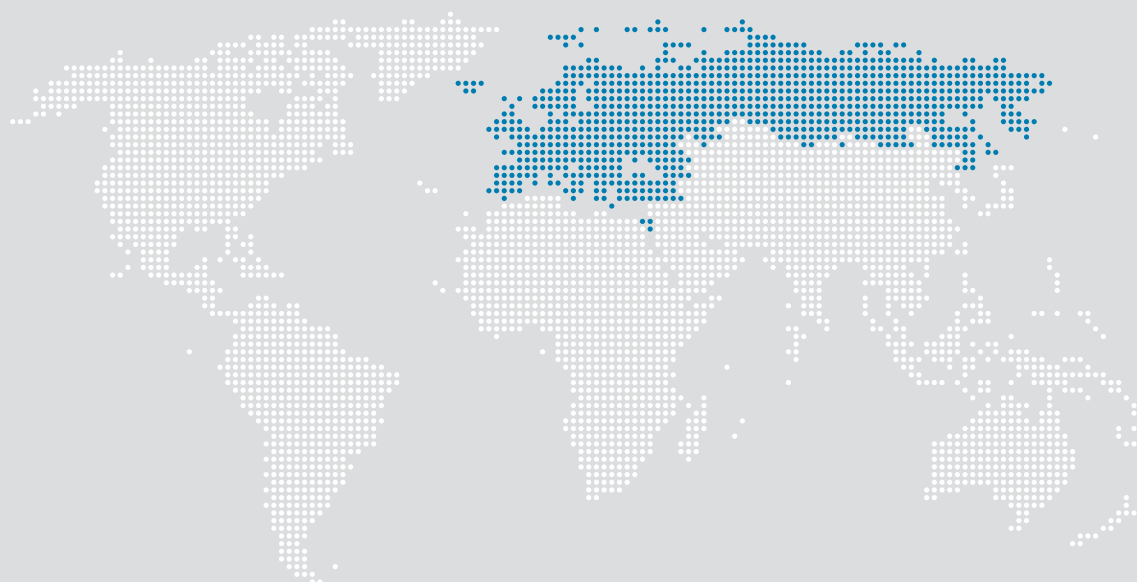


Regional Economic Issues

Central, Eastern, and Southeastern Europe Mind the Credit Gap

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MAY 15

International Monetary Fund

Central, Eastern, and Southeastern Europe

Regional Economic Issues

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MAY 15



MIND THE CREDIT GAP

May 11, 2015

EXECUTIVE SUMMARY

As central, eastern, and southeastern Europe (CESEE) continues to recover, lower oil prices, stronger euro area growth, and geopolitical tensions are affecting countries differently, resulting in three-speed growth in the region:

- In the *Baltics, central and eastern Europe (CEE)*, and *Turkey*, growth is expected to remain solid—ranging from 2.6 to 3.6 percent in 2015–16—supported largely by private consumption boosted by cheaper oil and stronger euro area recovery.
- In *southeastern Europe (SEE)*, recovery is projected to be muted (real GDP growth at 1.9 percent in 2015 and 2.4 percent in 2016), with debt overhang and other structural weaknesses, as well as a less supportive fiscal stance outweighing a modest boost from lower oil prices and stronger euro area growth.
- *Commonwealth of Independent States (CIS)* countries are expected to contract in 2015, with the largest output declines in Russia (–3.8 percent) and Ukraine (–5.5 percent)—reflecting lower oil prices and sanctions (Russia) and the fallout from geopolitical tensions and ongoing macroeconomic adjustment (Ukraine).

Most CESEE countries outside the CIS continue to grapple with downward price pressure.

Lower oil prices and downward inflation revisions in the euro area have significantly dampened the inflation outlook in CEE and SEE. Persistently lower prices and economic slack increase the risk of second-round effects through lower wages, which could entrench deflation pressure.

Despite many differences, in most CESEE countries private investment and growth remain below precrisis levels. This reflects uncertainties about the strength of global and euro area recovery, but also private sector balance sheet weaknesses in a number of CESEE countries. Before the 2008–09 global financial crisis, private debt stocks across CESEE increased much faster than GDP, opening up credit gaps, whereby the debt-to-GDP ratios are lifted well above their long-term trends. In the aftermath of the crisis, many countries came under pressure to realign their debt levels with economic fundamentals, resulting in simultaneous deleveraging, which exacerbated the overall decline in economic activity.

How large are the remaining credit gaps and are private balance sheet weaknesses holding back recovery? To answer this question, this report studies the post-2008 adjustment

in private non-financial sector debt and its impact on economic activity:

- *How much deleveraging took place?* Despite significant deleveraging efforts—as measured by the adjustment in private sector net saving-investment balances—relatively few countries managed to reduce their private-debt-to-GDP ratios below precrisis levels. This largely reflected weak debt repayment capacity and lack of debt restructuring. In some cases, debt burdens increased because of foreign exchange valuation effects.
- *What is the economic cost of deleveraging?* While deleveraging is necessary, it tends to be more protracted and entails larger output losses if the debt problem is pervasive, macroeconomic policies are not sufficiently supportive, and institutional frameworks are less flexible. Financial sector resilience and the external environment matter as well. Compared with the SEE countries, the Baltic countries adjusted faster not only because they had more flexible institutions, but also because of their stronger trade and financial links to countries less affected by the crisis.
- *Where are the remaining credit gaps across CESEE countries?* Postcrisis deleveraging has not been sufficient to align private debt with economic fundamentals in a number of countries. Bulgaria, Croatia, and Ukraine stand out as requiring further adjustment, and debt-related risks in their corporate sectors are still elevated, which is also the case in Latvia and Slovenia.
- *How can CESEE countries grow out of debt?* Highly indebted CIS and SEE countries may not be able to grow out of debt without significant institutional reforms. A comparison with Organisation for Economic Co-operation and Development (OECD) countries shows that CIS and SEE countries are lagging in key areas of structural reform.

In order to revive investment and ensure robust recovery, policies should aim at supporting domestic demand and completing the repair of private sector balance sheets.

- *Macroeconomic policies should be mindful of the credit gaps:* In countries where excessive debt continues to weigh on the economy, supportive macroeconomic policies are essential. *Fiscal consolidation*, although needed in many CESEE countries, should not derail the recovery. *Monetary policy* should remain accommodative in countries facing deflation risk.
- *Structural and institutional reforms* are critical to lifting potential growth, especially for countries that still face private sector debt overhang:
 - A lack of efficient *debt-resolution frameworks* and of capacity or incentives for banks to deal with nonperforming loans (NPLs) delays the necessary adjustment in non-financial sector balance sheets.
 - Less flexible *labor markets* may prevent overleveraged firms from carrying out the necessary labor shedding, thereby forcing them to disproportionately cut back on investment.
 - Many CIS and SEE countries also face the long-standing task of improving the investment environment, raising productivity, and reducing structural unemployment.

Approved By
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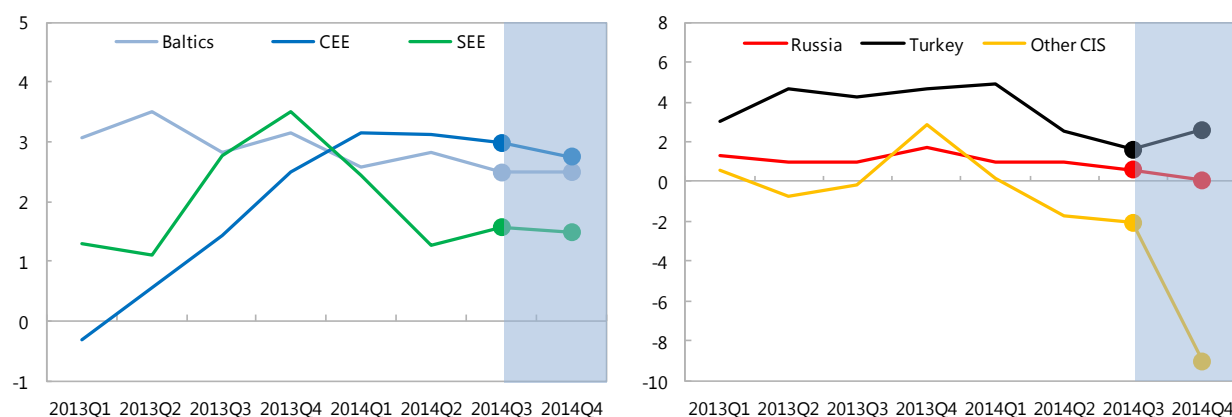
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I. RECENT DEVELOPMENTS AND OUTLOOK

Activity has begun to recover at a relatively solid pace across much of the region. However, with few signs of a rebound in private investment, growth remains far below precrisis levels in most countries, especially in SEE countries. CIS economies are facing particular difficulties from tighter financing conditions amid weak confidence and spillovers from Russia's slowdown.¹ Going forward, lower oil prices and better prospects in the euro area will be the main tailwinds.

Much of the region continues to recover. While growth is taking firmer root in the Baltic and CEE economies, activity in SEE remains subdued (text figure). Still-high indebtedness, slow labor market adjustment, strong trade links with weaker euro area economies, a tighter macroeconomic stance, and a lack of structural reforms compared with Baltic and CEE countries underlie the subdued activity in SEE. In addition, SEE countries experienced several country-specific negative shocks in 2014—that is, floods in Bosnia and Herzegovina and Serbia. In Turkey, growth softened in response to monetary tightening in early 2014.

Quarterly GDP Growth (Percent, year over year)



Sources: Haver Analytics; and IMF staff calculations.

Note: CEE = central and eastern Europe; SEE = southeastern Europe.

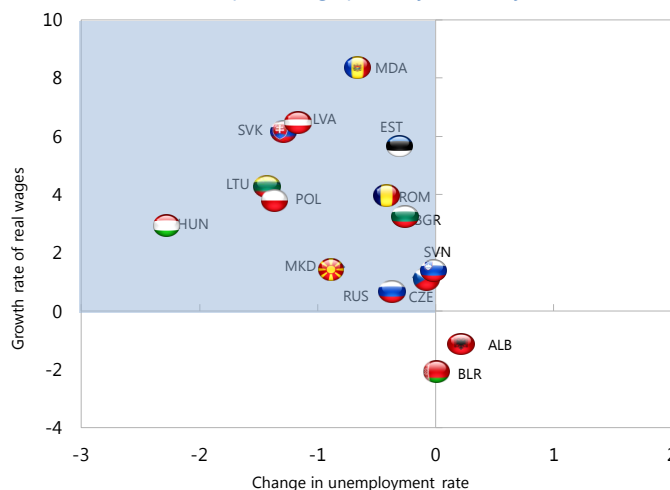
The CIS economies are slipping into recession. Falling oil prices on top of Western sanctions compounded Russia's underlying structural weaknesses, halting growth. Recession also deepened in Ukraine, partly reflecting declining activity in the eastern conflict zone. These developments had major adverse spillovers on activity in other CIS economies.

¹ CIS includes Belarus, Moldova, Russia, and Ukraine.

Private consumption remains the key growth driver in most of the region, as investment is held back by crisis legacies:

- Falling *unemployment*, higher real wages, and improved consumer credit growth have contributed to further strengthening of private consumption in most Baltic, CEE, and SEE countries (text figure). Lower oil prices are beginning to support real incomes. In contrast, consumption in the CIS declined further as a result of the worsening economic environment, including weaker confidence and credit.
- Investment* has yet to recover everywhere, except in CEE countries, which experienced less of a precrisis surge and thus less of an investment bust since the 2008–09 crisis. Since the crisis, the decline in private investment in the region has been on average about 1½ times as large as during previous episodes. The revival in investment has been sluggish, reflecting uncertainty about the strength of global and euro area recovery and geopolitical tensions, but also private sector balance sheet weaknesses (see Chapter II).

Real Wages and Change in Unemployment, 2014Q3
(Percent and percentage points, year over year)

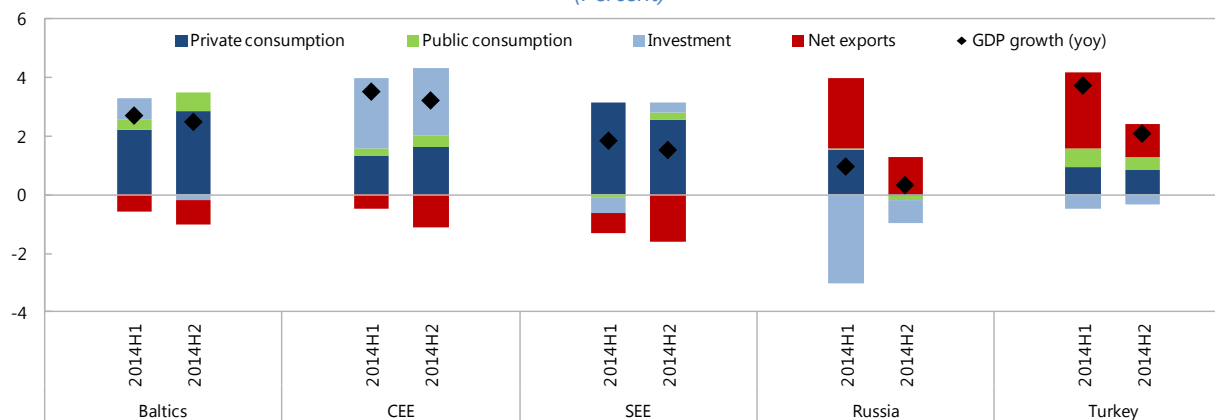


Sources: Eurostat; Haver Analytics; IMF, World Economic Outlook database; and IMF staff calculations.

Note: Data labels are defined in the abbreviations list.

Investment contributed negatively to growth in the second half of 2014, except in CEE, where it was supported by the automotive and energy sectors and increased use of European Union (EU) funds, and in some SEE countries (text figure).

CESEE: Contributions to Real GDP Growth
(Percent)

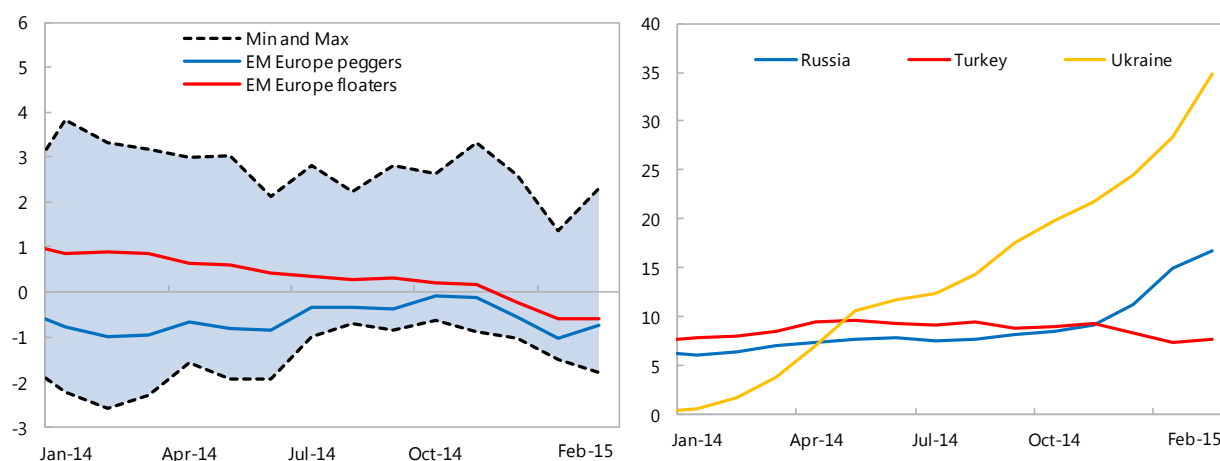


Sources: Haver Analytics; and IMF staff calculations.

Note: CESEE = central, eastern, and southeastern Europe; SEE = southeastern Europe; yoy = year over year.

Inflation continued to drift downward, reflecting mostly economic weakness, including abroad, except in the CIS, where large exchange rate depreciations boosted inflation. Headline and core inflation declined further in most of the CEE and SEE (text figure), in line with lower food and energy prices, euro area price developments, and economic slack (Box 1). Hungary, Kosovo, and Poland fell into deflation in the second half of 2014, joining Bosnia and Herzegovina, Bulgaria, Croatia, the former Yugoslav Republic of Macedonia, and Montenegro, which were already in deflation. Since November, lower oil prices have eased headline inflation in Turkey. In contrast, exchange rate depreciation and higher domestic food prices caused inflation to increase further in Russia and Ukraine.

Headline Inflation, Jan. 2014–Feb. 2015
(Percent, year over year)



Sources: Haver Analytics; IMF, World Economic Outlook database; national authorities; and IMF staff calculations.

Note: Emerging market (EM) Europe peggers are Bosnia and Herzegovina, Bulgaria, Croatia, Kosovo, Lithuania, FYR Macedonia, and Montenegro. EM Europe floaters are Albania, Czech Republic, Hungary, Poland, Romania, and Serbia.

Box 1. Low Commodity Prices: Risks of Second-Round Effects in Central, Eastern, and Southeastern European Countries^{1/}

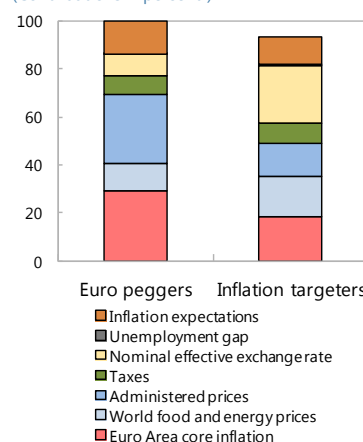
The pass-through of a commodity price shock to consumer prices can be broken down into first- and second-round effects. *First-round effects* capture (1) changes in energy and unprocessed food prices; and (2) the impact on other prices via input costs. *Second-round effects* reflect the impact channeled through inflation expectations via: (1) softening of contemporaneous demand as economic agents attempt to take advantage of the expected future price cuts; and (2) wage- and price-setting behavior, effectively embedding the expectation of disinflation in the evolution of future wages and prices. It is the latter channel that at the extreme can trigger a deflation trap—a self-feeding vicious feedback loop between inflation expectations and prices.

The importance of first- and second-round disinflationary effects from lower commodity prices is estimated using the open economy New Keynesian Phillips curve, in which the effect of inflation expectations is separated from that of the autonomous dynamics of actual inflation. Regression-based variance decomposition based on a sample extended until the end of 2014 confirms the findings shown in Figure 1 of the October 2014 Regional Economic Issues report.

- Disinflation across CEE has been primarily driven by *first-round effects* of lower commodity prices, as captured by the combined impact of world food and energy prices and administered energy prices.
- Disinflationary spillovers from the euro area have been an important additional factor for euro peggers, whereas for inflation targeters, nominal effective exchange rates predominated.

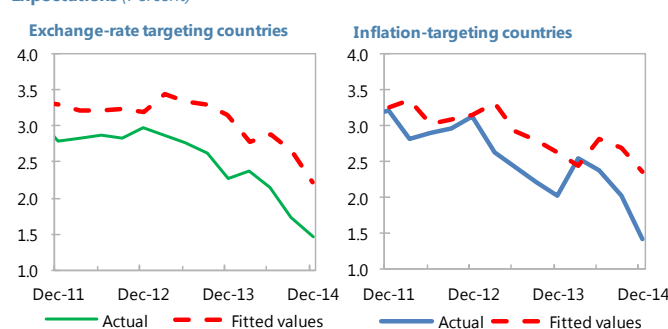
The updated results point to the presence of second-round effects, as measured by the impact of inflation expectations, which may account for about 10 to 15 percent of observed inflation variance. Their overall impact encompasses both the normal reaction of inflation expectations to oil prices and potential overshooting, which can signal the buildup of further deflation pressure that could be more difficult to reverse. The two effects can be disentangled by the gap between inflation expectations and their fitted values (Figure 2). The results show that the econometric model of inflation expectations cannot fully explain the fall in inflation expectations since early 2013 in euro peggers and since mid-2014 in inflation targeters. Further work is needed to pinpoint the exact size of these more persistent and potentially self-reinforcing second-round effects, though our analysis suggests that, at present, they play a minor role in the observed disinflation.

Figure 1. CESEE EU: Disinflationary Drivers, 2012-14
(Contributions in percent^{1/})



Source: Staff estimates based on Iossifov and Podpiera (2014).
Note: ^{1/} Inflation variances are normalized to the variance of CEE euro peggers.

Figure 2. CESEE EU: Gap Between Actual and Fitted 1-Year Ahead Inflation Expectations (Percent)

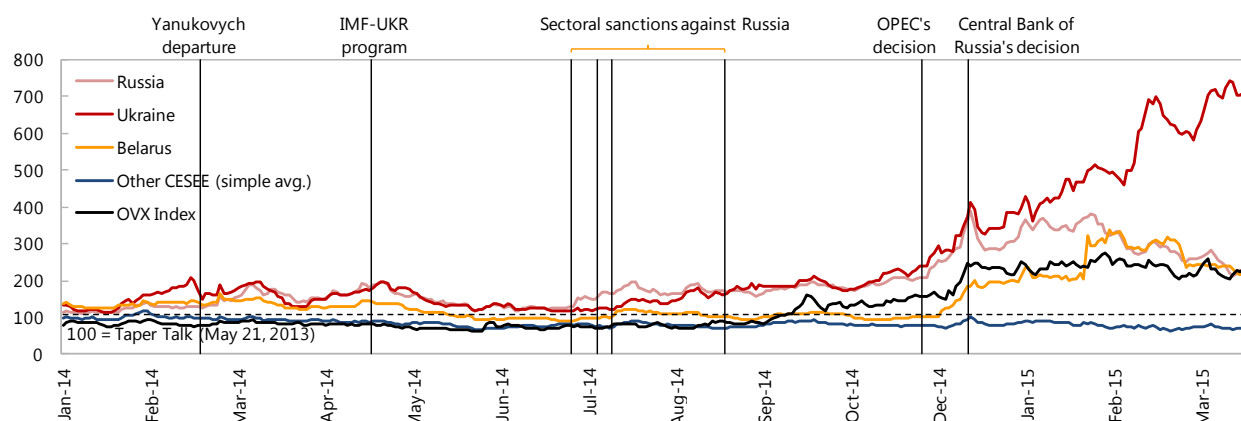


Source: Consensus Economics Forecasts, WEO, and Fund staff estimates.
Note: Fitted values from a fixed-effects regression over the period prior to the latest episode of falling world oil prices (2004–2011) of 1-year ahead inflation expectations on its first-lag (interacted by a dummy variable for exchange rate regime) and the log of the world price of oil in USD multiplied by the fraction of consumer basket spent on energy.

^{1/} This box was prepared by Plamen Iossifov, based on Iossifov and Podpiera (2014). CESEE EU countries are those countries in the region that are members of the EU.

Financial conditions remained favorable outside the CIS. Net capital flows stayed positive but slowed in the second half of 2014, in line with broader emerging market trends. Market indicators of implied volatility suggest that investor risk aversion has risen from historically low levels amid increasingly divergent monetary policy stances in advanced economies and volatile oil prices. Risk premiums remained within the range of their May 2013 pre-taper-talk levels for countries outside the CIS (text figure).

EMBIG Spread Indices
(May 21, 2013 = 100)

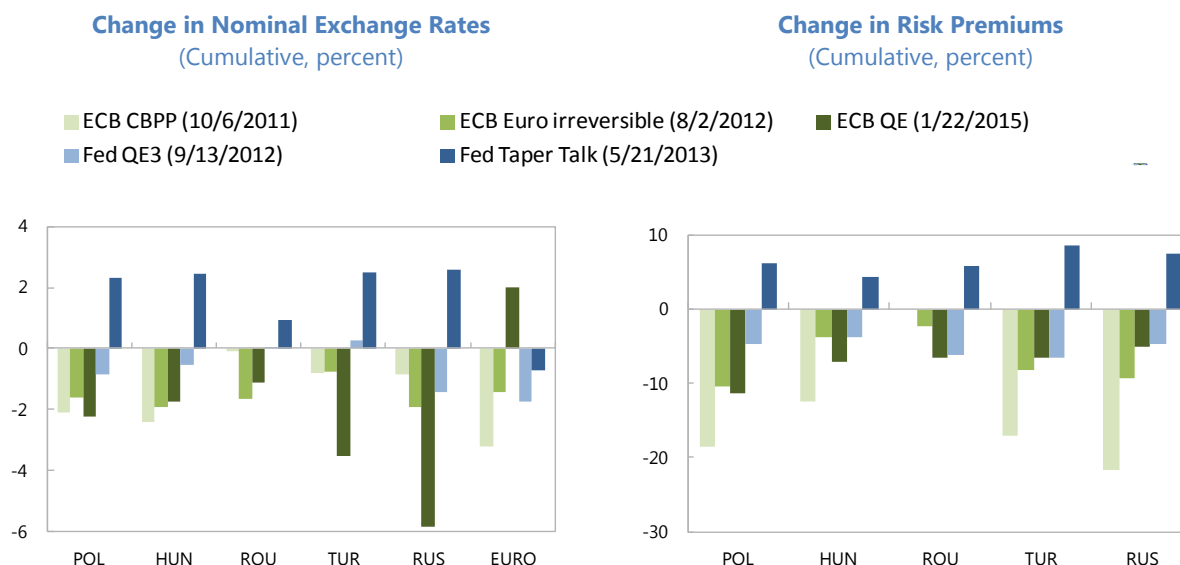


Source: Bloomberg.

