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The Determinants of Portfolio Flows

into the CIS countries

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Abstract

This paper employs a standard Tobin-Markowitz framework to analyse the determinants of capital flows into the CIS countries. Using the data from 1996-2006, we find that the Russian financial crisis of 1998 has had a profound impact on capital flows into the CIS (both directly and indirectly). Firstly, it introduced a structural shift into the investors' behaviour by shifting the focus from the external factors to the internal ones, e.g. domestic interest and real growth rates. Secondly, it also drastically changed the impact of a number of explanatory variables on capital flows into the CIS. Political risk was found to be the second most important determinant of capital flows into the CIS. Additionally, we report some strong evidence of co-movement between portfolio flows into the CIS and CEEC coupled with strong complementarity between global stock market activity and portfolio inflows into the CIS. Interestingly, external factors tend to be of higher significance than internal factors for the CIS largest members (Russia, Ukraine and Kazakhstan); whereas domestic variables tend to have a greater impact on the capital flows into the smaller CIS countries.

The Determinants of Portfolio Flows into the CIS countries

1. Introduction

Private capital flows to the developing countries have massively increased during the past years. During only 2002-2005 total private capital flows to the emerging markets and developing economies increased roughly 2.7 times as compared with 1998-2001[1]. Some of this capital has been heading to the CIS, the region whose prospects have considerable improved since the 1998 Russian financial crisis. Although the amount of capital flows into the CIS was largely insignificant before the crisis and shortly thereafter, the share of the CIS countries in the global private capital flows has averaged to more impressive 13% during 2002-2005. Attracted by strong economic growth in the majority of the CIS countries in the new millennium, international investors have begun investing into the CIS to exploit potentially lucrative investment opportunities. Yet, this investment has taken mostly the direct form due to the undeveloped CIS financial markets coupled with poor governance environment Li (2005).

The focus of this paper is nevertheless on portfolio flows to the CIS, which are less researched (as compared to direct flows), yet not less important component of capital flows. Although short-term capital flows might have a destabilising impact on the economy (as in the case of the Asian crisis), the benefits of the influx of foreign capital are also numerous. Fortunately, the portfolio flows into the CIS have picked up considerably since 2005 launching a healthier trend in the region. Nevertheless, the CIS economies are still highly vulnerable to sudden changes in investors' sentiments. An abrupt withdrawal of capital from the region may bring severe consequences to the emerging CIS given the small relative size of all CIS economies (excluding Russia) coupled with low market capitalization (for example, the third quarter of 2000 witnessed portfolio outflow from the CIS of USD 11.5bn). Hypothetically, the consequences of capital withdrawal could have been even more severe than those of the late

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[1] World Economic Outlook: a survey by the staff of the International Monetary Fund, September 2006, IMF.

1998, as now financial sectors account for larger parts of the respective economies. Therefore, understanding what guides portfolio investors, and what are the corresponding risks, if any, faced by the host economies is vital.

Consequently, the main goal of this research is to identify factors which drive portfolio flows into the CIS countries as well as to assess their relative importance. According to standard Tobin-Markowitz framework the determinants of portfolio inflows may be divided into four broad categories (Calderon, Loayza and Serven, 2003): (i) investment return in home country relative to abroad, (ii) perceived risk of investments, (iii) degree of co-movement between international returns (which sometimes may take the form of a contagion effect), and (iv) diversification motive. Equivalently these determinants may be grouped into global and country-specific factors. Relative importance of these determinants is an important indicator for policy decision making. Specifically, the sensitivity of portfolio flows to external factors will indicate the vulnerability of the CIS economies to global capital market developments. If this reliance is high, shocks to world financial markets will require an appropriate adjustment plan to be developed in order to keep the target economic indicators within their ranges. At the same time, higher independence of a country from the global financial swings will point towards strong domestic fundamentals and sound economic policy.

Special attention in this paper is paid to contagion effects, as their significance was evident in the aftermath of the Russian crisis of 1998. Given that the CIS region is still closely integrated (as can be seen from individual countries' growth patterns), we need to be able to better understand a potential impact of the regional contagion on the portfolio investment. Hence, the paper tests for the possibility of contagion effects by considering trade-related contagion channels and channels based on macroeconomic similarities between the countries.

Apart from the above-mentioned objectives, this paper enlarges the existing body of research on the determinants of portfolio investment in the developing countries (as most of the

attention in the empirical literature on capital flows is largely devoted to developed countries).

In the developed countries setting, scholars have been focusing on either optimal portfolio theory in which the return and risk were the main factors determining allocation of portfolio flows (Grubel, 1968); or the stock-equilibrium approach (Miller and Whitman, 1970; Kreicher, 1981), which assumes that there exists optimal allocation of portfolio flows among countries and actual flows reflect adjustment to the equilibrium.

In the context of developing countries, however, much of the attention is devoted to the analysis of capital flows during the currency crises. Calvo (1993) launched an exploration of determinants responsible for capital flows into the developing countries; while Chuhan, Claessens and Mamingi (1993) split the determinants of short-term capital flows in the developing countries into domestic and external or global. However, there's still no empirical agreement with respect to the relative significance of the domestic and global factors for developing countries. Unsurprisingly, different factors come into play in various country/time contexts. For example, in the CIS countries portfolio flows have been identified to move in accordance with just a couple of factors, e.g. LIBOR, foreign currency reserves (Claessens, Oks, Polastri, 1998; Garibaldi, Mora, Sahay and Zettlemeyer, 2001).

As a result, this paper not only contributes to our understanding of portfolio investment in the CIS countries, but also it is set to offer some insights in a broader, developing countries context in a non-currency crisis setting.

The paper is organized in the following way. We start by giving a brief overview of the capital flows into the CIS region after the break-up of the Soviet Union. Further on we discuss theoretical and empirical work that is devoted to the analysis of capital flows in the context of developed and developing/emerging economies. Later, we present the methods we use in our analysis, followed by discussion of the data used. Econometric results are presented in the

subsequent section, which are discussed in more detail in the last part. Some concluding remarks close the study.

2. Capital flows into the CIS

Since the breakdown of the Soviet Union and the beginning of integration with the global economy, the CIS countries have experienced swings in the short-term foreign capital flows. While the period since mid-1990s until 1998 can be characterized by net capital inflow, the Russian financial crisis that quickly spilled over to the neighbouring countries made a significant change to the overall pattern. Capital flights have been persistent for couple more years and the CIS countries were cut-off from foreign resources for some time. However, following strong growth in the CIS region and further development of its financial markets, portfolio capital flows have started slowly picking up in 2002 (please see Figure 1).

