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Portfolio and Short-term Capital Inflows to the New and Potential EU Countries: Patterns, Determinants and Policy Responses

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Abstract

In this paper we estimate a dynamic panel model (Arellano-Bond GMM) explaining the volume of portfolio and short-term capital inflows (predominantly bank loans) in the new and potential EU member States as a function of a set of variables representing macroeconomic fundamentals (both domestic and foreign), macroeconomic policies and development of the financial sector. We find that while inflows of short-term bank loans are significantly explained by macroeconomic factors, exchange rate regime and liquidity of the banking sector, portfolio inflows seem to be meaningfully influenced only by the level of foreign GDP. We suggest two explanations for the latter result. First, the inability of aggregate data to capture the risk and expected profitability dimensions that typically underlie portfolio decisions. Second, portfolio capital in the form of bonds might react to interest rates other than the domestic and the European ones.

During the last decade, the volume of short-term capital in the form of bank loans to the New and potential member States increased (with some heterogeneity across countries). In light of the econometric results, their vulnerability to reversals could be mitigated by adequate macroeconomic policies and further improvement of their financial sector.

JEL Classification Numbers: E44, F32, F41, P34
Keywords: Capital inflows, EU enlargement, policy responses, portfolio investment, dynamic panel estimation.
1. Introduction

The present study aims to analyze the patterns and the determinants of inflows of short-term and portfolio investment in the new and potential EU countries together with their macroeconomic performance during the last decade and the macroeconomic policy responses adopted by the recipient countries.

To our knowledge, the majority of the existing studies concerning the determinants of capital flows focus on foreign direct investment, which is considered the most stable component of total capital flows and, therefore, the more desirable. Attracting FDI is important because it is generally associated with positive spillovers such as transmission of managerial skills and technology transfer to the recipient countries. (Kinoshita & Campos (2004), Gastanaga, Nugent, Pashamova (1998), Cuyvers, Plasmans, Soeng, Van den Bulcke (2008), Bevan & Estrin (2004))

The present work focuses on short-term and portfolio capital flows. We think that in order to adequately manage the inflows of foreign capital, it is very important to consider the factors that drive volatile capital to a country in the first place.

Moreover, following Montiel and Reinhart (1999 and 2001) and Buch and Lusinyan (2002), we investigate the effect of government’s policies on the magnitude and composition of capital flows. Government policies might be very important not only to

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1 The new member countries are: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Slovenia. The potential member countries of South-Eastern Europe are: Albania, Croatia, Macedonia, Montenegro and Serbia. Among them, Croatia and Macedonia are official candidates for EU membership.


determine the magnitude of capital inflows in a particular country, but also the quality of such inflows: policies can influence the share of short-term debt of total inflows and they can explain why different types of flows go to different countries. (Carlson & Hernandez (2002)).

The scope of our research is threefold. First, we aim to investigate the trends and patterns of short-term capital inflows in the new and potential EU member countries: in particular, we will examine the extent to which capital inflows in the potential and candidate countries of South-Eastern Europe benefited from the recent EU membership of the Central and Eastern European countries. Secondly, we want to investigate the macroeconomic context in which the recent surge in short term capital inflows took place, and the evolution of indicators of financial sector stability in the recipient countries. Third, we want to investigate the factors driving short-term capital flows and portfolio flows in the countries of interest adopting a “push-pull” framework, emphasizing the role of government policy and financial sector development in shaping the magnitude and the composition of capital inflows. “Pull” factors include the internal characteristics of a country that determine its attractiveness to international investors, like macroeconomic performance, development of the banking sector and institutional quality. External, or “push”, factors originate outside the boundary of a country: high availability of capital and low interest rates in industrial countries “push” capital towards developing countries, for diversification or speculative purposes. (Montiel & Reinhart (1999))

Distinguishing between push and pull factors is important because it allows to understand whether capital flows are driven by internal characteristics of a country, which strictly depend on economic policy and institutional development, and therefore are under direct control of the country’s authorities, or by external factors (and therefore out of the control of the country’s authorities).

The rest of the paper is organized as follows. Section 2 describes the major features of capital inflows and the importance of studying the ones with short-term maturity because of the potentially disruptive effects they can exert on the recipient economy.
In section 3 we show the trends and patterns of short-term capital inflows to the new and potential EU member countries in the last two decades. Examining the composition of the inflows of capital, we find potential member economies less exposed to short-term capital.

We then turn in section 4 to illustrate the recent macroeconomic performance of the considered countries and the stability of their financial sector. In particular, we find that large current account deficits and massive reserves accumulation have accompanied large inflows of short term capital. We also describe the policy responses available to the authorities and we investigate the extent of their implementation.

Section 5 is devoted to the analysis of the factors driving short-term capital inflows to the countries of interest. First, a brief review of the existing studies is presented. Then, the methodology and the results of our econometric analysis are exposed.

Section 6 concludes.

2. About capital inflows

The countries of Central and Eastern Europe have attracted increasing amounts of capital since the beginning of their transition towards a market economy at the end of the 1980s. The fall of the Berlin Wall and the disruption of the Soviet bloc opened the capital markets of eastern European countries to international investors seeking new investment opportunities motivated by strategic, speculative or diversification purposes. Capital account liberalization occurred at different pace in the ex-Soviet countries, depending on the internal economic conditions and level of macroeconomic development. After current account convertibility was achieved as a condition for IMF membership between 1994 and 1996 and after OECD membership led many countries (Czech Republic, Hungary, Poland, and the Slovak Republic) to liberalize their capital account, EU membership dictated full capital account liberalization in all the new member countries.3

3 The Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic and Slovenia joined the EU in 2004, while Bulgaria and Romania joined in 2007.
International investors, attracted by the prospect of economic restructuring and expectations of future economic growth in the region, injected large amounts of capital. According to the IMF\textsuperscript{4}, in 1989 net capital flows in the region as a whole amounted to 535.5 billion US dollars; after a decade, they reached 653.6 billion US dollars and in 2008 they amounted to 2,309.1 billion US dollars, certainly influenced by the recent membership in the European Union of the ex-Soviet states.

The IMF classifies the items in the Financial Account of the Balance of Payments into three major categories according to the type of traded instruments and duration of the investment. The items of each category are then classified directionally under Assets and Liabilities (except for the category Direct Investment, where the distinction is made between Abroad and In the Reporting Economy), according to the direction of the flows. The “Assets” aggregate (or “Abroad” in the case of Direct Investment) refers to investments abroad originating from residents of a country, while the aggregate “Liabilities” (or “In the Reporting Economy” in the case of Direct Investment) refers to investments originating in foreign countries. Table 1 in the Appendix illustrates the characteristics of each of the three categories. Foreign Direct Investment (FDI) implies a long-term relationship between a foreign investor and a domestic firm, and a significant degree of influence of the former on the latter. The foreign investor takes an ownership position in the domestic firm, and contributes essentially to its management.

Portfolio Investment comprises instruments such as equity and debt securities, generally acquired by small investors with purposes of portfolio diversification. Therefore, portfolio investors cannot control the domestic firm. The category Other Investment includes all instruments not comprised in the first two categories such as bank loans, transactions in currency and deposits, and trade credits which do not imply a long lasting relationship or a significant influence of the foreign investor on the recipient of the investment.

Table 2 illustrates the evolution of the three major categories of capital flows as a percentage of regional GDP in the Western Hemisphere (i.e. Latin American countries),

\textsuperscript{4}World Economic Outlook (October 2008)
the CIS (including Mongolia) and the Central and Eastern European Countries (CEECs). While in the period 1994-1998 figures for the CEECs resemble in sign and magnitude the ones of the other two regions (except for the category of Other net Inflows), the next two sub-periods reveal a tendency of increased inflows of all three forms of capital in the CEECs that overtake the ones in the other two regions. This is particularly the case for the sub-period 1999-2003: while Latin America and the CIS experience outflows of portfolio and other capital, the CEECs continue to exhibit positive figures.

Transfer of capital to developing and transition economies does not only entail benefits for investors seeking perspectives of higher profitability, but it is also beneficial for the recipient countries. Capital inflows promote an efficient international allocation of capital and, through the channel of increased consumption and investment, they accelerate the growth and convergence process (Von Hagen & Siedschlag (2008)). Nevertheless, the attractiveness of large (and especially highly volatile) capital flows must be weighed against the potentially destabilizing effect they exert on the real economy. Capital inflows exert an expansionary effect on aggregate demand in that they foster consumption and investment: consumption and credit booms are often associated with phenomena of large capital inflows, together with a consequent rise in inflation. The increased demand of national currency from the foreign investors puts upward pressure on the recipient country’s exchange rate, leading to a real exchange rate appreciation. This, combined with the increased aggregate demand, leads to a deterioration of the current account. Moreover, as capital continues to flow in and the exchange rate appreciates, the domestic interest rate is likely to fall, making investment in the recipient economy less attractive in the eyes of international investors. Therefore, sudden stops and reversals (i.e. net outflows) of short-term capital inflows are likely to take place because (as opposed to FDI) they do not involve “disinvestment” costs and can thus easily be reversed. These theoretical findings are confirmed by empirical studies: Rodrik and Velasco (1999) show that countries with a high share of foreign short-term liabilities are three times more

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5 The CEE group includes: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, and Slovenia.
exposed to sudden capital flows reversals; Carlson and Hernandez (2002) find that while during the Asian crisis the amount of short-term debt does not matter in explaining the severity of the crisis, the ratio of short-term debt is important in explaining the severity of the Mexican crisis. The consequences of sudden stops and reversals of capital flows are dramatic for emerging markets, because they have to cope with a sudden collapse in output and a contraction of credit, lose their access to the capital markets and see the range of the available policy options widely reduced (Reinhart and Guillermo (2000)).