Note: CESEE = central, eastern, and southeastern Europe; EMBIG = J.P. Morgan Emerging Markets Bond Index Global; OPEC = Organization of the Petroleum Exporting Countries; OVX = Chicago Board Options Exchange Crude Oil Volatility Index; UKR = Ukraine. Central Bank of Russia's decision = see footnote 2.

The Swiss National Bank's recent decision to remove the cap on the value of the Swiss franc (CHF) and the European Central Bank's (ECB's) Quantitative Easing (QE) announcement had roughly offsetting effects on financing conditions outside the CIS:

- The Swiss National Bank's decision placed downward pressure on currencies in countries with significant Swiss franc-denominated mortgages, broadly commensurate with their level of exposure to such mortgages (Box 2). Currencies have regained some of the lost value since the initial depreciation, and the overall economic impact is expected to be limited, since banks are capable of absorbing associated losses and the pass-through is somewhat offset by lower interest rates on Swiss franc mortgages.
- The ECB's QE announcement on January 22, 2015, has had a positive impact on risk premiums and currencies in the region as investors have started to rebalance their portfolios in search of higher yields. The impact has been, on average, comparable to that experienced after other unconventional policy announcements by the ECB and the U.S. Federal Reserve (text figure). Reflecting the size and sophistication of financial markets, the impact varied across CESEE countries.



Sources: Bloomberg; and IMF staff calculations.

Note: The figure shows the seven-day cumulative impact from the day of the policy announcement. Exchange rates are local currencies against the euro (euro–U.S. dollar exchange rate for EURO): a negative value implies appreciation of the currency. CBPP = Covered Bond Purchase Program; ECB = European Central Bank; EURO = euro area; Fed = U.S. Federal Reserve; QE = quantitative easing. Risk premium is measured by J.P. Morgan Emerging Markets Bond Index Global spreads.

CIS economies, notably Russia and Ukraine, saw large increases in risk premiums and capital outflows. The ruble depreciated by almost 45 percent against the U.S. dollar between June and December 2014, when companies were effectively cut off from external financing. In response, Russian authorities took strong policy measures,² which helped dampen downward pressure on the exchange rate and stem deposit withdrawals (text figure). Meanwhile, faced with large debt redemptions and cut off from external financing, Russian companies were forced to rely on domestic borrowing from banks and bond markets to meet maturing debt obligations. The spillovers from Russia and Ukraine meant that the currencies of most CIS countries also depreciated sharply.³

² Following an emergency 650 basis point rate hike, the Central Bank of Russia announced temporary bank regulatory forbearance to provide additional foreign exchange to banks and doubled the limit of insured retail deposits. In addition, the authorities announced a recapitalization program of about 2 percent of GDP and issued a directive to large government-owned companies to repatriate foreign exchange receipts.

³ See the April 2014 Central, Eastern, and Southeastern Europe Regional Economic Issues report and <http://blog-imfdirect.imf.org/2014/08/01/europes-russian-connections> for a discussion of CESEE countries' trade and financial links to Russia.

Box 2. Swiss Franc Borrowing in Central and Eastern Europe^{1/}

Swiss franc loans were popular in the mid-2000s, but exposure has since decreased. At the time, these loans were considered a cheaper alternative to loans denominated in domestic currency or in euros. They came under scrutiny following appreciation of the Swiss franc in 2010–11, which revaluated these loans by up to 30 percent and triggered a relative increase in nonperforming loans. In response, some countries limited household debt payments by capping interest rates and/or lengthening loan maturities. In late 2014, Hungary mandated the conversion of foreign exchange mortgages—mostly in Swiss francs—to domestic currency loans.

The economic and financial stability impact of the recent removal of the cap on the Swiss franc–euro exchange rate is expected to be small. Initially, currencies in affected countries depreciated by about 20 percent against the Swiss franc, but they have regained some ground since then. The impact on the broader economy is expected to be limited. Although for a 25-year mortgage contracted in 2006, principal revaluation can now amount to almost 50 percent, about half of the impact on the monthly payment burden is offset by lower Swiss franc interest rates. In all countries, supervisors view banks as well able to absorb associated losses. Thus, the impact on growth is likely to be small.

Swiss Franc Exposures in Selected Central and Eastern European Countries

	Bosnia and Herzegovina		Croatia		Hungary		Poland		Romania ^{2/}		Serbia	
	2008	2014	2010	2014	2008 ^{2/}	2014	2008	2014	2008	2014	2008	2014
In percent of GDP												
Total CHF exposure	3.4	1.3	11.0	7.3	23.3	2.9	...	...	2.5	1.5	4.8	2.9
Household loans in CHF	1.9	0.9 ^{1/}	9.5	6.7	18.1	1.2	...	...	2.3	1.4	3.6	2.6
Housing loans in CHF	...	...	7.9	6.3	...	0.0	10.3	7.6	0.7	0.5	...	...

Sources: National central banks and supervisory agencies; and IMF staff calculations.

1/ Estimate based on partial data.

2/ Loans in currencies other than domestic currency or euros.

Note: CHF = Swiss franc.

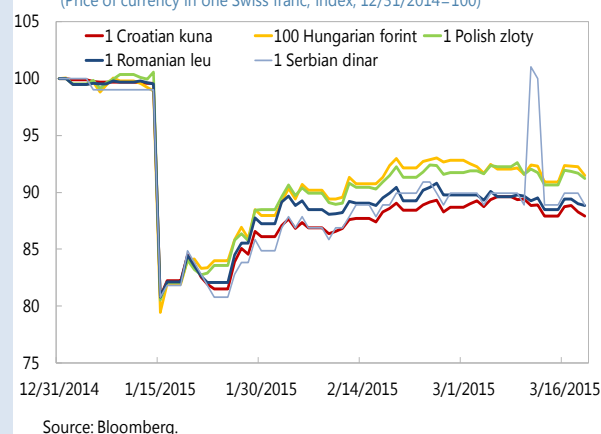
Political responses, mostly to address possible social and political repercussions, have differed.

- *Poland's* financial stability committee asked banks to pass on lower Swiss franc interest rates, abstain from additional collateral requirements, and consider loan restructuring requests flexibly.
- *Croatia's* parliament froze the exchange rate for Swiss franc loan payments at preappreciation parity for one year. Banks and representatives of debtors are working on a long-term solution.

Responses must be mindful of country-specific circumstances, but measures that overwrite contracts and/or restructure loans independently of borrowers' capacity to pay are best avoided. In some cases, however, a proactive role by supervisors is called for to achieve a fairer distribution of burden between creditors and poor debtors. Governments should avoid taking on extra burdens, especially in the absence of fiscal space.

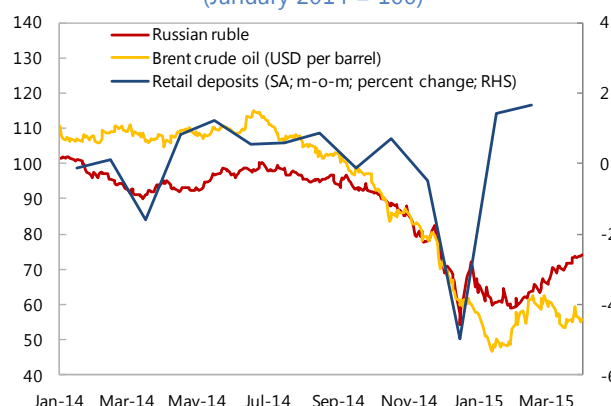
Swiss Franc Exchange Rate

(Price of currency in one Swiss franc; index, 12/31/2014=100)



^{1/} This box was prepared by Tonny Lybek and Johannes Wiegand.

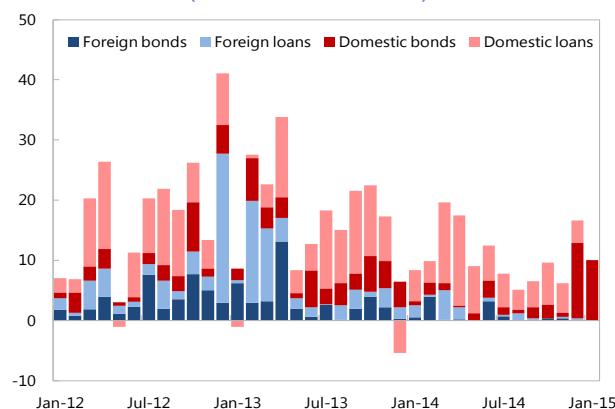
Russia: Exchange Rate, Oil Price, and Retail Deposits
(January 2014 = 100)



Sources: Bloomberg; Central Bank of Russia; and IMF staff calculations.

Note: m-o-m = month over month; RHS = right scale; SA = seasonally adjusted; USD = U.S. dollars

Russia: Corporate Financing, 2012–15
(Billions of U.S. dollars)

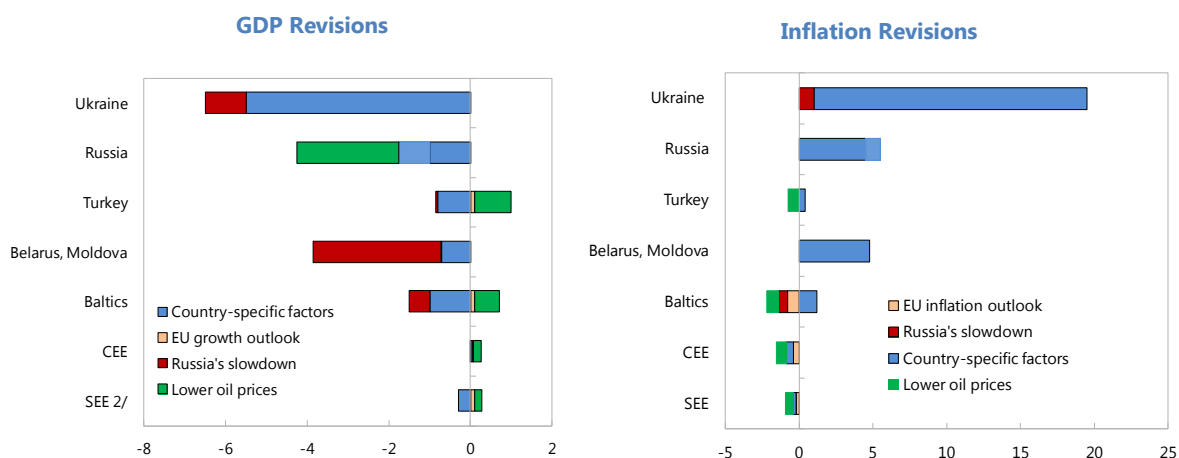


Sources: Central Bank of Russia; Dealogic; and IMF staff estimates and calculations.

The near-term economic outlook in the CESEE region is shaped by three external shocks.

- *A steep decline in oil prices:* Oil prices fell by about 50 percent during the second half of 2014. With the share of fuel in total consumption ranging from 2.5 to 8.2 percent, lower oil prices are expected to continue to provide a modest boost to growth, except in Russia.
- *The European Central Bank's decision to embark on an expanded, open-ended asset purchase program (QE):* The QE that started in March 2015 is expected to help lower borrowing costs across the euro area and boost inflation. Among the Baltic and CEE economies, the impact on inflation may be up to 0.5 percentage point. Activity in euro peggers will benefit from the more depreciated exchange rate, while floaters will have more room to ease monetary policy without risking capital flow reversals.
- *A dramatic slowdown in Russia:* Western sanctions, weak confidence, and a negative terms-of-trade shock are expected to cause Russia's GDP to contract by 3.8 percent in 2015—a more than 4 percentage point downward revision relative to the October 2014 Regional Economic Issues report (REI). Given strong links to Russia, the recession will have significant spillovers on other CIS and Baltic countries (text figure). For the rest of the region, spillovers from Russia are deemed to be limited.

GDP and Inflation Forecast Revisions April 2015 vs. October 2014: Key Drivers



Source: IMF country teams' estimates.

Note: The shaded area corresponds to the estimated impact of Western sanctions. CEE = central and eastern Europe; EU = European Union; SEE = southeastern Europe.

Overall, the external shocks and domestic developments are projected to result in more of the same in 2015; that is, activity at three different speeds (text table).

- *Solid growth in the Baltics, CEE, and Turkey:* Growth projections were revised upward marginally for CEE and Turkey and downward slightly for the Baltic countries relative to the October 2014 REI. Continued labor market improvements will support private-consumption-led growth in Baltic countries dented by spillovers from Russia. More favorable external developments will contribute to a slight upward growth revision in CEE. Turkey will benefit from lower oil prices, although somewhat countered by reduced export demand from Iraq, tighter fiscal policy, and weaker consumer confidence.
- *Sluggish growth in SEE:* Growth projections have been revised downward by 0.4 percentage point for the SEE subregion relative to the October 2014 REI. Slower-than-expected reconstruction after floods and a less supportive fiscal stance are expected to outweigh a modest boost from lower oil prices and slightly better euro area growth. These economies continue to struggle with high debt and are lagging the Baltics (which saw similarly strong investment in the precrisis boom) with respect to deleveraging (Chapter II).
- *Recession in CIS countries:* All CIS economies are expected to contract in 2015: Russia and Ukraine are expected to face the largest drop in output. Large downward revisions in Russia and Ukraine reflect the fallout from geopolitical tensions, ongoing macroeconomic adjustment, and in Russia's case, lower oil prices and a loss of confidence. Growth projections for Belarus and Moldova have also been revised downward by about 4½ percentage points for 2015 relative to the October 2014 REI.

Outlook for Growth

	REI April 2015			REI October 2014		
	2014	2015	2016	2014	2015	2016
Baltics	2.6	2.6	3.3	2.5	3.1	3.5
CEE	3.0	3.1	3.1	2.9	2.9	2.9
SEE	1.7	1.9	2.4	1.5	2.2	2.6
Other CIS	-3.9	-4.6	1.4	-3.9	1.7	2.2
Russia	0.6	-3.8	-1.1	0.2	0.5	1.5
Turkey	2.9	3.1	3.6	3.0	3.0	3.7
CESEE	1.4	-0.4	1.3	1.2	1.8	2.5

Source: IMF World Economic Outlook database.

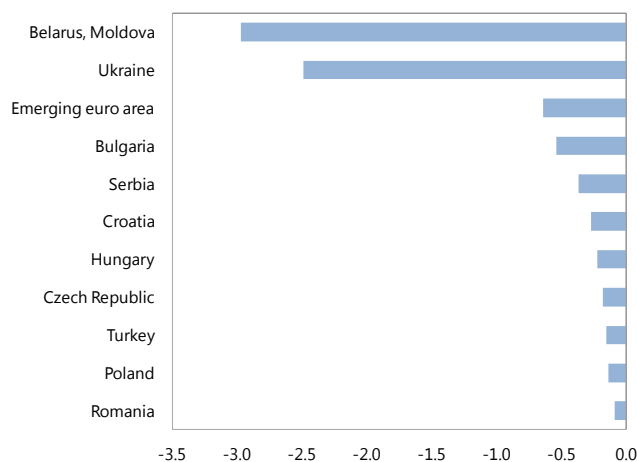
Note: CEE = central and eastern Europe; CESEE = central, eastern, and southeastern Europe; CIS = Commonwealth of Independent States.

Most CESEE countries outside the CIS will continue to grapple with downward price pressure in 2015. Lower oil prices and downward inflation revisions in the euro area have significantly dampened the inflation outlook not only in CEE and SEE, but also in Turkey, although it is somewhat countered by the lira depreciation and monetary easing. Persistently lower prices and economic slack have also increased the risk of second-round effects in EU members through lower wages, which could entrench deflation pressure (Box 1). In contrast, inflation in Russia is projected to stay above the central bank's target during 2015–16; projections have also been revised upward for other CIS countries as a result of the exchange rate depreciation pass-through and inflation inertia.

Risks to the near-term outlook are now more balanced:

- On the *downside*, a surge in financial volatility, an intensification of geopolitical tensions, and protracted slow growth in the euro area are still the main risks. Asynchronous monetary policy normalization in advanced economies, which could be accentuated by persistent strength in the U.S. dollar–euro exchange rate and a related reassessment of emerging market fundamentals, could result in capital outflows and liquidity strains on CESEE sovereigns and leveraged firms, given the region's high dependence on foreign funding. Persistent U.S. dollar strength may lead to balance sheet strains in countries with significant dollar-denominated debt, such as Russia, Turkey, and Ukraine. Geopolitical tensions surrounding Russia and Ukraine and a

GDP Losses from an Additional 4 Percent Fall in Russia's GDP, 2015 (Relative to baseline, percent)



Source: IMF staff estimates using the IMF's Flexible System of Global Models.

Note: Emerging euro area countries are Estonia, Latvia, Lithuania, the Slovak Republic, and Slovenia. An additional 4 percent fall in Russian GDP reflects further deterioration of confidence, a further increase in the cost of capital, and a decline in Russia's tradables sector productivity as a result of increased deintegration from the global economy.

protracted period of slower growth in the euro area still cloud the outlook for CESEE countries. Staff simulations show that a deeper contraction of activities in Russia could result in a fall in GDP level between 0.1-3 percent relative to the baseline, with the CIS countries feeling the largest impact (text chart above). If the situation in Greece were to deteriorate, it could cause negative spillovers on Balkan countries where Greek subsidiaries account for a sizable part of the banking system (see Box 3).

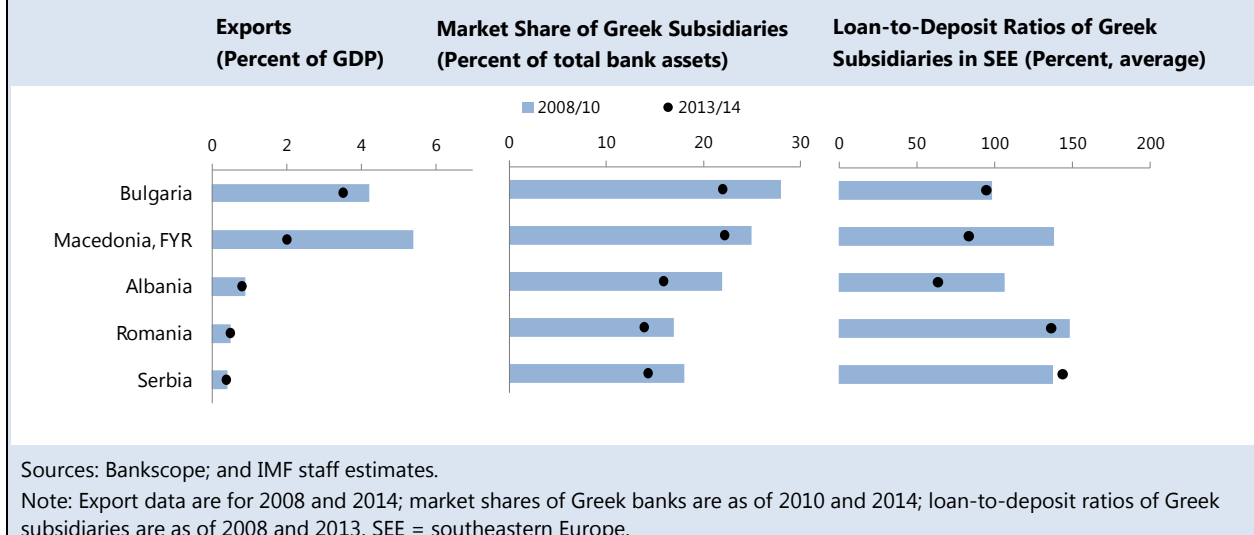
Box 3. SEE Links with Greece

Some SEE countries may be affected by a worsening situation in Greece through banking links.

Financial links between Greece and SEE economies are more significant than trade channels:

- **Trade linkages:** The share of exports to Greece relative to GDP is fairly small in SEE countries, with the highest exposure in Bulgaria, at 3.5 percent of GDP. This share has declined since 2008, reflecting weaknesses in the Greek economy (see figure below).
- **Financial linkages:** The banking sector exposure—though weaker than at the beginning of the financial crisis—is still significant in a number of countries. SEE subsidiaries of Greek banks account for 14 to 22 percent of banking sector assets (see figure below). The loan-to-deposit ratios in Greek subsidiaries have also declined over time, reflecting weak domestic demand for loans and less reliance on parent bank funding. Higher nonperforming loans in some subsidiaries, however, pose additional risks.

If the situation in Greece gets worse, it could cause spillovers to the financial sectors of some SEE countries through a loss of confidence, deposit outflows, and possibly pressure on the currencies—particularly in countries with pegged exchange rate regimes and high euroization.



- Since the October 2014 REI, some *upside risks* have emerged. The ECB's QE could produce stronger and more sustained gains in growth in the euro area, with positive spillovers to the region. In addition, it could trigger larger-than-expected capital inflows, particularly for CESEE countries with stronger fundamentals and more developed domestic debt and equity markets. Similarly, recent declines in oil prices could support domestic demand more than envisaged,

lifting CESEE growth above current projections. However, given large uncertainty regarding the future path of oil prices and its drivers, this upside risk is somewhat balanced by downside risk of an earlier-than-expected rebound in oil prices.

The following table highlights the key downside risks and the IMF staff's assessment of the relative likelihood and impact of these risks on the region.

CESEE Regional Risk Assessment Matrix ^{1/}

Source of Risks	Relative Likelihood	Relative Impact
Protracted slow growth in the euro area	High	Medium
A surge in financial volatility	High	Medium
Persistent strength in the USD	High	Medium
Escalation of geopolitical tensions surrounding Russia/Ukraine	Medium	Medium-High

Note: USD = U.S. dollar.

^{1/} The relative likelihood of risks reflects the IMF staff's subjective assessment of the risks surrounding the baseline. The relative impact is based on country-specific assessments weighted by purchasing-power-parity GDP. "Low" indicates a probability below 10 percent, "Medium" indicates a probability of 10 to 30 percent, and "High" indicates a probability of 30 to 50 percent.

II. CENTRAL, EASTERN, AND SOUTHEASTERN EUROPE: WEIGHED DOWN BY DEBT OR TURNING THE CREDIT CYCLE?

CESEE countries have undergone a process of financial deepening since the early 1990s. This process was facilitated by sizable capital inflows, which helped fund the rapid growth in credit, consumption, and investment and led to widening current account deficits and a buildup of external debt (Figure 1). Much of this debt was in the form of loans from western European banks and intercompany loans.⁴ From 2003 onward, the credit deepening in some CESEE countries morphed into increasingly unsustainable credit booms.

The 2008–09 global financial crisis triggered a sudden stop in capital inflows, causing sizable current account adjustments across the region. As a result, credit growth came to a halt, and domestic demand collapsed. Investment rates, in particular, plummeted across the region in the wake of the crisis, except in Russia (Figure 1).

Investment rates have, since, remained weak despite supportive macroeconomic policies. On the one hand, the precrisis boom in many instances resulted in overinvestment, particularly in real estate. On the other hand, private sector balance sheets became overextended in the run-up to the crisis, and the sharp drop in incomes and asset prices, together with the rise in risk premiums in the immediate aftermath of the crisis, made private debt unsustainable. This forced companies to curtail borrowing and thus to shelve investment. Households needed to do the same with respect to durables consumption and housing investment. At the same time, external demand slumped, and negative feedback loops pushed the region into a deep recession.

The question now is to what extent weak corporate and household balance sheets still hold back the recovery in CESEE. To answer this question, this chapter studies the post-2008 adjustment in private non-financial sector debt and its impact on economic activity. The analysis is structured as follows: Section A asks how much private sector deleveraging has already taken place across the region; Section B aims to gauge the real cost of private sector deleveraging; Section C reviews the remaining debt-related risks facing CESEE countries; Section D examines the dynamics of the fundamental determinants of private credit to estimate remaining credit gaps between the level of private debt and its secular trend and between the growth rate of private credit and its typical path over the credit cycle; Section E concludes by considering how the countries that are still suffering from debt overhang (that is, with positive credit gaps) can grow out of the debt problem over the medium term.

