CESEE countries) and the BIS (total credit for partner countries). More detailed information on data definitions and sources is available in Comunale et al. (2018).

Fundamental determinants of credit may themselves be subject to short-run shocks, potentially creating an incorrect impression for certain periods that actual

⁷ For a complete description of the cointegrating system applied here, see Pedroni (2000) and the appendix in Comunale (2017).

⁸ Specifically, we use the sum of the nominal GDP of 42 countries in USD million from IMF International Financial Statistics. This measure can be seen as a proxy for the global real business cycle.

⁹ We do not use financial weights for three main reasons. First, they would be very much correlated with our credit series; second, there is no consensus on the best way to compute such weights (see Kearns and Patel, 2016). Third, for the latter reason, the computation of different types of financial weights for CESEE countries would require a separate paper to be correctly done, especially at a quarterly frequency, given that these types of weights are not provided in any public database.

¹⁰ Normally the errors are taken as independently and identically distributed (i.i.d.) across i and t . In our case for each i , the errors are i.i.d. error terms but we do not assume independence anymore for all t . That opens the possibility of having cross-sectionally correlated idiosyncratic errors (due to common factors or cross-country spillovers). The assumption of stationarity remains, as well as zero mean and variance. We also assume that underlying error processes are symmetrically distributed. For a deeper understanding of the cross-sectional dependence and the error structure, see Pesaran (2004).

credit is overshooting, although a widening gap is actually due to lower fundamental levels of credit which are of a short-run nature due to adverse shocks. We address this concern by applying a one-sided Hodrick-Prescott (HP) filter to extract medium-term trends from credit determinants.¹¹ Based on the estimates of equation (1), the credit-to-GDP ratio determined by fundamentals is then calculated as the sum of the estimated coefficients multiplied by the correspondent HP-filtered values of each fundamental. This is how we arrive at country-specific, time-varying fundamental credit ratios.

3 Estimation results and credit gaps

Static panel estimation results for total private sector credit in the 11 CESEE EU countries, based on GM-FMOLS estimates of equation (1), are shown in table 1. Evidently, an increase in the credit-to-GDP ratio in a given quarter is associated with larger GDP per capita levels, higher lending rates, a lower interest rate spread, higher global GDP as well as more intense credit dynamics abroad in the preceding quarter. The results for domestic variables remain robust when accounting for the foreign variables in the last column. The inflation rate and government credit do not have a statistically significant impact.

Table 1

Static panel estimation results for total private sector credit

Explanatory variables	Dependent variable: total credit/GDP	
GDP per capita	1.383*** [0.036]	0.918*** [0.084]
Domestic general government credit/GDP	0.028* [0.020]	-0.041 [0.020]
PPI inflation rate	-0.244 [0.140]	-0.022 [0.130]
Lending rate	0.023*** [0.040]	0.064*** [0.030]
Interest rate spread	-0.204*** [0.020]	-0.172*** [0.010]
Global GDP		0.313*** [0.080]
Total credit spillovers		0.842*** [0.110]
Constant	-13.810*** [0.040]	-14.790*** [0.740]
Observations	811	811
Number of countries	11	11

Source: Authors' calculations.

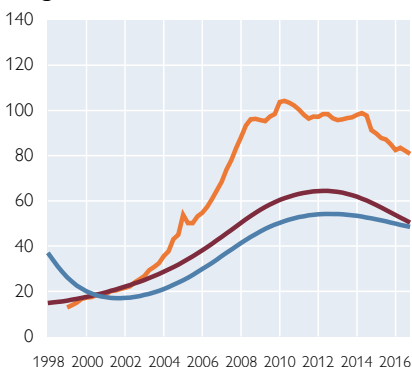
Note: Standard errors in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. GM-FMOLS estimator; all values in logs except for the PPI inflation rate.

¹¹ We mainly follow the approach by the IMF in the Consultative Group on Exchange Rate Issues (CGER). The IMF approach is normally used in calculating equilibria for the real effective exchange rate (Ricci et al., 2013; Comunale, 2017), the current account (Lee et al., 2008; Comunale, 2018) and credit growth (Jovanovic et al., 2017).