3. The experience of the new and potential EU member countries

In this section we show the trend and patterns of foreign short-term capital inflows (i.e. Portfolio and Other Inflows) of the last two decades. As our aim is to investigate the reasons behind the decision of foreign investors to invest in the new and potential EU countries, we focus our attention on items of the balance of payments concerning foreigners’ investment in the recipient countries. Therefore, according to the previously illustrated classification of the IMF, we consider the items “Portfolio Investment Liabilities” and “Other Investment Liabilities” in the financial account, hence excluding investments abroad made by residents.6

Figures 1(a) to 1(c) depict the trends of short-term net capital inflows (obtained as the sum of portfolio and other investment liabilities) as a percentage of national GDP in the new and potential EU countries.

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6 All data concerning capital inflows are taken from the IMF’s International Financial Statistics Database.
Figure 1

a) Short-term capital inflows as a percentage of GDP – EU members

![Graph showing short-term capital inflows as a percentage of GDP for EU members.]

Source: Author’s calculations based on IFS dataset

b) Short-term capital flows as a percentage of GDP – EU members

![Graph showing short-term capital flows as a percentage of GDP for EU members.]

Source: Author’s calculations based on IFS dataset
Three major facts draw our attention. First, figure 1(b) shows that, among the new members, the Baltic countries exhibit a similar increasing trend of short-term capital inflows. These countries never experienced net outflows of short-term capital since the beginning of the 1990s and the magnitude of inflows intensifies in the new millennium. Second, figure 1(a) reveals dispersion in the magnitude of short-term inflows to the new member countries of Central Europe. In particular, during the last years of the past century, the Czech and Slovak Republics experienced higher inflows, whereas countries like Bulgaria, Hungary and Poland exhibit lower inflows with some episodes of capital outflow (in Bulgaria, from 1993 to 1996 and again in 1998; in Poland in 1994 and in 1996; in Hungary, in 1996 and 1997). Slovenia and Romania are somewhat in the middle: Romania, in particular, exhibits a small episode of capital outflow at the end of the century. From 2003 on, short-run capital is increasing in all countries with exception of an abrupt drop in the Slovak Republic in 2006.

*Source:* Author’s calculations based on IFS dataset
Third, figure 1(c) reveals a more stable pattern of short-term capital inflow in the potential member countries. Among the set of countries, Croatia exhibits the largest volume of capital inflows, while Macedonia is the only country experiencing a (small) capital outflow in 2002. Moreover, these countries show no tendency towards an increase in capital inflows after 2004 (year in which many Central and Eastern European countries obtained EU membership), revealing that foreign investors weren’t influenced by the EU enlargement in their investment decisions with respect to Southern European countries. On the other hand, figures 1a and 1b reveal significant increases in inflows of short-term capital in the new member states during the years of the run-up to EU membership. Nevertheless, the pattern of short-term capital inflows in the potential members between 2002 and 2007 is very similar to that of the new members between 1998 and 2002 (the pre-accession period): the volume of inflows is, on average, less than 15% of GDP and it exhibits a similar volatility. The recent financial crisis had a strong impact on capital inflows to the new and potential member countries. IMF projections foresee, for Emerging Europe as a whole, a significant reduction in net FDI inflows, and a net outflow of portfolio and other forms of investment in 2009 and 2010 (World Economic Outlook, April 2009).

Figure 2 portrays the evolution of the composition of capital inflows in the single countries. As we can observe, it is difficult to draw a general pattern, because the composition of capital inflows is very country-specific. Some of the member countries such as Latvia, Lithuania (except for an inversion of tendency from 1999 to 2003) and Slovenia exhibit an average predominance of inflows of capital other than portfolio investment during the whole sample period. Portfolio inflows are, in general, less predominant, except for Hungary, Lithuania in 2000 and 2001, Poland in 2004 and 2005, Slovak Republic in 1993 and 1994 and Slovenia in 1996. Most of the countries exhibit an increase in the share of foreign direct investment inflows between the end of the XX century and the beginning of the new millennium. Nevertheless, in the most recent years, FDI inflows dominate the scene only in Bulgaria, in the Czech Republic and Hungary.

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7 Due to limited data availability, we had to restrict our analysis to seven years and to exclude Montenegro.
Other investment inflows are predominant in the rest of the countries. The potential member countries exhibit on average a smaller share of portfolio inflows: Croatia is the country that between 1996 and 2006 received the highest share of portfolio inflows. Foreign direct investment is predominant in Albania, in Macedonia in 2001, 2002 and 2006. In Croatia, FDI took a larger share of total inflows in the first two years of the 1990s and between 1998 and 2001. Other investment inflows constitute a consistent share of total inflows in all countries, although outflows are registered in Croatia in the beginning of the 1990s and in Macedonia in 2002.

Nevertheless, grouping portfolio and other investment in the broader category of short-term investments, we notice that in the recent years this category is predominant in most of the countries (except for Albania, Bulgaria, Hungary and Macedonia, where FDI is preponderant). All in all, we can observe that the potential member countries are on average less exposed to short-term capital inflows, while many of the new member countries rely heavily on this form of financing. This makes the new member states more vulnerable to the recent financial turmoil: the three Baltic countries (which present the highest share of other investment inflows in total inflows) have been heavily hit by the crisis, and they exhibit the sharpest fall in GDP of the entire region (-15.6% in Estonia, -18% in Latvia and -12.6% in Lithuania).8

4. Effects of capital inflows and policy responses

4.1 The real economy and the financial sector

Capital inflows entail both positive and negative effects on the recipient economy. On one side, they are beneficial in that they foster consumption and investment, therefore encouraging economic growth. On the other side, large capital inflows (especially if consisting of conspicuous shares of short-term capital) might exert a destabilizing effect on the real economy and on the financial sector. (Von Hagen & Siedschlag (2008), López-Mejia (1999))

8 The Economist, May 16th 2009, p.33
First of all, large inflows of capital cause an expansion of aggregate demand, which is likely to be followed by exchange rate appreciation, deterioration of the current account and inflationary pressures. Aggregate demand expands because the increased availability of capital leads to an expansion of domestic credit that can be directed to consumption smoothing or to new investment projects, thereby reducing domestic savings and deteriorating the current account. The monetary consequences of a positive shock to the balance of payments depend crucially on the exchange rate regime: if the exchange rate is free to float, capital inflows lead to nominal appreciation of the domestic currency and a consequent current account deficit (while foreign reserves and monetary aggregates remain unaffected). Under fixed exchange rate, the authorities must increase the money supply (i.e. lower the domestic interest rate) and accumulate foreign currency reserves in order to defend the parity. Figure 3 illustrates the evolution of selected macroeconomic indicators in the new and potential members during the last decade. Table 3 reports their average values for each country in two five-year sub-periods: the first corresponds to the pre-accession period for the current EU members and the second is the accession period (pre-accession period for Bulgaria and Romania). First of all, it is evident that all countries except for Albania, Bosnia-Herzegovina and Hungary registered higher real GDP growth. This brings an increase in consumption and investment (the latter also encouraged by a decrease in domestic interest rate when capital flows in the country) and a consequent reduction in domestic savings, which is reflected in a deficit of the current account. The three Baltic States, which experienced large volumes of capital inflows during the last five years of the sample, exhibit the fastest real GDP growth together with the largest current account deficits (Estonia and Latvia register values larger than 10% of GDP). Also Bulgaria and Romania, the countries that joined the European Union at last, exhibit very large current account deficits in the second period, during which they also display a surge in short-term capital inflows (cfr. Figure 1). Slovenia offers a remarkable exception to this pattern: while inflows of short-term capital reached a higher magnitude than in Estonia and Lithuania, current account balance as a percentage of GDP didn’t fall below -3% until 2007, when it reached its lowest value equal to -5.08%. The overall
tendency towards a sustained real GDP growth has been abruptly reversed by the spread of the crisis in 2007. Although real GDP growth decreases but remains positive in 2008 for all countries except Estonia and Latvia, projections for 2009 and 2010 by the IMF reveal negative figures for all countries except Albania. In particular, the largest drop in GDP growth is expected in the three Baltic States (more than 10%).

An expansion of aggregate demand also entails an appreciation of the real exchange rate, which is defined as the nominal exchange rate multiplied by the ratio between the domestic and foreign price level. This is particularly the case when consumption is tilted towards non-traded goods: as their supply is limited within the country, a rise in demand leads to upwards pressures on the internal price level, thereby appreciating the real exchange rate. Figure 4 reveals that the real exchange rate followed an appreciating trend in the last years in all countries except Macedonia, where it remained fairly stable. In particular, the real exchange rate appreciated less in the Baltic countries and Slovenia (which registered the highest magnitudes of short-term inflows in the last five years of the sample) than in the other Central European countries. As we can see from the last column of table 3, the countries experiencing higher real exchange rate appreciation operate under a flexible exchange rate regime. Moreover, in almost all countries (with the exception of Bosnia and Herzegovina, Latvia and Lithuania) inflation decreased from the first to the second five-year period. This is not surprising, in that the first condition for EU membership in the Maastricht Treaty states that inflation in a country must not exceed by more than 1.5% that of the three lowest inflation EU members. These results, combined with the exchange rate regime, seem to suggest that while in the Central European countries (Czech Republic, Hungary, Poland and Slovak Republic) real exchange rate appreciation is mainly due to movement of the nominal exchange rate, in the Baltic countries it is mainly driven by overheating of the economy.