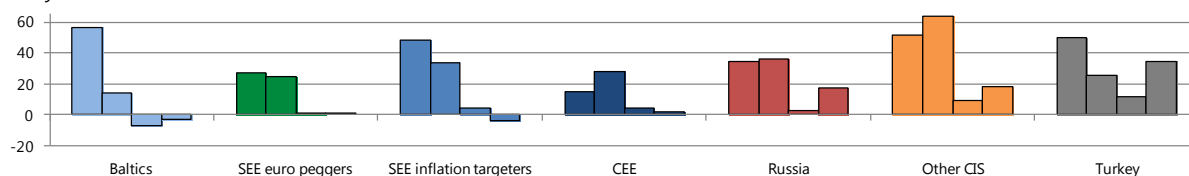
⁴ See the April 2014 REI for a detailed analysis of external funding patterns in the CESEE region.

Figure 1. CESEE: Real and Financial Sector Developments

(First bar - 2005; second bar - 2008, third bar- 2009, fourth bar - 2013)

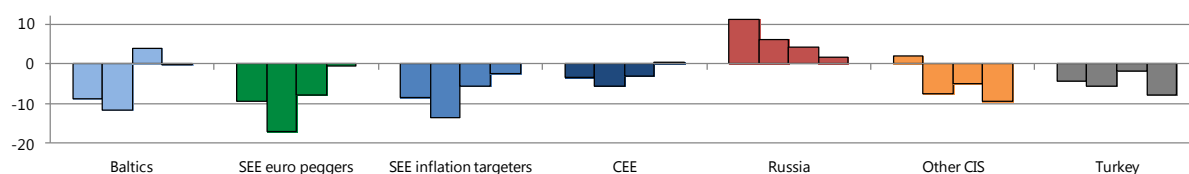
Bank Credit to Private Sector (Percent change, year over year, nominal)

Starting from a low level, bank credit grew rapidly before 2008, but has since slumped and stayed depressed, except in the CIS and Turkey



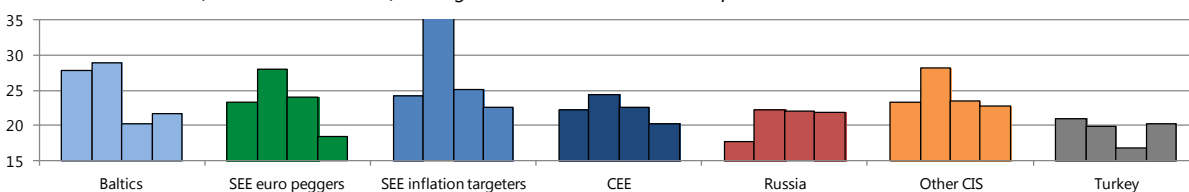
Current Account Balance (Ratio to GDP, percent)

A precrisis credit boom financed excessive growth of domestic demand, which has since adjusted, except in the CIS and Turkey



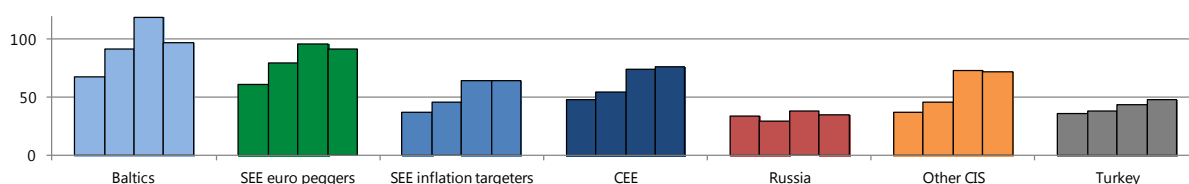
Investment-to-Nominal GDP Ratio (Percent)

Investment rates have fallen across much of the region and remain below their precrisis levels



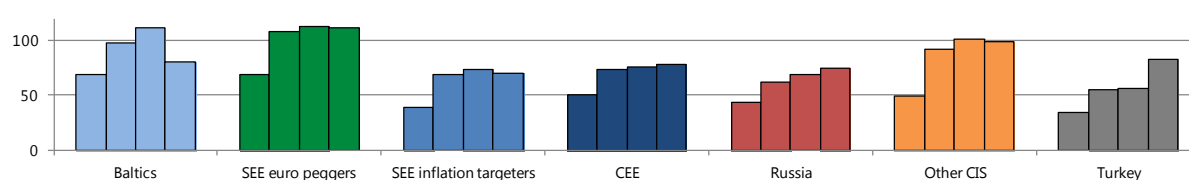
External Debt (Ratio to GDP, percent)

The external debt burden has increased in the wake of crisis amid currency devaluations and widening government deficits



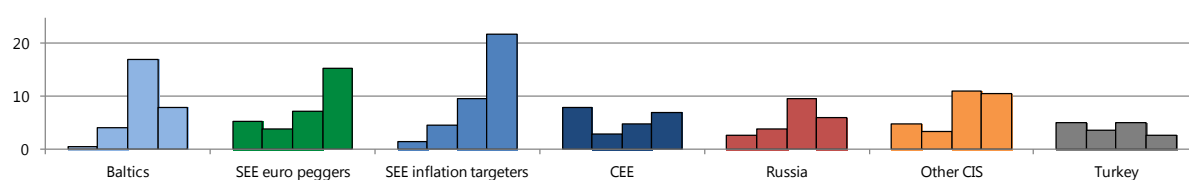
Private Sector Debt (Ratio to GDP, percent)

Despite deleveraging efforts, the private debt burden has stayed high or even increased, except in the Baltics



Ratio of Nonperforming to Total Bank Loans (Percent)

The share of nonperforming loans has crept up and stayed elevated, except in the Baltics, Russia, and Turkey



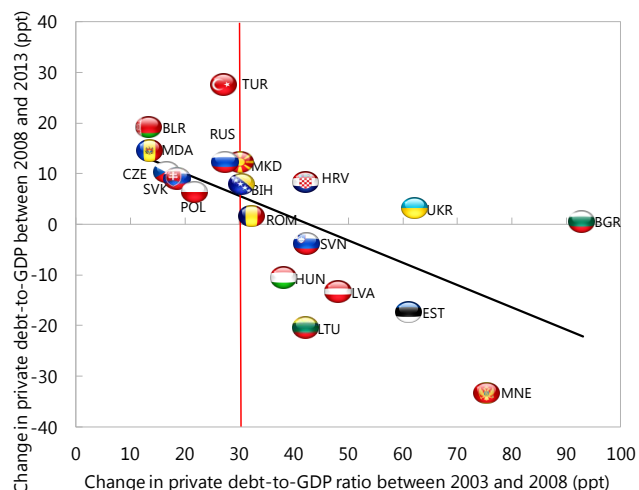
Sources: IMF, World Economic Outlook database; and IMF staff calculations.

A. How Much Deleveraging?

Despite significant deleveraging efforts—as measured by the adjustment in the private sector net saving-investment balances—relatively few of the countries with a sizable buildup of debt before the crisis managed to noticeably reduce their private-debt-to-GDP ratios after the crisis.

A larger stock of private sector debt has generally entailed larger deleveraging in the aftermath of the crisis. A comparison of the changes in private-debt-to-GDP ratios during 2003–08 and 2008–13 shows that countries that reduced their debt-to-GDP ratios between 2008 and 2013 were among those that experienced a significant buildup of debt in the precrisis period—at least a 30 percentage point of GDP increase between 2003 and 2008 (Figure 2). However, not all high-debt countries managed to bring down their debt-to-GDP ratios. *Bosnia and Herzegovina, Bulgaria, Croatia, the former Yugoslav Republic of Macedonia, Romania, and Ukraine*, whose private-debt-to-GDP ratios in 2008 were well above 2003 levels, subsequently stabilized at their peak values or increased further.

Figure 2. CESEE: Change in Private-Debt-to-GDP Ratios before and after 2008–09 Crisis



Sources: Eurostat; IMF, International Financial Statistics and World Economic Outlook databases; and IMF staff calculations.

Note: 2003 data for Albania, Kosovo, and Serbia are not available. Data labels are defined in the abbreviations list.

Since 2008–09, most CESEE countries have undergone significant correction of private sector net saving-investment balances. When an economy is hit by a sudden stop, the correction of the debt metrics typically occurs through reductions in consumption, implying higher saving and/or cutbacks in investment. Indeed, the economy-wide net saving-investment balances improved notably in much of the region (Figure 3).⁵ In some cases, large adjustments transformed the private sector from a net borrower to a net creditor. The corrections were largest in exchange-rate-targeting CESEE countries, where the precrisis external imbalances were among the biggest, and in Hungary.⁶

⁵ For the economy as a whole, domestic sectors' net lending/borrowing is equal to the sum of current and capital account balances, except for statistical discrepancies. The net lending (+)/net borrowing (-) broadly equals gross saving and net capital transfers minus gross capital formation (that is, saving-investment balance). When positive, it captures the excess savings that go toward principal debt repayment and asset accumulation. By construction, this measure does not capture "automatic" savings generated by revaluation effects on assets, which are recorded directly in the financial accounts.

⁶ In Hungary, the postcrisis depreciation of the forint exacerbated the burden of the foreign-exchange-denominated debt.

In addition, in all CESEE countries except Belarus, the former Yugoslav Republic of Macedonia, and Russia, the adjustment was achieved in part by large declines in the private sector investment rate.

Figure 3. CESEE: Change in Private Net Saving-Investment Balance between 2009–13 and 2006–08 (Percent of GDP)

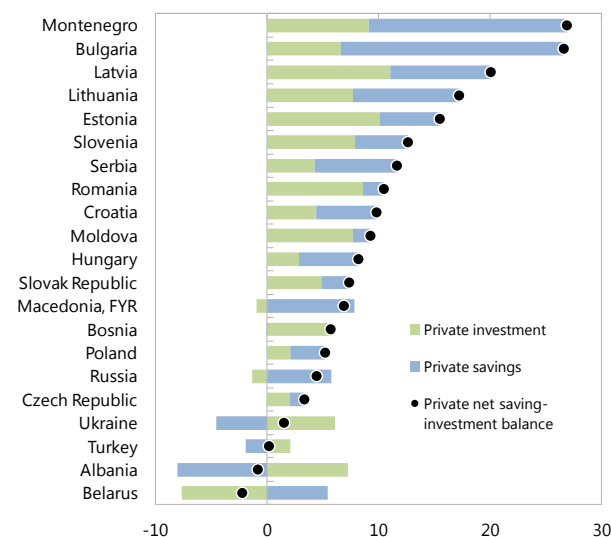
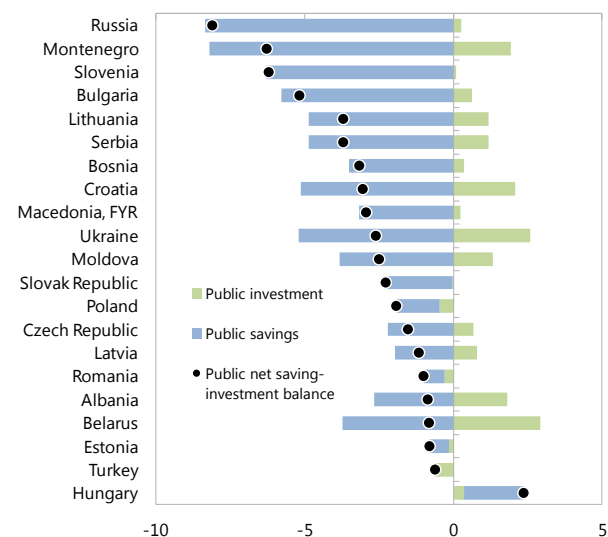


Figure 4. CESEE: Change in Public Net Saving-Investment Balance between 2009–14 and 2006–08 (Percent of GDP)



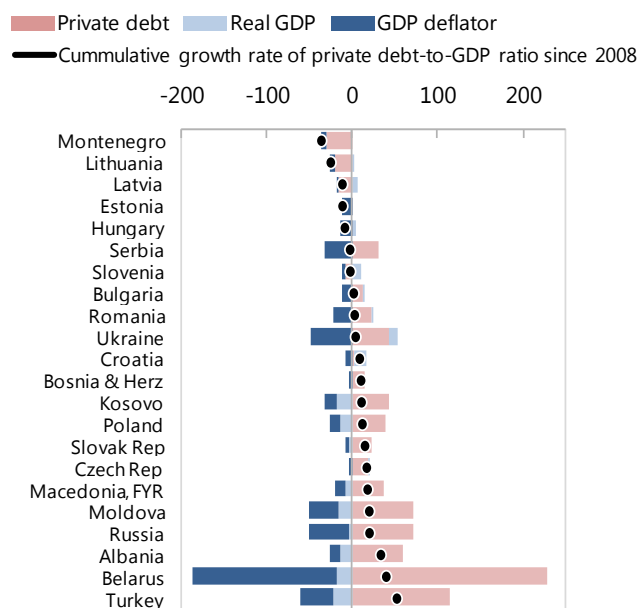
Sources: IMF, World Economic Outlook database; and IMF staff calculations.

Relatively few countries, however, saw their 2013 private-debt-to-GDP ratios dip below 2008 levels. The debt-to-GDP ratio can be lowered through (1) *reduction of the debt stock* (via liquidation of assets and use of the proceeds to pay down debt or via higher saving or lower investment or via debt restructuring); or (2) *an increase in nominal GDP* (via higher real growth or higher inflation and asset prices).

Let's consider what happened across CESEE:

- **Debt stocks:** Visible reductions in private debt stocks, including valuation effects, occurred only in the Baltics and Montenegro, as can be seen from the negative contributions of the debt stock to the growth of the debt-to-GDP ratios in these countries during 2008–13 (Figure 5). Countries with flexible exchange rates and a high share of

Figure 5. CESEE: Contributions to the Cumulative Growth Rate of Private Debt-to-GDP Ratio over 2008–13 (Percent)



Sources: Eurostat; IMF, World Economic Outlook database; and IMF staff calculations.

Note: See note to Figure 7.

foreign-exchange-denominated liabilities experienced an increase in their debt burdens in the immediate aftermath of the crisis due to valuation effects. For example, foreign exchange devaluations have increased the debt burdens for households in Hungary and Poland (Figure 6b). Russia, Turkey, and Ukraine, which have significant debt exposures in U.S. dollars, were also affected by exchange rate depreciation—but later on, in 2014. On the other hand, write-offs or restructuring of debt has lowered debt burdens in some cases. Available data for EU CESEE show that debt restructuring was applied more widely in the case of corporate than household loans. The biggest declines in corporate debt burdens attributable to revaluations and reclassifications were in Hungary, Latvia, Lithuania, Poland, and Slovenia (Figure 6a).⁷ Households benefited the most in the Czech Republic, Latvia, Romania, and the Slovak Republic (Figure 6b).

- *Inflation:* Higher inflation (growth of GDP deflator) helped bring down debt-to-GDP ratios in some countries (Figure 5).
- *Growth:* Real incomes facilitated reductions in the debt-to-GDP metrics to a lesser extent, reflecting the severity of the 2009 contractions and the weakness of subsequent recoveries (Figure 5). In some countries, stronger external demand helped lower their private-debt-to-GDP ratios in the postcrisis period (see Section B).

Figure 6a. EU CESEE: Valuation Effects on Postcrisis Growth of Bank Credit to Nonfinancial Corporations (Percent)

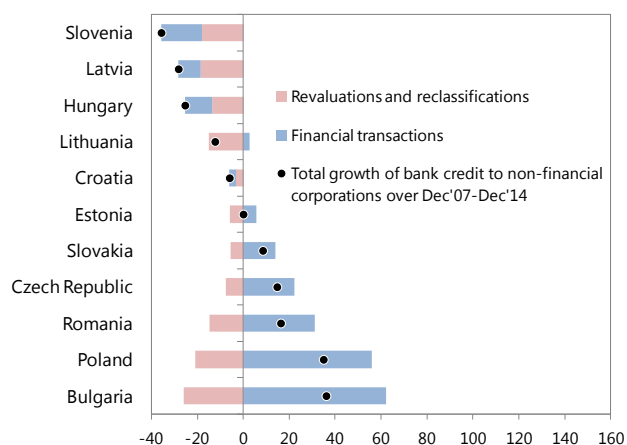
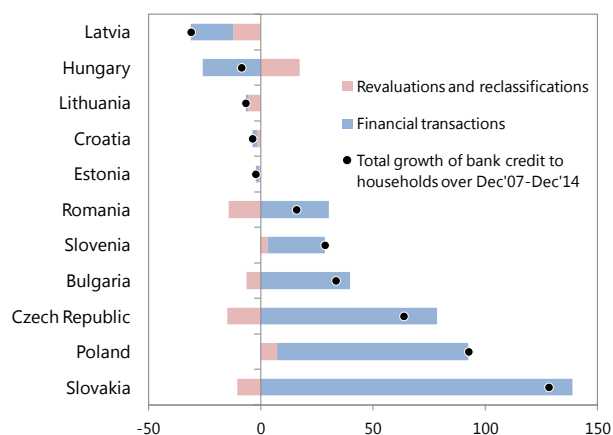


Figure 6b. EU CESEE: Valuation Effects on Post-Crisis Growth of Bank Credit to Households (Percent)



Sources: European Central Bank, monetary financial institution balance sheet statistics; and IMF staff calculations.

Note: Revaluation effects include write-offs and write-downs of loans and revaluation adjustments as a result of price and exchange rate changes. Financial transactions refer to the repayment and drawing of loans. Data for the Baltics is for the 2010–14 due to lack of data. EU CESEE = European Union central, eastern, and southeastern economies.

⁷ In the case of Bulgaria, the recorded revaluation and reclassification effects are mostly on account of the closure of a large domestic bank in 2014.

Private debt reductions reflected declines in both household and corporate debt. In the Baltics, Hungary, and Ukraine, a significant share of the adjustment was carried out by households, while corporate debt stocks were reduced in Estonia, Hungary, Lithuania, Serbia, and Slovenia (Figure 7). Within corporate debt, intercompany loans from abroad have fallen only in a few countries, reflecting the fact that such loans are typically more stable, but also that they are disproportionately affected by valuation effects from depreciation of floating currencies.

Figure 7a. CESEE: Private Sector Debt, 2008
(Percent of GDP)

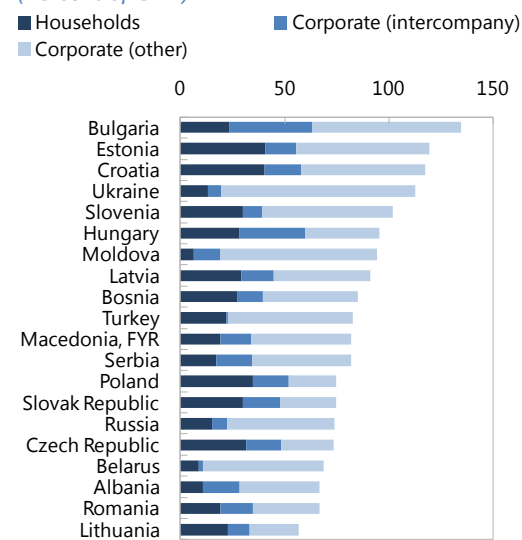
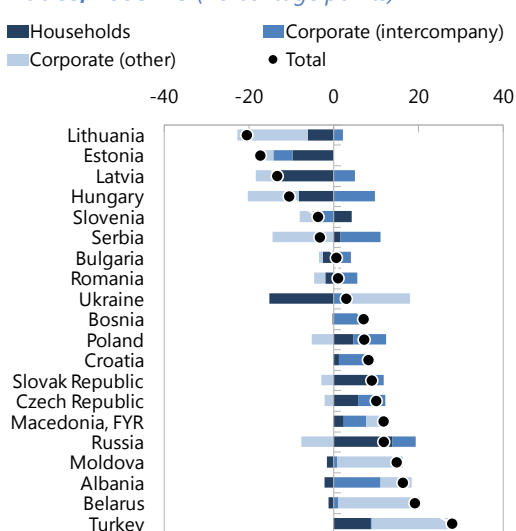


Figure 7b. CESEE: Change in Private Debt-to-GDP Ratios, 2008–13 (Percentage points)



Sources: Eurostat; IMF, International Financial Statistics and World Economic Outlook databases; and IMF staff calculations.

Note: For EU countries, debt includes loans and debt securities, excluding financial derivatives and consolidated within sector, owed by nonfinancial private and public firms and households (based on European System of National Accounts, 2010). For other countries, the sum of bank loans to sectors other than the government and other financial corporations and financial liabilities of "Other sectors" to nonresidents (as defined in the IMF's *Balance of Payments Manual* statistics and excluding other financial corporations), including intercompany loans from nonresidents. In the breakdown of corporate loans, only intercompany loans from nonresidents are shown.

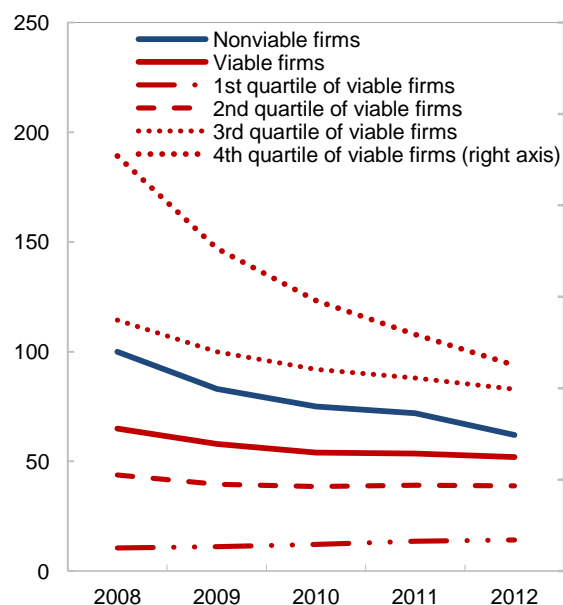
Firm-level data show that among continuously reporting viable firms, those with relatively higher leverage experienced the largest postcrisis adjustment (Figure 8):⁸

- *Among viable firms, the most indebted have undertaken the largest adjustments.* Nonviable firms had much higher median leverage in 2008 than continuously operating viable firms and in most cases ceased operations or reported irregularly in subsequent years. Nonviable firms accounted for about 10 percent of total sales of firms in the sample.

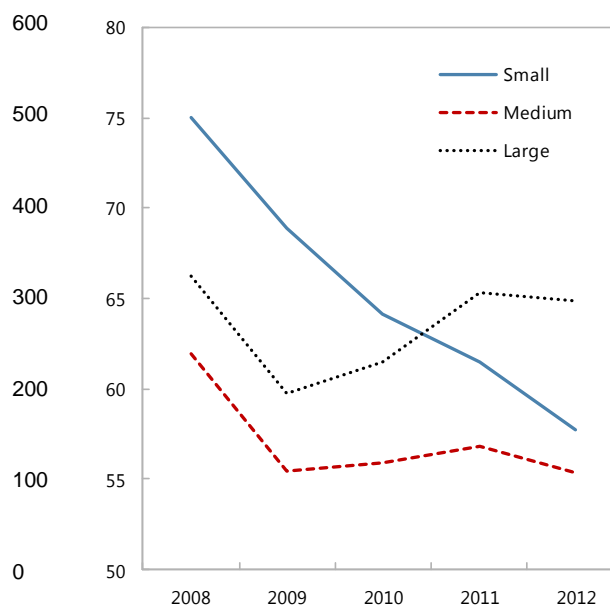
⁸ The analysis is based on a sample of firms that had non-zero debt in 2008 and continuously operated as viable entities (with nonnegative equity) during 2008–13. Given data availability, the sample includes Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Russia, Serbia, the Slovak Republic, Slovenia, Turkey, and Ukraine.