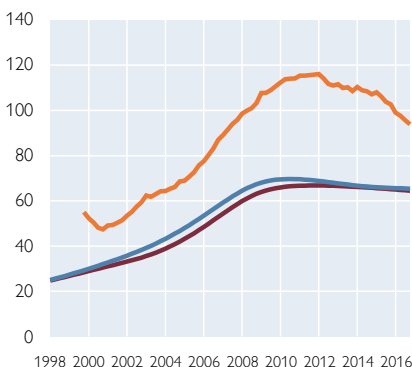
Evolution of total (domestic+cross-border) private sector credit in comparison to fundamentals-based levels

% of GDP

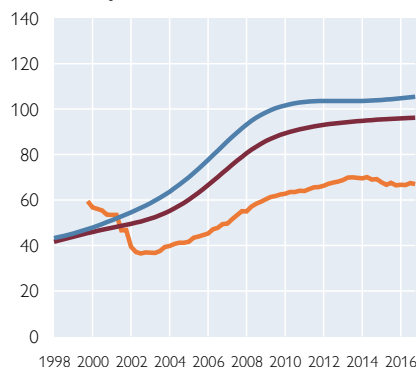
Bulgaria



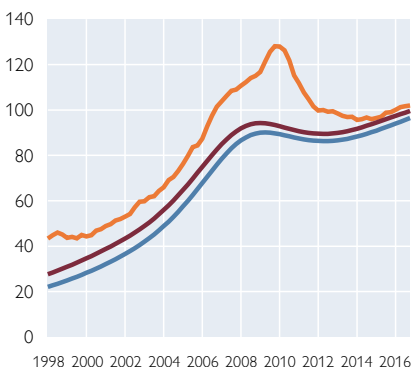
Croatia



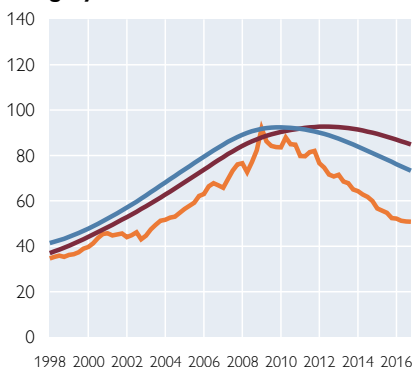
Czech Republic



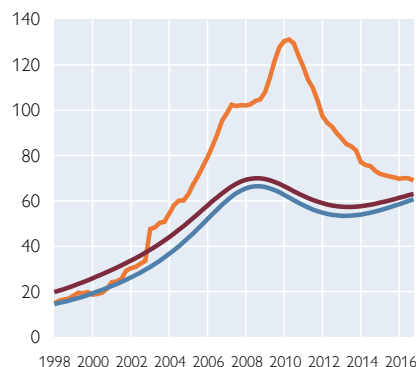
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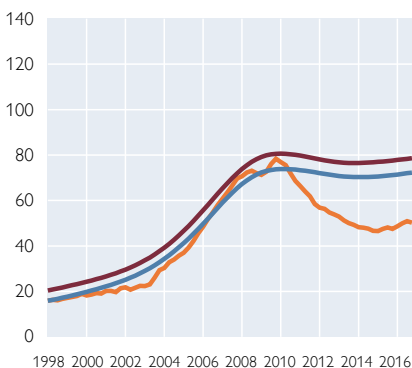
Hungary