The right vertical axis in the panels in figure 3 measures international reserves in millions US dollars. As we can see, accumulation of international reserves is common to all countries, and it is particularly pronounced in the last years of the sample, accompanying

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9 IMF, *World Economic Outlook*, April 2009
the rise in short-term capital inflows. Also, the pace of international reserves accumulation has increased considerably during the accession period for most countries in the sample. The third column of table 3 reveals that between 2003 and 2007, reserves have been growing, on average, faster than in the pre-accession period in all accession countries except Czech and Slovak Republics and Slovenia. Moreover, the fastest average growth rates are registered in the Baltic countries, Bulgaria and Romania. Average international reserves growth in the potential members exhibits a more stable pattern: only in Bosnia-Herzegovina a significant reduction occurs between the first and the second sub-period. In countries operating under a fixed exchange rate regime, accumulation of foreign currency during episodes of capital inflows is a necessity: the increased demand of domestic currency by international investors puts appreciating pressure on the exchange rate, which must be counteracted by absorption of foreign currency from the domestic authorities. Countries where the exchange rate regime is allowed to float do not have this necessity. Nevertheless countries like Czech Republic, Poland and Romania saw their foreign reserves increase dramatically, presumably to prevent capital inflows to exert an expansionary effect on the money supply.\(^\text{10}\)

The second channel through which large capital inflows can destabilize the recipient economy is financial vulnerability, and it is strictly connected to the first channel. The overheating of the economy is likely to have repercussions on the domestic financial system: in particular, the rise in lending (credit boom) which can follow massive capital inflows is likely to weaken the banking sector and make it more vulnerable, in that it can increase the maturity mismatch between banks assets and liabilities and this, in turn, can lead to banking crises (Lopéz-Mejia (1999), Hausmann and Gavin, (1998), Von Hagen & Siedschlag (2008)). Table 3 shows some indicators of financial sector stability for the countries of Central, Eastern and Southern Europe.\(^\text{11}\) Banks’ reserves-to-assets ratio and capital-to-assets ratio represent liquidity and solvency of the banking sector: a bank is more vulnerable when it can become easily insolvent or illiquid following a shock to

\(^{10}\)Details concerning sterilization policy are presented in section 4.2.

\(^{11}\) Due to data availability, for some series it was not possible to compute the averages in the two five-year periods.
income, asset prices or the availability of foreign capital. Reasonably high reserve and capital-to-assets ratios help banks facing solvency and liquidity problems arising, for example, as a result of a sudden stop in capital inflows or a decrease in the demand for deposits and other bank liabilities. In order to strengthen the solvency of European banks and adapt it to the riskiness of their assets, the European Union introduced in 2004 a comprehensive set of measures and minimum standards of capital adequacy which is known as Basel II. According to this Directive, the minimum capital requirement must not be lower than 8%. The third column of table 3 shows that while from 2000 to 2003 capital-to-assets ratio increased in the majority of countries, in 2006 it was lower than in 2003 in many of the considered countries. In particular, Albania, the Czech Republic, Latvia, Lithuania and Poland exhibit values lower than 8%. In 2006, the countries that registered a high capital-to-assets ratio were Bosnia and Herzegovina, Bulgaria, Croatia and Serbia.

Banks reserve-to-assets ratio followed a different trend: in some countries (the potential members, the 2007 EU members and Slovenia) it increased dramatically, while in others (the Baltic States and the other 2004 EU entrants) it diminished, with the lowest value being equal to 2.63% in the Czech Republic. In some countries, the decrease in liquidity was accompanied by a rise in the domestic credit provided by the banking sector, as shown in column 2. In particular, in countries like Estonia, Hungary and Latvia, domestic credit provided by banks exceeds 60% of GDP, while their reserves-to-assets ratio decreased to 7.42%, 3.81% and 6.47% respectively. The potential EU members’ banking system experienced a credit boom between 2003 and 2007: banks in these countries managed an increasing amount of private credit that amounted to more than 70% of GDP in Croatia. The credit boom was not followed, in general, by deterioration in banks’ portfolio (column 4): only in Macedonia and Serbia a high percentage of total loans are non performing. In the other countries, the percentage is lower, reaching the minimal values of 0.2% and 0.4% respectively in Estonia and Latvia.

Although the potential member countries are following a good path towards stabilization of external and internal imbalances, the overall assessment of their financial and
macroeconomic stability is not completely positive. Although banks’ capitalization and liquidity ratios are performing better in the potential member countries than in the new members, a significant percentage of loans are not performing and credit to the private sector follows an increasing trend. The spread of the financial crisis in 2007 exacerbated the pressure on the financial system and revealed its weaknesses, especially in the countries where short-term capital inflows were more conspicuous. The sudden stop in capital inflows initiated a vicious circle whereby illiquid banks found themselves unable to face the roll-over needs of the private sector; moreover, the reckless lending of the past decade results in the inability of banks to collect their credits, and this puts further stress on the system. The more banks contract credit, the larger the contractionary effect on consumption and investments and the farther away is a country’s recovery from the crisis. A recent study by the IMF\textsuperscript{12} imputes the responsibility of the current credit contraction to past banks’ imprudence: in particular, empirical evidence on Eastern European banks shows that they didn’t build up reserves counter-cyclically. In other words, they reduced accumulation of reserves in good times and increase it in bad times.

\subsection*{4.2 Policy responses}

The authorities of the recipient countries have many policy options at their disposal in order to counteract the potentially disruptive consequences of large capital inflows, and to prevent disastrous currency and banking crises to happen. In this section we briefly review the policy options available to the policymakers in the recipient countries, highlighting their advantages, drawbacks and extent of applicability in the new and potential member countries\textsuperscript{13}.

In the previous section, we discussed how capital inflows result in an expansion of aggregate demand, a rise in domestic credit to finance increased consumption and investments thereby increasing the demand of domestic currency. Moreover, in order to

\textsuperscript{12} IMF, \textit{Regional Economic Outlook}, May 2009

\textsuperscript{13} For a complete discussion of policy responses, see IMF (2007).
prevent an appreciation of the exchange rate, countries accumulate foreign reserves. If the authorities purchase foreign currency by injecting domestic currency in the economy, the expansion of the money supply reinforces aggregate demand, inducing a reduction of the domestic interest rate and an increase in inflation. Therefore, many Central Banks have tried to prevent capital inflows to exert an expansionary effect on the money supply. This policy line is referred to as sterilized intervention, and it involves increasing the reserves of foreign currency through the selling of government’s securities in order to keep the monetary base unchanged. Sterilized intervention has the power to avoid monetary expansion and it has the advantage of limiting banks’ intermediation of capital inflows thereby reducing their vulnerability in the event of a sudden reversal\textsuperscript{14}. Nevertheless, it is a two-edged sword, and has important drawbacks. First of all, it entails accumulation of foreign assets that typically yield lower interest rates than domestic currency denominated assets. Therefore, the interest rate payments resulting from this kind of maneuver could become a burden for the government (quasi-fiscal costs). Secondly, the issuance of government securities leads the interest rate to increase, thereby encouraging new waves of capital (Jang-Yung Lee, (1997)). Thirdly, in the event of domestic currency appreciation, domestic authorities are exposed to decreases in the values of their assets.\textsuperscript{15} Von Hagen & Siedschlag (2008) examine the development of central bank net foreign assets relative to reserve money in the new EU member states of Central and Eastern Europe. In countries operating under a pegged exchange rate, the ratio of net foreign reserves to reserve money was stable or slightly increasing in the period 1994-2005, revealing the attempt of the monetary authorities to preserve the parity. In countries where the exchange rate is allowed to float (Czech Republic, Hungary, Poland and Romania) the share of foreign currency is increasing. As we already noted in the previous section, the large purchase of foreign currency was primary motivated by their will to keep their currencies from appreciating.

\textsuperscript{14}López-Mejía (1999)
\textsuperscript{15}For a discussion of domestic implications of sterilized intervention and foreign currency accumulation, see Mohanty & Turner (2006).
A second policy choice consists in the reinforcement of capital controls in order to limit capital inflows, and especially of those kinds of inflows (portfolio and short-term capital) that are deemed dangerous for the stability of the economy. Although in principle this measure has proven to be effective in the majority of developing countries, the experience of the CEECs must be considered as a particular case. Indeed, the bulk of requirements the CEECs were obliged to meet in order to be granted membership to the OECD and to the European Union involved also the disruption of the barriers to capital movements. Therefore, in response to large and potentially volatile capital inflows, the transition economies were not authorized to freely dispose of this policy option. Moreover, observing the pattern of portfolio inflows to the CEECs, Arvai (2005) notes that the countries that liberalized their capital account more slowly (i.e. the group of “cautious liberalizers” including Hungary, Poland, the Slovak Republic and Slovenia) received larger portfolio flows than rapid liberalizers.