Figure 8. Firm-Level Deleveraging Patterns, 2008–12
(Median debt, percent of equity)

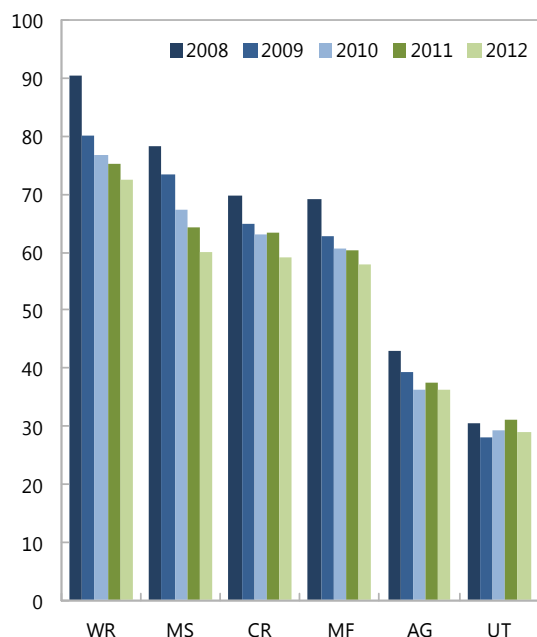
Leverage



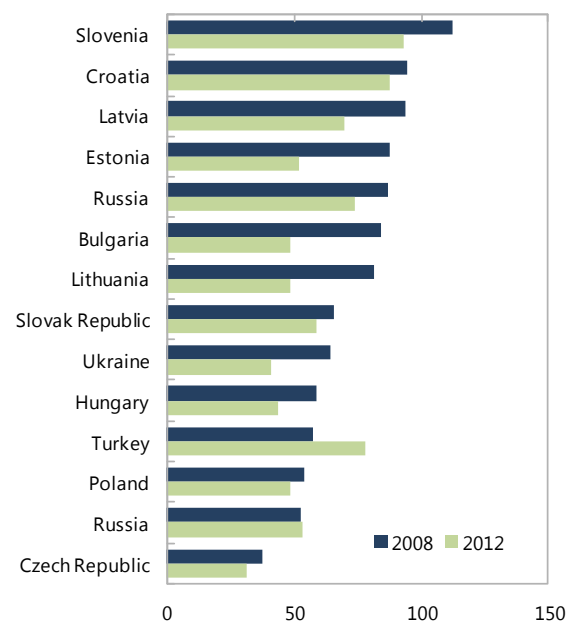
Leverage by Firms' Size



Deleveraging by Industry



Deleveraging by Country



Sources: ORBIS database; and IMF staff calculations.

Note: Sample excludes firms that ceased operations or reported irregularly during 2008–12. These nonviable firms had excessive leverage in 2008 and mostly closed down in subsequent years. Including these firms in 2008, the median leverage of the top 25 percent of firms by leverage would be close to 710 percent instead of the current 450 percent. The remaining quartiles would remain practically unchanged. Industrial sectors are agriculture and mining (AG), manufacturing (MF), utilities (UT), construction and real estate (CR), wholesale and retail trade (WR), and market services (MS). Size buckets are small, medium, and large.

- *Sectors dominated by small or highly leveraged firms deleveraged the most during 2009–12.* The wholesale-retail trade and market services sectors reduced their median debt-to-equity ratio by close to 20 percentage points from 80–90 percent in 2008. Construction, manufacturing, and agriculture have scaled back leverage by close to 10 percentage points. In contrast, leverage in the utilities sector—which is dominated by larger and least indebted firms—did not change much.
- *In countries with highly leveraged corporate sectors before the crisis, continuously operating viable firms experienced the largest reduction in leverage during 2008–12.* This was most notably the case in the Baltics, Bulgaria, Hungary, Slovenia, and Ukraine. In contrast, in countries with relatively low corporate leverage in 2008, such as the Czech Republic and Poland, firms reduced leverage only slightly. Also consistent with the aggregate-level evidence (Figure 7b), the up-leveraging by Turkish firms contrasts with the deleveraging trend in the rest of the region.

B. What Determines the Economic Cost of Deleveraging?

A smooth repair of private nonfinancial sector balance sheets—with minimal output losses—requires supportive macroeconomic policies and flexible institutions. The scale of debt overhang, financial sector resilience, and external environment matter as well. A less favorable combination of all these factors, as in the case of SEE, would result in more protracted private sector deleveraging, with higher real costs for the economy.

The repair of private balance sheets may take longer and entail larger output losses if

- *The debt overhang is pervasive:* If both firms and households are highly leveraged, the adjustment will likely be more difficult and/or more protracted.
- *Macroeconomic policies are not sufficiently supportive:* the private sector balance sheet adjustment could deepen the economic downturn if the government does not have *fiscal space* to accommodate private sector deleveraging and/or if the central bank lacks *monetary policy space* or flexibility to counter deflationary forces.
- *Institutions are not sufficiently flexible:* A lack of *efficient debt-resolution frameworks* would make it more difficult for firms and households to deal with the debt stock problem and make a fresh start. In addition, more rigid *labor market* regulations (such as high hiring and firing costs) would prevent firms from carrying out necessary labor shedding, thereby forcing them to disproportionately cut back on investment, which could further delay the recovery in corporate profitability and dampen growth prospects.
- *The financial sector is not sufficiently resilient:* This means that banks are less able to absorb losses stemming from nonperforming loan exposures and to facilitate debt restructuring.
- *External demand is weak:* This happens if many countries must adjust at the same time.

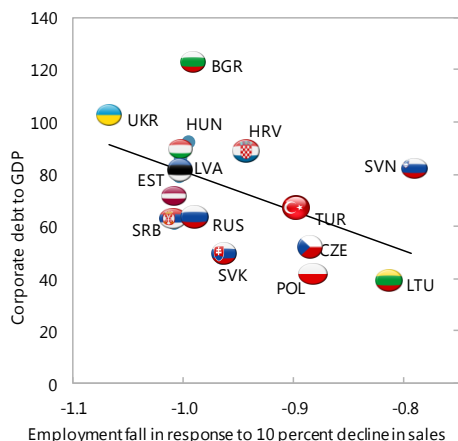
Corporate Debt Overhang and Financial Accelerator

The extent of balance sheet weaknesses determines the impact of corporate deleveraging on the economy. In response to falling demand, firms adjust production and costs to maintain profitability and reduce payouts to shareholders in order to be able to service debt and protect equity. Besides cutting investment and wage costs, they also sell off assets, particularly inventories and noncore fixed assets. As firms demand fewer inputs for their new lower production, they need less working and investment capital, leading to net repayment of debt. The intensity of the financial accelerator depends on the prevalence of balance sheet weaknesses that can increase firms' sensitivity to demand, income, and interest rate shocks (Bernanke and Gertler, 1989).

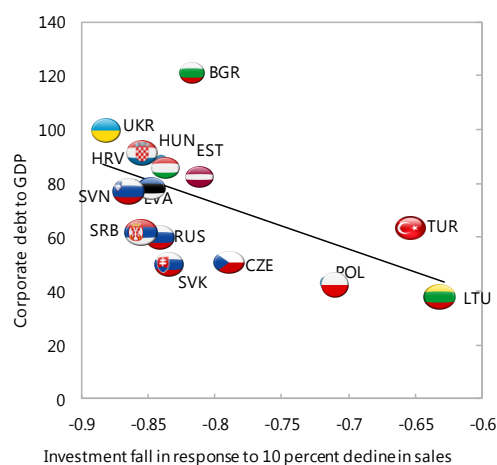
For a given decline in sales, more leveraged firms tend to react with larger cutbacks in employment and investment. As a result, the greater the share of overleveraged firms the larger the overall decline in aggregate demand. Figure 9 shows the average sensitivity of employment and investment of firms in different CESEE countries to a 10 percent decline in sales. In countries with larger corporate sector debt-to-GDP ratios, investment declines, on average, were larger than in other countries for a given shock to sales or demand.⁹ Our analysis also confirms that for a given decline in sales, more leveraged and/or smaller firms across CESEE countries tended to react by relatively larger cutbacks in employment and investment (see Box 4).

Figure 9. Firm-level Analysis of Employment and Investment Sensitivity to a Demand Shock

Employment and Leverage (Percent)



Investment and Leverage (Percent)



Source: IMF staff estimates (see Annex VII for details).

Note: The figure shows the link between firm-level response by employment and investment to a negative sales shock of 10 percent (corresponding to a negative-value-added shock of about 3 percent) and corporate sector leverage.

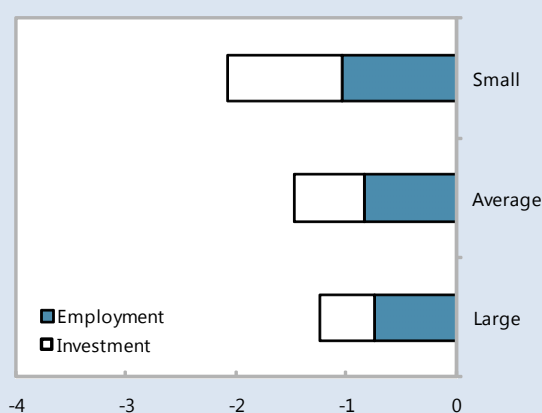
⁹ The firm-level investment analysis for CESEE implies the elasticity of investment to GDP growth in the range of 1.6 to 2.5, which is similar to the elasticity range estimated for advanced economies (see Annex Table 4.3.1 in the April 2015 *World Economic Outlook*).

Box 4. Firm-Level Analysis of Adjustment in Response to Aggregate Shock

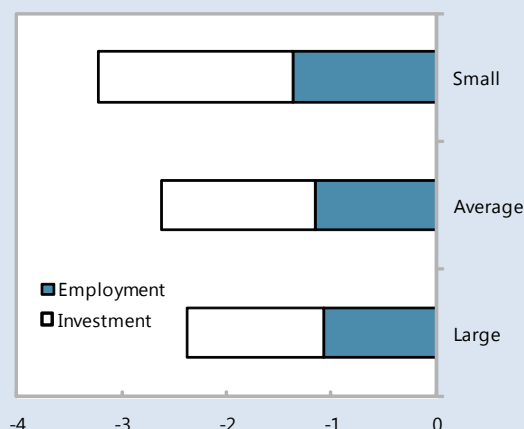
For a given decline in sales, more leveraged and/or smaller firms tend to react with relatively larger cutbacks in employment and investment (see Annex VII, Table 3, for details):

- *The adjustment is larger in more leveraged firms.* Such firms have lower free cash flow buffers and thus tend to be more sensitive to declining demand than less leveraged firms. This is in line with the evidence in studies for the United States and Canada (Sharpe, 1994; Heisz and LaRochelle-Côté, 2004). In the case of investment, when testing determinants of the standard investment intensity, leverage appears to have negatively affected investment in the aftermath of the 2008–09 crisis, but was not statistically significant before the crisis (Annex VIII, Table 4). This is similar to findings that firms' financial positions affected investment in the euro area in the aftermath of the crisis (Martinez-Carrascal and Ferrando, 2008; Goretti and Souto, 2013).
- *The adjustment is larger in smaller firms.* This is in line with the findings in the literature that larger manufacturing firms tend to hoard labor (Fay and Medoff, 1985; Sharpe, 1994) and that small firms are less able than large firms to adjust by selling fixed assets (Heisz and LaRochelle-Côté, 2004) when they face declining sales. Highly leveraged small firms tend to cut back investment disproportionately more than employment.

Average-leveraged firms
(Response to 10 percent decline in sales; percent)



High-leveraged firms
(Response to 10 percent decline in sales; percent)



Source: IMF staff calculations

Note: Average-leveraged firms have debt-to-assets ratio of 15 percent and high-leveraged firms 150 percent.

Large-scale repair of corporate balance sheets complicates deleveraging efforts of households, with negative feedback effects on firms. To put it simply, as firms cut back investment and fire workers, they depress household income, which weakens household debt metrics. This lowers consumption, in turn further weakening firms' balance sheets. Analysis based on sectoral accounts for CEE EU countries confirms that reductions in wages and salaries paid by firms have eroded incomes of households, except in Bulgaria and Slovenia, likely undoing much of the effect of higher corporate savings on firms' balance sheets (See Annex VI). When debt overhang afflicts both corporate and household sectors, the adjustment is even more painful.

Macroeconomic Policies

As private balance sheets adjust, macroeconomic policies need to buffer the adverse impact on growth and inflation.

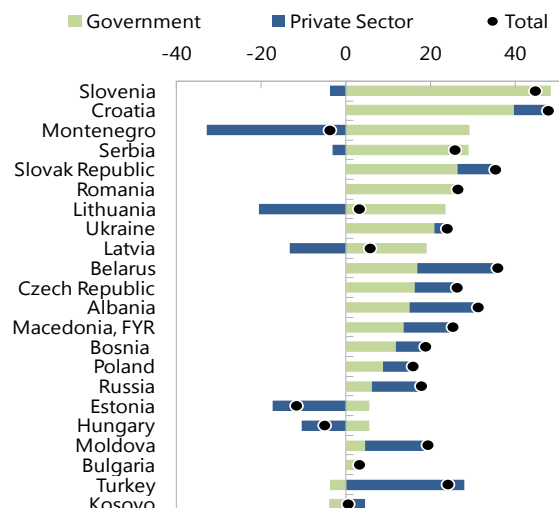
Governments and inflation-targeting central banks have indeed partially accommodated private balance sheet adjustment, cushioning the impact on the real economy. Governments in most CESEE countries have allowed their net savings to drop sizably, acting as safety valves in the economy-wide flow of funds (Figure 3). This helped reduce the downward pressure on domestic demand created by the deleveraging efforts of corporations and households.¹⁰ But as a result, public debt burdens increased (Figure 10). At the same time, inflation-targeting central banks have lowered policy rates to historical lows, providing reprieve to borrowers.

Institutional Flexibility

The lack of flexible institutions could amplify the impact of corporate deleveraging on investment:

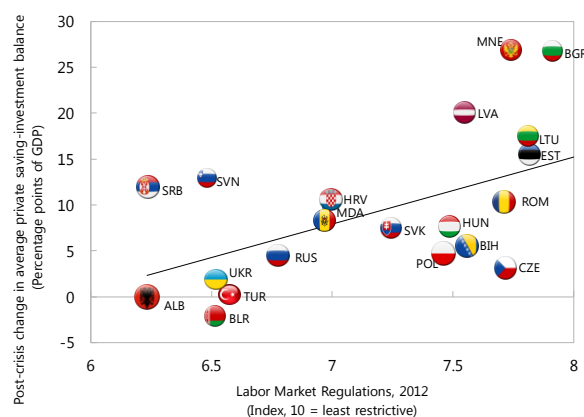
- Labor markets:** Countries with more flexible hiring and firing labor regulations tended to have bigger adjustments in their savings-investment balances (Figure 11). Using firm-level data, we are able to show that firms in countries with more flexible hiring and firing labor codes adjust more in economic downturns and upturns (see Annex VII for details). The results further expose the trade-off facing small and medium enterprises (SMEs), in particular between the investment and labor adjustment—greater labor market flexibility seems to be associated with relatively

Figure 10. CESEE: Change in Private- and Public-Debt-to-GDP Ratios, 2008–13 (Percentage points)



Sources: Eurostat; IMF, World Economic Outlook database; and IMF staff calculations.
Note: See note to Figure 7.

Figure 11. CESEE: Aggregate Deleveraging and Labor Market Regulations



Sources: Fraser Institute, Economic Freedom of the World database; IMF, World Economic Outlook database; and IMF staff calculations.

¹⁰ Existing safety nets were kept in place and further fiscal stimulus was provided, while allowing tax revenues to follow their procyclical behavior through the decline in direct tax payments net of transfers and subsidies and indirect tax revenues driven by the reduction of private consumption and investment.

larger adjustment in employment but smaller adjustment in investment.

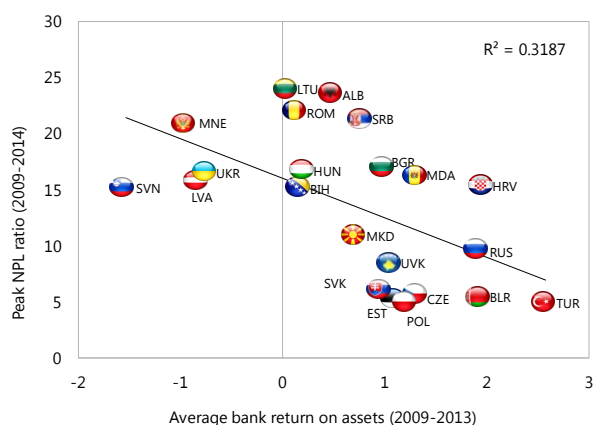
- *Debt-resolution framework:* Weaknesses in the debt-resolution framework mean that firms are less able to address the debt stock problem, which would also affect the overall economic cost of adjustment. SMEs, in particular, face a number of unique challenges, including lack or inadequacy of a fresh start and high fixed restructuring costs.¹¹

Financial Sector Resilience

Stronger balance sheets put banks in a better position to absorb losses and facilitate reallocation of credit to healthy sectors of the economy.

Given the size of the 2008–09 shock and the depth of subsequent recessions, many CESEE banking systems were saddled with sizable nonperforming loans. The share of these loans in total loans rose above 10 percent in many CESEE countries and even exceeded 20 percent in some cases (Figure 12a). The need for increasingly larger provisions amid the lack of loan growth has further undermined banks' profitability, thereby reducing their capacity and willingness to lend and to facilitate restructuring of non-financial sector balance sheets (Figure 12a). Furthermore, many of the euro area cross-border banking groups with operations in CESEE tended to have overall weaker balance sheets than their peers, reflecting asset quality deterioration both at home and abroad (Figure 12b), and they were therefore less able to support their subsidiaries in CESEE.

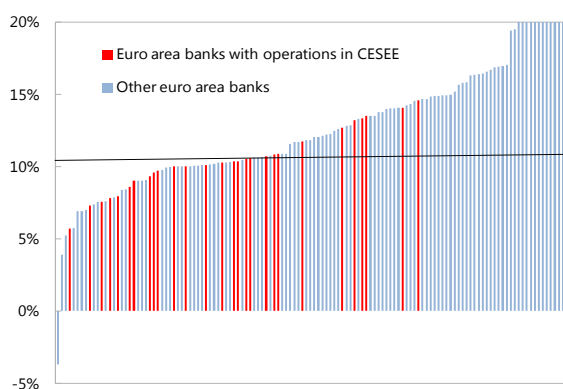
Figure 12a. CESEE: Bank Asset Quality and Profitability
(Percent)



Source: IMF Financial Soundness Indicators database.

Note: NPL = nonperforming loan. Data labels are defined in the abbreviations list.

Figure 12b. Common Equity Tier 1 Capital Ratios of Euro Area Banks after the Asset Quality Review
(Percent)



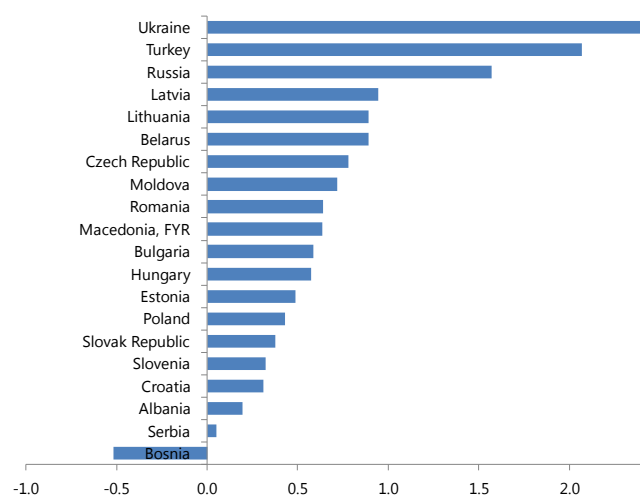
Source: European Central Bank, Comprehensive Assessment.

¹¹ See Bergthaler (2015).

External Environment

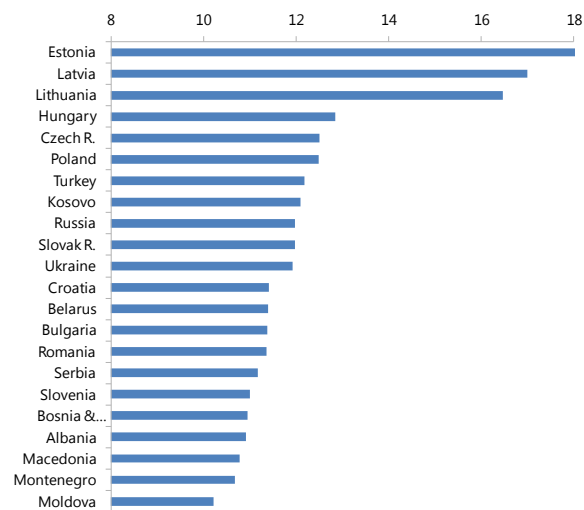
Having strong trade and financial links with countries that were less affected by the crisis helped some CESEE countries in their postcrisis adjustment. Notably, the growth rates of trading partners during 2008-14 tended to be higher for the Baltics than for the SEE countries (Figure 13a). Also, the Baltics benefited from the presence of Nordic banks that had relatively stronger balance sheets than many of the euro area banks (Figure 13b).

Figure 13a. CESEE: Average post-2008 Real GDP Growth Rate of Trade Partners (*Trade-weighted, percent*)



Source: IMF World Economic Outlook database.

Figure 13b. Tier 1 Capital Ratios of Foreign Parent Banks (*Weighted average 1/, percent*)



Sources: Bankscope; and SNL Database.

1/ Weighted by subsidiaries' assets in a given country.
Data are as of 2013 or latest available.

To sum up: given the large size of private debt before the global financial crisis, some of the Baltic and SEE economies faced significant deleveraging pressure, which was partly offset by fiscal accommodation (as many of these countries lacked monetary policy flexibility). In contrast with SEE countries, the Baltic countries were able to adjust faster, resulting in a quicker recovery in investment and economic activity (see Figure 1). This appears to have been largely due to their more flexible institutions, but also to strong trade and financial links with countries that were in better shape in the aftermath of the crisis.

C. What Are the Remaining Debt-Related Risks Facing CESEE?

A more granular analysis of aggregate and firm-level data suggests that debt-related risks remain elevated in some corporate sectors (notably in Bulgaria, Croatia, Slovenia, and Ukraine) and in some industries (notably, construction and real estate).

Aggregate Debt Risk Metrics

The postcrisis adjustment has helped put external debt on a more sustainable path across most countries. Based on the IMF staff's external debt sustainability assessments, only in Belarus,

Bosnia and Herzegovina, Estonia, and Turkey are the latest current account deficits wider than what is required to stabilize their external-debt-to-GDP ratios (Figure 14). External debt developments reflect both public and private balance sheet adjustment.

On aggregate, private-sector-debt-related risks are now lower. The EU Macroeconomic Imbalances Procedure (MIP) monitors economy-wide exposure to debt-related risks by comparing the ratio of private sector debt to GDP with the cutoff point of the top quartile of the EU-wide distribution over 1995–2007 (EC, 2012). By this metric, only Bulgaria breaches the MIP indicative threshold of 133 percent of GDP.¹³

But sector-level risk metrics for CEE countries reveal some weaknesses.¹⁴ CEE countries with the highest number of sectoral debt risk metrics exceeding the cutoff points of the top quartile of their precrisis EU-wide distributions include Bulgaria, Croatia, Latvia, Slovenia, and the Slovak Republic (Figure 15; see Iossifov and Zumer (2015) for details).

- *Liquidity risk*—measured by *debt-to-income* and *interest-expense-to-income ratios*—reflects the potential inability of borrowers to service debt obligations out of their current income. Corporate liquidity risks are high in Bulgaria and Slovenia.
- *Solvency risk*—proxied by the *debt-to-equity ratio*—measures the potential inability of borrowers to keep the value of their assets above that of liabilities. Solvency risks are elevated in the corporate sectors of Bulgaria, Croatia, Latvia, and Slovenia as well as for households in Croatia, Estonia, Latvia, Poland, and the Slovak Republic. CEE countries perform relatively worse on solvency- than on liquidity-debt-risk metrics in EU-wide comparisons, signaling that the gap between their sectoral net worth levels and that of the euro area is wider than the respective gap in incomes.

Figure 14. CESEE: IMF Staff External Debt Sustainability Assessments, 2008–13¹²

Gap between debt-stabilizing and actual current account balance				
Country	2008	2011	2013	
Belarus	0.5	2.5	5.6	
Bosnia	3.2	4	4.1	
Bulgaria	11.2	-7.9	-6	
Croatia	-3	-7.7	-6.2	
Estonia	-0.9	-14	1.7	
Hungary	-3.9	-12.5	-11.2	
Latvia	3.6	-8.8	-7.4	
Lithuania	3	-2.8	-5.6	
Macedonia, FYR	7.1	-4.6	-4.7	
Montenegro	16.5	0.3	-1.8	
Poland	-0.9	-2.5	-3.2	
Romania	1.8	-4.3	-4.8	
Russia	-9.9	-7.1	-0.3	
Serbia	5.1	-4.3	-3.1	
Slovak Republic	2.8	-5.1	-1.7	
Slovenia	-2.7	-4.5	-11.4	
Turkey	1.8	2.6	3.2	

Source: IMF staff reports.

Note: Countries that need to improve their noninterest current accounts to stabilize their external-debt-to-GDP ratio are highlighted in red.

¹² When 2008 data were unavailable, 2007 data were used for Bosnia and Herzegovina, Bulgaria, Montenegro, and Turkey; 2006 data were used for the Slovak Republic. When 2011 data were unavailable, 2010 data were used for Bulgaria and Estonia. The last column shows the latest available data (2012 data for Bulgaria, Estonia, Hungary, and Lithuania; 2014 data for Romania and Serbia).