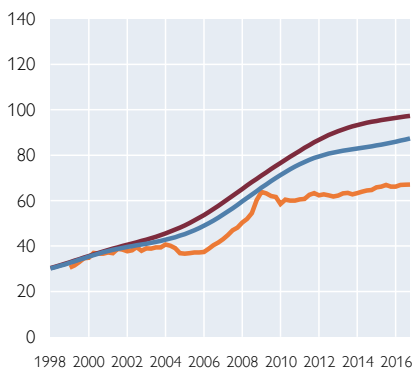
Latvia



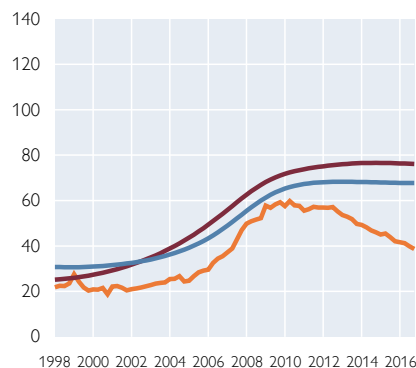
Lithuania



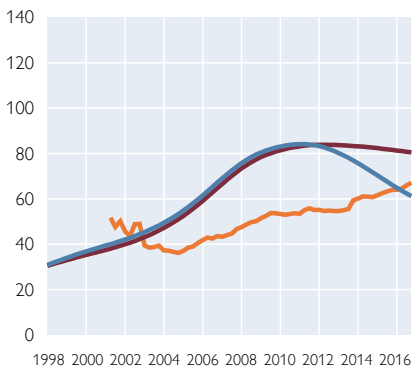
Poland



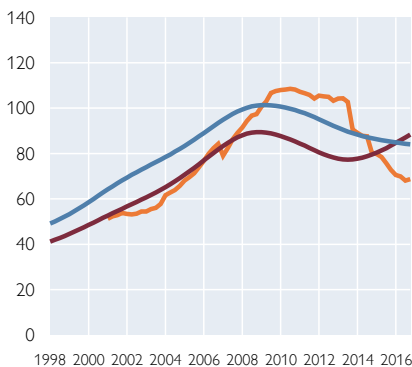
Romania



Slovakia



Slovenia



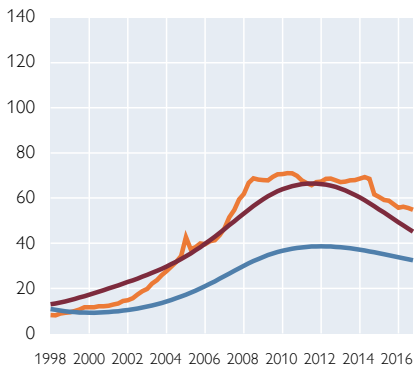
— Total private sector credit — Fundamental level (based on GM-FMOLS) — Fundamental level (based on fixed effects)

Source: National central banks, IMF, authors' calculations.

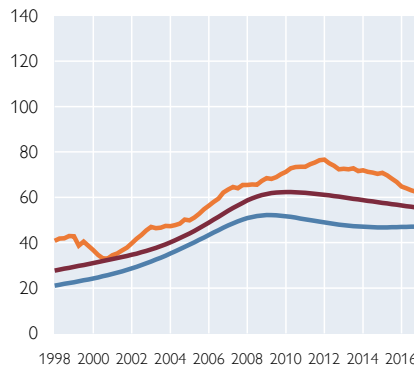
Evolution of domestic private sector credit in comparison to fundamentals-based levels