The third policy tool available to the authority in order to counteract large capital inflows is fiscal policy: a tight fiscal policy can effectively help reducing the risks associated with an expansion of aggregate demand without incurring in the problems characterizing sterilized intervention. In particular, Von Hagen & Siedschlag (2008) and Calvo, Leiderman and Reinhart (1996) argue that it is important to reduce public debt by reducing government spending instead of increasing fiscal pressure, because of the low popularity of a tax rise. The reduction of government spending has many benefits on the economy: first of all, it reduces aggregate demand and induces a decrease in the domestic interest rates, which in turn discourages further capital inflows; secondly, by reducing consumption of non-traded goods (of which government expenditure is mainly composed) it alleviates the appreciating pressures on the real exchange rate; thirdly, it allows a countercyclical fiscal response when the inflows are subject to a stop. (IMF (2007)) Although fiscal policy is an effective tool to reduce the effect of capital inflows on the real economy (through its repercussions on the exchange rate, the current account and the inflation rate), it is quite inflexible, in that it is the result of long political debates: given the length of the budgetary procedure, the effects of fiscal policy become
appreciable only after a considerable delay. (Arvai (2005)) Figure 5 illustrates the evolution of the government deficit in the new and potential EU members from 1996 to 2007.\textsuperscript{16} Although the vast majority of countries exhibit a negative balance over the whole considered period, we can detect a trend towards a reduction of the public deficits. Some countries, like Bosnia and Herzegovina, Macedonia, Bulgaria and Estonia even exhibit a positive balance in the last years; the only country that maintained a public deficit close to 6 percentage points of GDP is Hungary, meaning that the fiscal policy tool was not implemented. In general, the potential members exhibit a higher deficit compared to the EU members, also because the latter are constrained by the Maastricht Treaty to keep their deficit to GDP ratio lower than 3%.

5. Determinants of short term capital inflows

5.1 The existing literature

The majority of studies concerning the determinants of capital inflows adopt the “push-pull” framework: the factors driving capital flows to a country are divided in internal (pull) and external (push). The former category includes the internal characteristics of a country that determine its attractiveness to international investors: macroeconomic, political and social stability, and quality of institutions. Good macroeconomic performance, higher short-term interest rates, a sound financial system and a high degree of law enforcement are examples of factors that increase the attractiveness of a country in the eyes of international investors, in that they reduce the perceived risk of investment and increase the probability of high returns. External, or push, factors originate outside the boundary of a country. High availability of capital and low interest rates in industrial countries push capital towards developing countries, for diversification or speculative purposes. (Montiel & Reinhart (1999)) Distinguishing between push and pull factors is important because it allows to understand whether capital flows are driven by internal characteristics of a country, which strictly depend on economic policy and institutional

\textsuperscript{16}Due to data availability, data for Serbia start from 2003.
development, and therefore are under direct control of the country’s authorities, or by external factors (and therefore out of the control of the country’s authorities). Studying the relative importance of push and pull factors is important in that it gives information regarding the potential role of economic policy in shaping the magnitude and the composition of capital flows to a country.

The “push-pull” framework has been extensively used in the existing empirical literature on the determinants of capital flows to emerging economies. Despite no general consensus has been reached as to whether external or domestic factors are more important in explaining capital inflows, the most recent studies suggest that pull variables play a very important role in the matter. One of the most well-known studies that highlight the superiority of push variables has been performed by Fernandez-Arias (1996). He approaches the question by developing a model of international portfolio allocation where country creditworthiness plays an explicit role. Despite finding that country creditworthiness is a significant factor in explaining capital inflows, he finds that international interest rates are a more important determinant. Therefore, he concludes that push factors dominate domestic ones. In a later study, Taylor and Sarno (1997) use data on portfolio flows from the US to a group of Latin American and Asian countries and conclude that both internal and external factors have equal importance in explaining the inflows of portfolio capital. Subsequent studies started to challenge these views, and point towards an increased importance of domestic factors in explaining portfolio and short-term flows. Montiel and Reinhart (1999) consider a sample of 15 emerging economies in Latin America, Asia and Africa and estimate a fixed effect panel in order to identify the effect of two countercyclical policies (namely sterilization and restriction to capital flows), international interest rates and the development of the domestic capital market. Their results highlight a significant positive effect of sterilized intervention on the volume of total capital flows associated with a rise in the share of short-term capital, suggesting that the policy choices are indeed important in shaping the composition of capital inflows. The effect of capital controls is also a significant explanatory variable, and it is associated with a shift in the composition of total flows towards FDI and long-
term debt. Finally, the authors find that indicators of financial market depth are significant and positive in explaining the magnitude of inflows. Moreover, they have a particular importance in explaining portfolio inflows. In the same wave, Carlson & Hernandez (2002) focus on 8 countries which are meant to represent the areas that received the greatest share of capital inflows during the last decade (Asia, Latin America and Central and Eastern Europe) and they test whether policy and real factors affect the share of short-term flows and portfolio equity flows. They use three policy variables, namely the exchange rate regime, capital controls and a measure of sterilization: the results for short-term debt confirm that high sterilization leads to higher share of short run debt. Concerning the exchange rate regime, the authors conclude that a dirty float or a free float also increases the share of short-term flows; finally, higher growth rates tend to decline short-term flows in Asian countries, while it is not significant for the rest of the countries in the sample. Portfolio investments are positively related to domestic GDP growth and to past values of portfolio investments. Moreover, while a floating exchange rate regime significantly reduces the share of portfolio investment and capital controls are not significant, countries that have both capital controls and a fixed exchange rate see their share of inward portfolio investment decline. Observing the results obtained for FDI and for portfolio investment, the authors conclude that the latter react in the same way as the former to policy and real variables, and opposite as short-term flows. Therefore, they lay a shadow of doubt on the conventional wisdom that portfolio investments share the same characteristics of short-term investments. Another study confirming the importance of pull factor by applying dynamic panel data techniques to a set of developing countries to explain FDI and portfolio inflows has been performed by Amaya & Rowland (2004). These authors included in their analysis pull variables such as market size, macroeconomic variables, indicators of openness and variables concerning government finance, together with a set of push variables pertaining to the US economy. They find that only one push factor, US GDP growth, is significant in explaining portfolio flows, while among the “pull” factors they find indicators of market size, economic growth and the government’s debt position to be significant determinants. Their results suggest that
portfolio investment tend to favor larger and faster-growing economies implementing prudent fiscal policies. Moreover, the statistical insignificance of lagged values of net portfolio inflows confirms the widespread classification of this type of inflows as “hot money”, i.e. characterized by higher volatility and less degree of persistence.

Domestic factors are found to be important also in explaining international bank lending. Buch and Lusinyan (2002) estimate a panel data model explaining the share of short-term bank lending in total international financing and the share of short-term domestic debt securities in total securities in 60 countries. Among the significant determinants of short-term international bank lending, the authors find factors like market size and development, the importance of inter-bank market and the presence of financial centers while the exchange rate regime and EU membership turn out to be insignificant. Specifically, GDP per capita and the share of M2 over GDP positively influence the share of short-term debt securities: countries with a higher level of development and deeper financial markets will be recipient of higher shares of short-term securities.

Subsequent studies offer significant contributions to the literature by considering the degree of development of the recipient country’s institutions. A recent application to a set of 55 countries (including the new EU members and Croatia) is provided by Faria and Mauro (2004). They perform cross-sectional regressions of FDI, portfolio and other short-term liabilities stocks, including as explanatory variables both domestic macroeconomic factors and institutional ones: in particular, primary and secondary school attainment, an institutional quality index, and market capitalization of listed firms are considered. Their results reveal that institutional quality is positively correlated with portfolio equity and FDI, and that high market capitalization is positively correlated with portfolio equity. They conclude that weak institutions tend to encourage countries to rely on more volatile and crisis-prone sources of financing, while better institutions are associated with higher shares of FDI and portfolio investment.

The empirical literature concerning capital inflows in the new and potential EU members is relatively scarce. Nevertheless, the existing studies point towards the importance of pull variables in explaining inflows of both FDI and short-term capital. Baláz and
Williams (2001) analyze the determinants of FDI, portfolio and other short-term inflows for the Czech and Slovak Republics, Poland and Hungary from 1990 to 1997. Their model includes both push (difference between domestic and foreign interest rates) and pull (macroeconomic and population) variables. While the role of government policies and institutions is not investigated, they include the ratio of M2 to GDP as a proxy for the development of the financial sector. The results of their cross-sectional regression highlight that while FDI investors are less influenced by fluctuations in interest rates and trade balances, these factors are important for investors with a short-term horizon. In particular, for the regression of short-term capital inflows, the ratio of M2 to GDP, the interest rate margin and the inflation rate are the most significant variables. Their results for portfolio inflows reveal a very low explanatory power, and only one variable (per capita GDP) is significant. They attribute this outcome to the heterogeneity of portfolio investors that could have obscured the analysis of the independent variables.\(^{17}\) The difficulty of modeling portfolio capital flows in the Central and Eastern European countries has been encountered also by Garibaldi, Mora, Sahai and Zettlemeyer (2001). They perform a dynamic panel estimation of portfolio inflows as a function of inflation, exchange rate regime, market perceptions as captured by “country risk” ratings, US short-term interest rate, securities market index, international reserves per capita, political stability and security of property. Their results reveal that portfolio inflows are significantly associated only with the development of the financial sector and protection of property rights. Finally, Lozovy & Kudina (2007) analyze the determinant of portfolio inflows in the CIS countries (among which Bulgaria, Czech Republic, Hungary, Poland, Romania, and Slovakia). They conclude that important determinants of portfolio flows include the domestic deposit interest rate, which exerts a negative impact on the dependent variable, political stability and the quality of institutions. Moreover, indicators of the international economic activity (push factors) are not found to influence portfolio investment inflows.

\(^{17}\) Baláz and Williams (2001), p.10
5.2 Modeling the determinants of short term capital inflows

In the following analysis, we pay particular attention to two factors which have been given limited importance in the existing studies on the determinants of portfolio and short-term inflows in the new and potential EU countries.