¹³ The level of indebtedness of the corporate sector in Bulgaria may be overestimated by the risk metrics, as a large share of it is attributed to intercompany lending in the form of foreign direct investment, which is often used in tax optimization strategies. Bulgaria's corporate tax rate is the lowest in the European Union.

¹⁴ The metrics shown in Figures 13a and 13b are available only for EU countries.

- *The risk of unfavorable debt dynamics*—measured by the *interest rate–income growth differential*—reflects the likelihood that debt may be put on an unsustainable path relative to income. This metric has been above the cutoff point of the top quartile of its precrisis EU-wide distribution in the corporate sectors of the Czech Republic, Romania, and Slovenia, as well as for households in all CEE countries except Estonia, Lithuania, and Poland. On one hand, this reflects the steep declines in household incomes and their relatively slow recovery across CEE (except in Poland), which more than offset the positive effect of the postcrisis decline in nominal interest rates. On the other hand, it captures the generally higher country risk premiums of CEE countries, compared with other non-euro-area EU countries and nonstressed euro area countries.

The debt-related risks are interlinked through negative macro-financial feedback loops.

Negative real shocks erode the debt-servicing capacity of firms and households, increasing their exposure to liquidity risk. The slower income growth and higher demand for liquidity can then result in an increase in the risk to autonomous debt dynamics, as the interest rate—income growth differential widens. Lower disposable incomes and higher interest rates can, in turn, trigger deflation of asset price bubbles, eroding sectoral net worth and raising solvency risks.

*Firm-Level Risk Metrics*¹⁵

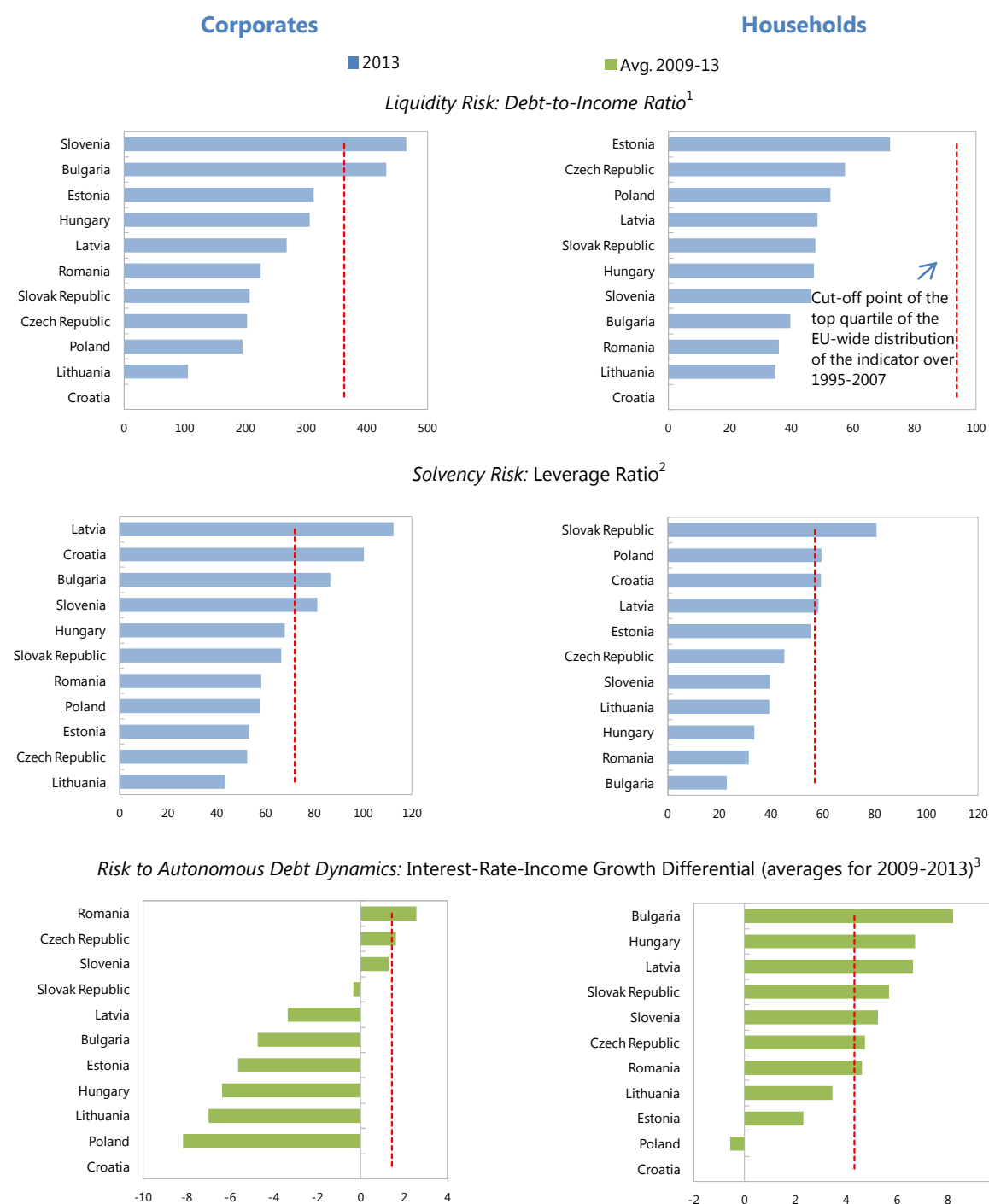
Firm-level analysis shows a broadly similar picture of debt-related risks for CESEE firms

(Figure 16). Both flag solvency risks for firms in Bulgaria, Croatia, Latvia, and Slovenia. In addition, the average solvency-risk metrics constructed from firm-level data (average debt-to-equity ratios) for Russia, Ukraine, and Turkey are also elevated, being above the 2013 average across sample countries. Using the same criterion, firm-level data suggest high liquidity risk in the corporate sectors of Croatia, Serbia, Slovenia, and Ukraine.

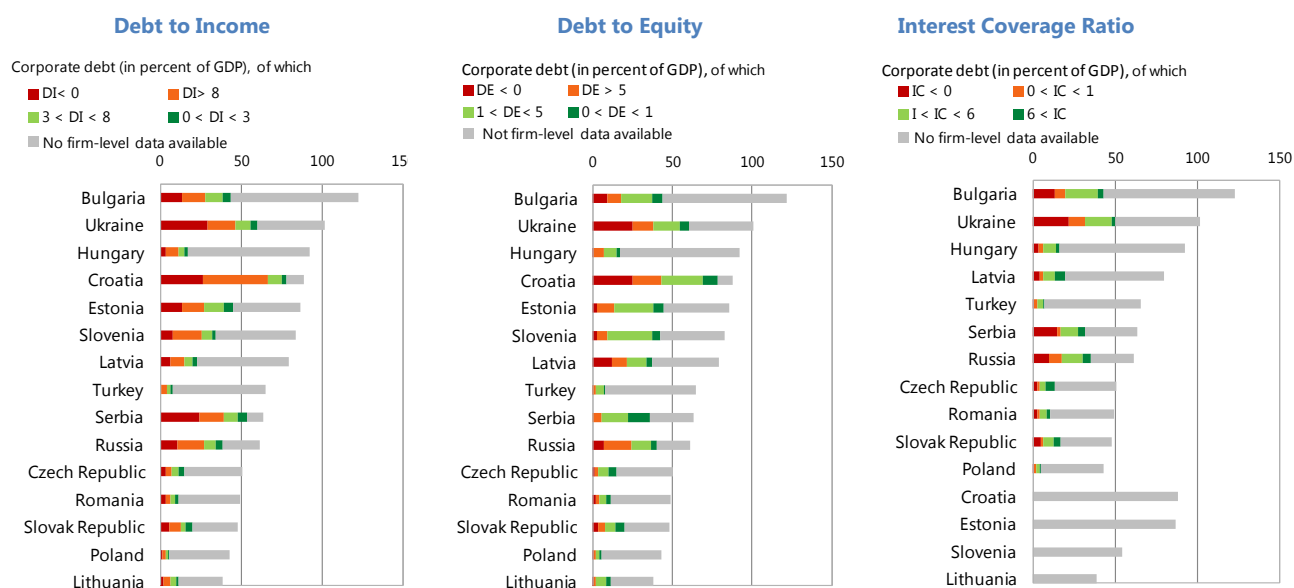
Furthermore, corporate data shed light on risk concentrations that could exacerbate debt-related weaknesses.

The concept that is often used to assess risk concentration is debt-at-risk. Debt-at-risk is defined as the share of debt owed by the most vulnerable firms. We identify vulnerable firms as those that are facing high solvency risks, as measured by the debt-to-equity ratio, or those facing high liquidity risks, as measured by debt-to-income (debt-to-EBIT [earnings before interest and taxes] in the firm-level data) and interest coverage ratio (ICR). The debt-at-risk

¹⁵ The analysis in this section is based on firm-level data from the ORBIS database for all CESEE countries except Albania, Belarus, Bosnia and Herzegovina, Kosovo, FYR Macedonia, Moldova, and Montenegro (due to insufficient data). While caution should be exercised in deriving conclusions based on aggregation of firm-level data, the ORBIS data set generally has good coverage—total debt owed by the firms in the sample on average accounts for 35 percent of total corporate sector debt as recorded in national statistics. See Annex V for details.

Figure 15. CESEE EU: Debt-Related Risks in Corporate and Household Sectors, 2013 (Percent)

Sources: EUROSTAT European System of National Accounts (ESA) 2010 and 1995 Annual Sector Accounts; and IMF staff calculations. Note: The debt stock includes the outstanding amounts of loans and debt securities, excluding financial derivatives. Data are unconsolidated within each sector, except in the case of the general government. ESA 2010 data for construction of liquidity and sustainability metrics are not available for Bulgaria, Poland, and Romania, for which ESA 1995 data that end in 2012 (2011 for Romania) are used. Data for Croatia are not available. ¹ Ratio of stock of debt to augmented gross disposable income (GDI). GDI is taken before interest payments and payments to shareholders. ² Ratio of stock of debt to firms' equity and households' net financial worth. ³ Difference between the implicit interest rate on debt and the nominal growth rate of augmented GDI. The implicit interest rate is calculated as the ratio of interest payments (including financial intermediation services indirectly measured) over the average of the beginning and end-period stock of debt.

Figure 16. CESEE: Corporate Sector Exposures to Liquidity and Solvency Risks, 2013*Average Exposures to Liquidity and Solvency Risks**Debt-at-Risk (Liquidity and Solvency)*

Sources: EUROSTAT Annual Sectoral Accounts; ORBIS database; and IMF staff calculations.

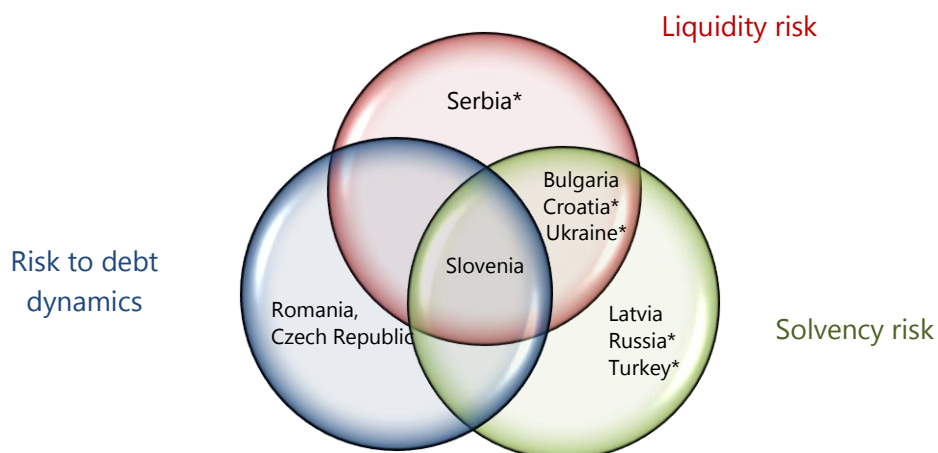
Note: For aggregate-level data, debt to income is the ratio of stock of debt to gross disposable income, and debt to equity is the ratio of stock of debt to firms' equity. For better compatibility between sectoral and firm-level data, debt stock data are unconsolidated within the corporate sector and no adjustments are made to gross disposable income, which is different from the construction of sectoral risk metrics in Figure 15. The aggregate-level gross disposable income data for Bulgaria, Poland, and Romania are available only until 2012. For firm-level data, debt to income is the ratio of firms' total financial debt to earnings before interest and taxes, and debt to equity is the ratio of firms' total financial debt to shareholders' funds. Firm-level data refer to the weighted average of all firms covered in ORBIS. ORBIS data for Serbia do not include firms reporting negative equity. ICR = interest coverage ratio.

thresholds are based on statistical data analysis and firm-level credit risk studies.¹⁶ The share of debt-at-risk in total debt based on the ICR exceeds 40 percent in most CESEE countries and in some cases is higher than 50 percent. This is comparable to, or higher than, the level in Portugal and Spain in 2008-2009, and much higher than around 20 percent in Germany and France (see the IMF's October 2013 Global Financial Stability Report).

The debt-at-risk analysis reveals relatively high risk concentration in some countries, including some that are not flagged based on aggregate data (Figure 16):

- Bulgaria, Croatia, Estonia, Russia, Serbia, Slovenia, and Ukraine have a relatively larger share than other CESEE countries of debt concentrated in firms with elevated liquidity risk, based on available firm-level data;
- Croatia, Latvia, Russia, and Ukraine show the largest share of debt concentrated in firms with elevated solvency risk, including a significant share of debt owed by firms with negative equity.
- In countries with high debt-at-risk, risks tend to be more acute in SMEs and certain industries (for example, construction and real estate—see Box 5.)

To sum up, risks stemming from corporate sector indebtedness appear elevated in a number of countries, based on available aggregate and firm-level data:



Source: Figures 15 and 16.

Note: (*) based fully on in part on firm-level data.

¹⁶ The cutoff values are generally chosen in reference to the distributions of the financial ratios across all countries. The debt-at-risk calculated using the debt-to-equity ratio refers to the share of debt owed by firms with a debt-to-equity ratio below zero or above 5. The debt-at-risk using the debt-to-income ratio refers to the share of debt owed by firms with a debt-to-EBIT ratio below zero or above 8. These thresholds are approximately equal to the cutoff values of the 95th percentile of the distributions of the ratios across all sample countries. The threshold for the ICR is 1, which is widely used in financial analysis, and it corresponds approximately to the cutoff value of the 30th percentile of the ICR distribution.

Box 5. Firm-Level Analysis of Debt-at-Risk of CESEE firms by Industry and Firm Size

Risks tend to be more acute in certain sectors and size groups:

- The construction and real estate as well as market services sectors in most countries exhibit a relatively high concentration of debt in the most vulnerable firms. Even in countries with relatively modest overall debt-at-risk, such as Poland, these two sectors tend to exhibit high risk concentration.
- Debt-at-risk is generally higher among small and medium enterprises than among large firms. This is particularly true for solvency risk, because small and medium firms tend to have less equity than large firms. Hungary and Poland appear to be exceptions, showing higher debt-at-risk levels among larger firms in the sample.¹⁷

CESEE: Debt-at-Risk Metrics by Sector and Firm Size

(Percent of total debt in each sector owed by vulnerable firms)

Liquidity risk: Debt-to-Income							Liquidity risk: ICR							Solvency risk: Debt-to-Equity						
CR	MS	WR	MF	AM	UT		CR	MS	WR	MF	AM	UT		CR	MS	WR	MF	AM	UT	
Estonia	67	69	54	50	65	56	Estonia							Estonia	43	42	30	23	37	17
Latvia	84	74	62	54	46	80	Latvia	68	44	25	31	21	13	Latvia	89	68	58	50	35	24
Lithuania	62	53	46	59	59	76	Lithuania							Lithuania	22	16	13	22	10	9
Czech Republic	59	65	62	49	45	26	Czech Republic	31	42	33	30	37	7	Czech Republic	32	29	32	17	36	11
Hungary	88	76	63	51	39	68	Hungary	25	52	33	40	20	48	Hungary	76	66	26	12	8	48
Poland	88	78	45	33	55	42	Poland	78	61	16	22	12	17	Poland	76	33	21	20	46	10
Slovak Republic	72	66	72	69	72	27	Slovak Republic	55	45	39	27	35	18	Slovak Republic	57	52	51	24	31	13
Slovenia	87	87	78	61	92	70	Slovenia							Slovenia	56	19	32	22	6	1
Bulgaria	74	79	64	67	42	43	Bulgaria	71	60	46	44	30	26	Bulgaria	64	48	44	32	30	32
Croatia	97	89	81	63	90	73	Croatia							Croatia	52	68	57	35	39	61
Romania	72	47	54	65	62	41	Romania	46	57	30	36	32	37	Romania	60	34	39	42	36	11
Serbia	88	72	66	75	69	72	Serbia	74	69	52	58	44	5	Serbia	12	15	21	22	9	1
Russia	73	77	64	64	68	70	Russia	56	58	47	43	51	36	Russia	78	62	64	56	57	51
Ukraine	91	87	76	75	69	69	Ukraine	76	82	59	58	52	48	Ukraine	70	45	81	62	55	49
Turkey	78	67	54	44	44	49	Turkey	40	54	36	35	35	41	Turkey	17	42	45	28	48	21

Liquidity risk: Debt-to-Income				Liquidity risk: ICR				Solvency risk: Debt-to-Equity			
S	M	L		S	M	L		S	M	L	
Estonia	64	63	57	Estonia				Estonia	41	40	19
Latvia	70	63	63	Latvia	41	33	17	Latvia	72	47	37
Lithuania	50	51	56	Lithuania				Lithuania	29	17	15
Czech Rep	72	56	43	Czech Rep	40	27	27	Czech Rep	60	29	11
Hungary	56	54	72	Hungary	34	29	41	Hungary	32	26	48
Poland	47	47	69	Poland	23	22	59	Poland	28	23	45
Slovakia	74	73	51	Slovakia	43	44	27	Slovakia	60	46	21
Slovenia	70	73	76	Slovenia				Slovenia	33	31	17
Bulgaria	60	70	63	Bulgaria	43	54	44	Bulgaria	53	52	26
Croatia	83	83	86	Croatia				Croatia	70	55	50
Romania	87	66	50	Romania	55	41	37	Romania	83	44	29
Serbia	65	71	76	Serbia	60	51	55	Serbia	24	25	11
Russia	75	71	68	Russia	61	55	47	Russia	79	74	55
Ukraine	83	83	76	Ukraine	67	69	62	Ukraine	78	79	58
Turkey	43	46	54	Turkey	22	27	42	Turkey	31	32	32

Sources: ORBIS database; and IMF staff calculations.

Note: Industrial sectors are agriculture and mining (AG), manufacturing (MF), utilities (UT), construction and real estate (CR), wholesale and retail trade (WR), and market services (MS). Size buckets are small (S), medium (M), and large (L). The cutoff values for the debt-at-risk metrics are in note 17. ICR = interest coverage ratio. Red indicates sectors or size groups with the highest debt-at-risk level, yellow indicates median, and green indicates the lowest for each risk metric.

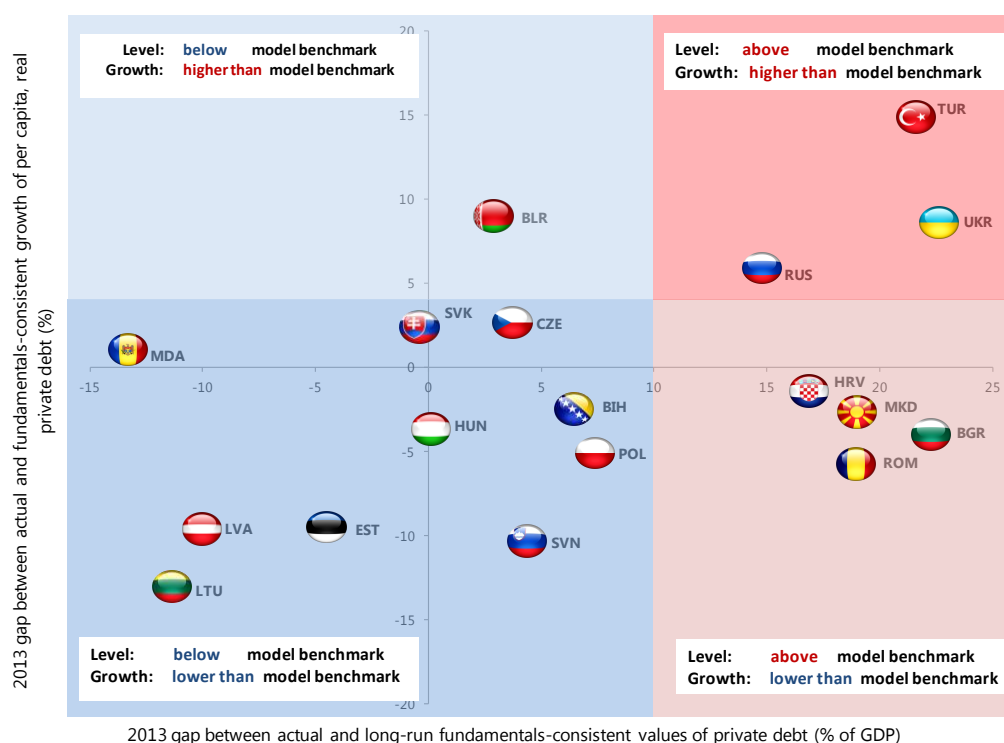
¹⁷ The four largest firms in Hungary (about 20 percent of all debt owed by the country's sample firms) and a few large firms in construction and real estate in Poland (nearly 10 percent of the country's sample debt) are identified as high risk by both the solvency- and liquidity-risk metrics.

D. What Are the Remaining Credit Gaps across CESEE?

Postcrisis deleveraging has not been sufficient to align private debt with its fundamentals in a number of CESEE countries, suggesting further adjustment in the years ahead that will continue to weigh on growth.

What are the remaining credit gaps across CESEE? To answer this question, we compare the current level of private sector debt to a time-varying benchmark derived from the estimated long-term relationship between private sector debt and its fundamental determinants.¹⁸ Under this approach, CESEE countries can be grouped into four classes, based on the combinations of positive or negative credit gaps between the current level of private debt and its secular trend and between the growth rate of private credit and its rate implied by the model (Figure 17 and Annex IV).

Figure 17. CESEE: Estimated Credit Gaps, 2013



Source: Annex IV.

Note: Data for Bulgaria and Poland are for the 2012 gap and for Romania for 2011 due to missing data.

¹⁸ This is done using data for 36 European countries for 1995–2013. Annex IV presents the results of the estimation of the stylized, reduced-form, demand and supply system for private sector debt. Explanatory variables include per capita GDP (in purchasing-power-parity U.S. dollars) as a proxy for debt-servicing capacity that positively affects both the demand for and supply of debt and the nominal interest rate on private debt, which has a negative effect on demand and a positive effect on supply. The model also includes country-specific constants that may reflect differences in the quality of institutions across countries, as well as other country-specific factors.