Figure 1. **Portfolio investment inflows in the CIS countries, million USD**
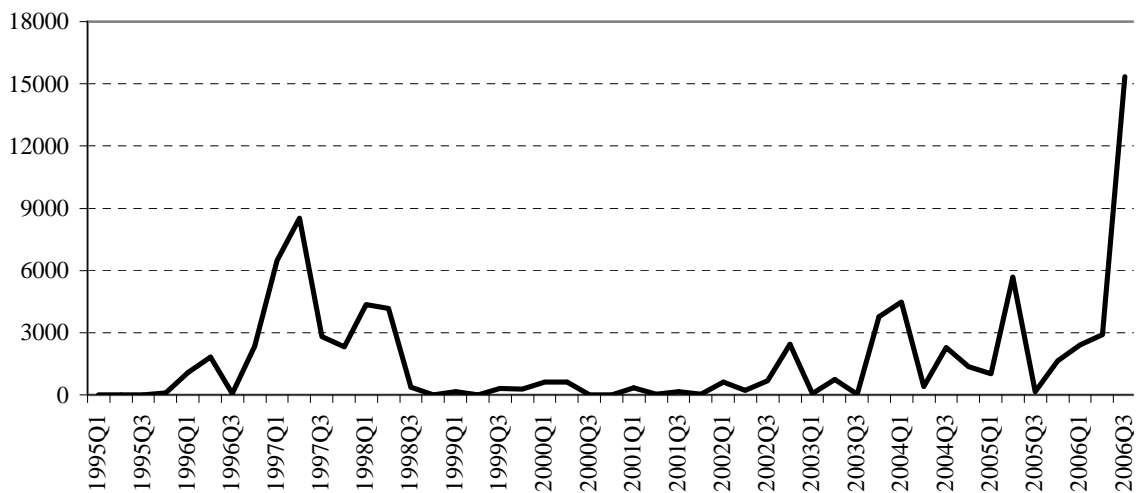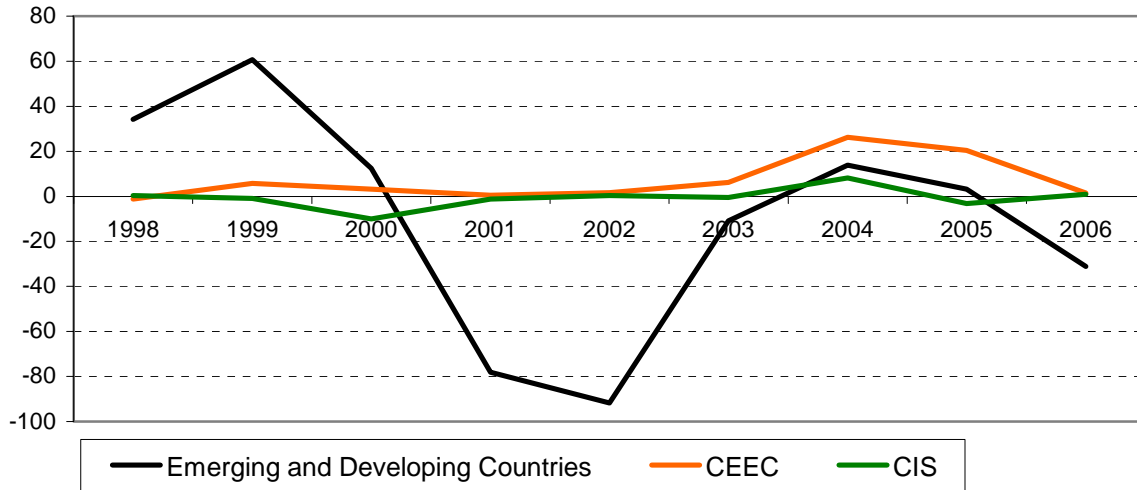

Source: International Financial Statistics

During the first few years of the CIS existence the only source of external financing was the official capital flows, hence, the amount of portfolio investment was negligible. These official capital flows took form of the borrowing from the international financial institutions

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(e.g. the IMF and World Bank) and were aimed to assist the CIS countries in reforming their economies. Underdeveloped financial systems along with poor protection of property rights and capital account restrictions were the major obstacles for portfolio flows to pour into the CIS economies. The portfolio flows started to pick up once some basic financial institutions and law systems were put in place (see Figure 2).

In particular, the national stock exchanges in the CIS have been created in the second half of the 1990s. Russian stock market index RTS was launched in September of 1995, while a corresponding Ukrainian equivalent (PFTS) has been brought to existence in November 1997. Still, despite creation of the stock exchanges, the equity flows into the CIS were largely negligible because of the underdeveloped financial markets and dominance of the banking sector. Equity flows increased considerably in 2005-2006. Starting the first quarter of 2005 and until the third quarter of 2006 total equity liabilities increased by USD 10bn while debt liabilities grew by only USD 6bn. Almost all equity flows into the CIS during 2005-2006 were directed to Russia. Share of other CIS countries is negligibly small and amounts to 0.7% of the total flows.

The total amount of capital inflows into the CIS countries since the beginning of 1995 and until the first half of 2006 adds up to sizeable USD 83.2bn, which of course falls short of capital inflows into other Central and Eastern European countries. Figure 2 offers a comparison of portfolio flows to Central and Easter European countries, CIS, and other emerging markets in the after-crises period (1998-2006).

*Figure 2. **Private Portfolio flows to Emerging Markets and Developing Countries, USD bn***

During 1995-2005 period, two sub-periods stand out considerably. The first period was characterized by large inflows (mostly debt) before the Russian crisis of 1998. The second period of considerable recovery of capital inflows into the CIS starts in 2004. Yet, this time the equity flows have been prevalent. On one hand, the CIS region has been already enjoying a healthy period of solid economic growth in the majority of its member-countries that considerably improved the region's economic fundamentals, hence little multilateral lending was required anymore. Still, on the other hand, the improving corporate governance and economic conditions have stimulated private portfolio investors to seek opportunities in the CIS. Therefore, in the analytical part of the paper we will be looking specifically into the changes brought in into the investment patterns by the crisis of 1998. There was almost no considerable activity in the interim period which was characterized by mainly the outflows of largely 'grey' capital.

*Figure 3. **Debt and Equity Flows into the CIS countries, million USD***
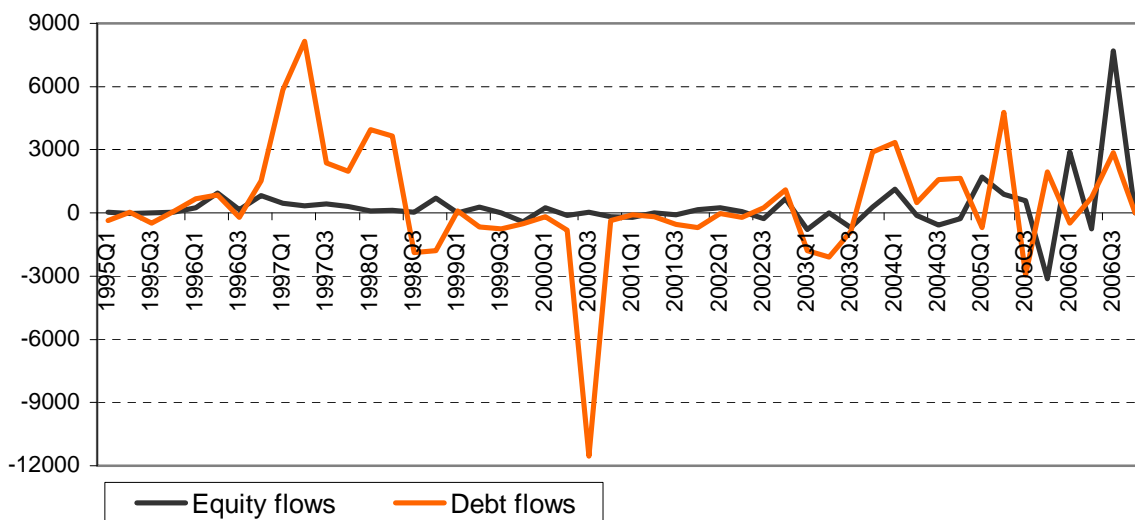
Unsurprisingly, Kazakhstan, Russia and Ukraine account for almost all portfolio flows into the CIS region with Russia standing out considerably of the three. Given that these countries are the largest economies in the region, with Russia and Kazakhstan enjoying considerable endowments of natural resources, their lead in the attracting capital inflows is in line with conventional logic. The relative weight of other CIS members has been very small.

3. Literature Review

The existing literature on portfolio flows may be divided into two broad categories. The first group looks at portfolio flows between developed countries. This part of literature analyzes portfolio capital flows in the context of portfolio equilibrium framework. The second group focuses on portfolio flows into developing countries. Scholarly interest in this area was revived following a series of currency crises, which hit a number of the emerging markets in the 1990s. These studies pay special attention to external (push) and domestic (pull) determinants of capital flows. The following section overviews the body of research on the topic, whereas Annex 1 provides more detailed account of the studies discussed below.

3.1. Capital flows in the developed countries

One of the most popular approaches to analyse the international capital movements is the stock-equilibrium model developed by Miller and Whitman (1970). The authors treat capital flows as combination of stock adjustment and flow adjustment components. Based on the U.S. quarterly data, they show the interest rate differentials to be highly important determinants of international capital movements as they induce investors to respond to interest rate changes. Speed of adjustment coefficient suggests that approximately 1/3 of adjustment between foreign and domestic assets holdings take place within one quarter.