First, we share the idea developed by Montiel and Reinhart (2001) according to which the policy responses enhanced by a country’s authority might contribute to shape both the magnitude and the composition of capital inflows. Therefore, we include in the determinants of capital flows variables that represent countercyclical policies and structural policies such as sterilization, fiscal policy and strengthening of the banking sector. As sterilization is an attempt by the authorities to limit the expansion of the money supply through an increase in reserves and issuance of government securities, we construct a sterilization index based on the ratio of broad money changes to changes in international reserves. In particular, following Carlson and Hernandez (2002)\textsuperscript{18}, the index is constructed as:

\[
\text{Sterilization index} = -1 \left[ \frac{M_2_t - M_2_{t-1}}{IR_t - IR_{t-1}} \right]
\]

In case of complete sterilization, the increase in international reserves does not affect the money supply, therefore the index will be close to zero. If the money supply increases as a consequence of an increase in international reserves, both nominator and denominator of the index will increase. Multiplying the ratio of broad money changes to changes in international reserves by -1 makes the index easier to interpret: higher values of the index imply higher sterilization.

In order to assess the role of fiscal policy in shaping the volume and composition of capital inflows, we include government deficit (as a percentage of GDP) in our model.

\textsuperscript{18}Carlson and Hernandez (2002) construct the index using the change in the dollar value of net domestic assets instead of using the change in broad money, in order to capture the degree to which the authorities contract domestic credit in order to prevent an expansion of the monetary base. However, data on net domestic assets are not available for some of the countries in our sample and, when they are, they cover only a limited time span.
We do not consider capital controls because this policy tool is not available to the new EU member countries, as the Maastricht Treaty requires full liberalization of the capital account. We use the ratio of banks’ liquid reserves to assets as an indicator of the strengthening of the banking system: by increasing the amount of liquid reserves, the authorities try to offset the expansion of credit originating from large capital inflows.

Second, when dealing with portfolio investment, we believe that it is very important to consider the development of the domestic financial market as a factor responsible for the attraction of capital flows. (Montiel and Reinhart (2001), Balaz&Williams (2001)). Indeed, as portfolio flows are more volatile and more subject of sudden withdrawals than FDI flows, a sound financial sector ensures that the inward flows are adequately intermediated and efficiently managed. Moreover, if the financial market is not developed, the variety of instruments available to foreign investors willing to invest in a country is limited usually to debt instruments (see also Garibaldi, Mora, Sahay & Zettelmeyer (2001)). Therefore, to account for the depth and the soundness of the financial system, we include the variable “number of listed companies on the domestic stock market”.

The recent empirical literature we reviewed in the previous section found an important role of institutional quality in explaining both FDI and short-term forms of international investment. Although we acknowledge the importance of including such institutional variables in our analysis, we are constrained by data availability. A complete dataset including data on corruption, regulatory quality and rule of law has been compiled by Kaufmann, Kraai and Mastruzzi (2009). Data are available for the last decade in yearly frequency. Including these variables in our model would significantly reduce the size of our sample or result in a model where too many series are the result of linear interpolation.

Our model includes push and pull variables present in the majority of studies concerning the determinants of capital inflows. As push variables, we consider the German Treasury
Bill rate and German GDP.\textsuperscript{19} The pull variables represent macroeconomic fundamentals. In particular, the domestic short-term interest rate (to capture returns on investments), GDP level (to capture market size) current account balance (performance of the external sector) and exchange rate regime are included as independent variables. Finally, we include the degree of privatization (private sector’s share of GDP) as additional pull variable. The new and potential EU member states of Central and Eastern Europe are characterized by a past in which state ownership was widespread, leaving little or no room to private entrepreneurship. During the transition from central planning to market economy, an increasing amount of industries were privatized, thereby increasing the need of the new private enterprises to attract foreign savings.

Following the previous discussion, we model short term capital inflows and their determinants as follows:

\[
\text{CAPINF}_{i,t} = f (GDP_{GER,t}, INT_{GER,t}, GDP_{i,t}, INTRATE_{i,t}, CA_{i,t}, ERR_{i,t}, STERIL_{i,t}, GOVBAL_{i,t}, BL_{i,t}, LC_{i,t}, PRIV_{i,t})
\]

Where:
\[
\text{CAPINF}_{i,t} = \text{dependent variable, representing in turn the volume of foreign portfolio and other investment inflows.}
\]
\[
GDP_{GER,t} = \text{logarithm of German GDP}
\]
\[
INT_{GER,t} = \text{German 3-month Treasury Bill rate}
\]
\[
GDP_{i,t} = \text{logarithm of recipient country’s GDP}
\]
\[
INTRATE_{i,t} = \text{Recipient country’s 3-month Treasury Bill rate}\textsuperscript{20}
\]
\[
CA_{i,t} = \text{current account balance as a percentage of national GDP}
\]
\[
ERR_{i,t} = \text{fixed exchange rate regime dummy}
\]

\textsuperscript{19}Appendix B describes the variables and the data sources in greater detail.
\textsuperscript{20}When not available, the deposit rate is used.
The equation is estimated for two specifications of the dependent variable: PI_VOL (volume of foreign portfolio inflows as a percentage of national GDP) and OI_VOL (volume of foreign other investment inflows as a percentage of national GDP). Appendix B provides a detailed description of the dataset and the data sources.

We specify a dynamic linear panel model where the dependent variable is regressed on its own first lag and a set of independent variables. The independent variables are treated as strictly exogenous, with the only exception of the sterilization policy variable. Indeed, we deem current magnitude of short term inflows to influence current sterilization: therefore we expect this policy variable to be correlated with the current error term. The GMM estimation method will account for this assumption by using lagged values of the endogenous variable as instruments for the current values. We do not make the endogeneity assumption for the other policy variable (i.e. fiscal balance) because current fiscal policy is the result of an often long political debate; therefore we expect the volume and share of current short term capital inflows not to influence current fiscal policy.

We estimate the model for 12 countries, of which 10 are the new EU members of Central and Eastern Europe (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Slovenia) and two are Southern European countries eligible for EU candidacy (Croatia and Macedonia, FYR). Albania, Bosnia and Herzegovina and Serbia and Montenegro were excluded from the analysis due to lack of data availability on the chosen time period. Data for these countries were available starting from the beginning of the 21st century, reducing the common sample to less than 20 (quarterly) time observations. As dynamic panel estimation requires at least two lags of each variable in order to estimate the equation for each time period, restricting the sample would result in less efficient and precise estimation.

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21 Albania, Bosnia and Herzegovina and Serbia and Montenegro were excluded from the analysis due to lack of data availability on the chosen time period. Data for these countries were available starting from the beginning of the 21st century, reducing the common sample to less than 20 (quarterly) time observations. As dynamic panel estimation requires at least two lags of each variable in order to estimate the equation for each time period, restricting the sample would result in less efficient and precise estimation.
ranging from 1994:1 to 2007:4 on the dependent and independent variables were collected for each country.22

5.3 Estimation methodology

Given the formulation of the model presented in the previous section, dynamic panel data is the most suited estimation method in order to estimate the coefficients of the independent as well as the lagged dependent variables. Let us rewrite the model in a more compact form as follows:

\[ y_{i,t} = \gamma y_{i,t-1} + x_{i,t} \beta_1 + w_{i,t} \beta_2 + \alpha_{i,t} + u_{i,t} \]  

(1)

Where \( x_{i,t} \) is a vector of strictly exogenous covariates, \( w_{i,t} \) is a vector of endogenous variables (in our case including only the sterilization variable), \( \alpha_{i} \) are fixed or random effects and \( u_{i,t} \) is the error term. The question about how to treat the individual effect \( \alpha_{i} \) is very different in a dynamic panel setting than in the static one. In the static model, the assumption regarding the correlation (or the absence of it, in the case of random effects) between the regressors and the individual effects has strong implications on the consistency and efficiency of the parameter estimators. In the dynamic setting, the lagged dependent variable \( y_{i,t-1} \) will be correlated with the individual effect no matter whether we treat it as fixed or random. Therefore, both fixed and random effects estimation procedures applied to equation (1) will yield inconsistent estimators of the autoregressive coefficient.23

In order to solve this problem, the model is considered in first differences, in order to eliminate the time invariant individual effect. Note that this procedure will eliminate all time-invariant variables: in our case, this does not constitute a problem, in that all

---

22 We deliberately exclude the first years of the 1990s because of two reasons: First, because for some countries observations of some variables would have been missing. Secondly, because data referring to the first years after the fall of the Berlin Wall may suffer from measurement errors.

23 We refer to Verbeek (2008) for a discussion of the issues related to dynamic panel data estimation.
variables vary with time (although the exchange regime dummy presents very little time variation). The differenced model looks as follows:

\[
y_{i,t} - y_{i,t-1} = \gamma(y_{i,t} - y_{i,t-1}) + (x_{i,t} - x_{i,t-1})\beta_1 + (w_{i,t} - w_{i,t-1})\beta_2 + (u_{i,t} - u_{i,t-1})
\]

(2)

OLS estimation of this model still yields inconsistent estimators, even in absence of independent endogenous variables, because by definition \(y_{i,t-1}\) is correlated with \(u_{i,t-1}\). To overcome this problem, it is necessary to implement Instrumental Variables (IV) estimation, using further lags or lag differences of the dependent variable as instruments for \((y_{i,t-1} - y_{i,t-2})\).