% of GDP

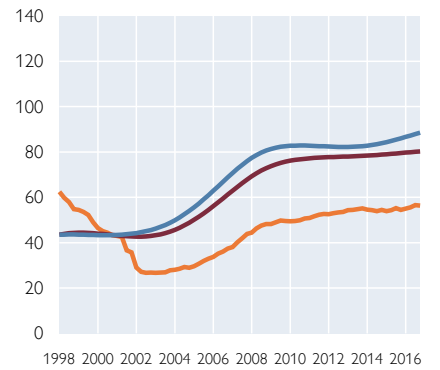
Bulgaria



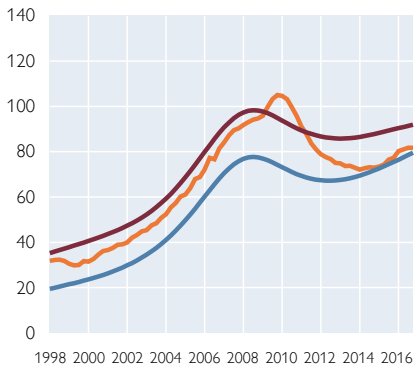
Croatia



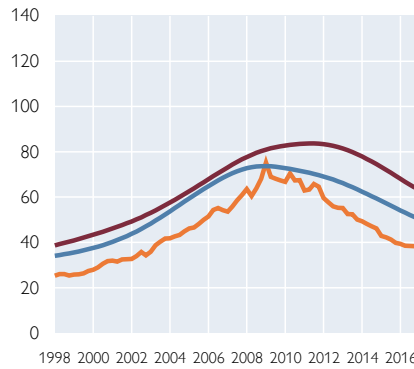
Czech Republic



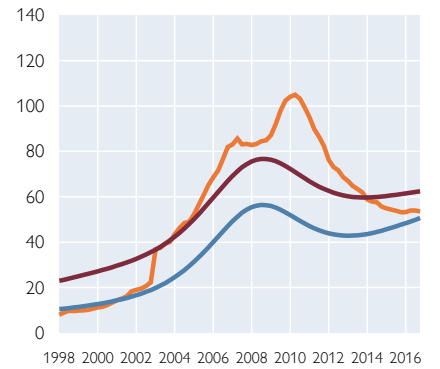
Estonia



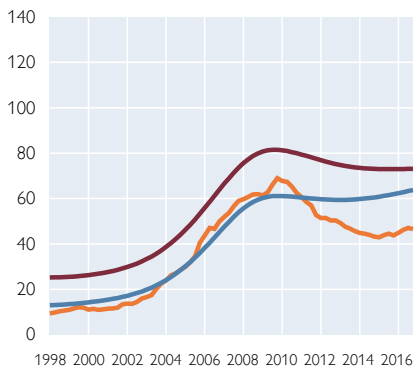
Hungary



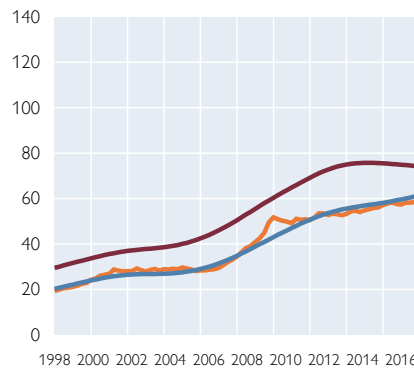
Latvia



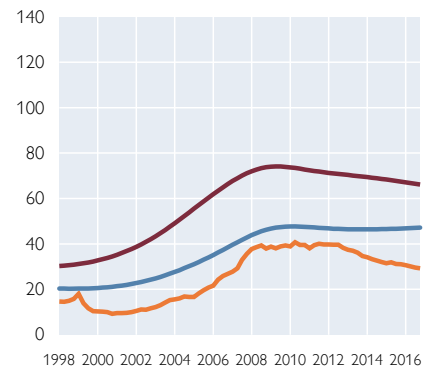
Lithuania



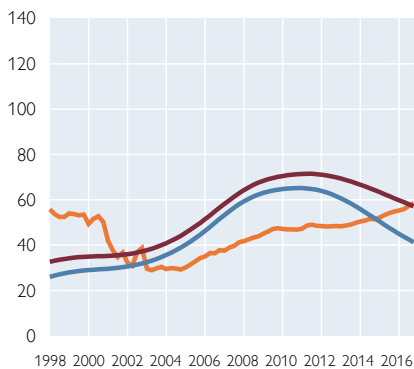
Poland



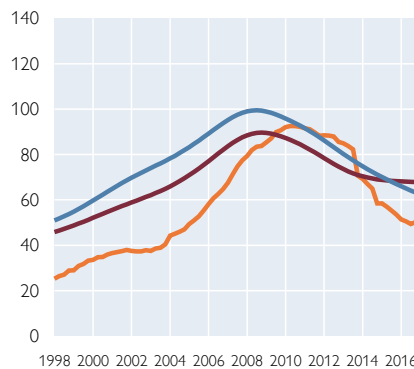
Romania



Slovakia



Slovenia



— Domestic private sector credit — Fundamental level (based on GM-FMOLS) — Fundamental level (based on fixed effects)

Source: National central banks, IMF, authors' calculations.