The same approach was also used by Kreicher (1981). However, his model assumes that there is some desired stock of capital that economic agents would like to have. However, as the actual stock differs from the desired it induces investments to flow. The author argues that the desired stock of capital depends on a set of country specific variables. Specifically, they are real interest rate, industrial production indices and dummy variables. The model was estimated for both capital inflows (liability equation) and outflows (asset equation) for four developed countries. Industrial production indices were found to be not significant in any of the asset flow equations; however, they are significant in liability equations. For all countries there is at least one real interest rate being significant. Hence, an increase in external market return leads to an increase in portfolio flows into the country. However, only for two countries domestic real interest rate is significant which suggest some independence in investment decisions about capital allocation between domestic economy and the rest of the world.

Further development to the stock equilibrium approach was undertaken by Kouri and Porter (1974) that combined stock equilibrium approach with balance-of-payment theory. The authors assume capital flows to be the means for eliminating excess money demand. Thus, it is believed that income and interest rates should have significant impact on capital flows. The authors find that primary source of capital flows is income which in turn is an important

determinant of money demand. Therefore, they conclude that money demand and supply forces determine the capital flows between countries.

The next important approach to the analysis of international capital movements is the portfolio equilibrium approach. It is often regarded as more suitable for portfolio flows estimation because it captures the effect of the two most important factors such as market return and risks associated with the investments (Kraay et all, 2000).

A complication to the portfolio equilibrium models arises when informational asymmetries between international investors are taken into account (Brennan and Cao, 1997). In this case investors may not act in line with the portfolio equilibrium theory logic. Brennan and Cao (1997) developed a model of international capital flows based on the differences of informational endowments about foreign markets. Thus, authors moved away from barriers to investments, and interest rate differentials. The only independent variables that enter the equation are market returns and foreign market indices measured in the US dollars. The authors conclude that while US investors have informational disadvantage in the foreign market (apart from the UK), investors from developed and developing countries do not have any informational shortages in the US market.

However, Brennan and Cao (1997) informational disadvantages hypothesis found little support in the study by Froot, O'Connell and Seasholes (1998). High frequency data employed in the paper helped to analyze portfolio flows more comprehensively. Daily international portfolio flows for 46 countries were used to estimate structural equation by employing VAR methodology. It was found that portfolio flows had been highly persistent over time. For developing countries current portfolio inflows predict future return. However, for developed economies this is not the case. Thus, inflows of capital to emerging markets contain some information about future value.

Another popular approach for analysis of portfolio flows has been borrowed from the international trade theory. More precisely, the gravity model has been successfully employed by, for example, Portes and Rey (1999). Augmented gravity equation gives especially good fit when estimating equity flows for 14 developed countries. As a measure of market size Portes and Rey (1999) use market capitalization. To proxy the cost of investing they include a distance variable. The authors find that market returns do not play any significant role in equity flows. Measures of market size and distance are the key significant determinants of capital flows. At the same time, informational asymmetry explanation of equity flows found robust support.

Siouronis (2002) employs a similar model to Portes and Rey (1999). Specifically, the author uses the volatility augmented gravity equation model to estimate the influence of monetary variables on composition of international capital flows. Contrary to Portes and Rey (1999) the distance proxy was found to be insignificant determinant of cross-border capital flows for developed economies. However, for developing countries distance was important in most of the cases. The capital flows were divided into three broad categories: government bonds, corporate bonds and corporate equities. For all of the capital categories market interest rate volatility as well as inflation volatility are significant and enter regressions with negative sign. This is to be expected as interest and inflation volatility increase riskiness of the investments. Exchange rate volatility has an opposite sign. In particular, greater volatility of exchange rate encourages all types of capital flows.

While consideration of domestic (or pull) and external (or push) factors is much widely used in literature about developing countries it was also applied in a developed country setting by Odedokun (2003). He used push and pull factors to analyze the determinants of capital flows from the perspective of a capital exporting country. Per capita income levels, interest rates, economic growth and phase of the economic cycle are among the key

explanatory variables in his study. The author reports a significant and positive effect of income per capita on capital flows. Relatively high interest rate in the destination country pulls the portfolio capital, while the increase of interest rate in other countries tends to discourage capital flows. Economic growth as well as economic cycle appeared to be insignificant factors in explaining capital flows. Thus, the only factors which matter are income and interest rate differentials.

A domestic interest rate has been found to be a significant determinant of portfolio flows into the developed countries by almost all authors. Hence, portfolio investment flows were confirmed to be responsive to the changes in international market returns. Furthermore, gravity models confirmed a positive impact of the market size on portfolio flows, whereas the impact of distance and information cost had not always been significant.

3.2. Capital flows in the developing countries

There's a significant body of research exploring the determinants of capital flows into the developing/emerging economies. Considerable attention is devoted to the analyses of causes of different currency crises. The Mexican crisis of 1994 and the Asian crisis of 1997 have spurred substantial interest from the economists. Financial crises are typically followed by significant exchange rate depreciation if floating exchange rate is adopted or foreign reserves reduction if it is fixed. However, the Mexican and Asian crises have witnessed both processes. Large IMF loans were used to cover international imbalances during those periods.

Carlson and Hernandez (2002) analyzed the major factors causing crises in both regions. While for Mexican crisis, low ratio of short term debt to reserves contributed to crises aggravation, for Asian countries denomination of debt was a major cause of the crisis. In both cases composition of capital flows affected the crisis' likelihood. A considerable part of capital inflows into these countries was short-term. As economic conditions in the countries started to

deteriorate short-term capital was the first to leave the country. Thus, the government should have implemented some policies to balance the structure of capital flows. For example, by imposing capital controls the government could have increased the level of FDI in the economy and restricted the volume of the short-term debt flows. Floating exchange rate tends to encourage the share of short-term debt while fixed exchange rate promotes FDI and portfolio flows. It is generally assumed that portfolio flows behave similarly to the short-term debt because of its short-term nature. Unexpectedly, the authors concluded that portfolio flows behaved similar to FDI but not to short-term debt.

Stock adjustment approach employed for developed countries is also used in investigation of portfolio flows to developing countries. Hernandez and Rudolph (1995) employ stock adjustment model by incorporating push (external) and pull (internal) determinants of capital flows. The estimation results support a proposition of larger importance of pull factors for portfolio flows to transition economies. In particular 12-month US Treasury bill rate was found to be insignificant. Therefore, it is inferred in the paper that adverse shock is very unlikely to happen solely because of external factors.

The opposite findings have been reported in Fernandez-Arias (1994). Push explanation of capital flows got greater backing. Fernandez-Arias (1994) developed a model of international capital flows based on "non-arbitrage conditions between external returns and domestic returns adjusted by country risk". Three key variables of the model are the countries creditworthiness, return on project and opportunity costs represented by market return in developed country. The results of estimation showed larger influence of international interest rate on capital inflow into the country than improvements in domestic investment climate. Countries creditworthiness appears to be an important factor driving capital inflows into the country. However, it is argued that the creditworthiness is influenced by external sources to some extent. A country's credit rating tends to improve when international interest rate is low.

The relative importance of push and pull factors in determining capital flows varies by countries. While for CIS countries domestic factors were found to be the major determinants of capital flows (Claessens, Oks and Polastri, 1998), both internal and external factors were found to be important for Latin American and Asian countries (Taylor and Sarno, 1997). The authors use the same monthly data on portfolio flows from the USA to a group of Latin American and Asian countries as in the study by Chuhan, Claessens and Mamingi (1993). Taylor and Sarno (1997) estimate seemingly unrelated error correction model to retrieve short-term effects. In order to receive long-term coefficients cointegration techniques were employed. Both methods testified approximately equal importance of external and domestic determinants. However, for bond flows global factors seem to have greater importance than domestic.

