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The Pre-Crisis Capital Flow Surge to Emerging Europe: Did Countercyclical Fiscal Policy Make a Difference?

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Abstract

A push-pull-brake model of capital flows is used to study the effects of fiscal policy changes on private capital flows to emerging Europe during 2000–07. In the model, countercyclical fiscal policy has two opposing effects on capital inflows: (i) a conventional absorption-reducing effect, as a tighter fiscal stance acts as a brake on capital flows; and (ii) an unconventional absorption-boosting effect, as a tighter fiscal stance increases investor confidence in the country. The empirical results suggest that push factors (low returns in flow-originating countries), rather than pull factors (high returns in flow-destination countries), drove most of the private capital flows to emerging Europe. And active countercyclical fiscal policy—once the fiscal stance is adjusted for the automatic effects on the fiscal position of both internal and external imbalances—acted as a brake on capital inflows. However, the empirical results also suggest that, even abstracting from political feasibility and fiscal policy lag considerations, countercyclical fiscal policy alone is unlikely to be an effective policy tool to put an effective brake on sudden capital flow surges.

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A. Introduction

During the run-up to the global financial crisis in 2008, emerging Europe was at the receiving end of an exceptionally large capital inflow surge. These inflows were part of a global boom in capital flows to emerging economies (Figure 1). However, when the surge to emerging Europe crested in 2007, net private capital flows averaged to about 15 percent of the region's GDP, threefold of the size of the 2007 capital inflows to all emerging economies combined.

But equally striking was the diversity of capital inflow experiences across countries in emerging Europe. Average private capital inflows in 2003–07 ranged from 3 percent of GDP to Russia to 27 percent of GDP to Bulgaria (Figure 2). The wide diversity in inflow experiences across the region suggests that variations in countries' initial conditions or policy responses made a significant difference to the size of inflows.

The debate on the policy lessons from emerging Europe's inflow surge remains in a state of ferment. Some authors see large capital inflows as giving rise to serious dilemmas for policies but also as intrinsic to the convergence process in emerging Europe (Lipschitz et.al., 2002). Other authors celebrated rapid financial deepening in emerging Europe as a welcome case of capital flowing downhill from rich to poor countries


Figure 1. Net Private Captial Flows, 1980-2011
(in US$ billion)
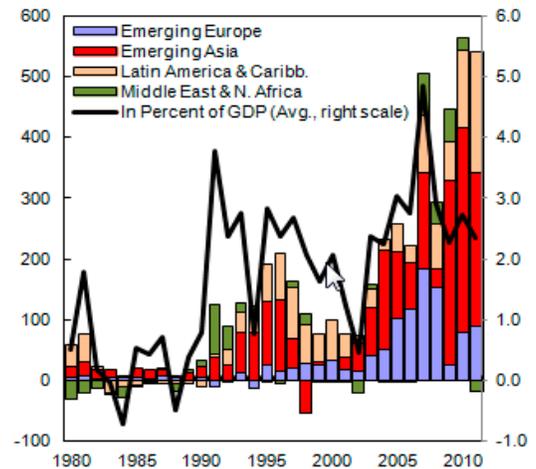
Sources: WEO; and IMF staff calculations.

Figure 2. Average Total Private Captial Inflows, 2003-07
(Percent of GDP)

Sources: WEO; and IMF staff calculations.

(Dell'Ariccia et.al., 2008, and Abiad et.al., 2009). Others took a more critical take, focusing on internal and external imbalances related to absorption and credit booms, stressed speed limits to growth, and called for policies to slow inflows (IMF, Regional Economic Outlook for Europe, November 2007). Finally, recent analysis has focused on disentangling the role of global factors from that of domestic factors in accounting for inflow surges, suggesting that the former factors are more likely to be responsible for the occurrence of a surge while the latter factors are more likely to be responsible for the size of the surge (Ghosh et.al., 2012).

At the same time, a tentative consensus has emerged that the policy tool kit to manage capital inflow surges should include both macroeconomic policies (fiscal policy, monetary policy, exchange rate policy, and foreign exchange market intervention) as well as prudential

regulations and capital controls. The appropriate mix between these tools would depend on the state of the economy, the level of foreign exchange reserves, the quality of existing prudential regulations, the scope to allow the currency to strengthen, and the likely persistence of the inflows (Ostry et.al., 2010).

Against this backdrop, there remains room to explore the role of fiscal policy in containing inflow surges. Fiscal policy is traditionally seen as a potent brake device for containing capital flows, particularly under fixed exchange rates and high capital mobility. Several authors (Peiris, 2010; Baldacci and Kumar, 2011; Pradhan et.al., 2011) reported that higher fiscal deficits in emerging markets tend to push up long-term yields, thus making domestic bond markets more attractive for portfolio inflows. Similarly, a comprehensive study of a large number of past surges in capital inflows found that expenditure restraints helped reduce upward pressures on both aggregate demand and the real exchange rate (Cardarelli et.al., 2009). In practice, however, the use of fiscal policy can also be constrained by political feasibility as well as policy recognition and implementation lags as capital inflow surges and absorption booms are difficult to track in real time.

This paper seeks to contribute to this discussion by focusing on the role of fiscal policies during the pre-crisis surge in capital inflows to emerging Europe. Specifically, this paper studies the capital inflow experience during the run-up to the global financial crisis using a push-pull-brake model of capital inflows, focusing on the role of countercyclical fiscal policy as a potential brake on capital inflows. Emerging Europe's capital inflow experience is particularly promising for identifying the empirical link between capital flows and fiscal policy because of significant cross-country variations in both capital inflows and fiscal stances.

The paper's main findings are twofold. First, for the region as a whole, push factors (low returns in originating countries), rather than pull factors (high returns in destination countries), drove most of the private capital flows to emerging Europe. But local pull factors also played an important role in some countries. Second, while forceful countercyclical fiscal policies could have slowed down capital inflows, this would not have been effective in countering inflows of the magnitude faced by some of the countries in the region. This suggests that other policy tools need to support countercyclical fiscal policy during surges.

The remainder of the paper is organized as follows. Section B derives a push-pull-brake model of capital flows, allowing for two off-setting effects of countercyclical fiscal policy on inflows. Section C suggests that the conventional way to measure the fiscal policy stance is misleading during absorption booms and uses an alternative approach to extract the transitory components from headline fiscal balances. Section D reports empirical findings, and Section E draws on the estimated results to simulate counterfactual outcomes for selected countries under assumptions of an alternative fiscal policy stance. Section F addresses the question of whether the results are robust relative to real-time measures of cyclical gaps, and Section G summarizes the policy implications.

B. The Model

A model of capital flows to emerging Europe needs to capture the interplay of three broad groups of factors:[2]

- Push factors: Abundant global liquidity and low risk aversion before the global crisis led to falling long-term interest rates in the euro area and the U.S. (Figure3). This could have "pushed" capital flows to emerging Europe.

Figure 3. International Returns and Flows to CESE Countries

Total private inflows to CESE countries, US$ billion
10-year US bond yield, right scale
10-year German bond yield, right scale

Source: IFS and WEO.

- Pull factors: Flows could also have been attracted by the prospects of high returns in emerging Europe, underpinned by relatively low wages and capital-labor ratios. Countries in the region may also have benefited from improving risk perceptions as they liberalized their economies and undertook large-scale privatization programs. In addition, for many countries, the EU accession process was seen as cementing institutional reforms and therefore credibly reducing risks to property rights. All these factors could have "pulled" capital flows to emerging Europe.

- Macroeconomic policies acting as pull or brake factors: Apart from these push-pull factors, countries across emerging Europe exhibited a large variety of monetary policy and exchange rate regimes, fiscal policy response functions, and prudential and regulatory financial sector regimes, which could also have influenced the size and composition of capital flows.
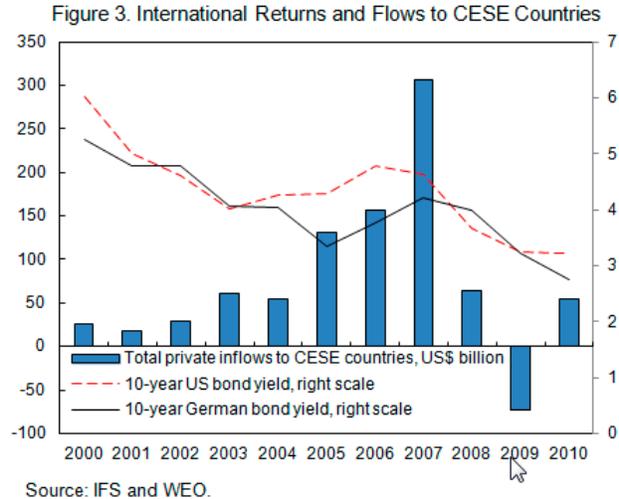
To assess the relative importance of these factors, we follow the model and estimation strategy of Fernandez-Arias (1996). Assume that, from the point of view of foreign investors, the marginal equilibrium condition for private flows equalizes the overall expected return of investing in an emerging European country (the contractual return, D_t, adjusted for the country's creditworthiness, C_t) with the alternative return of investing in an international asset, R_t:[3]

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[2]Tighter financial integration was likely another factor—distinct from push, pull, or macroeconomic policy factors—that gave rise to the large inflows during the boom years. Moreover, EU accession and euro adoption prospects likely reduced risk premiums, another instance of reduced frictions and a heightened degree of financial integration.

[3] International returns are assumed to be exogenous given the relative size of emerging European countries.

$$D_t \, C_t = R_t. \tag{1}$$

We assume that domestic returns increase as the country's absorption, A_t, expands and they decline as net foreign capital inflows, K_t, increase (as the quality of the pool of available investment opportunities diminishes). We also assume that a country's creditworthiness improves as the structural fiscal balance, F^S_t, improves.[4,5] This could be interpreted as assuming that the country's risk premium is reduced across all sectors when public sector finances improve, as the sovereign's rating usually serves as an upper benchmark for private sector ratings. Domestic returns are also assumed to be influenced by country-specific factors, I_t, which capture the country's investment climate and any other country-specific characteristics. In view of the catch-all nature of this variable, we do not impose any sign restrictions on it.

$$D_t = D\,(A_t, I_t, K_t), \quad D_A > 0, \; D_I <> 0, \; D_K < 0, \tag{2}$$

$$C_t = C\,(F^S_t), \quad C_F > 0. \tag{3}$$

The nonarbitrage condition (1), equating risk-adjusted domestic returns to international returns, can then be expressed as follows:

$$D\,(A_t, I_t, K_t) = R_t \,/\, C\,(F^S_t). \tag{4}$$

The comparative statistics of private net capital flows follows from totally differentiating (4) and applying the sign restrictions in (2) and (3):

$$K_t = b_1 \, A_t + b_2 \, F^S_t + b_3 \, I_t + b_4 \, R_t, \quad b_1 > 0, \; b_2 > 0, \; b_4 < 0. \tag{5}$$

Finally, we assume that domestic absorption increases with capital inflows and decreases in response to a tighter underlying fiscal stance:

$$A_t = a_1 \, K_t + a_2 \, F^S_t, \quad a_1 > 0, \; a_2 < 0. \tag{6}$$

Substituting (6) into (5) and solving for K_t, we obtain a reduced-form equation for capital inflows:

$$K_t = [(b_2 + a_2 b_1) \, F^S_t + b_3 \, I_t + b_4 \, R_t] / (1 - a_1 b_1). \tag{7}$$

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[4] The model's conclusions do not depend on whether capital inflows react to the headline or the structural fiscal balance.