Two – at first sight counterintuitive – results deserve some more discussion. First, the positive sign for the lending rate corroborates existing empirical evidence (see the discussion in Eller et al., 2010) and simply reflects the stable positive correlation of credit dynamics and interest rates over the past two decades in the region: credit growth was large in a period with comparatively high interest rates (before the GFC), while after the GFC subdued lending coincides with a low interest rate environment (as also pointed out in Zumer et al., 2009). Second, the result for the interest rate spread variable would suggest that the larger the lending rate compared to the deposit rate, the smaller the credit-to-GDP ratio. In pre-GFC studies (e.g. Égert et al., 2006) this variable was included to account for financial liberalization and/or bank profitability, whereby a higher spread was assumed to signal easier funding of banks' credit supply. However since the GFC, with deposit rates gradually approaching zero levels, the spread variable has widened considerably and now apparently captures something else than originally intended, e.g. the low post-GFC interest environment, nonstandard monetary policies or just deleveraging. With this different interpretation in mind we retain the spread variable in our set of fundamentals (also endorsed by its robust impact across a variety of specifications). In a robustness check we replaced the interest rate spread with another variable proxy for deleveraging, i.e. banks' leverage ratio (bank assets over equity) as in Bologna et al. (2014). In line with the discussion above, a shrinking leverage ratio is associated with lower credit ratios (while other regressors remain largely robust). Additional robustness checks, reported in Comunale et al. (2018), underline that the results shown in table 1 remain qualitatively unchanged across a variety of specifications (e.g. alternative or additional credit determinants).

Considering the significant and robust impact of the chosen determinants, we calculate the credit levels determined by fundamentals for the period 1998–2016. Chart 4 (for total credit) and chart 5 (for domestic credit only) compare the levels of credit that are in line with fundamentals, based on GM-FMOLS and fixed effects estimates, with actual credit levels. Several interesting results emerge.

First, referring to total credit (chart 4), all the countries that recorded large positive credit gaps in the pre-GFC boom years and/or during the GFC have experienced corrections back to fundamental levels in recent years. Nevertheless, there are considerable cross-country differences. While Estonia and Latvia have been able to bring formerly overshooting credit levels more or less fully back to fundamental levels, adjustment in Bulgaria and Croatia is not yet complete. Although overshooting gaps have narrowed in these two countries they are still quite sizeable, amounting to about 30% of GDP at the end of 2016. Another case is Slovenia where considerably positive credit gaps opened up in the wake of the GFC but were closed again as a result of the adjustment undertaken in the course of the Slovenian banking crisis in 2012–2013.

Second, there are several countries with undershooting credit levels, i.e. negative credit gaps. Total credit ratios in Hungary, Lithuania, Poland and Romania had been rather close to fundamental levels until the GFC, but the deleveraging episode right after the GFC led to negative credit gaps, reaching about 30% of GDP until the end of 2016. Poland is a bit different insofar as actual credit ratios have not declined since the GFC but experienced a sideward movement, while fundamental levels increased, thus widening the negative gap. The Czech Republic and Slovakia, in contrast, recorded negative credit gaps already considerably before the GFC, in

fact ever since they had implemented adjustments after their banking crises in the late 1990s and early 2000s. In both countries the undershooting gaps widened in the course of the GFC, and while they have remained very persistent in the Czech Republic, some recent closing can be observed in Slovakia.

Third, if we were to ignore cross-border credit, i.e. if we look only at domestic credit (chart 5), we observe clearly smaller credit gap overshoots. In Bulgaria for instance, the credit gaps for domestic credit would be about two-thirds lower than the figure for total credit at the end of 2016, and in Croatia they would be about three-quarters lower. Likewise, we find smaller and more short-lived overshoots for Estonia and Latvia around the GFC. For countries with negative credit gaps, in contrast, the gap size remains broadly unchanged.