The proposition about equal importance of push and pull factors for emerging economies was challenged in other studies. Hernandez, Mellado and Valdes (2001) found that domestic determinants are much more important than external ones in their research. The authors pay special attention to the so-called contagion effect which takes place if capital flows exhibit strong co-movement. In case of contagion effect decisions by large investors tend to be followed by many relatively small players whose behaviour mimics the pattern of the leader. Three possible sources of contagion considered in the paper are neighbourhood effect, trade related channel and similar macroeconomic indicators channel. The estimation results provided strong evidence that macroeconomic similarities and trade linkages between countries tended to intensify the impact of external shocks for the countries.

On the other hand, support for pull factors in explaining international capital flows in the developing country setting was offered in the study by Chuhan, Claessens and Mamingi (1993). The authors explored the relative importance of global and domestic determinants of capital flows. They analyzed net equity and gross bond flows from the USA to Latin America

and Asia countries. While for Latin American countries the external and domestic factors were roughly equally important, for Asian countries domestic fundamentals played a larger role. Interestingly, equity flows were shown to be more sensitive to global factors than bond flows.

Pull factors explanation of capital flows found some considerable support in the existing literature on developing countries. There is also some evidence to push factors explanation, although it is far less prevalent. Thus, reforming institutions and strengthening domestic economic environment are the key factors that should aid increasing capital flows into developing countries.

3.3. Capital flows into the CIS countries

For the CIS countries except Russia almost all capital flows have taken the form of foreign direct investment (FDI). Out of portfolio investment only, a considerable amount of capital flows took form of the government borrowings from international organizations (mostly from the IMF and the World Bank) both long-term type (in order to conduct structural reforms) and short-term type (in order to cover raising fiscal deficits).

The studies of the CEE and CIS countries claim that most important factors of portfolio inflows tend to be the domestic ones. Claessens, Oks and Polastri (1998) concluded that a country's success in reforms and robust creditworthiness are the only important determinants of the capital inflows into the country. The authors single out two broad categories of factors in their study, namely domestic and external. They report strong support for the reform variable. It is not surprising as the bulk of capital flows had been in the form of government borrowing to conduct reforms. Thus, the primary goal of the capital inflows was to promote the reform process. Because of the relatively short history of portfolio flows into the CEE and CIS countries the authors speculate about "weak relationships" in portfolio flow equation which limits the estimation options.

Another similar study which analysed the portfolio flows into the CEE and CIS countries has been conducted by Garibaldi, Mora, Sahay and Zettlemeyer (2001). As in the previous paper portfolio capital flows have been found to be much harder to properly model than FDI. The authors found only a few explanatory variables to be responsible for portfolio investment into the CIS and CEE. While macroeconomic variables played a significant role for FDI, portfolio investment was found to be associated with developments of financial market infrastructure and protection of property rights only. Hence, such factors as interest rates and solvency indicators were not reported to be among important determinants of portfolio flows into these countries. Hence, again for CEE and CIS countries the domestic factors were shown to be highly important in attracting capital inflow. In particular, the most important determinants for the CIS countries are property rights protection, financial markets developments and adherence to reforms. Large sensitivity of investment to these factors indicates that the CIS countries need to pay considerable attention to the development of healthy institutional environment.

4. Methodology

According to Tobin-Markowitz framework as discussed in Calderon, Loayza, and Serven (2003) the determinants of portfolio flows into a country or a region may be split into four categories:

(i)   Expected investment return in host country relative to abroad.

(ii)   Perceived risk of investments.

(iii)   Co-movement between portfolio flows in given countries.

(iv)   Diversification.

This set of determinants encompasses the factors that are responsible for portfolio flows to CIS countries most comprehensively. Hence, this approach allows for extensive explanation

of the portfolio flows into the CIS region. Furthermore, it is easy to expand this approach to the one most frequently used in the literature on developing countries, specifically, push-pull framework.

The four above-mentioned groups of portfolio flow determinants are essential in the long-run. In the short-run, additional factors such as frictions and imperfections of financial (as well as real) markets, and changes in the regulatory framework may play a significant part too. Additionally, co-movement in capital flows over and above a normal level can also be considered as determining portfolio flows in the short-run.

Portfolio flows seek to realize short-term profit opportunities, hence, a higher rate of return in the host country is seen as a primary driving factor. In order to balance the structure, the expected return in a host country should be weighted by the perceived risk. However, during some periods portfolio flows to a country may be driven by the conditions in other country or region and not as much by investment opportunities in the country. Investors may decrease the extent of excess co-movement in portfolio flows by properly diversifying investments. While excess co-movement may be eliminated there may exist long-term correlations in flows that are attributed to such factors as country similarities, same borders, trade and financial linkages etc.

Being a standard framework, Tobin-Markowitz approach, however, does not work accurately even for the developed countries. Investors usually tend to underinvest into foreign countries even after appropriately adjusting investment decisions by expected risk and return, and also overinvest into domestic market, thus, causing home bias in the portfolio investment (Tesar and Werner, 1995). Investors expect "return in their domestic equity markets to be several hundreds basis points higher than returns in other markets" (French and Poterba, 1991).

As for developing countries a number of other factors play a significant part in addition to the standard ones. One of these factors is restrictions on cross-border capital

movements in developing countries which control various aspects of foreign investment. The easiness of liquidation of investment position in the local market tends to be the most important. In the CIS the controls on capital flows have not been lifted yet. Definitely, this is one of the reasons of the relatively modest volumes of portfolio flows as compared to direct investment. The issue of capital account liberalization is an acute question for CIS countries to solve.

Another important factor that has been shaping the pattern of portfolio flows into the developing/transition economies and the CIS in particular is a country's political environment. The CIS countries have been characterized by constantly changing political situation which obviously had a detrimental impact on the investment climate. Hence, it is expected that an improvement in political stability will have a considerable impact on portfolio flows into the CIS.

Underdeveloped financial markets were yet another restricting factor to portfolio flows into the CIS. The set of possible investment opportunities in a typical CIS country was very narrow, mostly represented by debt instruments. Unsurprisingly, the majority of portfolio investment was of debt type. Large part of debt flows were government borrowings. Hence, during first years of independence portfolio flows were skewed toward government securities.

Following the approach used in the literature on developing countries, we split the determinants of portfolio flows into the CIS region into two large groups in this paper: global or push and domestic or pull factors. This division will help us to differentiate between domestic and global sensitivity of capital flows into the CIS region. Recognising the importance of domestic factors for capital flows into the developing countries and the CIS, we also expect global factors to play a significant part in the CIS setting as was shown by Calvo et al. (1993). In this case, external or global factors will only be reflecting the return on

investment. It is assumed that these investments are risk-free as compared to the investment in the CIS.

As a result, we employ the following external or push factors in this paper: (i) short-term international interest rate measured by *Market yield on U.S. Treasury securities at 3-month constant maturity*. The correlation of yield on the 3-month US Treasury securities with the Euro-Dollar 3-month deposit rate is close to one. The correlation with yield on the 2-year US Treasury securities is also very high that justifies the usage of the 3-month US T-bills rate. (ii) *yield on a world stock market index* measured by S&P500 (Standard & Poor's 500), (iii) *yield on emerging markets price index* from Morgan Stanley Capital International (MSCI). This index should reflect more closely the risk structure of investments similar to those in the CIS (i.e. the emerging markets). (iv) *US real GDP growth,* which is supposed to represent (be correlated with) the world economic activity. The inclusion of this global explanatory variable will shed a light on whether the portfolio flows to CIS countries follow the world economic cycles. The determinants of portfolio flows considered in this research constitute only a background or approximation to characteristics which are of primary interest to investor. Specifically, these are return and risk measures of investment into a particular asset.

The determinants of portfolio flows that account for investment opportunities in the host country (CIS) used in the analyses are: (i) *domestic deposit rate* and (ii) *real GDP growth rate*. Perceived risks of investing into the CIS countries are approximated by several variables. Because the risks in the CIS countries were numerous single measure of risk may not provide satisfactory results. The most common risks faced by investors are currency, financial, and political risks. We will assess these risks with the following explanatory variables: (i) *changes in the exchange rate of national currency against US dollar will approximate the exchange rate risk*, (ii) *financial and political risks will be estimated by employing corresponding indices* from the International Country Risk Guide (ICRG).