[5] While not pursued here, an extension of this approach could be to investigate whether the nature of fiscal adjustment—expenditure or revenue side measures—matters for the effectiveness of policy responses to surges in capital inflows. Tax incentives, differences in corporate tax rates, and free trade zones may also affect the pace of capital inflows.

In (7), the effect of fiscal tightening on capital inflows depends on the relative sizes of the unconventional "confidence effect" (b_2) and the conventional "absorption-reducing effect" (a_2b_1) of fiscal tightening:[6]

- If $(b_2 + a_2b_1) < 0$, fiscal tightening would discourage capital inflows as the contractionary absorption effect is stronger than the confidence effect (Figure 4, left diagram).

- If $(b_2 + a_2b_1) > 0$, fiscal tightening would attract additional capital inflows as the confidence effect dominates the absorption effect (Figure 4, right diagram).

Figure 4. Effect of Fiscal Tightening on Capital Inflows

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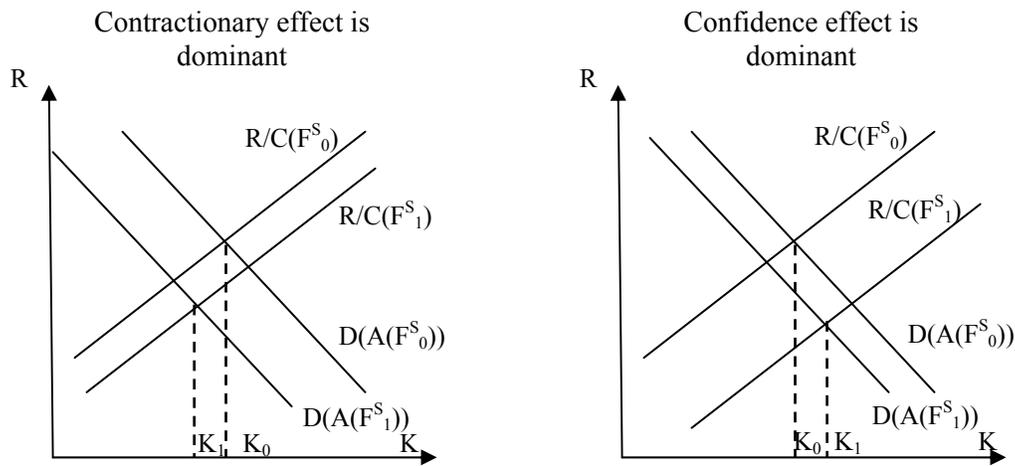
[6] In this model specification, it is not possible to identify separately the confidence effect of fiscal tightening as the six structural parameters of the model cannot be uniquely identified by the five reduced form coefficients. In the future research, we will explore alternatives ways to disentangle individual effects of fiscal policy.

C. Measuring the Fiscal Stance During Absorption Booms

Scatter plots of pre-crisis capital inflows and actual fiscal balances for emerging European countries suggest that lower fiscal deficits were associated with higher capital inflows (Figure 5). However, the actual fiscal balance is not a good measure of the fiscal stance as it also includes the automatic responses of the budget to changes in the economic environment. Conventionally, the stance of fiscal policy is measured by stripping out the part of the fiscal balance reflecting automatic responses of revenues and expenditures to the output gap, defined as the percentage deviation of actual from potential output. This assumes that the output gap summarizes sufficiently well the cyclical state of the economy relevant for measuring automatic fluctuations in the fiscal balance. However, this assumption is likely to be inappropriate in situations with large fluctuations in absorption, as in such a setting the output gap will only capture part of the relevant automatic fluctuations in the fiscal balance (Jaeger and Klemm, 2007).

Figure 5. Fiscal Balances and Capital Inflows, 2003-07
(Percent of GDP)

Source: WEO; and IMF staff calculations.
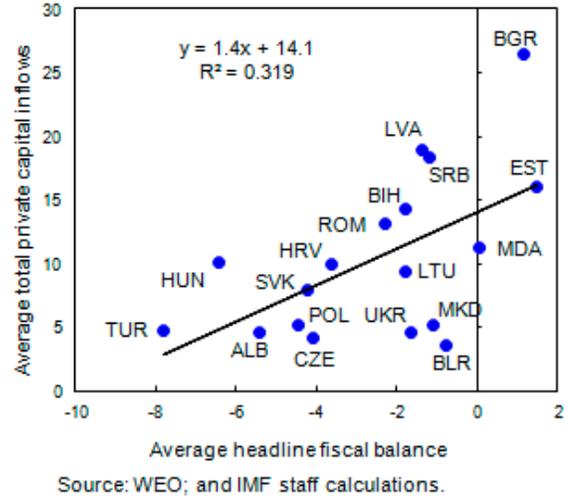
To see this, we write the gap between actual and potential (or sustainable) absorption (A^{GAP}) as approximated by the sum of the output gap (Y^{GAP}) and the gap between the actual and the sustainable current account balance deficit (CAD^{GAP})[7]:

$$A^{GAP} \approx Y^{GAP} + CAD^{GAP}. \tag{8}$$

Thus, an absorption gap will be reflected either in an output gap (internal imbalance), or a current account gap (external imbalance), or some combination of both gaps. The conventional measure of the fiscal stance estimates the structural balance as a percent of potential GDP (F^S) by stripping out from the actual deficit as a percent of actual GDP the response to the output gap:

$$F^S = F - \alpha Y^{GAP}, \tag{9}$$

where α is the automatic response coefficient. If the economy goes through an absorption boom in response to large capital inflows, excess absorption may in addition spill over into a

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[7] See Box 1 for the derivation.

significantly higher than sustainable current account deficit, resulting in additional revenue captured by the coefficient β:

$$F^S = F - \alpha Y^{GAP} - \beta CAD^{GAP}. \qquad (10)$$

Box 1. Absorption Gaps and Automatic Fiscal Stabilizers

The national account income identity:

$$Y + Y^F = A - CAD,$$

where Y is real GDP, Y^F is real net foreign incomes and transfers, A is real absorption, and CAD is the real current account deficit. This equation can be expressed in terms of deviations of individual variables from their equilibrium (potential or sustainable, indicated by the superscript "POT") levels:

$$(Y - Y^{POT}) + (Y^F - Y^{F,POT}) = (A - A^{POT}) - (CAD - CAD^{POT})$$

Assuming that the term $(Y^F - Y^{F,POT})$ is small can be neglected and re-arranging the different gaps gives:

$$(A - A^{POT}) \approx (Y - Y^{POT}) + (CAD - CAD^{POT}).$$

In words, an absorption gap will be either reflected in an output gap (internal imbalance) or a current account gap (external imbalance).

The underlying fiscal balance (as a ratio to potential GDP), F^S, can now be estimated using the definitional equation:

$$F = F^S + \alpha Y^{GAP} + \beta CAD^{GAP},$$

where F is the actual fiscal balance (as a ratio to actual GDP), the output gap (Y^{GAP}) and absorption gap (A^{GAP}) are expressed as ratios to potential GDP, and α and β are the automatic response coefficients of the actual fiscal balance to the two gaps. The output gaps for 2000–07 were estimated applying a Hodrick–Prescott filter over the period of 1995–2014. The current account gaps for 2000–07 were estimated as the deviation from the average current account balance during 1995–2014. The response coefficient α for each country is set equal to the average ratio of general government expenditure as a percent of GDP during 2000–07, and the response coefficient β is set equal to 0.20 for all countries.

Absorption gap experiences varied widely across the region. In the Baltics and Bulgaria, absorption booms financed by capital inflows not only resulted in large output gaps but also spilled over into large external imbalances (Figure 6), the process that got an additional boost from the procyclical effect of EU funds.[8] To a lesser extent, these experiences were also repeated in Bosnia and Herzegovina, Hungary, Romania, and Serbia. In Albania, Czech Republic, Poland, and Slovakia, absorption booms, and thus both internal and external imbalances, were largely contained. Finally, in some cases output gaps appear to have been driven by international commodity prices (Russia and Ukraine), as the current account position proved to be stronger than what would be expected based on the output gap.

Actual fiscal positions improved in most countries in the region during 2000–07. Pre-crisis fiscal headline balances were around zero in many countries in the region, indicating a significant strengthening of public finances since the early-2000s (Figure 7). By 2007, several countries—including Bosnia and Herzegovina, Bulgaria, Estonia, Montenegro, and Russia—were running large fiscal surpluses, while headline fiscal balances deteriorated only in Hungary and Romania.

Figure 6. Output and Absorption Gaps in emerging Europe countries, 2003-07
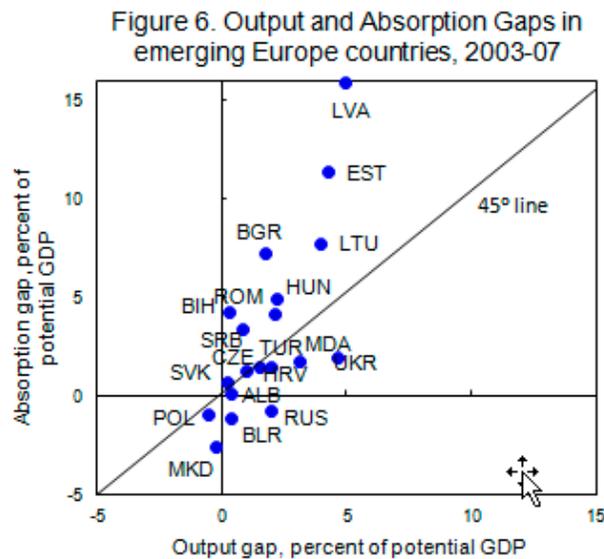
Source: WEO; and IMF staff calculations.

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[8] Rosenberg and Sierhej (2007) show that EU funds may have led to a fiscal drag of up to 1 percent of GDP and an additional aggregate demand stimulus of up to 1 percent of GDP during the first years of membership.