Arellano and Bond (1991) propose to estimate this model by Generalized Method of Moments (GMM), incrementing the number of moment conditions in order to improve efficiency. First of all, they suggest letting the number of moment conditions vary with \(t\): for every time period, the maximum number of moment restrictions will be employed to instrument the lagged differenced dependent variable. In particular, the moment conditions are obtained assuming that lagged levels of the dependent variables are orthogonal to the differenced disturbances. Secondly, the presence of strictly exogenous independent variables provides an additional set of moment restrictions that, if valid, can be exploited: indeed, strict exogeneity entails that a variable be uncorrelated with past, current and future values of the error term. Therefore, a set of orthogonality conditions of the form \(E[x_{i,t} \Delta u_{i,t}] = 0\) or, without loss of information, \(E[x_{i,t} \Delta u_{i,t}] = 0\) for each time period can be exploited. Moreover, when potentially endogenous variables are included in the model (as in our case) additional instruments must be included for the endogenous term \((w_{i,t} - w_{i,t-1})\) in equation (2): additional lags of these variables can easily be exploited for this purpose. We compute the Sargan test for over-identifying restrictions in order to test whether the model and the moment conditions are correctly specified: a rejection of the null hypothesis means that the over-identifying restrictions are not valid and hence the model is not correctly specified. Moreover, we report the Arellano-Bond
test for first and second order autocorrelation in the first-differenced disturbance. Arellano and Bond (1991)\textsuperscript{24} point out that since the error term in the first-differenced model is the first difference of a serially uncorrelated error term, consistency of the GMM estimators requires that $E[\Delta u_{it}, \Delta u_{i,t-2}] = 0$ (i.e. absence of second order serial correlation) while $E[\Delta u_{i,t}, \Delta u_{i,t-1}] = 0$ need not be zero. The model is estimated accounting for general heteroskedasticity, i.e. robust standard errors are computed. It is important to notice that when heteroskedasticity is present, the distribution of the Sargan test is not known, therefore the reported Sargan test statistics refer to the model estimated under homoskedasticity. A robust version of the Arellano-Bond test for serial autocorrelation is available, and it is computed and reported.

5.4 Estimation Results

The results presented in table 5 (below) reveal that the explanatory power of our specification is very different according to the dependent variable considered. In particular, the model explaining the volume of portfolio inflows performs very poorly. Only a few variables are significant and their signs correspond to our expectations only in the case of the logarithm of German GDP, whose higher values are associated with larger portfolio inflows. The domestic interest rate, the number of listed companies and the share of private sector in GDP carry a negative sign, while we expected them to increase the inflows of portfolio capital. Given the slightly high correlation between the variables “listed companies” and “banks liquidity”, we re-estimated the model dropping one of the variables\textsuperscript{25}. While the model estimated without the “banks liquidity” variable performs as the one in table 5, the one without the “listed companies” variable is slightly different, in that only the variable “German GDP” is significant and still positive. These results seem to suggest that high availability of capital in external economies (and in this particular

\textsuperscript{24}Pp. 281-282

\textsuperscript{25}The results are not reported, but are available upon request.
case with Germany, which is the European country with stronger commercial and financial links with Eastern Europe) pushes portfolio inflows to the new and potential members. As for pull factors, they either do not significantly explain portfolio inflows or they decrease them.

The results for other capital inflows (including bank loans, transactions in currency and deposits, and trade credits) are more satisfying in terms of overall significance of the explanatory variables. In particular, “pull” variables such as the domestic short-term interest rate and the logarithm of domestic GDP significantly increase the inwards volume of short-term capital. Our results also reveal the significance of current account balance in shaping the volume of other short-term inflows: in particular, the coefficient is negative, meaning that this type of capital inflows tend to diminish with a better external performance. This result is not surprising, given that trade credits are a component of other inflows. Also, the exchange rate dummy is positive and significant: international investors interested in short-term investment pay attention to issues related to exchange rate risk when directing their capital towards transition economies. A fixed exchange rate insures investors against a sudden and unexpected decrease in the value of their investments. A more liquid banking sector (characterized by a high ratio of reserves to assets) contributes to attract greater volumes of short-term capital. This is mainly due to the fact that a more liquid banking system reduces the risk of a liquidity crisis that could compromise the profitability of investments. If we interpret higher banks’ reserve requirements as a policy choice in order to contain the expansion of domestic credit, the significant and positive coefficient in our regression suggests that by increasing the volume of short-term inflows expansion of domestic credit is likely to increase. Nevertheless, as this explanatory variable was not considered as endogenous in our analysis its causal relation with the dependent variable might be biased by possible endogeneity.\(^{26}\)

\(^{26}\) Anyway, the results do not change by running the same regression controlling for endogeneity of the liquidity variable.
Table 5 - Determinants of short-term capital inflows – Arellano-Bond Dynamic GMM Panel regression (robust standard errors)

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Portfolio inflows (%GDP)</th>
<th>Other inflows (%GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>T-stat (P-value)</td>
</tr>
<tr>
<td>Lagged dependent</td>
<td>-0.0759</td>
<td>-1.33 (0.183)</td>
</tr>
<tr>
<td>Push</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDP Germany</td>
<td>5.9266</td>
<td>2.52 (0.012)**</td>
</tr>
<tr>
<td>Interest rate Germany</td>
<td>-0.2524</td>
<td>-0.89 (0.372)</td>
</tr>
<tr>
<td>Pull</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDP</td>
<td>-4.1675</td>
<td>-1.92 (0.055)*</td>
</tr>
<tr>
<td>Interest rate</td>
<td>-0.0102</td>
<td>-1.84 (0.066)*</td>
</tr>
<tr>
<td>CA balance</td>
<td>-0.0429</td>
<td>-0.97 (0.330)</td>
</tr>
<tr>
<td>Exchange rate regime</td>
<td>0.7348</td>
<td>0.85 (0.395)</td>
</tr>
<tr>
<td>Sterilization</td>
<td>-0.006</td>
<td>-0.64 (0.522)</td>
</tr>
<tr>
<td>Government balance</td>
<td>-0.1464</td>
<td>-1.16 (0.245)</td>
</tr>
<tr>
<td>Banks liquidity</td>
<td>0.003</td>
<td>0.16 (0.872)</td>
</tr>
<tr>
<td>Listed companies</td>
<td>-0.0007</td>
<td>-3.69 (0.000)***</td>
</tr>
<tr>
<td>Privatization</td>
<td>-0.0739</td>
<td>-1.70 (0.089)*</td>
</tr>
</tbody>
</table>

N.obs | 479 | 479
Wald χ² | 43.51 (0.000) | 49634.71 (0.000)
Sargan test | 471.51 (0.4328) | 484.225 (0.2814)
Autocorrelation test: 1st order | -2.180 (0.0292) | -2.463 (0.0137)
2nd order | -3.344 (0.7303) | .085 (0.9322)

Significance code:
*** Significant at the 0.01 level
**  Significant at the 0.05 level
*   Significant at the 0.1 level
Our results reveal that neither of the policy variables is significant. Moreover, looking at the signs of the coefficients, we notice that while in the regression of portfolio inflows both variables carry a negative sign, in the model explaining other inflows both estimated coefficients are positive. Moreover, the institutional indicator concerning the deepness of the financial sector is significant and positive, while the degree of privatization is not significant.

Overall, we notice how macroeconomic indicators significantly explain other capital inflows while they are not significant in the regressions for portfolio inflows. On the other side, we expected a significant impact of “push” factors on other inflows, while in fact the level of German GDP is significant for the regression of portfolio inflows and not for other inflows.

Our empirical analysis of portfolio and other forms of capital inflows lead us to formulate the following conclusions.

First, our findings suggest that portfolio and other investment (bank loans, trade credits, transactions in currency and deposits and other short term capital) are very different in nature and can hardly be grouped under the same umbrella. Not only they exhibit different patterns both within and across countries, but they do not share the same determinants.

Second, the lack of explanatory power of our model of portfolio inflows suggests the inadequacy of a model based on macroeconomic data. This finding can be interpreted in two ways. It could be a signal that aggregate data are not able to capture the risk and expected profitability dimensions international investors look at before making their investment decisions. In this line, a useful direction for further research might be towards the analysis of the characteristic of firms located in the countries of interest recipient of foreign portfolio investment. Anyway, this will require the collection of good quality firm-level data on portfolio investment. A second interpretation would connect the overall insignificance of macroeconomic variables in explaining portfolio inflows with their unresponsiveness to macroeconomic fundamentals. If investment decisions are driven by speculative and diversification purposes, these will hardly be captured in
macroeconomic data. Moreover, herding and non-rational behaviors could be significant determinants.

Third, given the insignificance of the macroeconomic policy variables, it emerges that a country’s authorities do not have much power to shape capital inflows. Therefore, more effort should be put into building an adequate financial system, capable of efficiently manage capital and protect the economy from destabilizing speculative behavior. In this fashion sudden withdrawals, currency and banking crises can be avoided or, in case they manifest, their consequences on the real economy can be mitigated.
6. Conclusion

In this paper we analyze the patterns, determinants and consequences of portfolio and short-term capital inflows in the new and potential EU member states of Central and South Eastern Europe. After the fall of the Berlin Wall and the beginning of the transition process towards a market economy, Eastern European countries attracted increasing amounts of foreign capital both in the form of foreign direct investment and financial flows. Our focus on portfolio and other investment (i.e. bank loans, transactions in currency and deposits and trade credits) inflows was motivated by the potentially destabilizing effects of massive inflows of short-term capital on the real economies of the recipient countries, and by the need of understanding the role of governments in shaping them. Our main findings are the following.