ICRG political risk index is a weighted average of the following categories (each assessed independently): government stability, socioeconomic conditions, investment profile, internal and external conflicts, corruption, military in politics, religious tensions, law and order, ethnic tensions, democratic accountability, and bureaucracy quality. The index is measured on 1 to 100 scale with higher values being assigned to the most stable countries, hence, 100 points indicate absence of political risk at all.

The financial risk components are: foreign debt as a percentage of GDP, foreign debt service as a percentage of exports of goods and services, current account as a percentage of export of goods and services, net international liquidity as month of import cover, and exchange rate stability. The numerical values of the categories are then assigned specific risk points in order to combine them into one index. The maximum and minimum points of the index are similar to those of political index.[1]

Another potentially important determinant of capital flows into the CIS is a relative return on investment. We measure it by the difference in the host country deposit rate (adjusted for exchange rate changes) and the yield on the 3-month US Treasury securities.

We have already emphasized the importance of the contagion for capital flows. The literature embraces different views with respect to the nature of the contagion effect. While Fiess (2003) does not distinguish contagion from global conditions, Forbes and Rigobon (1999) proposed to define contagion as "a significant increase in cross-market linkages after a shock". In this paper, we will follow the approach introduced by Forbes and Rigobon (1999). Specifically, they propose to use the term shift-contagion instead of contagion. Naturally, the Russian financial crisis of 1998 will be investigated as a source of shift-contagion in the CIS countries. A test on stability of the effects of push and pull factors before and after the crisis will help to analyze the presence of the contagion after the crisis period. The analysis of the

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[1] For more information on ICRG methodology please see http://www.prsgroup.com/ICRG_Methodology.aspx

two time periods, before the crisis of 1998 and afterwards, will also help to better understand the influence of the factors outlined above on portfolio flows. The behaviour of the domestic variables differs substantially before and after crisis that prompts a hypothesis of a significant (structural) change in the relationship between explanatory and dependent variables in 1998.

Although Forbes and Rigobon (1999) introduced a more sophisticated way to account for contagion effects through the use of unconditional correlation coefficients, it will not be applied in this paper due to the low frequency of data on portfolio flows in the CIS (in this case, a correlation coefficient for the period before the crisis of 1998 will offer little insights).

Apart from the contagion effects, the literature also suggests being watchful for the presence of co-movements in the flows of capital to the adjacent regions. To account for this effect, we include portfolio investments flows to Central and Eastern European countries as an additional explanatory variable. Furthermore, in line with Tobin-Markowitz model we test for a diversification motive in the CIS region through the inclusion of a country's GDP share in the total GDP of the CIS countries.

Another factor that is hypothesised to have a significant impact on short-term capital flows is capital account controls in the CIS. It is very important since capital account restrictions are present in almost all CIS countries except Armenia. However, we were not able to construct an appropriate index due to low variation in the data for the CIS countries (both across time and cross-sectional). There are plenty of controls imposed on transactions with capital market securities and money market securities which are still not abolished in the CIS.[2] Yet, it will be only possible to assess the effect of these restrictions when more countries start relaxing at least some of them.

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[2] See 'Annual Report on Exchange Arrangements and Exchange Restrictions', the IMF.

The determinants of portfolio flows to the CIS countries will be estimated using panel data regression. Using either fixed or random effect method (as will be suggested by Hausman specification test), the following model will be estimated:

$$PIL_{it} = \alpha + \beta_{1k}WR_{k,it} + \beta_{2j}DR_{j,it} + \beta_{3s}RI_{s,it} + \beta_4 CO_{it} + \beta_5 D_{it} + \varepsilon_{it},$$

where PIL_{it} is portfolio investment liabilities in USD, mn; $WR_{k,it}$ - is a set of global variables which measure return on investment in global markets. In particular, they encompass the 3 month U.S. T-bills yield, MSCI emerging markets yield, S&P 500 yield, and the US GDP growth rate. $DR_{j,it}$ - is a set of variables measuring domestic return on investment, which comprise the domestic deposit and GDP growth rates. $RI_{j,it}$ - is a set of risk variables, comprised of the exchange rate changes, financial and political risk indexes; CO_{it} - a co-movement variable, operationalised by portfolio investment flows to the CEEC[3]; D_{it} - a diversification variable measured by a country's GDP share in the total GDP of the CIS countries, ε_{it} - stochastic error term distributed as $N(0, \sigma^2)$.

5. Data

The time span of balance of payments data on the CIS members[4] is rather short (if available at all) and that determined a time dimension of the sample under consideration. More specifically, the data range starts from first quarter of 1996 and ends in second quarter of 2006.

The primary source of data is the International Financial Statistics (IFS) of the IMF. However, the IFS does not provide data on all countries-members of the CIS. In particular, the data for Uzbekistan are not available in the IFS database at all, whereas the data on Tajikistan contain highly limited number of series which makes them of no value for the purposes of this research. Hence, these countries will not be considered in this paper. Also, the two Caucasus countries – Azerbaijan and Georgia –are not included in the sample either. A number of series

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[3] Central and Eastern European Countries (CEEC) in this research comprise the following countries: Bulgaria, Czech Republic, Hungary, Poland, Romania, and Slovakia.

[4] CIS includes the following countries: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Ukraine and Uzbekistan. Turkmenistan has suspended participation in CIS in 2005.

is unavailable for Azerbaijan, whereas portfolio flows to Georgia have very often been reported to be of zero in magnitude. In the end, the final sample comprises the following countries: Armenia, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia and Ukraine.

We employ quarterly portfolio investment liabilities[5] (which consist of the claims of foreigners on assets in the CIS) as a dependent variable in this paper. Quarterly series is the most frequent data format available for the CIS countries that defined the frequency of the sample under study. Table 1 offers a more detailed description of variables and their sources; whereas Appendix 2 provides summary statistics and related graphs.

6. Results

We employ a random effect Generalized Least Squares technique (with a correction for cross-country heteroskedasticity) to analyse the determinants of portfolio flows into the CIS countries. The choice of random effect technique was supported by Hausman specification test which rejected the use of fixed effects model. The fixed effects technique produces inefficient estimates when no correlation between fixed effects and regressors are observed in the model. The random effects model, on the other hand, supplies lower estimates of the standard errors, hence, more precise inference can be made. Usage of random effect model for the CIS indicates that individual specific effects of each country are the realization of random process and constitute individual specific errors. The results are quite natural given common past of the CIS member countries and approximately the same level of economic development during time period under study.

Table 2 reports estimation results of the determinants of portfolio flows into the CIS countries. The obtained estimates are generally consistent with the theory of allocation of international portfolio flows. Higher return in the host country attracts more portfolio

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[5] Portfolio investments are divided into debt and equity securities. Debt securities are subdivided into bonds and notes, money market instruments, and financial derivatives. Equity securities include shares, stocks, participation, preferred stocks or shares, mutual funds, and investment trusts.

investment to the CIS countries, whereas higher risk (especially political) has a detrimental effect on the investment attractiveness of the region. We also found empirical support of co-movement between portfolio flows into the CIS and CEE regions. Additionally, the size of the economy has been confirmed to induce portfolio flows to the CIS countries.

The following discussion of the results is organised according to the 4 categories of Tobin-Markowitz framework we have based our analysis on, i.e. relative return, risk, co-movement and diversification. As have been mentioned before, we have employed the following measures of the relative return: global and domestic GDP growth rates, the US T-bill yield, MSCI emerging markets yield, domestic interest rate and S&P 500 yield.

Portfolio flows to the CIS countries were found to be independent from global economic cycles and to some extent from domestic ones. The world economic cycles (as approximated by seasonally adjusted US GDP growth rate) do not have a statistically significant impact on portfolio investment into the CIS (see Table 1).