Figure 7: General Government Balance in emerging Europe Countries, 2000-10
(In percent GDP)

Headline
Cyclically adjusted (output gap)
Cyclically adjusted (output/external gaps)
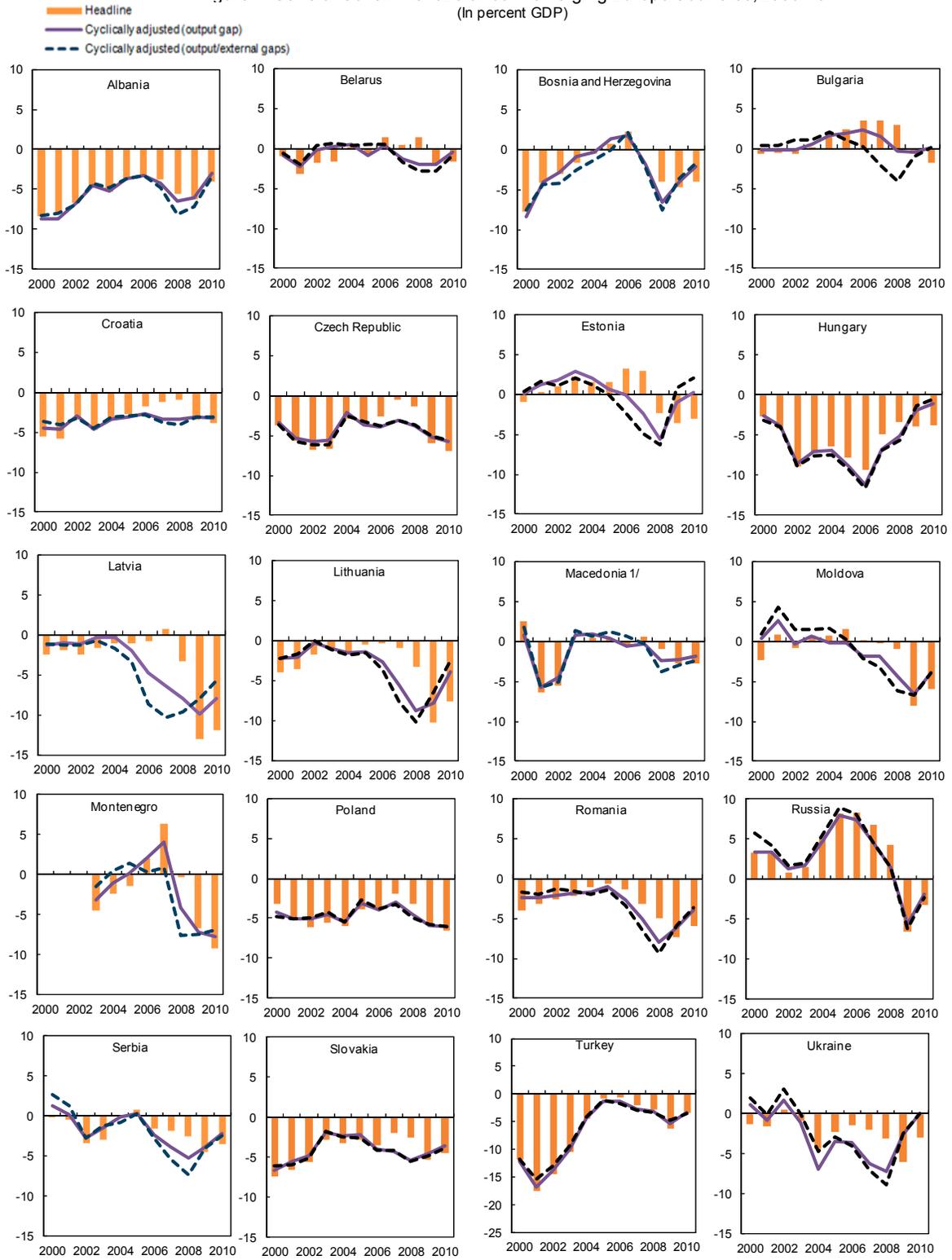
Sources: WEO; and IMF staff calculations.
1/ Public sector coverage is limited to central government.

However, once adjusted for cyclical factors, underlying fiscal positions looked much less healthy. Revenue booms seemed to have been the predominant force behind fiscal improvements in countries were growth was led by capital inflow-driven domestic absorption booms.[9] At the same time, the policymakers often failed to fully appreciate (in real time) the cyclical nature of the tax revenue buoyancy, or found it politically difficult to accumulate large fiscal surpluses in a catching-up economy, and allowed significant growth in government expenditures. As a result, notwithstanding significant strengthening of headline numbers, the pre-crisis fiscal policy stance was particularly procyclical in the Baltic countries as well as in Bulgaria, Hungary, Romania, Serbia, and Ukraine (Figure 8). On the other hand, improvements in cyclically-adjusted fiscal balances were pronounced in Turkey as well as in Albania, Bosnia and Herzegovina, Czech Republic, Macedonia, and Russia.[10,11]

Figure 8. Change in Cyclically-Adjusted General Government Balance (2000-03 vs. 2004-07, in percent of GDP)
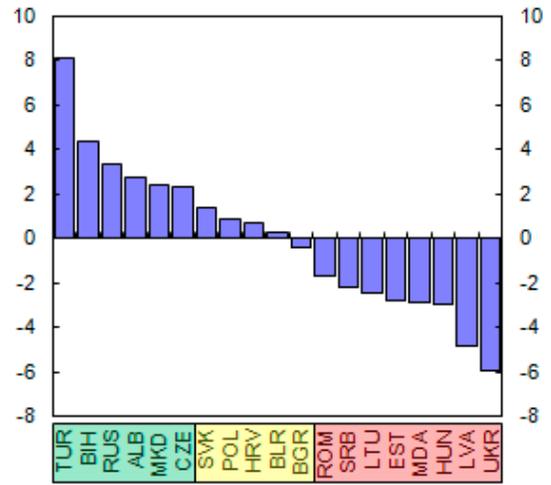
Sources: WEO; and IMF staff calculations

1/ Colors groupings correspond to fiscal stance positions: countercyclical (green), broadly neutral (yellow), and procyclical (red).

The bi-variate relationship between measures of the fiscal stance and capital inflows is sensitive to the measure of fiscal stance. Figure 9 plots average general government balances in 2000–07 against cumulative private capital inflows. On the one hand, countries that generally maintained stronger headline fiscal balance were also among those who attracted most of capital inflows, particularly in the form of debt inflows and foreign direct investment. On the other hand, there is some bi-variate evidence that capital inflows were more moderate to countries with tighter cyclically-adjusted fiscal balances, particularly if these were adjusted for both output and external gaps to capture effects of absorption booms on indirect taxes.

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[9] Rahman (2010) and Bakker and Gulde (2010) provide extensive discussions of the fiscal policy stance in emerging European countries during the absorption boom years.

[10] These examples of "countercyclical" policies in the boom years should be viewed in the context of relative performance vis-à-vis other regional peers. Most countries fed the windfall revenues from an unsustainable domestic demand boom back into excessive expenditure growth. Truly countercyclical policy in the boom years remained essentially an untried experiment.

[11] As Russia is an oil exporting country, the nonoil balance—rather than the overall balance—is a more appropriate benchmark of the underlying fiscal policy stance. Taking this measure, the fiscal stance of Russia was procyclical in the run-up to the crisis, as highlighted in a number of recent IMF Article IV Consultation reports.

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Figure 9.Capital Flows and Fiscal Policy Stance, 2000-07 1/
(In Percent of GDP)
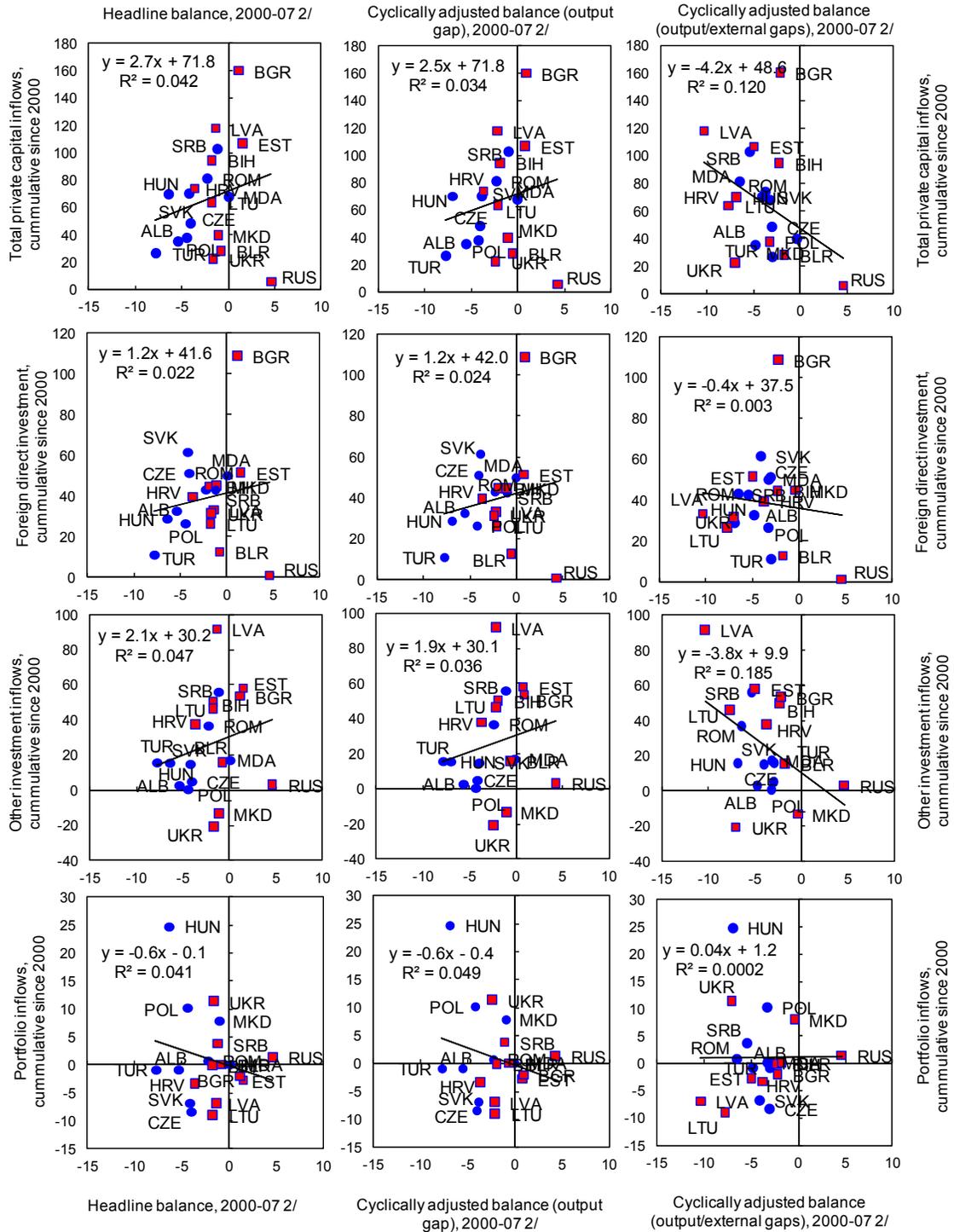
Source: WEO; and IMF staff calculations.
1/ The marker ■ denotes a fixed exchange rate regime and ● denotes a floating exchange rate regime.
2/ Period average; positive numbers refer to fiscal tightening.