First, the analysis of the evolution of portfolio and short term inflows shows heterogeneity and variability among the new EU members, while the potential and candidate countries exhibit a more similar and stable pattern. In particular, among the new members, the Baltic countries exhibit a surge in the magnitude of inflows from the beginning of the new millennium and they never experienced net outflows of short-term capital since the beginning of the 1990s. During the last years of the past century, the Czech and Slovak Republics experienced higher inflows, whereas countries like Bulgaria, Hungary and Poland exhibit lower inflows with some episodes of capital outflow. From 2003 on, short run capital is increasing in all countries with exception of an abrupt drop in the Slovak Republic in 2006. Among the potential member countries, Croatia exhibits the largest volume of capital inflows, while Macedonia is the only country experiencing a (small) capital outflow in 2002. Moreover, the potential member countries do not exhibit a tendency towards an increase in capital inflows after 2004 (year in which many Central and Eastern European countries obtained EU membership). As for the composition of capital inflows, we conclude that, grouping portfolio and other investment in the broader category of short-term investments, this category is predominant in most of the countries (except for Albania, Bulgaria, Hungary and Macedonia, where FDI is preponderant). All
in all, we can observe that the potential member countries are on average less exposed to short-term capital inflows, while many of the new member countries rely heavily on this form of financing. The heterogeneity of the patterns of capital inflows, macroeconomic performance and policy responses of the past decade will determine the impact and the severity of the current global crisis on the economic performance of these countries. Analysis of the most recent data reveals that the Baltic states (which presented the largest external imbalances and the largest proportion of short-term capital inflows) were the most heavily hit by the crisis; moreover, their choice to stick to a currency board further narrows the policy instruments to counteract the economic downturn. Furthermore, closer compliance with the Maastricht inflation and debt requirement is found to soften the fall.

Second, the main macroeconomic consequences of capital inflows on the new and potential EU members involve the expansion of domestic credit, the appreciation of the real exchange rate and the accumulation of foreign reserves. While the latter effect is to be expected in countries operating under a fixed exchange rate regime, it is also observed in countries where the exchange rate is free to float (i.e. Czech Republic, Poland and Romania), probably in order to prevent the nominal exchange rate to appreciate. Although in the pre-accession period many countries experienced high inflation and large current account deficits, the tendency of the most recent years is towards an appreciable stabilization of internal prices and the external balance (with the exception of the Baltic countries, which still exhibit large current account deficits) accompanied by increased real GDP growth. Much effort has been devoted by the new member countries to the development and stabilization of the financial and banking sectors, although additional measures have to be taken in this area, especially in light of the recent financial turmoil. Banks’ liquidity and capitalization have improved, making banks less vulnerable to sudden reversals of short-term inflows, and the percentage of non-performing loans have been reduced. Nevertheless, past imprudence, reckless lending and inadequate supervision are at the core of the current stress of the banking system. Given the high percentage of western European bank subsidiaries in the new and potential member states, close cooperation between western and Eastern Europe will be the key for future
banking stability. The potential member countries are following a good path towards stabilization of external and internal imbalances; nevertheless, the overall assessment of their financial and macroeconomic stability is not completely positive. Although banks’ capitalization and liquidity ratios are performing better in the potential member countries than in the new members, a significant percentage of loans is not performing and credit to the private sector follows an increasing trend. The current reversal of capital inflows will then significantly jeopardize macroeconomic stability and economic growth, also because of institutional vulnerabilities still present in these countries.

Finally, concerning the determinants of capital inflows to the new and potential EU members, our results lead us to conclude the following. First, our findings suggest that portfolio and other investment (bank loans, trade credits, transactions in currency and deposits and other short term capital) are very different in nature and can hardly be grouped under the same umbrella. Second, the lack of explanatory power of our model of portfolio inflows suggests the inadequacy of a model based on macroeconomic data. This could be a signal that aggregate data are not able to capture the risk and expected profitability dimensions international investors look at before making their investment decisions or it could be caused by the unresponsiveness of portfolio inflows to macroeconomic fundamentals. Third, given the insignificance of the macroeconomic policy variables, it emerges that a country’s authorities do not have much power to shape capital inflows. Therefore, more effort should be put into building an adequate financial system, capable of efficiently manage capital and protect the economy from destabilizing speculative behavior. In this fashion sudden withdrawals, currency and banking crises can be avoided or, in case they manifest, their consequences on the real economy can be mitigated.

The current financial turmoil is likely to have very serious repercussions on the economies of the new and potential EU member states. In particular, the decreased availability of capital in investing countries and the consequent decrease in capital flows will contribute to jeopardize economic growth and the compliance to EU membership criteria. Moreover, the consequences on these countries will be intensified by the
institutional vulnerabilities which still persist in the ex-Soviet countries. The performance of the new and potential member states in fighting the crisis will crucially determine their future attractiveness in the eyes of international investors, and hence the volume and quality of capital inflows they will be able to attract in the coming years.

Useful directions for further research involve the analysis of the determinants of short term capital inflows to the new and potential EU members, using a microeconomic approach. On one side, analysis of firm level data would allow to explain the link between portfolio inflows and firms’ expected profitability, transparency and efficiency of management. On the other side, the lack of correlation between portfolio inflows and macroeconomic fundamentals found in our model could be examined from the perspective of behavioral finance. This would allow to detect possible herding behavior, speculative and diversification purposes of international investors. Finally, focusing on the policy perspective and on the current financial crisis, further research will be needed in order to analyze the reactions of international capital markets to the policy responses enacted by the single countries to stabilize the economy, as soon as data will be available.
7. References


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## Appendix A – Tables and figures
### Table 1 - Classification of the Financial Account

<table>
<thead>
<tr>
<th>Category</th>
<th>Composition</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct investment</td>
<td>“Equity capital, reinvested earnings, other capital and financial derivatives associated with various intercompany transactions between affiliated enterprises”(^\text{27})</td>
<td>“Direct investment is the category of international investment that reflects the objective of a resident entity in one economy obtaining a lasting interest in an enterprise resident in another economy. […] The lasting interest implies the existence of a long-term relationship between the direct investor and the enterprise and a significant degree of influence by the investor on the management of the enterprise (ownership of 10% or more of the ordinary shares or voting power).”(^\text{28})</td>
</tr>
<tr>
<td>Portfolio investment</td>
<td>“Corporate securities (shares, stock, participation and similar documents), bonds, debentures, notes and money market instruments”</td>
<td>“The major components of portfolio investment are equity securities and debt securities. Excluded are any of the instruments included in the categories of direct investment and reserve assets.”(^\text{29}) The level of ownership in an entity denoting these instruments is less than 10%. These instruments are generally acquired by small investor with purposes of portfolio diversification.</td>
</tr>
<tr>
<td>Other investment</td>
<td>“Transactions in currency and deposits, loans and trade credits”</td>
<td>“Trade credits consist of claims and liabilities arising from the direct extension of credit by suppliers and buyers for transactions in goods and services and advance payments for work in progress that is associated with such transactions (short-term in nature).” […] “Loans comprise those financial assets created through the direct lending of funds by a creditor to a debtor”.(^\text{30})</td>
</tr>
</tbody>
</table>

\(^{27}\)IMF, [http://www.imfstatistics.org/imf/IFSIntTr.htm](http://www.imfstatistics.org/imf/IFSIntTr.htm)


\(^{29}\)IMF, “Balance of Payments Manual” p. 91

\(^{30}\)IMF, “Balance of Payments Manual” pp. 95, 96
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Western Hemisphere</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FDI, net</td>
<td>2.15%</td>
<td>3.06%</td>
<td>1.77%</td>
</tr>
<tr>
<td>Private portfolio investment, net</td>
<td>1.86%</td>
<td>-15.75%</td>
<td>0.18%</td>
</tr>
<tr>
<td>Other private investment, net</td>
<td>-0.68%</td>
<td>-0.94%</td>
<td>-0.36%</td>
</tr>
<tr>
<td><strong>CIS &amp; Mongolia</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FDI, net</td>
<td>0.98%</td>
<td>1.07%</td>
<td>1.41%</td>
</tr>
<tr>
<td>Private portfolio investment, net</td>
<td>0.23%</td>
<td>-0.58%</td>
<td>0.39%</td>
</tr>
<tr>
<td>Other private investment, net</td>
<td>-2.42%</td>
<td>-0.50%</td>
<td>1.53%</td>
</tr>
<tr>
<td><strong>Central &amp; Eastern Europe</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FDI, net</td>
<td>2.08%</td>
<td>3.12%</td>
<td>3.80%</td>
</tr>
<tr>
<td>Private portfolio investment, net</td>
<td>0.63%</td>
<td>0.58%</td>
<td>0.78%</td>
</tr>
<tr>
<td>Other private investment, net</td>
<td>0.86%</td>
<td>1.73%</td>
<td>3.75%</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations based on IMF *World Economic Outlook* (October 2008)