However, the impact of domestic economic activity (as measured by a host country's growth rate) changes over the period under consideration. Despite the variable being insignificant over the whole time period, it becomes significant if only an after-crisis period is considered. Before 1998 the GDP in the majority of CIS countries was declining, yet large portfolio (debt) inflows were reported. The situation reversed after Russian default in 1998: both GDP and capital flows were growing shortly thereafter. Unsurprisingly, no relationship could be detected over the whole time period. Yet, domestic GDP growth rate turns out to be statistically significant at 10% significance level after 1998. Consequently, portfolio flows in the after-crisis period have become much more sensitive to the domestic economic activity that indicates a structural shift in the pattern of capital flows into the CIS.

The Russian crisis has also had a significant impact on the relationship between another measure of return on the investment the interest (deposit) rate in the CIS countries and

capital flows. Being significant in a baseline specification, the coefficient loses its significance when the influence of the 1998 crisis is accounted for (See Table 1). This suggests that the crisis of 1998 made a crucial impact on the relationship between the deposit rate and portfolio flows into the CIS. Our estimates show that the influence of the deposit rate has changed over time. While for the period before Russian default the coefficient of the deposit rate is significant at 5% significance level and negative (a higher interest rate in that period was a reflection of high domestic inflation and risk rather than higher return on investment); the coefficient changes the sign to positive and becomes significant at 1% level after the crisis (see Table 2). Before the crisis a decline in deposit rate meant not lower profits but higher macroeconomic stability and lower risks in a country. The largest value for the deposit rate in CIS countries during 1996-2006 is 61.7% whereas the mean value is 16% only. After the crisis the deposit rate has become more stable and its influence on portfolio flows has become more predictable.

Similar to domestic deposit rate, the world interest rate measured by 3 months US T-bills yield is not statistically significant when controlled for the effect of the Russian crisis. The signs of the coefficients of the world interest rate before and after crisis are opposite to the signs for the domestic interest rate. It is positive before the Russian default and small negative afterwards. This is sensible from a statistical point of view (given that the correlation between the world interest rate and domestic deposit rate is negative before 1998 third quarter and positive thereafter), yet not entirely so from the economic one. In any case, we should not worry read too much into this result as it is not statistically significant.

Another measure of relative return employed in this analysis is the return on alternative investment with similar risk characteristics, like, for example, MSCI Emerging Market (EM) price index. The risk of this index is similar to the one of CIS countries, hence it is likely to be considered as an alternative investment, therefore, we test for a presence of a

substitution effect and expect a negative relationship. Indeed, the coefficient turned out to be significant and negative in a baseline scenario. However, in all other specifications we were not able to reject a hypothesis of equivalence between S&P500 and EM price indices, which is not surprising given strong correlation among various world stock market indices. Therefore, it was excluded from further consideration.

The last indicator of the relative return considered in this study is the yield on S&P500. The return on global stock market is only important for equity flows which have been small in the CIS as compared to debt flows. But nevertheless the coefficient of yield on S&P 500 is statistically significant and positive (see Table 2). Like above mentioned measures of relative return the influence of S&P 500 return on portfolio flows has seen a considerable change in the aftermath of the Russian crisis. Specifically, the magnitude of the coefficient declined strongly, though, remaining positive (Table 3). A positive relationship between S&P 500 yield and portfolio flows to the CIS signals a larger willingness to invest in emerging markets when more liquidity in the developed markets are available. In this case investment into the CIS is deemed complementary to the investment in the global stock markets.

Among the risk measures considered in this research only political risk is statistically significant and robust determinant of portfolio flows. Other two risk variables which are financial risk and exchange rate risk were found to be insignificant. Exchange rate risk which is basically the risk of depreciation of national currency has even positive sign when accounting for the impact of Russian crisis. The test on stability of influence of exchange rate risk on portfolio flows indicates that there was statistically significant change in magnitude of coefficient of exchange rate depreciation (or appreciation) in 1998. The signs of the coefficients before and after crisis are negative, though, before crisis the influence of the variable on portfolio flows is higher. As it was stated, the political risk was found to be the most important risk variable. Furthermore, the coefficient on this variable has second largest

value after the dummy on Russian crisis. However, the value of the coefficient has declined considerably after the Russian default in 1988 (See Table 4).

There is a strong evidence of co-movement in portfolio flows between the CIS and CEE countries. The coefficients for portfolio flows into the CEE countries remain significant and positive in all specifications under consideration. Hence, investment into the CEEC and CIS are deemed as complementary: the more capital flows are recorded in the CEE countries the more likely capital is to flow into the CIS.

The diversification motive measured as the ratio of a host country's GDP in total GDP of CIS countries has also been reported to have a significant positive effect on the portfolio flows in the CIS. The value of the coefficient declined strongly after the crisis of 1998 (see Table 3). However, it remained positive which means that investors tend to invest in larger CIS economies even after controlling for all other determinants.

One of the most robust findings of this analysis is the significance of the Russian 1998 crisis for the capital flows into the region. A dummy variable which controls the effect of the crisis has been statistically significant at 1% level in all specifications. Unsurprisingly it has a negative sign. Furthermore, as was mentioned earlier, the performed stability tests indicated a structural break, with many variables behaving differently in the periods before and after the crisis.

Three countries out of all CIS countries are responsible for almost all portfolio flows to the CIS region. These countries are Kazakhstan, Russia, and Ukraine. Furthermore, among these countries Russia stands out considerably. The results on the group of larger countries (the three listed above) show more importance of external factors (see Table 2). Specifically, these are yields on S&P 500 and portfolio flows into the CEEC. Also Russian default dummy is found again to be a strong determinant. The impact of the deposit rate is similar to its impact

on the full sample. On a contrary, for a group of other CIS countries (smaller countries), the domestic variables play a greater role as compared to the external variables.

7. Discussion

The Russian crisis of 1998 has had the largest influence on capital flows into the CIS countries. It is the most statistically robust and significant variables among all other determinants of portfolio flows considered in this study. The crisis has re-shaped the pattern of portfolio flows into the CIS countries in the consequent years. Up to 2002, the CIS has been mainly experiencing net outflows of the capital. According to our estimates, the Russian default of 1998 was responsible for the outflow of portfolio capital from the three largest CIS countries in the amount of USD 2.7bn (see Table 2). For the CIS as a whole the influence of the Russian default on portfolio flows is somewhat smaller and constitutes only USD 1.7bn (in outflows). A lower impact of the crisis in the whole CIS setting is due to much lower volumes of portfolio investment into smaller CIS countries before the 1998.

The portfolio investment flows to the CIS move together with the flows into the Central and Eastern European countries. Specifically, an increase in portfolio flows to the CEEC by USD 1mn induces an inflow of capital to the CIS region of USD 0.07mn (Table 2). Though an impact of co-movement is small, it is robust to the inclusion of other explanatory variables.

The impact of variables measuring the relative return in the CIS with respect to the return abroad has a mixed pattern. The return variables have different influence on portfolio flows before and after the Russian crisis. Interestingly, before the crisis lower domestic interest rates tended to increase portfolio inflows. During 1996-1998 due to large risks in the CIS interest/deposit rates were high. Thus, a decrease in interest rate signified lower investment risks in the country which had a positive effect on portfolio flows. When, after the crisis,

interest rates generally decreased, their magnitude started to positively influence inflows of short-term capital. In particular, before the Russian crisis a decrease in the deposit rate by 1% was followed by an increase in portfolio flows by USD 33.8mn; whereas after the default an increase in deposit rate by 1% was causing portfolio flows to rise by USD 30mn (see Table 3).

The influence of world interest rate has also experienced changes after the Russian default. Controlling for the effect of the crisis, the world interest rate has an expected negative impact on portfolio flows to the CIS. In the period since the end of 1998 an increase in world interest rate by 1% was causing portfolio flows to the CIS countries to decline by USD 3.6mn (Table 3). This finding is consistent with a push factor explanation of capital movements.