D. Empirical Results

We estimate the reduced-form equation for capital inflows by OLS using annual data for 2000–07 for a panel of 19 emerging European countries. Capital inflows, expressed in net terms, were measured in dollars and deflated by the U.S. CPI index, to arrive at flows in real dollars, and then expressed as a fraction of 2000 GDP to facilitate cross-country comparisons. External returns were proxied by annualized 10-year German government bond nominal yields. The structural fiscal balance is measured by excluding automatic effects of both internal and external imbalances. To account for potential interactions between fiscal policy and monetary conditions, we estimate the model including an interaction term between the fiscal stance variable and a dummy variable for hard peg exchange rate regimes.[12]

Country-specific effects are treated as unobservable. These effects are estimated as the residual capital flows which are not accounted for by other variables in the model. As such, the country-specific intercepts would reflect not only country-specific characteristics (such as income level, population size, and geography), but also systematic differences in the investment climate or other policies, including prudential and regulatory financial sector policies. Following Fernandez-Arias (1996), to facilitate cross-country comparisons, without relying on an implausible assumption of structural similarity, all variables in the model are expressed in terms of their deviations from 2000 levels. This transformation eliminates structural differences across countries and the model explains the changes in capital inflows in terms of changes in the explanatory variables, taking 2000 as a benchmark.[13] In this setting, country-specific intercepts capture the portion of the increase (decrease) in capital inflows due to improvements (deterioration) in domestic investment climate in each country but would also help to control for cross-country differences in reliance on macro-prudential policies in leaning against the surge in capital inflows.

The findings confirm that both push and pull factors played a role in attracting capital inflows to emerging Europe countries. They also suggest the critical importance of properly accounting for the cyclical implications of absorption booms in assessing the role of fiscal policy in attracting capital inflows. The estimated parameter values for total private capital inflows are shown in regressions 1–4 in Table 1:

- There is strong empirical evidence that falling international returns have played a critical role in pushing capital flows to emerging markets in the region. The coefficient on German government bond yields is negative and highly significant with 100 basis points

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[12] Hard pegs are defined as arrangements characterized as currency board arrangement or conventional peg to a single currency/composite in the Fund's exchange rate regime classification.

[13] Model findings are robust to the choice of an alternative base year.

drop in international returns associated with about 8–15 percent of GDP higher capital inflows.

- Countercyclical fiscal policy is found to have a net dampening effect on capital inflows. The coefficient on cyclically adjusted fiscal balance is negative and significant. This implies that, notwithstanding its confidence-improving effect, tighter fiscal policy reduces demand and lowers overall returns in the economy which, in turn, attracts less capital. An improvement of the cyclically-adjusted fiscal balance of 1 percent of GDP is associated with 2–4 percent of GDP less capital inflows. This effect seems to hold irrespective of the exchange rate regime arrangement as the coefficient on the interaction term is negative (reinforcing the dampening effect of fiscal tightening), but is not statistically significant.[14]

- The measurement of the fiscal stance is critical for uncovering the effects of fiscal policy on capital inflows. If cyclical forces are not taken into account and headline fiscal balances are used in place of the structural fiscal balance (see regression 1), positive correlation between improvements in fiscal positions and capital inflow-financed absorption booms would (wrongly) suggest that policymakers need to loosen fiscal policy when confronted by large inflows. If cyclical forces are taken into account but the adjustment is missing additional revenues arising from external gaps (regression 2), the net dampening effect of fiscal consolidation is identified, but its magnitude is found to be notably smaller than for absorption-gap adjusted fiscal balances (regressions 3–4).

- The impact of country-specific factors is not consistently positive (see discussion below).

While regressions 4 in Table 1 are our preferred model specifications, a number of alternative model specification and statistical tests were run to test robustness of the empirical findings.

- Alternative model specifications produced qualitatively similar results. A measure of implied market volatility (VIX) has been added to the model (regression 5) to test if lower risk aversion, in addition to the search for higher yields, contributes to pushing capital flows to riskier destinations. While key conclusions remain the same, adding market volatility to the model drains the explanatory power from the international return variable, likely reflecting high degree of co-linearity between these two variables. To allow for heterogeneous effect of global liquidity conditions on flows to individual countries, we estimated a model with the international return variable interacted with

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[14] We also tested (results available upon request) for potential interactions between fiscal policy and capital account regulations by including an interaction term with overall index of capital controls (Mathisen and Mitra, 2010). While the sample size is significantly reduced due to data availability, there seems to be some evidence that capital controls somewhat reduce the dampening effects of fiscal policy on capital inflows.

country-specific effects (regression 6). Finally, the findings are also robust to
(i) inclusion of an interaction term between fiscal policy variable and a measure of
capital account restrictions (not significant) or initial per capita income (strong support
for downhill flows from rich to poor); and (ii) expanding the sample to 2008 or
restricting it to noncommodity exporters.[15]

- Results are robust to the use of proxies. Using U.S. government bond yields produces no
  change in qualitative conclusions presented in the paper but support for the "push" story
  is marginally weaker, likely reflecting strong regional nature of capital inflows to
  emerging Europe.

- Inconsistency due to nonstationarity is rejected by the Dickey-Fuller cointegration test
  ran on stacked vectors of within-country residual-based statistics.

- Serial autocorrelation of the disturbance term does not appear to be a problem based on
  Durbin-Watson statistic.

The estimated model can be used to decompose capital inflows into proximate causes. A
country-specific decomposition of the increase in total capital flows since 2000 is presented in
Table 2. This decomposition is based on the average of each explanatory variable (also
measured in terms of changes from its 2000 level) multiplied by the corresponding estimated
coefficient in the preferred model specification (regression 4). While reported averages are
useful to describe the qualitative characteristics of the surge in capital inflows, individual
contributions are important to understand heterogeneity of driving forces in each country. The
findings discussed below are based on the model for total private capital inflows but are
qualitatively similar with those obtained for individual types of inflows (Appendix):

- Falling international returns explain the lion share of the surge in capital inflows to
  emerging Europe countries. For an average country in the region, relative contributions
  of this explanatory variable capture 134 percent of the increase in foreign direct
  investment and 100 percent of the increase in other investment. However, falling
  international returns appear to have had very little bearing on private portfolio inflows to
  the region.

- Country-specific fixed effects are critical for understanding the cross-country differences
  in capital inflows. Bulgaria, Bosnia and Herzegovina, and Serbia appear to benefit the
  most, possibly reflecting significant improvements in investment climate, large scale
  privatization programs, rapid financial integration, and, for the latter two countries, the
  benefits of post-conflict normalization. For these countries, the magnitudes of country-
  specific effects are often twice as important as the contribution of falling international

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[15] These estimates are available upon request.

returns. To a lesser extent, these factors also helped pull capital to Estonia, Romania, Slovak Republic, and Turkey. Countries with negative fixed effects include not surprisingly countries with poor reform track-record and wide-spread governance problems (Belarus, Russia, and Ukraine). But the group also includes countries that are typically recognized for their strong investment environment (Czech Republic, Hungary, and Poland), probably reflecting the frontloaded nature of their structural reform efforts, greater initial capital-labor ratios, and a pronounced tilt in the structure of their inflows toward portfolio flows.

- Fiscal policy developments also plaid an important role in selected countries. The average fiscal policy effect for the region is relatively small (about 7 percent of total capital inflows), but this is misleading as it masks a wide variety of country-specific experiences that are as important as the two other factors discussed above. Procyclical fiscal policy—characterized by a deteriorating cyclically-adjusted fiscal stance—fueled aggregate demand and pulled in capital inflows to Hungary and Serbia and also to Latvia, Macedonia, and Ukraine, where the impact of loser fiscal stance was reinforced by fixed exchange rate regimes. By contrast, a prudent fiscal stance helped to mitigate capital inflows to Albania, Bosnia and Herzegovina, Slovak Republic, and Turkey.

E. Counterfactual Simulations

Simulations provide further insight into the role of fiscal policy in selected emerging European countries that experienced a particularly large surge in capital inflows. To this end, we did a counterfactual experiment that uses the estimated model to simulate what would have been the level of capital inflows would these countries have maintained a less procyclical fiscal stance. Specifically, we use the model's estimated coefficients (regression 4) and historical values for all explanatory variables, except for cyclically-adjusted fiscal balance for which we assume no change from its 2000 level, to construct predicted levels of total capital inflows in 2001–07 (Figure 10).

These simulations can only provide indications of the general direction of the impact of implemented policies, rather than their exact quantitative effect. With this important caveat in mind, the following observations highlight cross-country differences in the role of fiscal policy in managing capital inflows are worth noting.

- Preserving the cyclically adjusted fiscal balance at the 2000 levels in Bulgaria and Romania would have had very little effect on capital inflows as those appear to be driven by other factors than fiscal policy.

- Avoiding the fiscal expansions of 2005–07 in Estonia, Latvia, and Serbia would have significantly reduced the extent of capital inflows to these countries, but other factors have also been important in attracting capital.

- A large fiscal expansion in Hungary appears to be the main driving force of capital inflows during the boom years.

While these simulations suggest that a pronounced counter-cyclical fiscal stance would have been effective in leaning against surging capital inflows, the required magnitude of fiscal tightening for most countries would have been difficult to achieve for several reasons:[16]

- In practice, it was difficult to track capital inflows and absorption booms well in real time, as also illustrated by the wide misses of IMF forecasts during the capital inflow surge period (see Jaeger and Klemm, 2007).

- Even if it would have been possible to track developments well in real time, the implied magnitudes of fiscal tightening would have required strong political backing in a region where electorates had little sympathy for fiscal austerity "just as things start to get a bit better."

- And even if the political backing would have been in place, there could still have been significant implementation lags as regards the fiscal tightening, and the quality of the fiscal tightening might also have been less-than-optimal from a growth perspective.

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[16] Even if it could dampen capital inflows only so much, countercyclical fiscal policy helped deal with the consequences of "excessive" capital flows. Those countries that were running fiscal surpluses and accumulated large fiscal reserves during the boom phase were less vulnerable and they had more fiscal space than those countries that had a procyclical fiscal stance in the pre-crisis years.