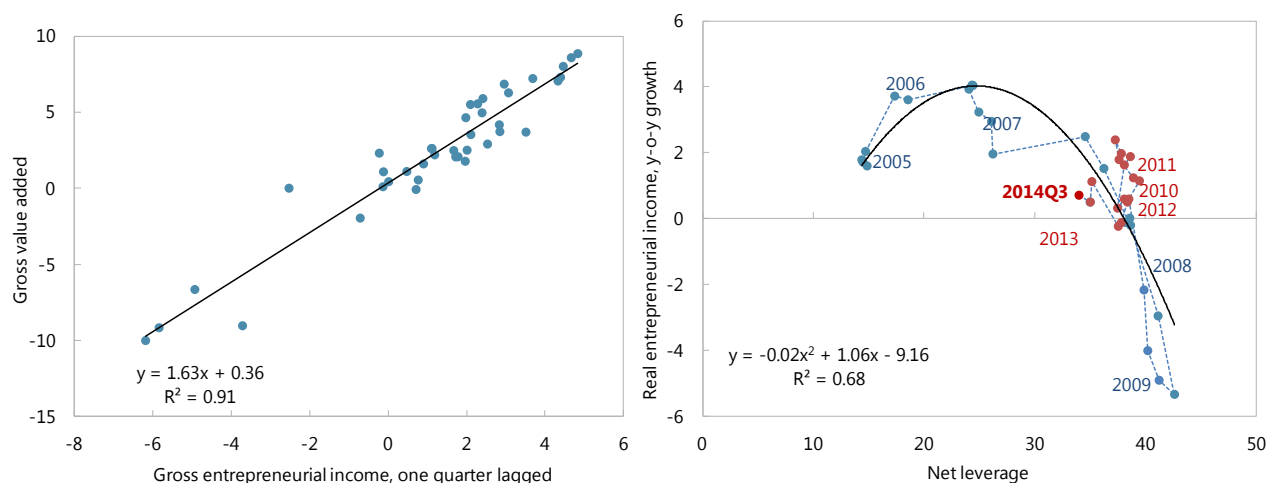
The analysis suggests that postcrisis deleveraging has not been sufficient to align private debt with its fundamentals in a number of CESEE countries. As of 2013, countries with positive credit gaps (that is, where private debt exceeds the model-based values)¹⁹—though with a rate of growth below the speed of adjustment predicted by the model—include *Bulgaria, Croatia, the former Yugoslav Republic of Macedonia, and Romania*. At the same time, *Russia, Turkey, and Ukraine* stand out with debt above the level consistent with fundamentals and growth of debt higher than predicted by the short-term dynamics of the model. In the model, the debt overhangs weigh on credit growth because positive credit gaps must be gradually closed through reduction in debt stocks (Annex IV). One important caveat is that the model assumes the credit gap to be zero, on average over the sample period (1995–2013) in each country. In reality, it is possible that the initial debt levels were already too high in some cases. A comparison between country-specific constants and the fitted trend line with these countries' relative institutional strength suggests that in some cases debt levels are indeed notably higher than one would expect given their institutional quality (see Annex IV for details).

Recovery in corporate sector profitability tends to lead recovery in GDP growth. Rising profitability encourages investing, hiring, and borrowing and thus accelerates domestic-demand-driven growth. Borrowing increases leverage, which boosts profitability further and strengthens the upturn in the business cycle. The upturn phase lasts until growth and borrowing reach unsustainable levels. Then profitability starts to weaken and the economy cools down (Figure 18). The analysis of quarterly national accounts data for the CESEE EU countries during 2005–14 shows that in the current cycle, net leverage above 40 percent signals the need for adjustment.

Further balance sheet adjustment is needed to create conditions for resumption of the new credit cycle. Although the region as a whole shows signs of turning a corner, in many instances legacy debt burdens remain above their fundamentals-consistent values (Figure 17), acting as a drag on credit growth. Some CEE EU countries appear to have entered a phase of so-called economic bounce-back (McKinsey Global Institute, 2012), characterized by leverage reduced to levels that would allow resumption of credit, investment and output growth. Countries with lower levels of corporate leverage already see some positive credit growth, while credit continues to fall where leverage is still high (Figure 19, right panel). For others, past episodes of deleveraging (Tang and Upper, 2010) seem to suggest that deleveraging may continue through real growth and inflation over a number of years, with real credit gradually growing again—but by less than the equity gains from improved profitability (Figure 19, left panel).

¹⁹ Defined as private debt overhang in excess of 10 percent of GDP, which is also the threshold for statistical significance. The Basel Committee on Banking Supervision proposed the same threshold, as a trigger for a countercyclical capital buffer add-on, but based on the deviation of the credit-to-GDP ratio from its long-term trend (BCBS, 2010). The regression analysis in Annex IV develops this concept further by using only the component of the long-term trend that can be explained by developments in the fundamental determinants of private debt.

Figure 18. CESEE EU Countries: Leverage and Growth

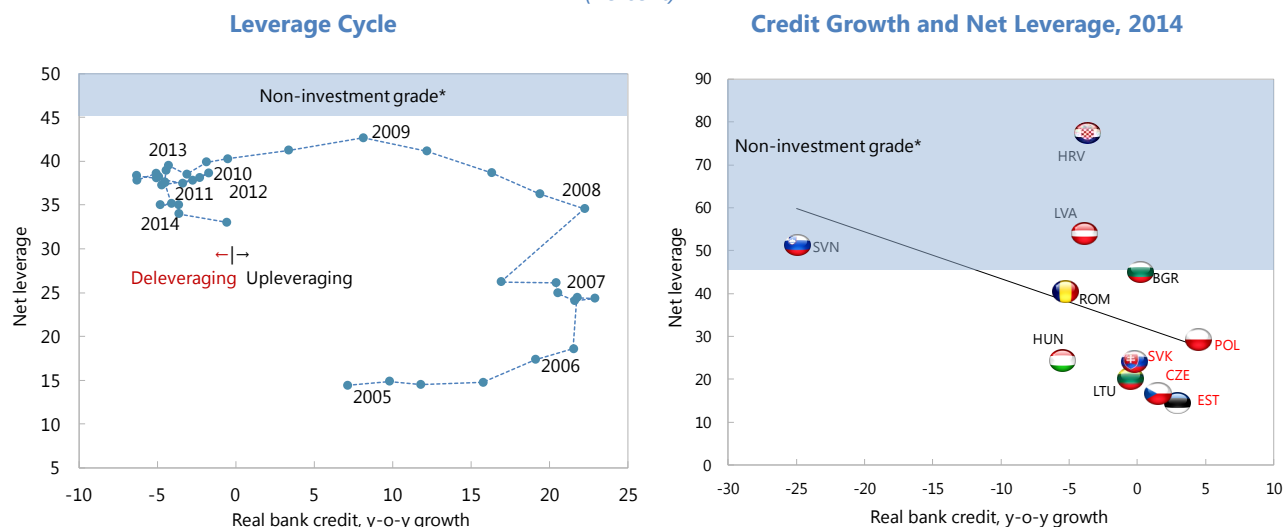


Sources: Haver Analytics; and IMF staff calculations.

Note: Net leverage is calculated as net financial debt over equity. Real gross operating profit after net financial charges (gross entrepreneurial income) of the nonfinancial private sector was derived using quarterly financial and national accounts data for 11 countries. CESEE EU = central, eastern, and southeastern Europe European Union; y-o-y = year-over-year.

Figure 19. CESEE EU Countries: Leverage Cycle

(Percent)



Sources: European Bank for Reconstruction and Development; Haver Analytics; and IMF staff calculations.

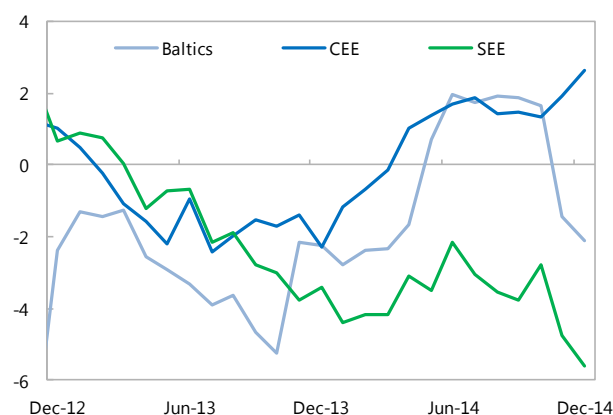
Note: *According to Moody's 2006 ratings mapping into leverage. Net leverage is net financial debt over equity. The regionwide leverage cycle holds for individual countries as well. CESEE EU = central, eastern, and southeastern Europe European Union; y-o-y = year-over-year.

To sum up, private sector balance sheet repair is not yet complete in some CESEE countries:

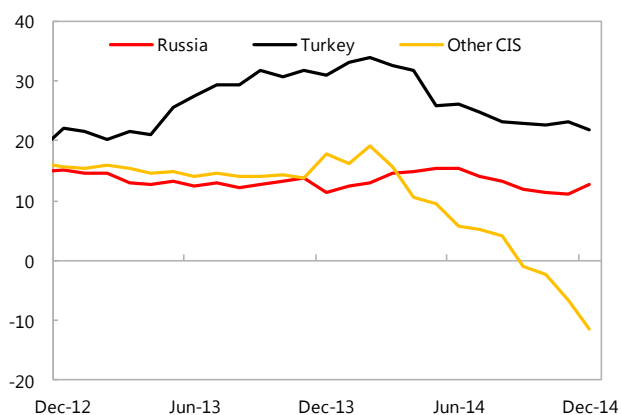
- Bulgaria, Croatia, and Ukraine stand out as requiring further adjustment in order for credit and investment growth to resume; in Latvia and Slovenia corporate sector risks remain elevated despite progress in recent years. Romania also had a large positive credit gap in 2011, but this gap has likely narrowed since then on the back of monetary policy easing, strong performance, and efforts to facilitate debt restructuring through sales of nonperforming loans, write-offs, and higher provisioning.
- Belarus, Russia, and Turkey are in the upswing of the credit cycle, which raises the risk that balance sheets may become overextended. Similar risk exists in the former Yugoslav Republic of Macedonia as well.
- Other CESEE countries appear better positioned for an upturn in the credit cycle.

Consistent with this assessment, credit developments during 2014 show a robust pickup in credit growth only in CEE countries. At the same time, CIS countries were facing tighter financing conditions, and experienced significant deceleration of corporate credit growth throughout 2014 (Figure 20).

Figure 20. CESEE: Credit to Nonfinancial Companies
(Percent change, year over year, nominal, exchange-rate adjusted)



Source: European Bank Reconstruction and Development.



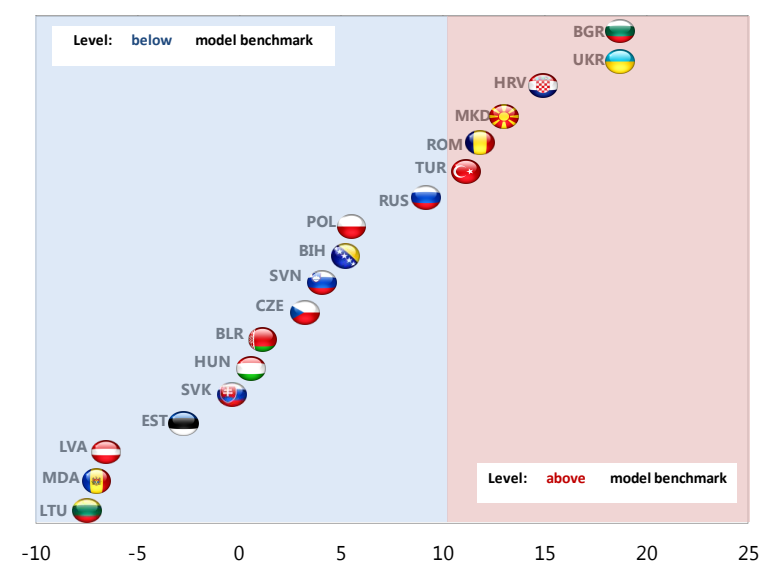
Source: European Bank Reconstruction and Development.

E. How Can CESEE Countries Grow out of Debt?

Growing out of debt may be challenging for some SEE and CIS countries without major structural reforms.

Over the medium term, growth is projected to remain at about half of its precrisis potential, slightly below 2½ percent in the CESEE region. While labor markets in CESEE countries have seen considerable improvement (see Chapter I), limited support from improving labor market conditions for a consumption-driven recovery may well become increasingly evident, if investment does not rebound or reforms do not tackle low productivity and structural unemployment. A comparison with OECD countries shows that CESEE countries, particularly those in SEE and the CIS, are below the 25th percentile in many key areas of structural reform, including of labor markets (Figure 22).

Figure 21. CESEE: 2013 Gap between Actual and Long-Term, Fundamentals-Consistent Values of Private Sector Debt As a Ratio of Forecast GDP in 2020
(Percent of GDP)



Sources: Arellano-Bond dynamic-panel generalized method of moments estimates of coefficients of Model 2 and country-specific intercepts (Table 1 in Annex IV); and IMF, *World Economic Outlook* nominal GDP forecasts.
Note: Data labels are defined in the abbreviations list.

Growing out of the debt problem will likely remain a challenge for some CESEE countries.

Simulation of the gap between actual and long-term, fundamentals-consistent values of private sector debt in 2020—carried out by dividing the 2013 gap between actual and fundamentals-consistent values of private debt by the IMF's 2015 *April World Economic Outlook* forecast for nominal GDP in 2020—suggests that absent a policy response, the debt burden will remain a drag on credit and by extension on domestic demand in Bulgaria, Croatia, the former Yugoslav Republic of Macedonia, and Romania, as well as in Turkey and Ukraine (Figure 21). In other countries, especially those where growth has picked up recently, the private sector is in a better position to grow out of the debt problems.

Figure 22. CESEE: Structural Reforms Relative to OECD Countries



Sources: Fraser Institute Index of Economic Freedom (IEF) 2014; Organisation for Economic Co-operation and Development (OECD), *Going for Growth* 2015; World Bank *Doing Business* 2015; World Economic Forum (WEF) *Global Competitiveness Report* 2014–15; and IMF staff calculations.

Note: Red indicates a value below the 25th percentile, orange indicates a value below the 75th percentile, and green indicates a value above the 75th percentile. The sample includes all OECD and CESEE countries. FDI = foreign direct investment; R&D = research and development.

III. POLICY PRIORITIES

Supporting domestic demand and completing the repair of private sector balance sheets are the key near-term priorities.

Despite some progress, the repair of private sector balance sheets remains a work in progress in several CESEE countries. While most countries improved saving-investment balances, the accompanying reduction in absorption has eroded national incomes, only marginally lowering private-debt-to-GDP ratios. In some cases, the debt-related problems are pervasive, afflicting both firms and households, while policy space to accommodate private sector deleveraging is limited, further complicating and raising the economic cost of the adjustment process.

Macroeconomic developments may pose new challenges for balance sheet repair:

- *Low inflation*—driven by falling world oil prices—has boosted households' purchasing power, freeing up funds for debt service. But persistent disinflation and particularly deflation can complicate the process of deleveraging by heavily indebted firms and households, because it increases their real debt burden.
- *Tightening of global financial conditions* (for example, as the United States begins to normalize its monetary policy) are also a downside risk to debt dynamics, particularly for countries with large participation by nonresidents in domestic financial markets, large external and/or short-term and/or U.S. dollar-denominated debt. However, to the extent that they accompany higher U.S. and euro area growth, the effects on funding costs will be mitigated by better prospects for exports.

Macroeconomic policies should be mindful of the credit gaps. Countries whose private debt does not exceed a level consistent with fundamentals (for example, in CEE) are well positioned for balanced growth, with positive contributions from both investment and consumption. In the rest of the region, debt-related risks may continue to weigh on demand, and *supportive macroeconomic policies* are therefore essential. Among CESEE countries still afflicted with private debt overhang and subpar credit growth, the Bulgarian, Croatian, and Slovenian economies are exhibiting symptoms of balance sheet stagnation. The economies of Latvia, the former Yugoslav Republic of Macedonia, and Romania are more dynamic, but may still need to do more to complete balance sheet repair in order to ensure robust recovery and resumption of income convergence. Ukraine is currently in the process of restructuring of privately held external debt.

Fiscal consolidation, while needed in many CESEE countries, should not derail the recovery. In the aftermath of the crisis, many governments helped accommodate the deleveraging of firms and households. The flip side was a significant increase in public debt levels, which now need to be brought back on a sustainable path in a number of countries, notably in Croatia, Serbia, and Slovenia, (Figure 23a). Countries with high public debt levels have been pursuing fiscal consolidation mostly via expenditure reductions. Yet further consolidation is needed for these countries to reach

their medium-term fiscal targets (Figure 23b). In CEE and SEE, fiscal consolidation needs to be mindful of the fragile recovery and could be partly offset by bringing forward public investment, as envisaged in Poland and Romania, supported by higher absorption of EU funds. A tighter fiscal stance in Turkey—in line with the new medium-term program—will contribute to a gradual narrowing of external imbalances. In Russia, although fiscal consolidation would likely be required to stabilize debt over the medium term, cyclical considerations and fiscal space permit some easing in the short run.

Figure 23a. CESEE: IMF Staff Public Debt Sustainability Assessments, 2008–13²⁰

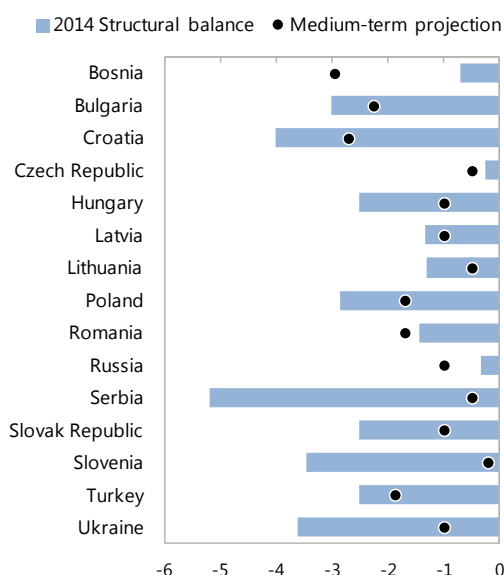
Gap between debt-stabilizing and actual primary balance

Country	2008	2011	2013
Belarus	-4.8	-4	0.1
Bosnia	-1.7	1.1	-0.5
Bulgaria	-4.6	3.9	-0.1
Croatia	-1.1	3.5	2.8
Czech Republic	-0.8	2.2	-0.5
Hungary	-1	2.1	-0.8
Latvia	4.1	1.1	-0.5
Lithuania	2.7	3.1	-0.3
Macedonia, FYR	-0.1	1.3	1.7
Poland	0.6	1.4	0.8
Romania	2.5	2	-0.3
Russia	-0.2	-0.5	1
Serbia	0.3	1.5	3.8
Slovak Republic	1.2	2.3	0.3
Slovenia	-1.3	4.7	3.5
Turkey	-1.5	-2.2	-1.1
Ukraine	1.5	1.4	-1

Source: IMF staff reports.

Note: Countries that need to improve their primary balance to stabilize the public-debt-to-GDP ratio are highlighted in red.

Figure 23b. CESEE: Fiscal Balance and Medium-Term Projections (Percent of GDP)



Sources: World Economic Outlook database; and IMF staff calculations.

Monetary policy should remain accommodative in countries facing deflation risks. Monetary conditions are appropriately supporting recovery of domestic demand in CEE and SEE countries. Additional policy action may be necessary to return inflation to target in inflation-targeting CESEE countries, should inflation expectations continue to decline or interest-rate differentials widen, resulting in unwarranted upward pressure on the exchange rate. In Turkey, further easing of monetary conditions should only be considered once inflation expectations are well anchored and real interest rates are firmly in positive territory. In Russia, the speed of monetary policy easing

²⁰ When 2008 data were unavailable, 2007 data were used for Bosnia and Herzegovina, the Czech Republic, Montenegro, and Turkey; 2006 data were used for Bulgaria and the Slovak Republic. When 2011 data were unavailable, 2010 data were used (Bulgaria and Croatia). The last column shows the latest available data (2012 data for Bulgaria; 2014 data for Romania, Serbia, and Ukraine).

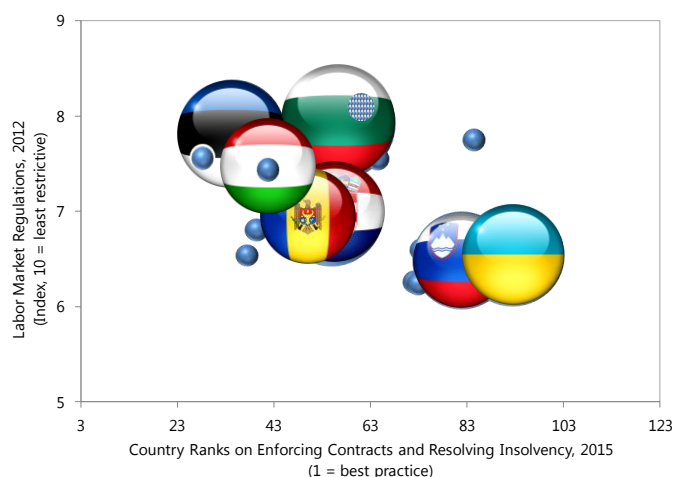
should be tied to developments in core inflation and inflation expectations to ensure that inflation will come down to target over the medium term.

Financial sector policies should encourage further strengthening of bank balance sheets and ensure that banks have adequate capacity and incentives to deal with large stocks of NPLs. A comprehensive strategy of dealing with NPLs and debt overhang would combine stricter supervisory standards, reforms to speed insolvency procedures, and efforts to jump-start distressed debt markets, where feasible. A robust debt-restructuring framework is particularly important for countries where the stock of debt is high, institutional frameworks are weak, and current baseline growth projections do not allow them to escape the debt overhang over the medium term (see Figure 21 and Annex IV).

Institutional reforms are critical to lifting potential growth and facilitating balance sheet repair. Potential growth in the region is estimated to be half of what it was during the precrisis years. To lift growth potential in light of much lower capital flows and aging populations, improving productivity and competitiveness through deep structural reforms will be key. These include the long-standing tasks of improving the business environment, increasing labor market flexibility, privatizing inefficient government-owned enterprises, and improving governance. For countries suffering from debt overhang, *institutional reforms* that increase labor and product market flexibility (notably, reduce hiring and firing costs; open product and services markets to competition) may help reduce the real costs of private sector balance sheet adjustment. Figure 24 shows that in Slovenia and Ukraine, labor market regulations, as well as insolvency frameworks or contract enforcement are weaker than in other CESEE countries; while Slovenia significantly overhauled its insolvency framework, it still has a relatively weak score on enforcing contracts.

For countries experiencing rapid credit growth (for example, Turkey) further targeted **macroprudential policies** could be considered to maintain the quality of credit, control risk exposures, and ensure adequate capital to absorb potential losses. In Russia, macroprudential measures taken in 2013 to curb unsecured consumer lending by increasing applicable risk weights and provisioning requirements have cooled the credit boom. In addition, sizable external deleveraging is already taking place in Russia amid sanctions and uncertainty surrounding conditions for resumption of access to international capital markets.

Figure 24. CESEE: Labor Market Regulations and Insolvency Frameworks 1/



Sources: Eurostat; Fraser Institute, Economic Freedom of the World database; IMF, International Financial Statistics and World Economic Outlook databases; World Bank *Doing Business* indicators; and IMF staff calculations.

1/ The size of the national flags of selected CESEE countries is proportional to the ratio of private debt to GDP. The score shown on the horizontal axis is an average of the two scores (enforcing contracts and resolving insolvency).