Though most of portfolio flows into the CIS countries were of a debt type, S&P 500 was found to be an important determinant of portfolio flows into the region as well. A growth in S&P 500 by 1% has been causing the portfolio investment liabilities to increase by USD 4.9mn in the after-default period (see Table 3). The positive sign of the coefficient points to the complementarity of portfolio flows in CIS and world stock market activity.

Expectedly, the most important risk determinant of portfolio flows into the CIS region is political risk. The employed ICRG political risk index measures not only stability of a country's political environment but also the quality of bureaucracy, law and order, corruption level etc. Hence, portfolio flows to the CIS are more sensitive to the quality of institutions rather than to a country's creditworthiness measured by ICRG financial risk index (which appeared to be insignificant). An increase in political risk index by 1% has been estimated to increase portfolio flows into the CIS by USD 24.7mn on average (see Table 2).

8. Conclusions

This paper was devoted to the analysis of the determinants of capital flows into the CIS countries. Taking Tobin-Markowitz framework as a basis, we have analysed the impact of global, domestic, co-movement and diversification factors on the capital flows into the region.

The Russian crisis of 1998 has had the most considerable impact on portfolio flows into the CIS countries. It had influenced portfolio flows directly and indirectly, through its effect on other related factors. The behaviour of a number of determinants capital flows into the CIS changes significantly before and after the crisis of 1998. In particular, an important determinant of portfolio flows – the domestic interest (deposit) rate – has undergone serious changes in the aftermath of the Russian financial crisis. Having had a negative impact on the portfolio flows before the default, it has changed its impact to a positive one after the crisis.

Political stability is the second most important determinant of portfolio investment into the CIS. Apart from political risk, the employed ICRG political risk index also assesses the quality of institutions in a host country. Hence, the quality of institutions was shown to shape considerably the attractiveness of the CIS region for private investors.

Another interesting finding is that a growth in portfolio flows to Central and Eastern European countries (which are now members of the EU) seem to enhance capital flows to the CIS too. It is likely that some investors have perceived the CIS region to show to some extent similar performance as the CEECs. Though coefficient measuring this influence is small, it is robust to the inclusion of other explanatory variables.

Our results have also implications for domestic economic policies in the CIS countries. As the investors tend to link the actual investment with the performance of the country (as opposite to pre-1998 period), the inadequate macro policies may transmit faster into sudden capital flight in the case of bad economic policies. As we have already mentioned, the consequences for the economy in general and financial sector in particular may be even more pronounced than in 1998-1999.

However, there is also another, more positive side to the same story. It is the fact that institutional investors tend to notice positive domestic developments in the CIS region, and tend to react to them. Hence, if the CIS countries continue to grow, reform and integrate with global trading blocks, short term capital is expected to flow thus contributing to the development of domestic financial markets. Large inflows usually also mean that financing of the budget deficits can became cheaper over time.

Looking from this perspective, a significant increase in capital inflows into the region is expected in the future. If positive economic developments in the CIS region will be accompanied by lowering/abolishing the restrictions on the current account, persistent reforming of domestic financial sectors and further integration with the global economy, an upsurge in capital flows into the region is anticipated to be of much higher magnitude.

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*Table 1. **Description of Explanatory Variables***

Variable	Operationalization	Data source	Label
External explanatory variables			
Market yield on U.S. Treasury securities at 3-month constant maturity, quoted on investment basis	Average yield over quarter, %	Federal Reserve Board, Statistics: Releases and Historical Data, (www.federalreserve.org)	US T-bills yield
Yield on US stock market index, S&P500	Yield on S&P500 over the quarter, %	http://finance.yahoo.com	S&P 500 yield
Yield on Emerging Markets Price Index	Average yield on MSCI EM Price Index over quarter, %	MSCI Barra, (http://www.mscibarra.com)	EM Prices index
US Real GDP growth	US GDP percent change based on chained 2000 dollars (seasonally adjusted growth rates), %	Bureau of Economic Analysis, (http://www.bea.gov)	US GDP growth
Portfolio flows to CEEC	Portfolio investment liabilities to CEEC, million USD	IFS	Portfolio flows to CEEC
Domestic explanatory variables			
Domestic interest rate paid on deposit	Quarterly deposit rate, %	IFS	Domestic deposit rate
Appreciation/Depreciation of the domestic exchange rate against US dollar	Quarterly decline/growth of exchange rate against US dollar, %	IFS/Authors calculations	Exchange rate changes
Political Risk Index	Average index values over quarter, points	International Country Risk Guide	Political risk
Financial Risk Index	Average index values over quarter, points	International Country Risk Guide	Financial Risk
Domestic GDP growth rate	GDP growth rate, %	IFS/Authors calculations	Domestic GDP growth
Relative size of economy	Ratio of domestic GDP to GDP of all CIS countries, %	IFS/Authors calculations	Ratio of GDP
Dummy to account for Russian default effect	Dummy takes value zero before default and one afterwards		Russian default dummy

Table 2. **The Determinants of Portfolio Flows into the CIS: Estimation Results**

Dependent Variable: *Portfolio flows to the CIS*

Variable	General Specification	With dummy for Russian default	Group of larger countries	Group of smaller countries
Constant	-2282.9*** (720.9)	-213.9 (770.9)	11314 (1380.1)	-40.7*** (13.7)
US T-bills yield	52.6 (54.5)	58.0 (48.5)	106.7 (87.9)	0.5 (0.8)
S&P 500 yield	44.1*** (14.6)	24.2*** (8.8)	38.0*** (14.7)	0.08 (0.1)
EM Price Index	-19.4** (9.5)	-	-	-
Domestic deposit rate	16.5* (9.1)	1.5 (8.9)	-28.9* (16.7)	0.5** (0.2)
Exchange rate changes	-3.3 (8.9)	1.7 (8.3)	-20.3* (11.2)	-
Political risk	28.1*** (10.4)	24.7*** (9.6)	20.9 (17.8)	0.3 (0.2)
Financial risk	-	-	-	0.9*** (0.3)
Ratio of GDP	11.6*** (2.5)	6.3** (2.5)	-	-2.4* (1.2)
Portfolio flows to CEEC	0.05* (0.03)	0.07** (0.03)	0.1** (0.05)	-
US GDP growth	-3.5 (38.6)	-37.8 36.2	-	-
Domestic GDP growth	10.2 (13.9)	14.9 (12.9)	-	-
Russian default dummy	-	-1686.2*** (303.4)	-2725.5*** (477.7)	-18.2* (9.4)
R2	0.22	0.32	0.39	0.14
P-value for Wald test for joint significance	0.00	0.01	0.00	0.04

*** - significant at 1% level
** - significant at 5% level
* - significant at 10% level
values in the brackets show standard errors

*Table 3. **Testing stability of influence of explanatory variables over time***

***Dependent Variable:** Portfolio flows to the CIS*

Variable	Testing the stability of influence of GDP growth	Testing stability of influence of deposit rate	Testing stability of world interest rate	Testing stability of yield on SP500
Constant	52.5 (764.6)	797.0 (802.9)	-57988*** (13050.6)	747.8 (698.0)
US T-bills rate	48.1 (47.8)	14.7 (48.7)	11532.4*** (2588.3)	21.9 (43.3)
S&P 500 rate	18.3** (8.9)	24.5*** (8.6)	12.5 (8.8)	209.7*** (28.1)
Domestic deposit rate	-2.2 (8.9)	-33.8** (13.4)	-6.8 (8.7)	-8.4 (8.1)
Exchange rate changes	-1.2 (8.3)	1.6 (8.1)	0.9 (7.9)	1.9 (7.4)
Political risk	28.1*** (9.6)	24.6*** (9.3)	15.5* (9.4)	11.7 (8.7)
Ratio of GDP	6.1** (2.5)	9.7*** (2.7)	3.1 (2.5)	2.1 (2.3)
Portfolio flows to CEEC	0.06** (0.03)	0.08*** (0.03)	0.07** (0.03)	0.05** (0.03)
US GDP growth	-27.9 (35.8)	-38.7 (35.1)	-17.4 (34.6)	-12.8 (32.3)
Domestic GDP growth	65.4*** (23.0)	21.5* (12.7)	6.1 (12.5)	4.3 (11.6)
Russian default dummy	-2084.7*** (334.4)	-3028.9*** (487.9)	56867.7*** (13209.1)	-1551.8*** (269.8)
Domestic GDP growth after the crisis of 1998	-61.6*** (23.4)	-	-	-
Deposit rate after the crisis of 1998	-	63.7*** (18.5)	-	-
World interest rate after the crisis of 1998	-	-	-14496.8*** (2592.9)	-
Yield on SP500 after crisis of 1998	-	-	-	-204.7*** (29.8)
R2	0.35	0.37	0.39	0.47
P-value for Wald test for joint significance	0.00	0.00	0.00	0.00