Figure 10. Increase in Total Private Capital Inflows since 2000: Historical and Counterfactual
(Counterfactual scenario: no change in cyclically-adjusted fiscal balance since 2000)
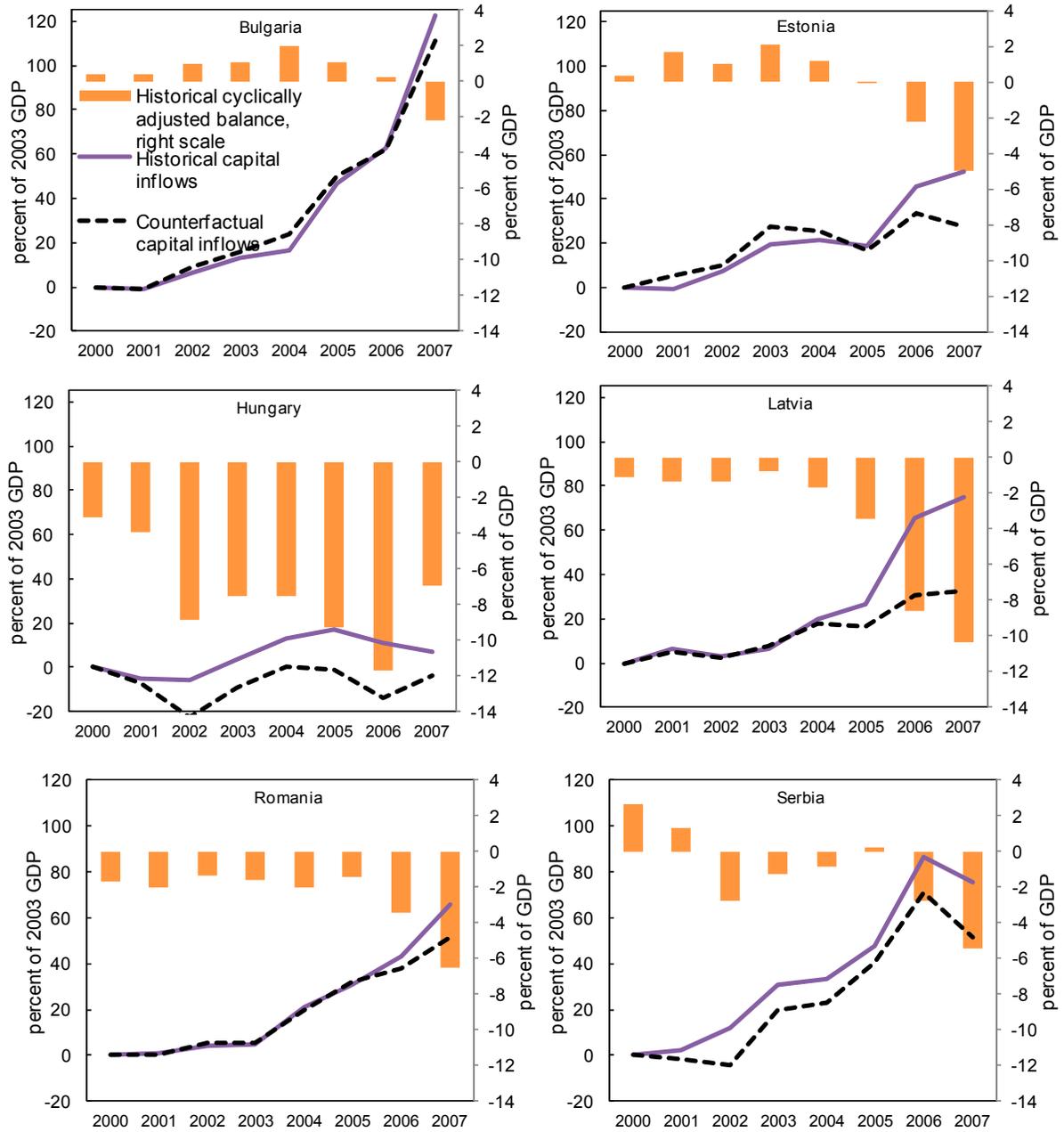
Sources: WEO; and IMF staff calculations.

F. Interpreting Policy: Historical vs. Real Time

The issue of what potential output or absorption was believed to be in real time, and what it is believed to be now, is important in terms of interpreting policy at the time. Indeed, our empirical investigation of the impact of the underlying fiscal policy stance on capital inflows hinges on estimates of output and current account gaps that make full use of today's information to estimate historical gaps. Policy makers and the private sector, however, may act on estimates based on much more limited real-time information. A number of studies has shown that real-time estimates of gaps can be different from those based on today's information (Orphanides (2001), and Nelson and Nikolov (2001)), and subsequent revisions of cyclical gaps are often large and in many cases change the real-time assessment in a qualitatively important way (Orphanides and van Norden (1999, 2001).

In this study, the use of HP filters to measure output gaps using a historical sample—including the massive drop in output in the aftermath of the 2008-9 crisis—mechanically leads to an estimated large drop in potential output before the crisis, and thus a large positive output gap. Similarly, estimates of the historical current account gap are also influenced by including the information on, in some cases, abrupt current account adjustments following the crisis. The result is a cyclically adjusted fiscal balance which, with the benefit of hindsight, may be more plausible from today's perspective but is likely different from the perception by policy makers and investors of the cyclically-adjusted fiscal balance in real time. In what follows, we investigate the robustness of the results with respect to this caveat by replicating the empirical analysis based on real-time data proxied by historical and projected data from the last pre-Lehman WEO vintage (Spring 2008).[17] While this approach may be not truly identical to the use of (unavailable) real-time data, it has an important advantage of omitting the abovementioned crisis effect from the data, producing notably more modest estimates of overheating in periods leading to the crisis (Figure 11). Accordingly, the extent of fiscal discipline relaxation (in cyclically adjusted terms), while still vivid in more extreme cases, could have been perceived to be less pronounced (Figure 12).

Empirical findings from a sample based on real-time data yield broadly similar results to those obtained based on historical data, although there are two important differences (Table 3). First, the dampening effect of the countercyclical fiscal policy on capital inflows is confirmed as the estimated coefficients on the cyclically-adjusted fiscal balance are uniformly negative. However, it is found to be statistically significant only when cyclical adjustment in addition to conventional adjustment for output gap also accounts for the current account gap. Thus, reliance on the conventional measure of the fiscal stance could have led observers to the misleading conclusion that fiscal policy is ineffective when leaning against capital inflows. Second, even if cyclical forces are properly accounted for, the estimated coefficient from the real-time sample suggests that fiscal policy offers smaller bang for the buck: a 1 percent improvement of the cyclically adjusted fiscal balance would reduce capital inflows only by about 2½ percent of GDP, compared with up to 4 percent of GDP based on the historical sample.

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[17] Alternatively, real-time data could be proxied by estimating cyclical gaps based on the truncated pre-crisis sample (1995-2007). This alternative approach yields qualitatively similar results, which are available upon request.

Figure 11: Historical vs. Real Time: Output Gaps in Emerging Europe Countries, 2000-07
(In percent GDP)
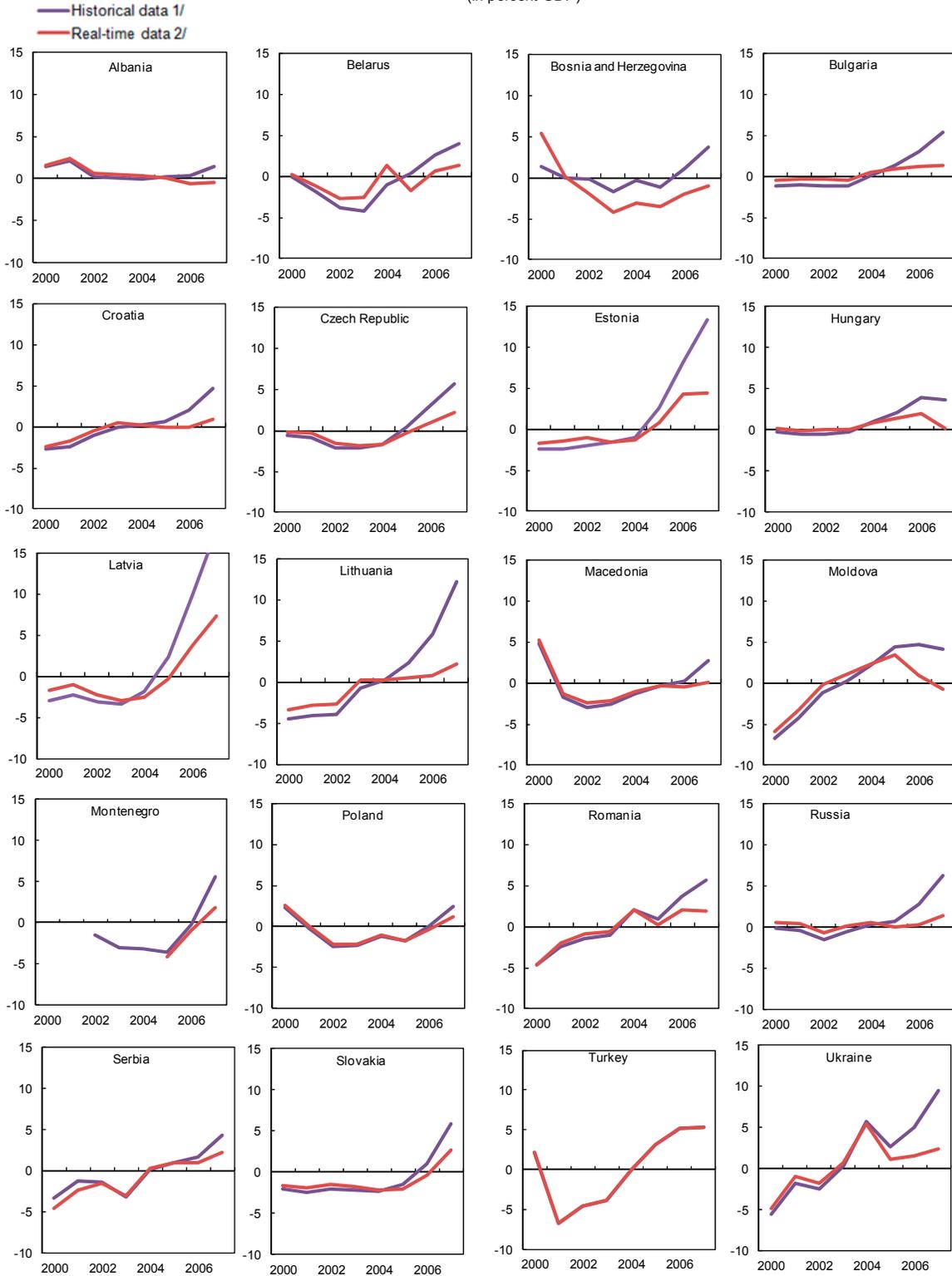
Sources: WEO; and IMF staff calculations.
1/ Output gaps were estimated based on the Fall 2010 WEO data over the full 1995-2014 sample.
2/ Output gaps were estimated based on the Spring 2008 WEO data over the full sample 1995-2013 sample.