---

31Here, the group includes also Albania, Croatia, Macedonia and Turkey.
<table>
<thead>
<tr>
<th>Country</th>
<th>Real GDP growth (%)</th>
<th>CA balance</th>
<th>Reserves (% change)</th>
<th>Inflation (%)</th>
<th>ER regime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>7.92 5.78</td>
<td>-5.12 -6.81</td>
<td>22.44 21.01</td>
<td>6.39 2.09</td>
<td>n.a.</td>
</tr>
<tr>
<td>Bosnia &amp; Herzegovina</td>
<td>8.10 5.34</td>
<td>-11.32 -14.98</td>
<td>50.95 30.76</td>
<td>2.34 3.16</td>
<td>n.a.</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>4.06 6.06</td>
<td>-3.81 -12.76</td>
<td>16.08 31.69</td>
<td>8.95 5.84</td>
<td>Fixed</td>
</tr>
<tr>
<td>Croatia</td>
<td>2.59 4.73</td>
<td>-5.89 -7.08</td>
<td>18.69 19.23</td>
<td>4.10 2.64</td>
<td>Float</td>
</tr>
<tr>
<td>Czech Rep</td>
<td>1.70 5.44</td>
<td>-4.05 -3.65</td>
<td>17.10 7.72</td>
<td>4.63 2.05</td>
<td>Float</td>
</tr>
<tr>
<td>Hungary</td>
<td>4.48 3.64</td>
<td>-7.29 -6.91</td>
<td>2.65 19.71</td>
<td>9.70 5.36</td>
<td>Float</td>
</tr>
<tr>
<td>Latvia</td>
<td>5.89 9.74</td>
<td>-7.55 -15.81</td>
<td>12.63 37.64</td>
<td>2.82 6.50</td>
<td>Fixed</td>
</tr>
<tr>
<td>Lithuania</td>
<td>4.77 8.43</td>
<td>-7.66 -9.47</td>
<td>19.99 26.77</td>
<td>1.69 2.44</td>
<td>Float</td>
</tr>
<tr>
<td>Macedonia</td>
<td>1.72 4.18</td>
<td>-5.40 -3.18</td>
<td>24.52 24.47</td>
<td>2.68 1.82</td>
<td>Fixed</td>
</tr>
<tr>
<td>Poland</td>
<td>3.28 5.15</td>
<td>-4.52 -2.76</td>
<td>6.85 17.41</td>
<td>7.29 1.99</td>
<td>Float</td>
</tr>
<tr>
<td>Romania</td>
<td>1.40 6.35</td>
<td>-4.62 -8.20</td>
<td>30.21 44.60</td>
<td>41.51 9.51</td>
<td>Float</td>
</tr>
<tr>
<td>Serbia</td>
<td>-0.26 6.08</td>
<td>-2.06 -10.87</td>
<td>n.a. 48.24</td>
<td>51.65 11.03</td>
<td>n.a.</td>
</tr>
<tr>
<td>Slovak Rep.</td>
<td>3.17 7.07</td>
<td>-6.62 -5.93</td>
<td>27.75 17.10</td>
<td>7.99 5.21</td>
<td>Float</td>
</tr>
<tr>
<td>Slovenia</td>
<td>4.09 4.82</td>
<td>-1.06 -2.65</td>
<td>18.22 4.59</td>
<td>7.77 3.54</td>
<td>Float</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations based on EBRD (Transition Report 2008) and World Bank (World Development indicators 2007) data.
Note: Exchange rate regimes are classified as Fixed in case of currency union, currency board or conventionally fixed pegs; Floating regimes comprise crawling pegs, managed float and independent float. N.a. = data not available for the sample period. Exchange rate regimes data before 2002 are taken from Effenberger (2004); from 2003 onwards data are taken from IMF’s Annual Report on Exchange rate Arrangements and Exchange Restrictions, various issues.
### Table 4 - Development and stability of the banking sector

<table>
<thead>
<tr>
<th></th>
<th>Banks reserves to assets ratio (%)</th>
<th>Domestic credit provided by banking sector (%GDP)</th>
<th>Banks capital to assets ratio (%)</th>
<th>Nonperforming loans as a percentage of total loans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>11.74</td>
<td>11.10</td>
<td>n.a.</td>
<td>4.70</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>8.20</td>
<td>n.a.</td>
<td>39.40</td>
<td>43.63</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>8.97</td>
<td>11.69</td>
<td>18.52</td>
<td>41.95</td>
</tr>
<tr>
<td>Croatia</td>
<td>11.09</td>
<td>18.55</td>
<td>51.49</td>
<td>73.38</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>15.47</td>
<td>2.63</td>
<td>50.21</td>
<td>48.01</td>
</tr>
<tr>
<td>Estonia</td>
<td>11.78</td>
<td>7.42</td>
<td>36.36</td>
<td>70.22</td>
</tr>
<tr>
<td>Hungary</td>
<td>7.86</td>
<td>3.81</td>
<td>54.38</td>
<td>63.93</td>
</tr>
<tr>
<td>Latvia</td>
<td>6.86</td>
<td>6.47</td>
<td>24.46</td>
<td>71.05</td>
</tr>
<tr>
<td>Lithuania</td>
<td>12.40</td>
<td>7.41</td>
<td>15.66</td>
<td>41.58</td>
</tr>
<tr>
<td>Macedonia, FYR</td>
<td>6.43</td>
<td>9.29</td>
<td>17.64</td>
<td>24.13</td>
</tr>
<tr>
<td>Poland</td>
<td>6.57</td>
<td>3.65</td>
<td>35.71</td>
<td>40.46</td>
</tr>
<tr>
<td>Romania</td>
<td>39.73</td>
<td>52.24</td>
<td>16.07</td>
<td>23.21</td>
</tr>
<tr>
<td>Serbia</td>
<td>19.77</td>
<td>33.41</td>
<td>35.74</td>
<td>25.07</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>4.51</td>
<td>4.38</td>
<td>57.19</td>
<td>47.40</td>
</tr>
<tr>
<td>Slovenia</td>
<td>22.91</td>
<td>18.29</td>
<td>42.18</td>
<td>61.65</td>
</tr>
</tbody>
</table>

*Source: World Development Indicators, World Bank (2007)*
Figure 2 – Composition of foreign capital inflows
Slovenia

Year

FDI

OI

PI

Source: Authors’ calculations based on IMF’s *International Financial Statistics*, February 2009
Figure 3 – Selected macroeconomic indicators

Albania

Bosnia & Herzegovina
Poland

Romania
Source: Authors’ calculation based on EBRD Transition Report 2008 and World Bank World Development Indicators 2007 data.
Figure 4 – Real Effective Exchange Rate

**Baltics and Slovenia**

**Southern European Countries**
Figure 5

Government deficit (%GDP)

Government deficit (%GDP)

BG  CZ  HU  PL  RO  SI  SK

EE  LT  LV
Source: EBRD, Transition Report, 2008
### Appendix B – Data sources

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portfolio inflow volume</td>
<td>Foreign net portfolio inflows as a percentage of national GDP</td>
<td>IMF, International Financial Statistic Database (IFS). Obtained from lines 78bgd (Portfolio investment liabilities, n.i.e.) and 99b..zf</td>
</tr>
<tr>
<td>Other inflow volume</td>
<td>Foreign net other inflows as a percentage of national GDP</td>
<td>IMF, IFS. Obtained from lines 78bid (Other investment liabilities, n.i.e.) and 99b..zf</td>
</tr>
<tr>
<td>Portfolio inflow share</td>
<td>Foreign net portfolio inflows as a percentage of total foreign inflows</td>
<td>IMF, IFS. Obtained dividing line78bpd by the sum of the absolute values of lines 78bpd 78bid and 78bed (the latter being FDI in the reporting economy)</td>
</tr>
<tr>
<td>Other inflow share</td>
<td>Foreign net other inflows as a percentage of total foreign inflows</td>
<td>IMF, IFS. Obtained dividing line78bid by the sum of the absolute values of lines 78bpd 78bid and 78bed (the latter being FDI in the reporting economy)</td>
</tr>
<tr>
<td>GDP</td>
<td>Logarithm of the dollar value of national GDP</td>
<td>IMF, IFS. Computed from lines 99b..zf</td>
</tr>
<tr>
<td>Short-term interest rate</td>
<td>3-month Treasury Bill rate. When data on Treasury Bill are not available, the Deposit rate is used.</td>
<td>IMF, IFS. Line 60c (Treasury bill rate) Line 60l (Deposit rate)</td>
</tr>
<tr>
<td>Current account balance</td>
<td>Sum of the balance on goods, services and income, plus current transfers, as a percentage of national GDP</td>
<td>IMF, IFS. Line 78ald</td>
</tr>
<tr>
<td>Exchange rate regime dummy</td>
<td>1= fixed; 0=flexible</td>
<td>The classification of exchange rate regimes has been drawn from Dirk Effenberger (2004) for the years 1994-2002, and from IMF (Classification of Exchange Rate Arrangements and Monetary Frameworks, <a href="http://www.imf.org/external/np/mfd/er">www.imf.org/external/np/mfd/er</a>)</td>
</tr>
<tr>
<td>Sterilization index</td>
<td>Measure of the extent to which the authorities try to prevent capital inflows to result in a monetary expansion. Constructed as the ratio of the change in</td>
<td>IMF, IFS. Series codes: M2: 91859MB.ZF... Foreign exchange: 918.1D.DZF...</td>
</tr>
</tbody>
</table>

Note that this category excludes investments by residents in foreign countries. Portfolio (and Other) investments liabilities, n.i.e. represent net inflows of foreign capital in the reporting economy. A plus sign means that there has been a net inflow of foreign capital, while a minus sign means that foreign capital has been repatriated. The chosen category also excludes current transfers.
broad money (dollar value) to the change in international reserves, multiplied by -1.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banks liquidity(^{27})</td>
<td>Banks liquidity to assets ratio</td>
<td>World Bank, World Development Indicators (WDI) (2007)</td>
</tr>
<tr>
<td>Listed companies(^{27})</td>
<td>Number of companies listed on the domestic stock market.</td>
<td>World Bank, World Development Indicators (WDI) (2007)</td>
</tr>
<tr>
<td>Private sector share(^{27})</td>
<td>Private sector share in total GDP</td>
<td>World Bank, World Development Indicators (WDI) (2007)</td>
</tr>
</tbody>
</table>

\(^{27}\) These figures were only available at annual frequency, therefore they have been linearly interpolated into quarterly observations.