Annex I. CESEE: Growth of Real GDP, Domestic Demand, Exports, and Private Consumption, 2013–16

(Percent)

	Real GDP Growth				Real Domestic Demand Growth				Real Export Growth (goods and services)				Real Private Consumption Growth			
	2013	2014	2015	2016	2013	2014	2015	2016	2013	2014	2015	2016	2013	2014	2015	2016
Baltics ¹	3.2	2.6	2.6	3.3	2.5	3.8	3.3	4.3	5.5	2.8	2.0	3.3	4.7	4.4	3.5	4.2
Estonia	1.6	2.1	2.5	3.4	0.9	4.8	3.2	3.8	2.4	2.6	3.2	3.8	3.8	4.5	4.0	4.0
Latvia	4.2	2.4	2.3	3.3	3.1	2.0	2.3	4.7	1.4	1.9	1.2	2.6	6.2	2.3	2.9	4.1
Lithuania	3.3	2.9	2.8	3.2	2.8	4.5	3.8	4.3	9.4	3.4	1.9	3.4	4.2	5.6	3.7	4.2
Central and Eastern Europe ¹	1.1	3.0	3.1	3.1	0.1	3.9	3.3	3.4	4.2	6.6	6.2	5.6	0.5	2.4	3.1	3.0
Czech Republic	-0.7	2.0	2.5	2.7	-0.8	2.2	2.9	3.1	0.3	8.8	5.0	5.2	0.4	1.7	2.5	2.6
Hungary	1.5	3.6	2.7	2.3	1.2	4.3	1.1	2.0	5.9	8.7	6.2	5.5	0.2	1.6	2.6	2.6
Poland	1.7	3.3	3.5	3.5	0.2	4.7	4.1	4.0	5.0	5.6	7.1	5.8	1.0	3.0	3.5	3.4
Slovak Republic	1.4	2.4	2.9	3.3	0.0	3.0	3.1	2.8	5.2	4.6	4.4	5.6	-0.7	2.2	2.9	2.8
Slovenia	-1.0	2.6	2.1	1.9	-2.1	0.8	0.8	1.9	2.6	6.3	4.3	4.3	-3.9	0.3	1.0	1.6
Southeastern Europe-EU ¹	2.3	2.2	2.1	2.3	-0.9	2.1	2.2	2.6	12.8	6.6	5.5	5.4	0.1	3.3	3.0	2.7
Bulgaria	1.1	1.7	1.2	1.5	-1.3	2.7	1.3	1.5	9.2	2.2	1.6	2.8	-2.3	2.0	1.7	2.6
Croatia	-0.9	-0.4	0.5	1.0	-0.9	-1.9	-0.6	0.4	3.0	6.3	7.0	6.0	-1.2	-0.7	0.1	0.8
Romania	3.4	2.9	2.7	2.9	-0.8	2.7	3.1	3.4	16.2	8.1	6.4	6.1	1.2	4.7	4.0	3.2
Southeastern Europe-non-EU ¹	2.5	0.4	1.6	2.7	-1.0	0.9	1.6	2.6	12.5	6.6	4.9	6.1	0.8	-0.1	-0.2	2.3
Albania	1.4	2.1	3.0	4.0	0.6	3.1	4.3	4.6	7.9	9.9	4.7	4.7	1.8	0.8	1.1	2.8
Bosnia and Herzegovina	2.5	0.8	2.3	3.1	0.5	2.1	3.3	3.0	7.6	5.2	5.9	8.1	2.2	0.1	2.5	3.3
Kosovo	3.4	2.7	3.3	3.5	1.7	3.3	3.6	3.4	2.5	1.9	3.6	1.5	2.0	3.6	3.5	3.6
Macedonia, FYR	2.7	3.8	3.8	3.9	-2.6	4.2	4.7	4.1	-2.7	17.0	10.0	9.1	2.1	2.3	4.0	3.4
Montenegro	3.3	1.1	4.7	3.5	0.3	3.1	9.9	6.7	0.1	-2.2	4.2	4.0	3.1	1.8	7.5	5.1
Serbia	2.6	-1.8	-0.5	1.5	-1.9	-1.5	-1.9	0.8	21.3	3.9	3.1	5.0	-0.6	-1.3	-3.9	1.0
European CIS countries ¹	1.2	0.0	-3.9	-0.8	1.6	-1.8	-6.6	-1.9	2.4	-2.0	-2.0	-1.2	5.4	0.5	-4.6	-1.2
Belarus	1.0	1.6	-2.3	-0.1	8.9	0.3	-1.8	-0.1	-16.0	2.6	-10.7	-0.8	12.1	3.5	-0.5	0.3
Moldova	9.4	4.6	-1.0	3.0	4.9	1.8	-11.0	1.2	10.7	-0.5	-1.6	7.1	6.5	3.5	-7.9	1.3
Russia	1.3	0.6	-3.8	-1.1	1.3	-1.0	-6.8	-2.4	4.6	-0.1	-1.1	-2.0	4.8	1.2	-4.6	-1.7
Ukraine	0.0	-6.8	-5.5	2.0	0.2	-10.7	-7.0	2.4	-9.3	-22.8	-7.3	5.4	7.8	-7.1	-6.4	2.6
Turkey	4.1	2.9	3.1	3.6	6.7	0.6	4.0	3.5	-0.3	8.0	3.5	4.6	5.1	1.3	5.0	3.4
CESEE ^{1,2}	1.8	1.4	-0.4	1.3	1.9	0.3	-1.4	0.9	3.4	2.5	1.6	2.2	3.8	1.3	-0.3	1.1
Emerging Europe ^{1,3}	1.9	1.3	-0.6	1.2	2.1	0.1	-1.9	0.7	3.4	2.2	1.4	1.9	4.1	1.2	-0.6	0.9
New EU member states ^{1,4}	1.5	2.8	2.8	2.9	0.0	3.5	3.0	3.3	6.4	6.3	5.8	5.4	0.6	2.8	3.1	3.0
Memorandum																
Euro Area ¹	-0.5	0.9	1.5	1.6	-0.9	0.8	1.2	1.5	2.0	3.7	4.4	4.3	-0.7	1.0	1.7	1.5
European Union ¹	0.1	1.4	1.8	1.9	-0.3	1.6	1.7	1.9	2.5	3.5	4.6	4.5	-0.1	1.4	2.1	2.0

Source: IMF, World Economic Outlook database.

¹Weighted average. Weighted by GDP valued at purchasing power parity.

²Includes Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Kosovo, Latvia, Lithuania, Macedonia FYR, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovak Republic, Slovenia, Turkey, and Ukraine.

³CESEE excluding Czech Republic, Estonia, Latvia, Lithuania, Slovak Republic, and Slovenia.

⁴Includes Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, and Slovenia.

Annex II. CESEE: Consumer Price Index Inflation, Current Account Balance, and External Debt, 2013–16 (Percent)

	CPI Inflation (Period average)				CPI Inflation (End of period)				Current Account Balance to GDP				Total External Debt to GDP			
	2013	2014	2015	2016	2013	2014	2015	2016	2013	2014	2015	2016	2013	2014	2015	2016
Baltics ¹	1.3	0.4	0.1	1.9	0.6	0.0	0.9	1.9	-0.3	-1.1	-0.7	-1.4	96.0	89.2	96.7	97.0
Estonia	3.2	0.5	0.4	1.7	2.0	0.0	0.8	2.1	-1.1	-0.1	-0.4	-0.7	97.1	97.0	107.3	108.8
Latvia	0.0	0.7	0.5	1.7	-0.4	0.3	1.6	1.7	-2.3	-3.1	-2.2	-3.0	135.5	128.6	140.8	144.3
Lithuania	1.2	0.2	-0.3	2.0	0.5	-0.2	0.5	2.0	1.6	-0.4	0.2	-0.8	69.2	58.8	61.6	59.4
Central and Eastern Europe ¹	1.2	0.0	-0.5	1.4	0.8	-0.7	0.6	1.7	0.2	0.3	0.4	-0.2	77.9	75.4	80.9	77.1
Czech Republic	1.4	0.4	-0.1	1.3	1.4	0.1	0.8	1.8	-0.5	0.6	1.6	0.9	51.4	53.4	53.3	53.8
Hungary	1.7	-0.3	0.0	2.3	0.4	-0.9	1.7	2.4	4.1	4.2	4.8	4.1	122.4	107.6	106.7	90.2
Poland	0.9	0.0	-0.8	1.2	0.7	-1.0	0.4	1.5	-1.3	-1.2	-1.8	-2.4	72.6	70.5	78.6	75.5
Slovak Republic	1.5	-0.1	0.0	1.4	0.4	-0.1	0.7	1.4	1.5	0.2	0.4	0.4	84.2	83.8	90.7	90.4
Slovenia	1.8	0.2	-0.4	0.7	0.7	0.2	-0.2	1.9	5.6	5.8	7.1	6.5	114.8	115.1	126.9	126.6
Southeastern Europe-EU ¹	3.0	0.3	0.3	1.8	0.9	0.1	1.4	1.8	0.0	-0.2	-0.3	-0.8	80.9	68.7	68.4	66.6
Bulgaria	0.4	-1.6	-1.0	0.6	-0.9	-2.0	0.3	0.9	2.3	0.0	0.2	-0.8	93.9	87.3	90.0	89.3
Croatia	2.2	-0.2	-0.9	0.9	0.3	0.2	-0.6	1.2	0.8	0.7	2.2	2.0	109.1	96.1	99.1	96.7
Romania	4.0	1.1	1.0	2.4	1.6	0.8	2.2	2.2	-0.8	-0.5	-1.1	-1.5	68.7	55.6	54.7	53.2
Southeastern Europe-non-EU ¹	4.5	1.0	1.7	2.7	1.3	0.8	2.7	2.9	-6.6	-7.4	-7.6	-7.8	69.9	64.3	74.1	73.9
Albania	1.9	1.6	1.8	2.5	1.9	0.7	2.1	2.8	-10.7	-13.9	-15.7	-15.5	35.5	34.3	42.1	42.6
Bosnia and Herzegovina	-0.1	-0.9	0.6	1.1	-1.4	-0.5	1.2	1.7	-5.9	-7.1	-9.0	-8.2	51.0	51.7	56.3	56.5
Kosovo	1.8	0.4	0.3	1.4	0.5	-0.4	1.5	1.5	-6.4	-7.1	-7.3	-8.0	...	...	...	...
Macedonia, FYR	2.8	-0.1	0.1	1.3	1.5	-0.5	0.8	1.8	-1.8	-1.3	-2.0	-3.3	66.4	56.6	55.5	53.5
Montenegro	2.2	-0.7	0.5	1.0	0.3	-0.3	0.9	1.2	-14.6	-17.8	-20.6	-25.3	132.8	128.5	144.2	153.1
Serbia	7.7	2.1	2.7	4.0	2.2	1.8	4.2	4.0	-6.1	-6.0	-4.7	-4.7	81.9	74.0	88.4	87.5
European CIS countries ¹	6.5	8.6	19.4	10.2	6.3	12.8	13.7	8.5	0.4	2.3	4.3	5.3	38.6	41.8	60.5	52.2
Belarus	18.3	18.1	22.1	17.4	16.5	16.2	22.0	18.1	-10.5	-6.1	-7.0	-4.2	56.0	54.6	69.4	69.0
Moldova	4.6	5.1	7.5	6.3	5.2	4.7	8.6	5.4	-5.0	-5.5	-4.5	-5.4	83.1	78.2	100.4	98.6
Russia	6.8	7.8	17.9	9.8	6.5	11.4	12.0	8.0	1.6	3.1	5.4	6.3	34.4	36.9	52.7	44.7
Ukraine	-0.3	12.1	33.5	10.6	0.5	24.9	26.7	8.7	-9.2	-4.0	-1.4	-1.3	78.3	100.4	158.4	149.5
Turkey	7.5	8.9	6.6	6.5	7.4	8.2	7.0	6.0	-7.9	-5.7	-4.2	-4.8	47.4	49.7	55.8	56.2
CESEE ^{1,2}	5.2	5.9	10.5	6.6	4.7	7.7	8.2	5.7	-1.3	-0.1	0.6	0.8	53.3	54.6	66.9	62.3
Emerging Europe ^{1,3}	5.5	6.4	11.4	7.0	5.1	8.4	8.9	6.1	-1.5	-0.2	0.5	0.8	50.9	52.2	65.2	60.1
New EU member states ^{1,4}	1.6	0.1	-0.2	1.5	0.8	-0.4	0.8	1.7	0.1	0.1	0.1	-0.5	79.9	74.9	79.2	76.2
Memorandum																
European Union ¹	1.5	0.5	0.0	1.2	1.0	0.0	0.3	1.3	1.7	1.7	2.2	2.0	...	...	...	...

Source: IMF, World Economic Outlook database.

¹ Weighted average. Consumer Price Index (CPI) inflation is weighted by GDP valued at purchasing power parity, and current account balances and external debt are weighted by GDP in U.S. dollars.² Includes Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Kosovo, Latvia, Lithuania, Macedonia FYR, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovak Republic, Slovenia, Turkey, and Ukraine.³ CESEE excluding Czech Republic, Estonia, Latvia, Lithuania, Slovak Republic, and Slovenia.⁴ Includes Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, and Slovenia.

Annex III. CESEE: Evolution of Public Debt and General Government Balance, 2013–16¹

(Percent of GDP)

	General Government Balance				Public Debt			
	2013	2014	2015	2016	2013	2014	2015	2016
Baltics ²	-1.7	-0.7	-1.2	-1.1	30.8	30.9	31.1	30.9
Estonia	-0.5	0.4	-0.5	-0.1	10.1	9.7	10.1	10.0
Latvia ³	-1.2	-1.7	-1.4	-1.0	35.2	37.8	37.7	37.0
Lithuania	-2.6	-0.7	-1.4	-1.6	39.0	37.7	38.1	38.1
Central and Eastern Europe ²	-3.6	-2.9	-2.6	-2.2	56.7	53.2	53.4	53.2
Czech Republic	-1.4	-1.0	-1.4	-1.2	43.8	41.6	42.0	42.0
Hungary	-2.4	-2.6	-2.7	-2.5	77.3	76.9	75.5	74.7
Poland	-4.0	-3.5	-2.9	-2.3	55.7	48.8	49.4	49.2
Slovak Republic	-2.6	-3.0	-2.6	-2.3	54.6	54.0	53.9	54.0
Slovenia ³	-14.3	-6.3	-4.4	-3.9	70.0	82.9	79.8	82.1
Southeastern Europe-EU ²	-2.9	-2.8	-2.6	-2.2	42.0	45.4	46.0	46.1
Bulgaria ⁴	-1.8	-3.7	-3.0	-2.5	17.6	26.9	28.9	30.7
Croatia ³	-5.2	-5.0	-4.8	-3.8	75.7	80.9	85.1	87.2
Romania	-2.5	-1.9	-1.8	-1.7	38.8	40.4	40.5	40.0
Southeastern Europe-non-EU ²	-4.4	-5.1	-4.6	-3.9	55.4	62.0	64.6	65.5
Albania ³	-5.2	-5.6	-4.8	-3.3	70.1	72.6	73.6	69.8
Bosnia and Herzegovina	-1.9	-3.6	-2.0	-1.7	41.5	44.9	46.6	46.5
Kosovo ^{3,4}	-3.1	-2.6	-3.7	-3.9	17.6	18.5	20.2	22.1
Macedonia	-3.9	-4.2	-3.8	-3.5	34.2	38.0	37.3	40.2
Montenegro ³	-3.3	-0.8	-5.3	-7.9	58.2	58.4	60.4	64.3
Serbia ³	-5.6	-6.7	-5.9	-4.7	61.4	72.4	76.4	78.4
European CIS countries ²	-1.5	-1.3	-3.7	-2.6	16.9	22.1	24.7	22.9
Belarus ^{3,5}	-0.8	0.3	-3.0	-2.6	38.3	37.9	39.6	45.5
Moldova ³	-1.8	-1.7	-5.3	-6.3	23.8	31.5	48.0	50.8
Russia ³	-1.3	-1.2	-3.7	-2.6	14.0	17.9	18.8	17.1
Ukraine ³	-4.8	-4.5	-4.2	-3.7	40.7	71.2	94.1	92.6
Turkey ³	-1.7	-1.9	-1.8	-1.2	36.2	33.5	33.4	32.5
CESEE ^{2,6}	-2.2	-2.0	-2.9	-2.2	31.6	34.1	37.2	35.8
Emerging Europe ^{2,7}	-2.1	-2.0	-3.0	-2.2	30.0	32.7	36.0	34.5
New EU member states ^{2,8}	-3.3	-2.7	-2.5	-2.1	51.7	49.9	50.1	50.0
Memorandum								
European Union ¹	-3.1	-2.9	-2.6	-1.8	87.0	87.7	87.7	86.8

Source: IMF, World Economic Outlook database.

¹ As in the WEO, general government balances reflect IMF staff's projections of a plausible baseline, and as such contain a mixture of unchanged policies and efforts under programs, convergence plans, and medium-term budget frameworks. General government overall balance where available; general government net lending/borrowing elsewhere. Public debt is general government gross debt.

² Average weighted by GDP in U.S. dollars.

³ Reported on a cash basis.

⁴ Public debt includes former Yugoslav debt, not yet recognized by Kosovo.

⁵ General government balance: the measure reflects augmented balance, which adds to the balance of general government outlays for banks recapitalizations and is related to called guarantees of publicly-guaranteed debt.

⁶ Includes Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Kosovo, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovak Republic, Slovenia, Turkey, and Ukraine.

⁷ CESEE excluding Czech Republic, Estonia, Latvia, Lithuania, Slovak Republic, and Slovenia.

⁸ Includes Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, and Slovenia.

Annex IV. Estimation of the Private Sector Debt Level Consistent with Fundamentals¹

The relationship between private sector debt and its main determinants is cast as a single equation, autoregressive-distributed lag (ADL) model. The latter can be interpreted as a stylized, reduced-form, demand and supply system expressed in semi-loglinear form:

$$\ln \frac{D_{it}}{P_{it}} = \alpha_i + \sum_{j=1}^2 \beta_j \ln \frac{D_{it-j}}{P_{it-j}} + \sum_{j=0}^1 \gamma_j \ln \frac{Y_{it-j}}{P_{it-j}} + \sum_{j=0}^1 \delta_j R_{it-j} + \epsilon_{i,t} \quad (1)$$

$\frac{D_t}{P_t}$ – Per capita private sector debt stock in thousands of 2005 purchasing-power-parity

U.S. dollars (see note to Figure 7 for details);

$\frac{Y_t}{P_t}$ – Per capita GDP in thousands of 2005 purchasing-power-parity U.S. dollars (source:

IMF's World Economic Outlook database), used as a measure of debt-servicing capacity that affects positively (+) both the demand and supply of credit;

R_t – nominal interest rate on private sector debt (fraction)², which has opposite effects on demand (-) and supply (+);

i – country index, t – time index.

The demand-side effect of changes in interest rates is expected to dominate the supply-side impact in the reduced-form equation, in line with the findings in the existing literature (Cottarelli, Dell'Ariccia, and Vladkova-Hollar, 2003; Schadler and others, 2005; Iossifov and Khamis, 2009). Lack of data on private sector net worth for CESEE countries outside the EU prevents us from including that variable in the regional regressions.

The long-run relationship between private sector debt and its main determinants is then given by the long-run solution of the ADL model, under the stability condition ($0 < \sum_{j=1}^2 \beta_j < 1$):

$$d_{it}^* = \frac{\alpha}{1 - \sum_{j=1}^2 \beta_j} + \frac{\sum_{j=0}^1 \gamma_j}{1 - \sum_{j=1}^2 \beta_j} y_{it}^* + \frac{\sum_{j=0}^1 \delta_j}{1 - \sum_{j=1}^2 \beta_j} R_{it}^*, \text{ where} \quad (2)$$

lowercase variables are expressed in natural logarithm of per capita quantities in thousands of 2005 purchasing power parity U.S. dollars; asterisk indicates long-run value;

¹ This annex was prepared by Plamen Iossifov.

² For EU countries, the implicit interest rate is calculated using sectoral accounts data as the ratio of interest payments (including financial intermediation services indirectly measured) over the average of the beginning and end-period combined stock of debt of firms and households. For other countries, data are mostly for the lending rate, published in the IMF's International Financial Statistics database, with gaps in country coverage filled with data for the short-term interest rate published in the OECD's Economic Outlook database and from national data sources.

All variables entering equation (2) are assumed to be either (trend) stationary or integrated of order one and cointegrated (that is, there is a linear combination of the variables in levels that is stationary). In the latter case, the long-run coefficients inferred from the short-run regression specification lie in the cointegration space of the dependent and explanatory variables (Hendry, 1995).

The equilibrium-correction (EC) model isomorphic to the reduced-form demand and supply system (1) is then given by:

$$\Delta d_{it} = \gamma_0 \Delta y_{it} + \delta_0 \Delta R_{it} - (1 - \beta_1) (d_{t-1} - d_{it-1}^*) \quad (3)$$

Regression findings

The long-run relationship between private sector debt and its main determinants is estimated with data for 36 European countries during 1995–2013.³ The use of a broad sample of European countries is valid under the assumption that all countries share the same long-term elasticities with respect to fundamentals. Restricting the sample to CESEE countries is not appropriate because it increases the risk of contaminating the long-term equilibrium path with credit-boom dynamics. All series are time demeaned by subtracting the mean across all countries in a given period from the individual country values. This removes nuisance cross-sectional dependency that creates size distortions and makes inference based on two-stage generalized method of moments (GMM) estimates unreliable (Roodman, 2009). Exploratory data analysis suggests that all variables are panel stationary.

The static and dynamic versions of equation (1) are evaluated using different estimation methods (Table 1). Model 2 in Table 2 represents the full ADL model. The static and dynamic regression specifications are first evaluated using pooled and within-group (fixed-effects) ordinary least squares. While these estimators have the advantage of computational ease, both are inconsistent in the presence of endogenous explanatory variables and/or a lagged dependent variable. Therefore, in the final stage of analysis we use the Arellano-Bond dynamic-panel system GMM estimator (GMM-SYS). It is consistent in these circumstances, with the caveat that its asymptotic properties require a cross-sectional unit dimension of the data that is large relative to its time dimension. The latter condition is only partially met in the case of European panel data studies.

Regression analysis confirms the importance of the identified demand and supply factors in determining the path of the stock of private sector debt. The magnitudes of the coefficients of real per capita GDP in purchasing-power-parity U.S. dollars and the nominal interest rate are sizable, and their signs are consistent with theoretical priors (Table 1). The per capita debt stock exhibits a

³ Albania, Belarus, Iceland, Luxembourg, Montenegro, Norway, and Serbia are dropped from the sample, due to lack of data or data free of major structural breaks for the typical duration of a full business cycle (eight years). For all CESEE countries, data prior to 1998 are discarded, due to structural breaks in the early stage of transition.

Table 1. Determinants of Real per Capita Private Sector Debt in Europe

/ Dependent variable	Log of per capita private sector debt in thousand 2005 PPP USD				
Regressors / Regression model	(1)		(2)		
/ Estimator	OLS	Within (Fixed Effects)	OLS	Within (Fixed Effects)	Arellano-Bond Two- Step System GMM ⁵
Lagged dependent variable	...	...	1.25 (0.048)***	0.92 (0.063)***	0.98 (0.094)***
Second-lag of dependent variable	...	...	-0.32 (0.045)***	-0.20 (0.040)***	-0.23 (0.070)***
Log of per capita GDP in thousand 2005 PPP USD	1.66 (0.056)***	2.16 (0.280)***	0.62 (0.124)***	0.40 (0.109)***	0.46 (0.211)**
First lag of log of per capita GDP in thousand 2005 PPP USD	...	...	-0.54 (0.122)***	0.07 (0.147)	-0.03 (0.273)
Interest rate (fraction)	0.34 (0.561)	0.87 (0.904)	0.344 (0.494)	-0.057 (0.468)	1.191 (0.864)
First lag of interest rate (fraction)	...	...	-0.59 (0.370)	-0.72 (0.279)**	-1.41 (0.543)**
Common intercept	-0.05 (0.019)**	-0.07 (0.011)***	0.01 (0.004)***	-0.002 (0.004)	0.003 (0.019)
Country-specific effects	No	Yes	No	Yes	Yes
Observations	560		513		
Number of countries	36		36		
Time span	Available data over 1995-2013				
Adjusted R-squared	0.84	0.84	0.99	0.98	...
Within adjusted R-squared	...	0.52	...	0.91	...
Chi ² (54) ¹	...	...	...	...	33.3
Durbin-Watson	0.06	...	2.06	...	...
F(1,35) ²	...	158.8***	...	...	...
AR(1) ³	...	...	...	...	-3.33***
AR(2) ³	...	...	...	...	-0.44
F(35, 522) ⁴	...	60.3***	...	...	...
F(35, 471) ⁴	...	...	...	5.87***	...

Source: IMF Staff estimations.

Note: All variables are time demeaned. Standard errors are in parentheses. GMM = generalized method of moments; OLS = ordinary least squares; PPP = purchasing power parity; USD = U.S. dollars.

* coefficient significant at 10%; ** significant at 5%; *** significant at 1%.

¹ Hansen test of overidentifying restrictions (whether the instruments, as a group, appear exogenous).

² Wooldridge test for autocorrelation in panel data (H0: no first-order autocorrelation).

³ Test of (n-th) order serial correlation in regression residuals in first differences, N(0,1). Null hypothesis is no autocorrelation.

⁴ F-test that all fixed effects are jointly zero.

Instruments for (1) first differences equation: L(2/3).(l_crdprs_ppp_r_pc_dt l_gdp_ppp_r_pc_dt int_rat_dt); and (2) levels equation: DL.(l_crdprs_ppp_r_pc_dt l_gdp_ppp_r_pc_dt int_rat_dt), using the first 50 principal components of the GMM-style instruments.

significant degree of inertia, with 23 percent of any existing gap between the actual and fundamentals-consistent (in the long run) values closed each year. Diagnostic tests point to the lack of serial correlation in the non-idiosyncratic residuals of the dynamic model⁴ and to the validity of

⁴ As seen from the rejection of the hypothesis of the presence of second-order correlation in the residuals in first-differences (Doornik, Arellano, and Bond, 2002).

the instruments used.⁵ **According to the Arellano-Bond dynamic-panel GMM estimates of Model 2, the long-run relationship between private sector debt and its fundamentals is**

$$d_{it}^* = 1.66y_{it}^* - 0.83R_{it}^* \quad (4)$$

Our preferred modeling approach is to include country-specific intercepts in the long-run relationship, equation (4), and partially incorporate common time effects:

- **Country-specific intercepts**—included to ensure that the actual series and their fundamentals-consistent counterparts have the same means for each country in the sample.⁶ The underlying assumption is that CESEE countries may not converge to a common equilibrium path from different starting points. This is in line with the thesis in Barajas and others (2013) that countries contend with different, constrained, optimum levels of financial development.
- **Common time effects**—included but only to the extent that they can be explained by common time effects in the right-hand variables. The underlying assumption is that the dynamics of fundamentals have the same impact on the “equilibrium” debt burdens, whether or not they are driven by common time effects or country idiosyncratic factors. This provides a midrange estimate of the misalignment between actual private debt burdens and their long-run, fundamentals-consistent values.⁷

Equation (4) can then be used to calculate the long-run, fundamentals-consistent values of real per capita private sector debt in CESEE countries. Using equation (3), countries can be further classified into four broad classes, depending on their positions relative to the secular trend in private sector debt and the phase of the credit cycle:

1. Level of debt *above* its long-run value consistent with fundamentals and growth of debt *higher* than predicted by the short-run dynamics of the model.
2. Level of debt *above* its long-run value consistent with fundamentals and growth of debt *lower than or close to* the value predicted by the short-run dynamics of the model.
3. Level of debt *below or close to* its long-run value consistent with fundamentals and growth of debt *lower than or close to* the value predicted by the short-run dynamics of the model.