Figure 12: Historical vs. Real Time: General Government Balance in Emerging Europe Countries, 2000-07
(In percent GDP)
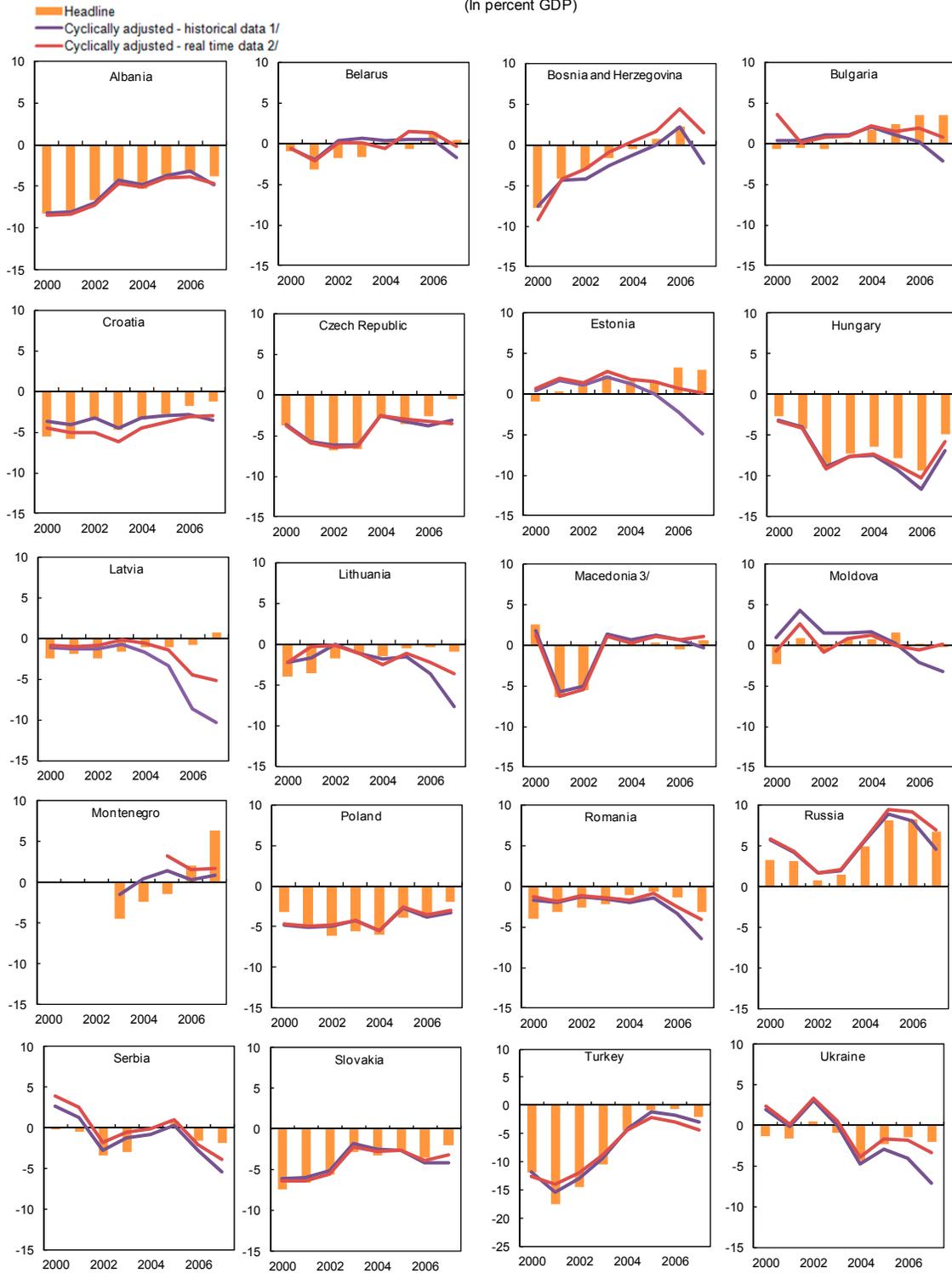
Sources: WEO; and IMF staff calculations.
1/ Output and current account gaps were estimated based on the Fall 2010 WEO data over the full 1995-2014 sample.
2/ Output and current account gaps were estimated based on the Spring 2008 WEO data over the full sample 1995-2013 sample.
3/ Public sector coverage is limited to central government.

G. Conclusions

Several lessons from the region are worth mentioning, particularly in light of the increasing evidence that current expansionary policies in advanced markets coupled with elevated risks and poor growth prospects at home are once again pushing a wall of global liquidity to emerging markets in Asia and Latin America in search for higher yields:

- Push factors seem to largely explain the surge in flows to emerging Europe before the global financial crisis. But local pull factors also played an important role in some countries.

- The effects of countercyclical fiscal policy put a brake on capital inflows, in line with conventional expectations, but only if the consolidation accounts for the effects of the output gap as well as cyclical movements in the external current account position.

- However, even a pronounced countercyclical fiscal policy stance, while likely being difficult to implement from a political economy point of view, would not have been effective in countering capital inflows flows of the magnitudes observed in many countries. Nevertheless, countercyclical fiscal policy would have helped to create fiscal space to mitigate the impact of the crisis.

- This suggests that other policy tools will need to play a complementary role in future capital inflow surges.

Table 1. Total Private Capital Inflows (percent of GDP) 1/ 2/

	Headline balance	Cyclically adjusted balance				
		Output gap	Output and external gaps			
	(1)	(2)	(3)	(4)	(5)	(6) 3/
Yield on GR Bond	-8.68 ***	-14.449 ***	-15.038 ***	-14.381 ***	4.175	…
	(3.046)	(2.542)	(2.269)	(2.355)	(4.651)	...
Volatility (VIX index)	…	…	…	…	-33.302 ***	…
	...	...	...	...	(8.255)	...
Fiscal balance variable	1.132	-2.447 ***	-3.828 ***	-2.953 ***	-2.889 ***	-2.724 **
	(0.695)	(0.787)	(0.715)	(0.981)	(0.929)	(1.221)
Interaction between fiscal balance and ER regime dummy 4/	…	…	…	-1.657	-1.264	-1.747
	...	...	...	(1.328)	(1.278)	(1.698)
Albania	-9.146 ***	-3.273	-0.619	-2.609	9.799 **	-11.376 ***
	(3.330)	(3.453)	(3.429)	(3.576)	(4.734)	(3.737)
Belarus	-2.605	-7.972	-8.097 *	-7.257	5.225	-6.999 **
	(5.123)	(5.101)	(4.616)	(4.461)	(4.801)	(3.225)
Bosnia and Herzegovina	5.004	24.324 ***	27.786 ***	33.055 ***	43.013 ***	-40.508 ***
	(4.351)	(5.804)	(5.486)	(7.266)	(7.421)	(7.505)
Bulgaria	26.123	25.044	21.794	22.625	35.179 **	-34.358 ***
	(16.368)	(17.006)	(14.522)	(14.554)	(15.023)	(9.973)
Croatia	0.895	-0.768	-2.79	-1.994	10.541 **	-12.357 ***
	(3.279)	(3.926)	(3.816)	(3.876)	(4.510)	(2.405)
Czech Republic	-6.562	-15.373 ***	-16.723 ***	-15.393 ***	-2.739	-0.749
	(5.057)	(4.641)	(4.161)	(4.307)	(4.880)	(1.219)
Estonia	10.596	9.382	4.462	4.753	17.622 ***	-17.623 ***
	(6.865)	(5.773)	(4.162)	(3.922)	(4.379)	(3.945)
Hungary	1.035	-22.528 ***	-29.376 ***	-24.417 ***	-11.494 *	4.136
	(6.250)	(6.362)	(6.168)	(6.946)	(6.514)	(5.304)
Latvia	17.806	10.539	1.429	-0.038	13.86 ***	-14.375 ***
	(10.845)	(8.242)	(5.417)	(4.787)	(4.751)	(4.320)
Lithuania	0.565	-2.473	-4.967	-4.501	8.266 *	-9.675 ***
	(5.322)	(4.364)	(3.648)	(3.654)	(4.632)	(1.445)
Macedonia, FYR	0.512	-15.792 ***	-22.189 ***	-23.692 ***	-9.773 **	1.44
	(6.211)	(4.270)	(4.457)	(5.035)	(4.886)	(2.455)
Moldova, Republic of	4.817	0.29	-0.578	0.486	13.121 *	-12.931 **
	(9.647)	(8.514)	(6.915)	(7.066)	(7.698)	(5.557)
Poland	-6.615	-14.761 ***	-13.122 ***	-12.881 ***	-0.308	-3.26
	(4.805)	(4.552)	(4.323)	(4.219)	(5.318)	(2.249)
Romania	12.607	8.345	4.145	5.694	18.365 ***	-19.978 ***
	(9.070)	(7.655)	(6.150)	(6.604)	(6.533)	(4.448)
Russian Federation	-0.907	-3.172	-9.105	-7.452	5.136	-9.216 **
	(5.283)	(5.521)	(5.804)	(5.711)	(5.822)	(3.581)
Serbia, Republic of	32.702 ***	18.174 *	7.893	12.376	25.264 **	-28.296 ***
	(11.841)	(10.162)	(8.994)	(9.741)	(9.974)	(7.015)
Slovak Republic	1.718	6.869	7.517	6.245	18.706 **	-18.113 ***
	(5.343)	(5.563)	(5.560)	(5.586)	(7.402)	(5.314)
Turkey	-13.635 ***	-1.507	5.856	1.72	13.969 *	-17.276 **
	(4.201)	(6.662)	(8.257)	(7.838)	(8.190)	(7.444)
Ukraine	0.387	-16.582 **	-23.552 ***	-25.645 ***	-11.203	7.761
	(6.611)	(6.778)	(7.705)	(8.589)	(9.216)	(6.436)
R squared	0.606	0.633	0.712	0.717	0.741	0.729
No. of observations	133	133	133	133	133	133

Sources: WEO; Bloomberg; and IMF staff calculations.
1/ All variables expressed as change since 2000.
2/ Standard error in parentheses.
3/ Country-specific effects are interacted with year-specific international returns.
4/ ER regime dummy = 1 if hard peg.
Note: * = 90%; ** = 95%; *** = 99% confidence level.

Table 2. Empirical Decomposition of Total Private Capital Inflows
(Percent of GDP)

	Increase in inflows	Country specific effects	Fiscal tightening 1/	Fiscal tightening in hard pegs 1/	Reduction in international returns
Albania	4.3	-2.60	-9.2	0.0	16.0
Belarus	8.2	-7.3	-1.1	-0.4	16.0
Bosnia and Herzegovina	22.4	33.05	-17.1	-9.6	16.0
Bulgaria	38.1	22.6	-0.4	-0.2	16.0
Croatia	13.2	-2.0	-0.7	-0.1	16.0
Czech Republic	2.7	-15.3	2.0	0.0	16.0
Estonia	23.4	4.8	1.7	0.9	16.0
Hungary	5.9	-24.4	14.2	0.0	16.0
Latvia	29.0	0.0	8.3	4.6	16.0
Lithuania	13.2	-4.5	1.0	0.6	16.0
Macedonia, FYR	5.6	-23.6	8.4	4.7	16.0
Moldova, Republic of	17.7	0.5	1.1	0.0	16.0
Poland	1.5	-12.8	-1.7	0.0	16.0
Romania	24.5	5.7	2.7	0.0	16.0
Russian Federation	10.4	-7.5	2.1	0.3	16.0
Serbia, Republic of	41.1	12.4	12.6	0.0	16.0
Slovak Republic	15.5	6.3	-6.8	0.0	16.0
Turkey	1.3	1.7	-14.9	0.0	16.0
Ukraine	9.6	-25.6	12.6	6.0	16.0
Average	15.1	-2.0	0.8	0.4	16.0
	100%	-13%	5%	2%	106%

Sources: WEO; Bloomberg; and IMF staff calculations.
1/ Cyclical adjustment of fiscal balances is based on output and external gaps.