4 Summary and policy implications

Our analysis reveals that countries which experienced overshooting before and/or during the GFC have indeed been able to bring total credit levels back toward fundamentals-based levels. In a few countries, though, adjustment has not yet been accomplished, e.g. considering still sizeably positive credit gaps in Bulgaria and Croatia. On the other hand, several countries shifted toward undershooting during the post-GFC deleveraging episode, often with widening negative credit gaps in recent years. As several of these countries had already been quite close to fundamental levels up to the GFC, post-GFC deleveraging was apparently driven also by other factors, such as a the specific composition of credit (featuring e.g. high shares of foreign currency-denominated loans in some cases). The policy response to identified (positive or negative) credit gaps must be geared not only to the size of the gap, but also to the adjustment path. For instance, in order not to undermine economic development and convergence, restrictions on (domestic) credit growth could be tightened in order to contribute to shrinking positive credit gaps if and only if macrofinancial conditions are favorable.

Note that our results may differ from recent attempts in calculating credit-to-GDP gaps based on statistical filtering techniques. These are recommended when setting a countercyclical capital buffer (CCyB), whereby national authorities rely on a set of indicators and attach different weights to selected indicators across countries (see Mazzaferro and Dierick, 2018, in this issue to learn more about the current state of play in the EU). Our approach draws a relationship between the credit-to-GDP ratio on the one side and macroeconomic and financial fundamental factors on the other side in a CESEE context, and hence takes a more structural perspective. In the CCyB framework, in contrast, the focus is on the deviation of the credit-to-GDP ratio from its long-term trend over time in each individual country, with a view to assessing the position of the economy in the financial cycle (Drehmann and Tsatsaronis, 2014). For a more detailed discussion of the two alternative approaches, see Geršl and Seidler (2015). Similarly to them, we suggest using both approaches complementarily. What does this mean in practice in our view? In case the credit ratio is considerably above the identified fundamentals-based level, but the filtering approach does not signal a positive credit gap due to only moderate credit growth (such as currently in Bulgaria and Croatia), policymakers may nevertheless want to consider policy measures to steer credit ratios toward the level justified by fundamentals. At the same time, there are certainly also good reasons to take regulatory measures to smoothen the financial cycle even if a

country records credit levels below the identified fundamental levels. Such a country, e.g. recently the Czech Republic, can have expansionary phases (i.e. positive deviations from the trend) that can justify the activation of the CCyB.¹² Moreover, as Hajek et al. (2017) pointed out, the main purpose of the CCyB is not necessarily to tame credit growth (this can only be seen as a positive side effect), but to boost the banking sector's resilience to ensure smooth funding of the real economy throughout the financial cycle. From our perspective, it is important that the regulatory framework taken as a whole does not hinder the credit-to-GDP ratio moving toward the level justified by fundamentals in the longer term.

Finally, our results also show that accounting for cross-border credit as a substitute for domestic bank credit matters considerably for credit gap assessments. Cross-border credit is quite sizeable in several countries, and ignoring it would lead to the conclusion that actual credit levels are not larger than levels justified by fundamentals in most of the CESEE countries under review. One could argue that cross-border credit does not constitute credit risk from a domestic point of view. However, if a company relying on both cross-border and domestic credit gets into debt-servicing difficulties due to its overall heavy debt burden, the domestic banking sector would nonetheless be affected. Furthermore, an overly large share of cross-border credit has implications for overall macrofinancial stability, as an overly indebted private sector has a harder time adjusting during episodes of macrofinancial stress. Moreover, in such a situation, a relatively large share of private sector debt owed to foreigners could imply risks of unduly large capital outflows and thus balance of payment risks. Finally, there is also an ongoing policy discussion to which extent cross-border lending and macroprudential measures are interrelated. The European Systemic Risk Board (ESRB, 2018), for instance, investigates the role of cross-border lending for the reciprocity of macroprudential measures activated in another EU country.

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¹² The CNB justified its decision of June 2017 to increase the CCyB with risks of excessive credit growth; explicitly mentioned are mortgage loans (https://www.cnb.cz/en/public/media_service/press_releases_cnb/2017/20170613_zfs.html).

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