⁵ As seen from the statistical insignificance at the 10 percent level of confidence of the Hansen test of overidentifying restrictions (whether the instruments, as a group, appear exogenous).

⁶ The alternative is to use a common intercept for all sample countries.

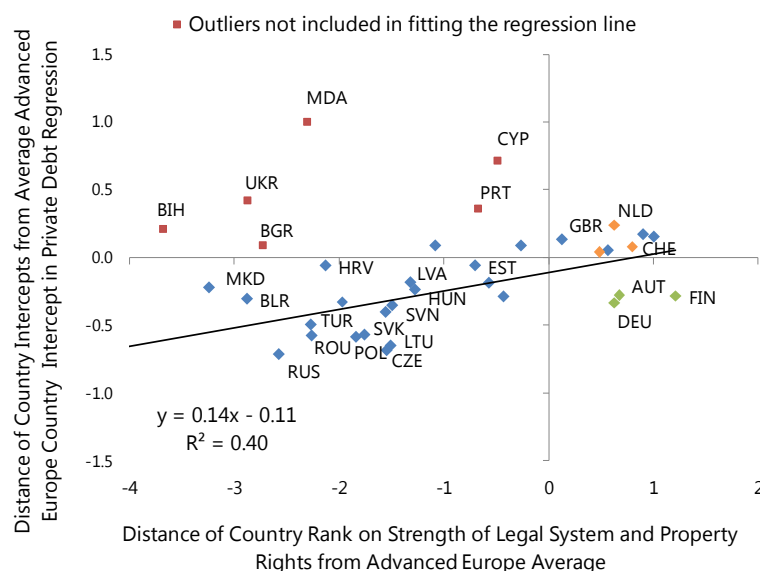
⁷ The alternatives are to exclude the common time effects altogether or to fully include the common time effects in the left-hand variable in its long-run equilibrium values.

4. Level of debt below or close to its long-run value consistent with fundamentals and growth of debt higher than predicted by the short-run dynamics of the model.

Differences in country-specific intercepts in the regression of private debt may reflect differences in the quality of institutions across countries, as well as other country-specific factors. This conjecture is indeed supported by evidence, as countries with weaker institutions (compared with the euro area average) tend to have lower country-specific constants (compared with the euro area average), implying that they would, on average, be expected to have lower debt levels (see Figure 1). Thus, the differences in country-specific intercepts could be interpreted as capturing the potential for further financial deepening after controlling for differences in interest rates and per capita incomes.

However, other idiosyncratic effects may be present as well. In particular, in some cases the initial debt levels may be higher than expected given the quality of institutions in these countries. The empirical relationship between the country-specific intercepts and institutional quality could be used to separate the country-specific-level effects unexplained by institutional quality. Then, if the credit gaps obtained from the regression analysis were adjusted to include the country-specific-level effects unexplained by institutional quality, the credit gaps would be even larger in a number of countries (see Figure 2). This further underscores the importance of structural reforms to increase countries' capacity to support financial deepening.

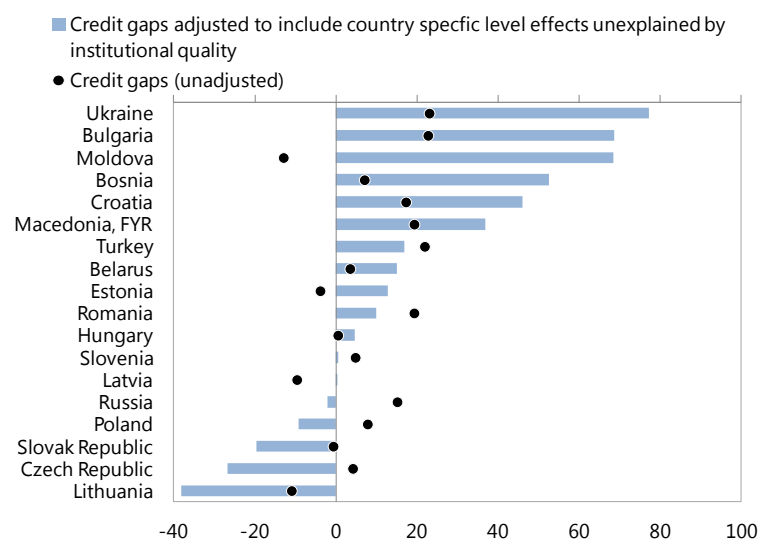
Figure 1. CESEE: Explanatory Power of Institutional Quality for Differences in Country-Specific-Level Effects in Private Debt Regressions



Sources: Fraser Institute, Economic Freedom of the World database; and IMF staff estimates (Model 2, Table 1).

Note: Data labels are defined in the abbreviations list.

Figure 2. CESEE: Credit Gaps Adjusted for Country-Specific-Level Effects Unexplained by Institutional Quality



Source: IMF staff estimates (Model 2 in Table 1 and Figure 1).

Annex V. Firm-Level Debt-at-Risk Analysis¹

To examine the distribution of corporate sector debt, the analysis uses disaggregated, firm-level annual data from the ORBIS database, covering about 2 million firms in 14 countries for the period between 2008 and 2013. The coverage of sample firms for each country varies, but on average total debt owed by sample firms accounts for about 35 percent of countries' aggregate corporate sector debt calculated using sectoral accounts.

Table 1. Number of Observations and Data Coverage by Country

Country	Debt-to-EBIT		ICR		Debt-to-Equity	
	N. Firms	Coverage (%)	N. Firms	Coverage (%)	N. Firms	Coverage (%)
Bulgaria	194,293	35.67	81,924	35.03	214,862	36.20
Croatia	68,931	88.40			77,031	89.34
Czech Rep.	50,262	29.15	20,011	26.50	57,177	29.46
Estonia	17,866	51.71			19,671	52.07
Hungary	63,767	18.30	5,951	17.61	69,452	18.44
Latvia	37,669	28.99	10,004	24.59	72,734	47.03
Lithuania	1,310	30.17			1,310	30.18
Poland	13,752	13.07	11,079	11.69	13,829	13.22
Romania	10,222	22.74	3,993	20.94	18,128	23.03
Russia	947,475	63.27	131,979	57.44	1,058,322	65.89
Serbia	37,000	84.30	1,082	49.41	32,818	56.77
Slovak Rep.	99,214	41.74	31,238	35.58	11,8670	42.04
Slovenia	6,012	41.08	3,119	34.81	5,999	50.94
Turkey	7,953	11.84	6,039	11.24	8,072	11.87
Ukraine	193,682	59.36	8,631	49.56	245,513	59.67
Total	1,749,408		315,050		2,013,588	

Sources: Eurostat, Annual Sectoral Accounts data; and ORBIS database.

Note: Both ORBIS and aggregate-level data are nonconsolidated data for the nonfinancial corporate sector (for non-EU countries, aggregate-level data are consolidated data). Coverage is the share of total debt owed by sample firms to the aggregate-level corporate sector debt. The aggregate corporate debt stocks for Russia, Serbia, and Ukraine—countries for which sectoral accounts data are not available—are underestimated, as they do not include domestic intercompany loans and domestically held debt securities issued by nonfinancial companies. EBIT = earnings before interest and taxes; ICR = interest coverage ratio.

¹ This Annex was prepared by Jiaae Yoo.

Within each country sample, we divide firms into six industries—agriculture and mining (AG), manufacturing (MF), utilities (UT), construction and real estate (CR), wholesale and retail trade (WR), and market services (MS)²—and three firm-size groups (small, medium, large).³ The breakdown of the sample firms by industry and firm sizes is reported in Table 2.

Table 2. Number of Observations and Data Coverage by Industry and Firm Size

Country	Debt-to-EBIT		ICR		Debt-to-Equity	
	N. Firms	Percent of total debt	N. Firms	Percent of total debt	N. Firms	Percent of total debt
Agriculture/mining	96,002	12.63	29,503	13.43	114,857	12.53
Manufacturing	221,374	26.83	54,570	28.50	244,420	26.11
Utilities	30,460	6.17	7,348	5.88	33,822	6.09
Construction/real estate	199,437	10.73	33,000	9.65	229,225	11.24
Wholesale/retail	647,286	21.09	113,407	20.36	742,201	21.07
Market services	554,849	22.55	77,224	22.18	649,063	22.96
Small	1,586,744	11.65	235,907	8.02	1,849,149	12.44
Medium	128,821	18.22	58,078	17.36	130,400	18.33
Large	33,843	70.13	21,067	74.63	34,039	69.23

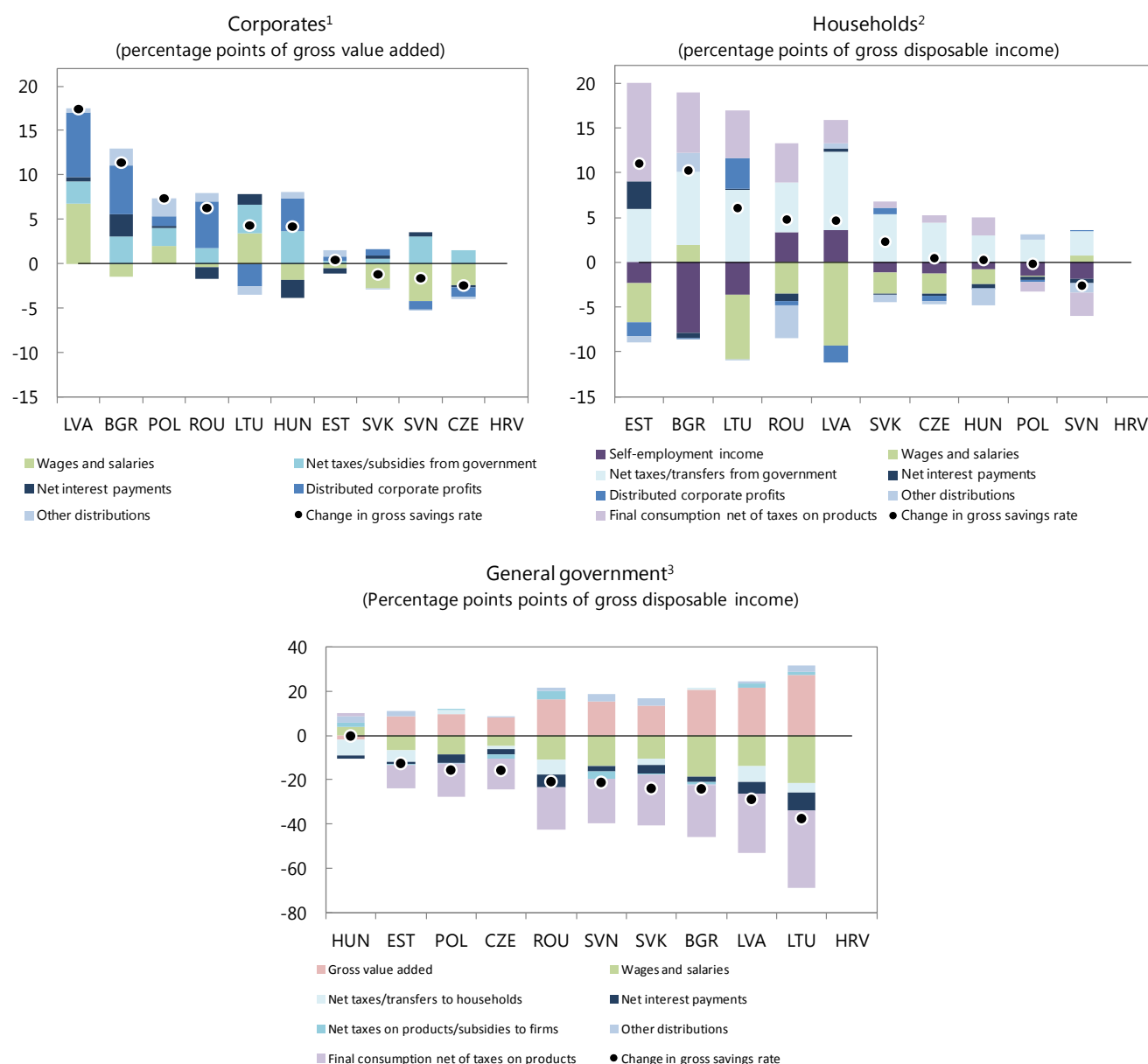
Source:

Note: Percent of total debt is the share of each sector. EBIT = earnings before interest and taxes; ICR = interest coverage ratio.

² Industry classification is based on NACE 2 codes (in parentheses): agriculture and mining, AG, includes agriculture, forestry, and fishing (A) and mining and quarrying (B); utilities, UT, refers to electricity, gas, steam, and air conditioning supply (D) and water supply, sewage, waste management, and remediation activities (E); market services, MS, includes transportation and storage (J), accommodation and food service activities (I), information and communication (J), professional, scientific, and technical activities (M), administrative support service activities (M), arts, entertainment, and recreation (R), and other service activities (S).

³ Firms are classified as small, medium, or large, depending on their number of employees and the size of the total balance sheet. The classification is based on the ceiling defined by ECB (2013): medium firms are defined as firms that employ fewer than 250 people and whose annual balance sheet does not exceed 43 million euros; small firms are firms that employ fewer than 50 people and whose annual balance sheet does not exceed 10 million euros.

Annex VI. CEE EU Countries: Contributions to Difference between Average Sectoral Saving Rates in 2009–12 and 2006–08 (Percentage points)



Source: EUROSTAT ESA 1995 Annual Sector Accounts and Fund staff calculations.

Notes: Data for Croatia are not available, while data for Romania end in 2011.

¹ All cash flows identified in the chart typically represent net outflows for corporates and as such a positive contribution to the saving rate signify a reduction in the corresponding outlays. The net inflow is the gross value-added, which also appears in the denominator of the saving ratio and as such does not contribute to the percentage point difference in saving rates before and after the crisis.

² For households, positive cash flows typically are wages and salaries, self-employment income, net interest payments and other distributions. A positive contribution to the saving rate by these inflows signify increase in the corresponding revenues. The share of indirect taxes paid by households is calculated as the ratio of household consumption to the sum of household consumption and government consumption, the latter being net of compensation of employees.

³ Government's gross value added is measured as the sum of public sector wages and benefits and depreciation. Public sector wages and benefits are also part of government final consumptions, with the two entries cancelling each other. Government's gross disposable income is equal to total revenues minus social benefits other than social transfers in kind.

Annex VII. Firm-level Analysis of Employment and Investment⁴

Following a large body of firm-level studies, we estimate the accelerator-style model. Such a model was used by Cantor (1990), Sharpe (1994), Heisz and LaRochelle-Côté (2004), and Chodorow-Reich (2014) to test the procyclicality of firm-level employment and investment in relation to differences in leverage and size of companies. In addition, we add a country-specific variable measuring flexibility of hiring and firing labor market regulations and test its significance for an average firm, and specifically for small firms. For a firm i in time t and country j , the whole model can be expressed as follows:

$$\Delta Y_{i,j,t} = \alpha + \beta \Delta Y_{i,j,t-1} + \Delta S_{i,j,t} (\gamma + \delta \Delta A_{i,j,t-2} + \theta \Delta L_{i,j,t-2} + \tau R_{j,t} + \tau R_{j,t} D_s) + \vartheta \Delta A_{i,j,t-2} + \dots \varphi \Delta L_{i,j,t-2} + R_{j,t} (\mu + \rho D_s) + \varepsilon_{i,t}$$

The dependent variable Y is alternatively employment or investment. Investment is measured as a change in fixed assets. S stands for sales; A for assets (measuring size); L is leverage (debt to total assets); R is the index of flexibility of hiring and firing labor market regulation of the Fraser Institute's Economic Freedom of the World database; and D is a dummy variable equal to one if a firm has fewer than 50 employees. Following the literature, the choice of the lag structure minimizes endogeneity issues. The model is estimated using an Arellano-Bond dynamic panel data two-step estimator with robust Windmeijer-adjusted standard errors. Residuals are assumed to be independent and identically distributed.

Results suggest that leverage and size of firms as well as flexibility of hiring and firing regulation influence firms' responses to shocks in sales. According to the results in Table 3, firms respond to falling sales by cutting employment and investment.

- A 10 percent decline in sales calls for cost reductions between 2 and 4 percent (since value added typically ranges between 30 and 50 percent of sales and profits account for a third of value added) to restore profitability.
- Firms of average size and leverage respond by about 2 percent, equally divided between investment and employment. Small firms adjust more, and their response seems to be also dependent on the degree of labor market flexibility, with more rigid regimes associated with lower response of employment and greater in investment. For instance, small, low-leverage firms in countries with relatively rigid labor regulation respond to a 10 percent decline in sales by cutting employment by 1 percent and investment by 3 percent. Highly leveraged small firms in countries with flexible labor codes reduce employment and investment by close to 2 percent

⁴ This Annex was prepared by Jiri Podpiera.

each. Large firms tend to fire fewer workers and cut less investment, as they rely more on selling off assets to deleverage.

Table 3. Corporate Response to Changing Demand

	Δ Employment			Δ Investment		
	(E1)	(E2)	(E3)	(I1)	(I2)	(I3)
Lagged dependent variable	-0.047*** (0.0033)	-0.049*** (0.0033)	-0.049*** (0.0033)	-0.018*** (0.003)	-0.026*** (0.003)	-0.026*** (0.003)
Δ Sales _{i,t}	0.125*** (0.005)	0.078*** (0.015)	0.074*** (0.017)	0.123*** (0.008)	0.11*** (0.027)	0.23*** (0.028)
x Size _{i,t-2}	-0.003*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.006*** (0.001)	-0.005*** (0.001)	-0.016*** (0.002)
x Leverage _{i,t-2}	0.002* (0.001)	0.003** (0.001)	0.003** (0.001)	0.007*** (0.002)	0.007*** (0.002)	0.007*** (0.002)
x Labor market regulation _{j,t}		0.024*** (0.008)	0.018** (0.008)		0.018 (0.013)	0.02 (0.013)
x Labor market regulation _{j,t} x 1 (Small _{i,t})			0.008*** (0.003)			-0.06*** (0.005)
Size _{i,t-2}	-0.088*** (0.002)	-0.083*** (0.002)	-0.086*** (0.002)	-0.15*** (0.004)	-0.15*** (0.004)	-0.12*** (0.005)
Leverage _{i,t-2}	-0.007*** (0.001)	-0.007*** (0.001)	-0.007*** (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.002)
Labor market regulation _{j,t}		0.139*** (0.01)	0.36*** (0.01)		0.63*** (0.01)	0.63*** (0.01)
Labor market regulation _{j,t} x 1 (Small _{i,t})			-0.32*** (0.005)			-0.03*** (0.005)
Constant	0.93*** (0.03)	0.28*** (0.02)	0.23*** (0.02)	-0.24*** (0.04)	-0.24*** (0.04)	-0.22*** (0.04)
Observations	514,824	514,824	514,824	465,410	465,410	465,410
Firms	117,633	117,633	117,633	109,330	109,330	109,330

Source: IMF staff estimates.

Note: All variables are in logarithms. *Investment* is measured as the percent change in fixed assets (investment intensity—that is, I_t/K_{t-1}). Firms with fewer than 50 employees and assets below 10 million euros are small firms. *Size* is measured by total assets and *leverage* by debt to total assets. *Labor market regulation* is represented by the Hiring and Firing regulation index (5Bii) of the Fraser Institute's Economic Freedom of the World database. The model is estimated using an Arellano-Bond dynamic two-step panel data estimator with robust standard errors. Lagged dependent and independent variables were used as instruments. Standard errors are in parentheses.

* coefficient significant at 10 percent; ** at 5 percent; *** at 1 percent.

Annex VIII. Firm-Level Analysis of Debt and Investment¹

Dynamic panel regressions confirm the sensitivity of firms' investment-to-capital ratio to their debt overhang. Following the earlier literature, we estimate a specification for the investment equation of the firm as follows:

$$IK_{i,t} = \alpha + \beta IK_{i,t-1} + \gamma CF_{i,t-1} + \delta D_{i,t-1} + \varepsilon_{i,t}$$

where $IK_{i,t}$ is the investment-to-capital ratio of firm i at time t . The debt overhang or financial pressure variable $D_{i,t-1}$ is proxied by standard measures such as the debt-to-asset ratio or interest-coverage ratio. The latter is defined as the ratio of EBIT (earnings before interest and taxes) to interest payments. We include the lagged cash-flow-to-capital ratio to control for standard sales-accelerator effects in such models. The coefficient δ measuring the sensitivity of investment to balance sheet variables appears to be significant and with the correct sign (Table 4, columns 1,3).

Table 4. Investment Ratio and Debt Overhang in CESEE

Dependent variable: IK_{it} Investment-to-capital ratio				
Variables	D = Interest-coverage ratio		D = Debt to Assets	
	(1)	(2)	(3)	(4)
IK_{it-1}	0.0046*** (0.000)	0.0047*** (0.000)	0.0056*** (0.000)	0.0233*** (0.000)
Cash Flow $_{it-1}$	0.0229** (0.010)	0.0269* (0.092)	-0.0457 (0.230)	-0.0661 (0.165)
D_{it-1}	0.0355** (0.049)		-0.12717*** (0.000)	
$D_{it-1} \times 1(t < 2009)$		-0.0389 (0.268)		0.2133 (0.815)
$D_{it-1} \times 1(t \geq 2009)$		0.1888*** (0.000)		-0.1390*** (0.000)
Observations	3,159	3,159	3,458	3,458
AR(1) ¹	-1.506*	-1.508*	-1.620*	-1.621*
AR(2) ¹	-1.328	-1.334	-1.324	-1.278
Hansen test ²	27.34	54.71	23.73	50.70

Source: IMF Staff estimates.

Note: Regression results of equation (3) are estimated with a two-step generalized method of moments estimator for dynamic panel models, using lags of dependent variables as instruments. Given the high number of exits and entrances of firms in the data set, the regression is run on representative firms representing 10 different size bins for each country, industry, and year spanning 2004–13. Regressions include country and industry dummies. CESEE = central, eastern, and southeastern Europe.

*, **, *** represent significance at 10%, 5% and 1% respectively. P-values are in parentheses. ¹ Test of (n-th) order serial correlation in regression residuals is in first differences. Null hypothesis is no autocorrelation. ² Hansen test of overidentifying restrictions.

¹ This annex was prepared by Faezeh Raei.

ABBREVIATIONS

ALB	Albania	HUN	Hungary
AQR	Asset Quality Review	ICR	Interest coverage ratio
AUT	Austria	IMF	International Monetary Fund
BGR	Bulgaria	ITA	Italy
BiH	Bosnia and Herzegovina	LTU	Lithuania
BIS	Bank for International Settlements	LVA	Latvia
BLR	Belarus	LUX	Luxembourg
CEE	Central and eastern Europe	MDA	Moldova
CESEE	Central, eastern, and southeastern Europe	MKD	Former Yugoslav Republic of Macedonia
CHF	Swiss franc	MNE	Montenegro
CIS	Commonwealth of Independent States	NPL	Nonperforming loan
CZE	Czech Republic	OECD	Organisation for Economic Co- operation and Development
DEU	Germany	PMI	Purchasing Managers Index
ECB	European Central Bank	POL	Poland
EIB	European Investment Bank	REI	Regional Economic Issues
EM	Emerging Market	ROU	Romania
EMBIG	Emerging Markets Bond Index Global	RUS	Russia
EPFR	Emerging Portfolio Fund Research	SA	Seasonally adjusted
EST	Estonia	SEE	Southeastern Europe
EU	European Union	SRB	Serbia
FIN	Finland	SVK	Slovak Republic
FDI	Foreign direct investment	SVN	Slovenia
FX	Foreign exchange	TUR	Turkey
GDP	Gross domestic product	QE	Quantitative easing
GRC	Greece	UKR	Ukraine
HICP	Harmonised Index of Consumer Prices	UVK	Kosovo
		WEO	World Economic Outlook

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