Table 3. Historical vs. Real Time: Total Private Capital Inflows (percent of GDP) 1/ 2/

	Historcal data			Real-time data		
	Fall 2010 WEO Sample: 1995-2014			Spring 2008 WEO Sample: 1995-2013		
Yeild on GR Bond	-8.68 ***	-14.449 ***	-15.038 ***	-8.500 ***	-11.478 ***	-14.511 ***
	(3.046)	(2.542)	(2.269)	(2.782)	(2.695)	(2.352)
Headline fiscal balance	1.132	…	…	1.022	…	…
	(0.695)	…	…	(0.639)	…	…
Cyclically adjusted balance,	…	-2.447 ***	…	…	-0.370	…
output gap adjustment	…	(0.787)	…	…	(0.715)	…
Cyclically adjusted balance,	…	…	-3.828 ***	…	…	-2.498 ***
output gap and external gap adjustment	…	…	(0.715)	…	…	(0.762)
Country dummies included	Yes	Yes	Yes	Yes	Yes	Yes
R squared	0.606	0.633	0.712	0.637	0.631	0.669
No. of observations	133	133	133	133	133	133

Sources: WEO; Bloomberg; and IMF staff calculations.
1/ All variables expressed as change since 2000.
2/ Standard error in parentheses.
Note: * = 90%; ** = 95%; *** = 99% confidence level.

Appendix: Capital Flows by Type

As different types of capital inflows may react differently to changes in model determinants, we also estimate the model separately for foreign direct investment, private other capital flows, and portfolio flows (Tables A1–A3).

- The model's explanatory power is the greatest for other investments and foreign direct investment.

- The model is noticeably less successful in explaining private portfolio inflows, possibly reflecting a more speculative and event-driven nature of these flows. These appear to be driven by country-specific factors: country-specific intercepts for Hungary and Latvia are large and statistically significant.

- Large positive country-specific effects for Estonia, Latvia, and Slovakia suggest that post-2000 improvements in the investment climate played an important role in attracting other investment inflows to these countries. At the same time, lack of significant progress in this area appeared to lower FDI inflows to Russia and Moldova.

Tables A4-A6 provide results for empirical decomposition of individual types of capital inflows into proximate causes. The findings are qualitatively similar with those obtained for total capital inflows and discussed in the main text.

Table A1. Foreign Direct Investment (percent of GDP) 1/ 2/

	Headline balance	Cyclically adjusted balance				
		Output gap	Output and external gaps			
	(1)	(2)	(3)	(4)	(5)	(6) 3/
Yield on GR Bond	-4.364 **	-6.526 ***	-6.786 ***	-6.581 ***	4.868 *	…
	(1.745)	(1.416)	(1.352)	(1.419)	(2.648)	...
Volatility (VIX index)	…	…	…	…	-20.549 ***	…
	...	...	...	...	(4.459)	...
Fiscal balance variable	0.427	-0.914 ***	-1.47 ***	-1.197 ***	-1.157 ***	-1.061 **
	(0.376)	(0.300)	(0.317)	(0.393)	(0.368)	(0.408)
Interaction between fiscal balance and ER regime dummy 4/	…	…	…	-0.518	-0.276	-0.507
	...	...	...	(0.596)	(0.571)	(0.680)
Albania	-2.655	-0.46	0.614	-0.008	7.648 ***	-6.008 ***
	(2.180)	(2.236)	(2.230)	(2.149)	(2.579)	(1.716)
Belarus	-1.95	-3.963	-4.04	-3.777	3.925	-2.82 **
	(2.867)	(2.646)	(2.473)	(2.466)	(3.019)	(1.190)
Bosnia and Herzegovina	0.626	7.855 *	9.341 **	10.989 **	17.133 ***	-14.838 ***
	(3.915)	(4.429)	(4.394)	(5.263)	(5.297)	(4.282)
Bulgaria	16.593	16.188	14.934	15.194	22.94 **	-20.329 ***
	(10.297)	(10.525)	(9.532)	(9.642)	(9.896)	(6.962)
Croatia	-2.475	-3.096	-3.888	-3.639	4.096	-3.159 *
	(2.572)	(2.731)	(2.681)	(2.747)	(3.074)	(1.812)
Czech Republic	-3.336	-6.637 **	-7.214 **	-6.798 **	1.01	-0.976
	(3.023)	(2.859)	(2.854)	(2.900)	(3.225)	(2.308)
Estonia	1.608	1.156	-0.749	-0.658	7.283 **	-7.536 **
	(3.305)	(2.928)	(3.052)	(3.158)	(3.628)	(3.536)
Hungary	-1.633	-10.455 ***	-13.256 ***	-11.706 ***	-3.732	2.96
	(3.451)	(3.475)	(3.728)	(4.085)	(4.097)	(2.166)
Latvia	-2.194	-4.912 **	-8.475 ***	-8.933 ***	-0.358	0.621
	(3.170)	(2.479)	(2.254)	(2.292)	(2.502)	(1.440)
Lithuania	-3.05	-4.184 *	-5.175 **	-5.029 **	2.849	-1.835 **
	(2.180)	(2.225)	(2.410)	(2.502)	(2.857)	(0.853)
Macedonia, FYR	-0.185	-6.297 **	-8.848 ***	-9.319 ***	-0.73	0.216
	(4.050)	(3.100)	(3.128)	(3.210)	(3.014)	(1.571)
Moldova, Republic of	-4.053	-5.741	-6.126 *	-5.794 *	2.002	-1.749
	(4.184)	(3.739)	(3.115)	(3.200)	(3.551)	(2.025)
Poland	-5.271 **	-8.327 ***	-7.737 ***	-7.662 ***	0.096	-0.081
	(2.529)	(2.087)	(1.949)	(1.961)	(2.430)	(0.738)
Romania	4.41	2.817	1.165	1.649	9.467 ***	-8.697 ***
	(3.455)	(3.055)	(2.660)	(2.866)	(2.786)	(1.922)
Russian Federation	-4.565 **	-5.415 ***	-7.705 ***	-7.188 ***	0.579	-0.974
	(2.042)	(1.826)	(2.016)	(2.109)	(2.303)	(1.088)
Serbia, Republic of	12.357 **	6.919	2.859	4.261	12.213 **	-11.757 ***
	(5.327)	(4.624)	(4.417)	(4.624)	(5.085)	(4.176)
Slovak Republic	-3.212	-1.285	-0.993	-1.391	6.298 **	-4.42 ***
	(2.773)	(2.653)	(2.574)	(2.570)	(3.028)	(1.436)
Turkey	-4.187 *	0.349	3.282	1.989	9.547 ***	-8.179 ***
	(2.296)	(2.527)	(3.139)	(2.881)	(3.126)	(2.545)
Ukraine	4.749	-1.597	-4.421	-5.075 *	3.836	-3.223
	(4.021)	(3.128)	(3.027)	(3.041)	(3.251)	(2.859)
R squared	0.500	0.517	0.573	0.575	0.618	0.612
No. of observations	133	133	133	133	133	133

Sources: WEO; Bloomberg; and IMF staff calculations.
1/ All variables expressed as change since 2000.
2/ Standard error in parentheses.
3/ Country-specific effects are interacted with year-specific international returns.
4/ ER regime dummy = 1 if hard peg.
Note: * = 90%; ** = 95%; *** = 99% confidence level.

Table A2. Other Investments (percent of GDP) 1/ 2/

	Headline balance	Cyclically adjusted balance				
		Output gap	Output and external gaps			
	(1)	(2)	(3)	(4)	(5)	(6) 3/
Yield on GR Bond	-4.255 **	-8.198 ***	-8.564 ***	-8.015 ***	-1.917	...
	(2.119)	(2.040)	(1.842)	(1.782)	(3.778)	...
Volatility (VIX index)	...	...	...	...	-10.944 *	...
	...	...	...	...	(6.408)	...
Fiscal balance variable	0.895 *	-1.457 **	-2.295 ***	-1.565 **	-1.543 **	-1.342
	(0.461)	(0.650)	(0.564)	(0.632)	(0.617)	(0.844)
Interaction between fiscal balance and ER regime dummy 4/	...	...	...	-1.383	-1.254	-1.648
	...	...	...	(1.016)	(1.009)	(1.203)
Albania	-7.777 ***	-4.123 **	-2.512	-4.173 *	-0.095	-3.909
	(2.234)	(2.076)	(2.038)	(2.343)	(3.545)	(2.402)
Belarus	-0.672	-4.402	-4.488	-3.787	0.315	-4.141 *
	(3.113)	(3.327)	(3.054)	(2.885)	(3.399)	(2.488)
Bosnia and Herzegovina	3.169	15.608 ***	17.742 ***	22.14 ***	25.412 ***	-26.117 ***
	(3.516)	(4.380)	(3.662)	(5.167)	(5.684)	(4.874)
Bulgaria	7.9	7.14	5.19	5.883	10.009	-12.717 ***
	(6.930)	(7.310)	(6.077)	(5.928)	(6.578)	(3.956)
Croatia	3.587	2.531	1.313	1.978	6.097 *	-9.676 ***
	(2.496)	(2.893)	(2.959)	(2.855)	(3.481)	(1.524)
Czech Republic	-4.749	-10.651 ***	-11.482 ***	-10.372 ***	-6.213 *	1.035
	(3.553)	(3.393)	(2.947)	(2.950)	(3.465)	(1.136)
Estonia	13.935 *	13.259 *	10.303 *	10.546 *	14.776 **	-17.53 ***
	(8.088)	(7.302)	(6.086)	(5.686)	(6.573)	(4.843)
Hungary	-4.063	-19.603 ***	-23.771 ***	-19.632 ***	-15.386 ***	6.468 *
	(4.924)	(5.668)	(5.243)	(4.965)	(5.134)	(3.893)
Latvia	16.278 *	11.678 *	6.193	4.968	9.535 *	-12.124 ***
	(8.409)	(6.819)	(4.992)	(4.571)	(4.991)	(3.182)
Lithuania	6.088	4.277	2.769	3.158	7.354 *	-10.656 ***
	(5.061)	(4.286)	(3.343)	(3.038)	(3.859)	(1.683)
Macedonia, FYR	-0.342	-11.523 ***	-15.393 ***	-16.648 ***	-12.074 **	3.325
	(4.538)	(3.660)	(3.671)	(4.380)	(4.704)	(2.592)
Moldova, Republic of	8.646	5.999	5.459	6.347	10.499 **	-11.579 ***
	(5.805)	(5.332)	(4.439)	(4.484)	(5.109)	(4.176)
Poland	-0.535	-6.259	-5.291	-5.09	-0.958	-2.896
	(3.857)	(4.086)	(3.933)	(3.813)	(4.681)	(2.368)
Romania	7.524	4.85	2.317	3.61	7.774	-11.155 ***
	(6.195)	(5.383)	(4.557)	(4.713)	(5.232)	(3.229)
Russian Federation	3.076	1.483	-2.078	-0.698	3.438	-8.169 ***
	(4.067)	(4.310)	(4.549)	(4.275)	(4.792)	(2.405)
Serbia, Republic of	18.597 ***	9.125	2.92	6.661	10.896 *	-15.92 ***
	(6.251)	(5.814)	(5.304)	(5.504)	(5.590)	(3.068)
Slovak Republic	7.744	11.049 **	11.453 **	10.391 *	14.486 **	-15.804 **
	(5.219)	(5.546)	(5.623)	(5.646)	(7.010)	(6.262)
Turkey	-10.278 ***	-2.593	1.861	-1.592	2.434	-7.18
	(2.937)	(4.287)	(5.178)	(4.732)	(5.456)	(4.993)
Ukraine	-10.114 **	-20.882 ***	-25.115 ***	-26.862 ***	-22.116 **	16.982 ***
	(4.798)	(7.888)	(8.885)	(10.230)	(10.796)	(5.576)
R squared	0.585	0.601	0.666	0.675	0.681	0.696
No. of observations	133	133	133	133	133	133

Sources: WEO; Bloomberg; and IMF staff calculations.
1/ All variables expressed as change since 2000.
2/ Standard error in parentheses.
3/ Country-specific effects are interacted with year-specific international returns.
4/ ER regime dummy = 1 if hard peg.
Note: * = 90%; ** = 95%; *** = 99% confidence level.

Table A3. Portfolio Investments (percent of GDP) 1/ 2/

| | Headline balance | Cyclically adjusted balance | | | | |
| | | Output gap | Output and external gaps | | | |
	(1)	(2)	(3)	(4)	(5)	(6) 3/
Yield on GR Bond	-0.061	0.275	0.312	0.215	1.224	…
	(1.453)	(1.245)	(1.131)	(1.138)	(2.384)	...
Volatility (VIX index)	…	…	…	…	-1.81	…
	...	...	...	...	(3.062)	...
Fiscal balance variable	-0.19	-0.077	-0.063	-0.192	-0.188	-0.32 *
	(0.218)	(0.234)	(0.185)	(0.178)	(0.177)	(0.177)
Interaction between fiscal balance and ER regime dummy 4/	…	…	…	0.244	0.266	0.408
	...	...	...	(0.335)	(0.332)	(0.318)
Albania	1.286	1.31	1.279	1.572	2.246	-1.459 ***
	(1.087)	(1.002)	(1.099)	(1.116)	(1.872)	(0.519)
Belarus	0.017	0.393	0.43	0.307	0.985	-0.038
	(1.599)	(1.334)	(1.234)	(1.245)	(2.000)	(0.117)
Bosnia and Herzegovina	1.208	0.862	0.703	-0.074	0.467	0.447
	(0.860)	(1.235)	(1.182)	(1.876)	(2.363)	(1.316)
Bulgaria	1.631	1.717	1.67	1.548	2.23	-1.312 *
	(1.507)	(1.463)	(1.503)	(1.501)	(2.172)	(0.738)
Croatia	-0.218	-0.202	-0.216	-0.333	0.348	0.479
	(1.346)	(1.368)	(1.364)	(1.365)	(2.053)	(0.423)
Czech Republic	1.523	1.914	1.973	1.777	2.465	-0.808
	(2.066)	(1.942)	(1.780)	(1.810)	(2.432)	(1.128)
Estonia	-4.948	-5.033	-5.092	-5.135	-4.436	7.442
	(5.554)	(5.520)	(5.552)	(5.527)	(5.371)	(5.754)
Hungary	6.731 **	7.529 **	7.652 ***	6.921 **	7.624 **	-5.293 ***
	(3.323)	(3.238)	(2.889)	(2.858)	(3.492)	(1.760)
Latvia	3.723 **	3.773 **	3.711 *	3.927 **	4.682 *	-2.872 **
	(1.723)	(1.883)	(1.902)	(1.977)	(2.569)	(1.113)
Lithuania	-2.474	-2.565	-2.561	-2.63	-1.936	2.815 ***
	(1.777)	(1.924)	(1.885)	(1.852)	(2.476)	(0.923)
Macedonia, FYR	1.039	2.028	2.053	2.275	3.031	-2.101 ***
	(2.619)	(2.021)	(1.873)	(1.948)	(2.521)	(0.799)
Moldova, Republic of	0.223	0.033	0.09	-0.067	0.619	0.398 **
	(1.151)	(1.477)	(1.301)	(1.315)	(2.060)	(0.200)
Poland	-0.808	-0.175	-0.093	-0.129	0.554	-0.283
	(2.194)	(1.846)	(1.712)	(1.714)	(2.356)	(1.312)
Romania	0.674	0.679	0.663	0.435	1.123	-0.125
	(1.322)	(1.433)	(1.399)	(1.398)	(2.126)	(0.455)
Russian Federation	0.582	0.76	0.678	0.434	1.118	-0.073
	(1.571)	(1.414)	(1.508)	(1.516)	(2.207)	(0.648)
Serbia, Republic of	1.748	2.13	2.115	1.454	2.155	-0.618
	(2.314)	(2.298)	(2.168)	(2.001)	(2.643)	(0.818)
Slovak Republic	-2.815	-2.895	-2.943	-2.756	-2.078	2.112 *
	(1.774)	(1.848)	(1.890)	(1.899)	(2.532)	(1.233)
Turkey	0.829	0.737	0.713	1.322	1.988	-1.917 *
	(1.208)	(1.127)	(1.242)	(1.332)	(1.947)	(1.049)
Ukraine	5.753 *	5.897	5.984	6.293	7.078	-5.998 ***
	(3.458)	(3.887)	(3.635)	(3.952)	(4.435)	(1.898)
R squared	0.311	0.308	0.308	0.310	0.312	0.452
No. of observations	133	133	133	133	133	133

Sources: WEO; Bloomberg; and IMF staff calculations.
1/ All variables expressed as change since 2000.
2/ Standard error in parentheses.
3/ Country-specific effects are interacted with year-specific international returns.
4/ ER regime dummy = 1 if hard peg.
Note: * = 90%; ** = 95%; *** = 99% confidence level.

Table A4. Empirical Decomposition of FDI Inflows
(Percent of GDP)

	Increase in inflows	Country specific effects	Fiscal tightening 1/	Fiscal tightening in hard pegs 1/	Reduction in international returns
Albania	3.6	0.0	-3.7	0.0	7.4
Belarus	3.0	-3.8	-0.4	-0.1	7.4
Bosnia and Herzegovina	8.4	11.0	-6.9	-3.0	7.4
Bulgaria	22.3	15.2	-0.1	-0.1	7.4
Croatia	3.4	-3.6	-0.3	0.0	7.4
Czech Republic	1.4	-6.8	0.8	0.0	7.4
Estonia	7.7	-0.7	0.7	0.3	7.4
Hungary	1.4	-11.7	5.7	0.0	7.4
Latvia	3.3	-8.9	3.4	1.4	7.4
Lithuania	2.9	-5.0	0.4	0.2	7.4
Macedonia, FYR	2.9	-9.3	3.4	1.5	7.4
Moldova, Republic of	2.0	-5.8	0.4	0.0	7.4
Poland	-1.0	-7.7	-0.7	0.0	7.4
Romania	10.1	1.7	1.1	0.0	7.4
Russian Federation	0.9	-7.2	0.9	0.1	7.4
Serbia, Republic of	16.7	4.3	5.1	0.0	7.4
Slovak Republic	3.2	-1.4	-2.7	0.0	7.4
Turkey	2.7	2.0	-6.0	0.0	7.4
Ukraine	9.4	-5.1	5.1	1.9	7.4
Average	5.5	-2.3	0.3	0.1	7.4
	100%	-41%	6%	2%	134%

Sources: WEO; Bloomberg; and IMF staff calculations.
1/ Cyclical adjustment of fiscal balances is based on output and external gaps.

Table A5. Empirical Decomposition of Other Investment Inflows
(Percent of GDP)

	Increase in inflows	Country specific effects	Fiscal tightening 1/	Fiscal tightening in hard pegs 1/	Reduction in international returns
Albania	-0.1	-4.2	-4.9	0.0	9.0
Belarus	5.2	-3.8	-0.6	-0.3	9.0
Bosnia and Herzegovina	14.0	22.1	-9.0	-8.0	9.0
Bulgaria	14.5	5.9	-0.2	-0.2	9.0
Croatia	10.4	2.0	-0.3	-0.1	9.0
Czech Republic	-0.3	-10.3	1.1	0.0	9.0
Estonia	21.2	10.5	0.9	0.8	9.0
Hungary	-3.1	-19.6	7.5	0.0	9.0
Latvia	22.2	5.0	4.4	3.9	9.0
Lithuania	13.1	3.2	0.5	0.5	9.0
Macedonia, FYR	0.7	-16.6	4.5	3.9	9.0
Moldova, Republic of	15.9	6.4	0.6	0.0	9.0
Poland	3.0	-5.1	-0.9	0.0	9.0
Romania	14.0	3.6	1.5	0.0	9.0
Russian Federation	9.1	-0.7	1.1	0.3	9.0
Serbia, Republic of	22.3	6.7	6.7	0.0	9.0
Slovak Republic	15.8	10.4	-3.6	0.0	9.0
Turkey	-1.4	-1.6	-7.9	0.0	9.0
Ukraine	-5.7	-26.8	6.7	5.0	9.0
Average	9.0	-0.7	0.4	0.3	9.0
	100%	-8%	5%	3%	100%

Sources: WEO; Bloomberg; and IMF staff calculations.
1/ Cyclical adjustment of fiscal balances is based on output and external gaps.

Table A6. Empirical Decomposition of Portfolio Investment Inflows
(Percent of GDP)

	Increase in inflows	Country specific effects	Fiscal tightening 1/	Fiscal tightening in hard pegs 1/	Reduction in international returns
Albania	0.7	1.6	-0.6	0.0	-0.2
Belarus	0.1	0.3	-0.1	0.1	-0.2
Bosnia and Herzegovina	0.0	-0.1	-1.1	1.4	-0.2
Bulgaria	1.3	1.6	0.0	0.0	-0.2
Croatia	-0.6	-0.3	0.0	0.0	-0.2
Czech Republic	1.7	1.8	0.1	0.0	-0.2
Estonia	-5.4	-5.1	0.1	-0.1	-0.2
Hungary	7.6	6.9	0.9	0.0	-0.2
Latvia	3.5	3.9	0.5	-0.7	-0.2
Lithuania	-2.9	-2.6	0.1	-0.1	-0.2
Macedonia, FYR	1.9	2.3	0.5	-0.7	-0.2
Moldova, Republic of	-0.2	-0.1	0.1	0.0	-0.2
Poland	-0.5	-0.1	-0.1	0.0	-0.2
Romania	0.4	0.4	0.2	0.0	-0.2
Russian Federation	0.4	0.4	0.1	0.0	-0.2
Serbia, Republic of	2.0	1.5	0.8	0.0	-0.2
Slovak Republic	-3.4	-2.8	-0.4	0.0	-0.2
Turkey	0.0	1.3	-1.0	0.0	-0.2
Ukraine	5.9	6.3	0.8	-0.9	-0.2
Average	0.7	0.9	0.1	-0.1	-0.2
	100%	138%	8%	-8%	-37%

Sources: WEO; Bloomberg; and IMF staff calculations.
1/ Cyclical adjustment of fiscal balances is based on output and external gaps.

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