*** - significant at 1% level
** - significant at 5% level
* - significant at 10% level
values in the brackets show standard errors

*Table 4. **Testing stability of influence of explanatory variables, cont.***

Variable	Testing stability of influence of political risk	Testing stability of influence of portfolio flows to CEEC
Constant	-2007.7 (1278.6)	-211.9 (769.2)
US T-bills yield	48.0 (48.5)	48.1 (48.9)
S&P 500 yield	22.8** (8.8)	21.0** (9.1)
Domestic deposit rate	1.6 (8.9)	2.3 (8.9)
Exchange rate changes	3.0 (8.3)	1.3 (8.3)
Political risk	56.3* (20.5)	23.4** (9.7)
Ratio of GDP	5.5** (2.6)	6.2** (2.5)
Portfolio flows to CEEC	0.07** (0.03)	0.4 (0.25)
US GDP growth	-36.3 (35.9)	-30.6 (36.5)
Domestic GDP growth	17.7 (13.0)	13.0 (13.0)
Russian default dummy	741.2 (1417.5)	1598.6 (309.6)
Political risk after the crisis of 1998	-41.3*** (23.6)	-
Portfolio flows to CEEC of the crisis of 1998	-	-0.3 (0.25)
R2	0.33	0.32
P-value for Wald test for joint significance	0.00	0.00

*** - significant at 1% level
** - significant at 5% level
* - significant at 10% level
values in the brackets show standard errors

Appendix 1. ***Overview of Empirical Research on the Determinants of Portfolio Capital Flows***

Study	Model	Dependent Variables	Independent Variables	Other independent Variables
Gordon and Gupta (2003)	Portfolio allocation choice. OLS estimates	Monthly Foreign Institutional Investors equity flows in millions of US dollars and as a % of markcup on the BSE	Global: 12 month % change in industrial production; mom % yield in NASDAQ, SP, DOW; 3 month LIBOR in USD, Federal Fund Rate, Treasury bill rate. Regional; mom % change in Morgan Stanley Cap International (MSCI) emerging market index; dummy for currency crises; industrial production growth in emerging markets. Domestic: 12 month % change, mom % yield in BSE index; mom % change in exchange rate with respect to USD; sovereign credits ratings; dummies to capture political events, turnover at BSE/marcup.	Variance and covariances returns on the BSE, the NASDAQ and the MSCI emerging market index, dummies for seasonal effects.
Garibaldi et al. (2001)	OLS; Wide range of possible explanatory variables	Inward portfolio investments per capita and per GDP	General to all flows: Natural log of average Inflation; fiscal balance as a percent of GDP; lagged growth; preannounced exchange rate regime dummy; multiple exchange rates; liberalization index from De Melo et al (1997); institutional quality indices from WDR. Specific to PI: security market index; PI restriction index; real Treasury bill rate; external debt per capita; international reserves per capita; ratio of short-term debt to total.	different dummies
Claessens et al. (1998)	Fixed effect model	Private capital flows	Push factors: US dollar 6-month LIBOR interest rate; economic growth in OECD countries. Pull factors: liberalization index from De Melo et al. (1997) to account for reform efforts; GDP growth rates; inflation; fiscal balance; private savings; change in countries reserves as an indicator for creditworthiness; nominal domestic interest rate minus the rate of change in the local exchange rate minus US interest rate; domestic credit growth.	Dummies
Hernandez et al. (2001)	Panel regression	Private capital flows	Push factors: real ex-post international interest rate (US dollar 3-month LIBOR minus the US CPI 3 month inflation); net private cap flows available to all developing countries minus the flows received by country j as a share of GDP of major industrial countries; economic activity (GDP) in industrial countries. Domestic variables: real GDP growth; public sector balance as a share of GDP; gross domestic investment as a share of GDP; total export as a share of GDP; foreign debt service as a share of GDP; growth in banking sector nominal credit; real exchange rate appreciation during past year.	To test contagion effect: inflation; CA balance; the stock of int. reserves; the stock of foreign debt, total export; similarity index.
Chuhan et al. (1993)	Panel data approach	Gross bond flows; Net equity flows	Global factors: US i-rates; US industrial activity. Country-specific factors: secondary market price of a countries debt; the country's credit rating; the price-earning ratio; the return on domestic stock	

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			market; black market premium; first principal components.	
Ahmed et al. (2005)	Dynamic panel using GMM	Ratio of portfolio flows to GDP	Domestic variables: lagged GDP per capita growth; index of law and order from International Country Risk Guide; ratio of imports and exports to GDP; annual standard deviation of monthly changes in the real effective exchange rate; inflation volatility; three proxies for capital account controls from IMF's AREAER; # of telephones per 1000 people; fuel export receipts as a % of export; domestic credit to the private sector and domestic stock market capitalization as a % of GDP. Global factors: real short-term and long term US i-rates.	Lagged capital inflow as a % of GDP to capture agglomeration effect
Fernande z-Arias (1994)	Fixed-effect model	Portfolio flows both equity and bonds	External returns were proxied by annualized 10-year US bond nominal yields; the countries capacity to pay index was proxied by the debt secondary market price; stock of portfolio liabilities proxied by accumulating portfolio flows after 1988; the domestic investment climate parameter is indirectly measured as a residual.	All the variables are expressed as deviations from their 1989 average level.
Hernande z and Rudolph (1995)	Panel data for 1986-1993; A stock-adjustme nt model	Total long-term private flows as a ratio of GDP	Domestic variables: two year moving average of gross domestic investment as a ratio of GNP; two year moving average of aggregate private consumption as a ratio of GNP; total external debt minus stock of international reserves as a ratio of GNP; total stock of foreign liabilities; volatility of the real effective exchange rate; real export growth. Global: US i-rates (US three year government bond yield, twelve month US treasury bond rate, first principal component of five interest rates and the US production index)	One lag of the dependent variable
Dasgupta and Ratha (2000)	Time series; Panel data estimatio n; Two stage process of investing int.		Factors specific to developing countries: real i-rate; lagged dep. Variable; GDP growth in developing countries; world GDP growth rate; dummy for financial crisis. Pull variables: creditwithiness indicator such as CA balance with one year lag; per capita income; three year MA of GDP growth rate; private net non-FDI flows to all developing countries; net FDI as a % of GDP.	Regional dummies; inflation and exchange rate appreciation; WB lending commitments .

			Expected return proxied by composite index (real per capita GDP growth, inverse of black market premium, liquid liabilities to GDP, real imports plus exports to GDP, indices of governance, negative of government consumption to FDP, population size) and also perceived risk measured by composite index (standard deviation of real per capita GDP growth, ratio of external debt to debt plus equity external liabilities, average and standard deviation of inflation, standard deviation of RER standard deviation of TT, standard deviation of import plus export to GDP, negatives of indices of governance, negative of quasi-liquid liabilities to GDP). Expected return based on real per capita GDP growth and perceived risk as standard deviation of real per capita GDP growth. Expected return as real stock market return and perceived risk as standard deviation of real stock market return.	
Calderon et al. (2003)	Dynamic panel esimation procedure (pooled mean group estimator developed by Pesaran, 1999)	NFA position normalized by wealth		Co-movement was measured as correlation of the relevant return index in a country and the rest of the world.
Taylor and Sarno (1997)	Error correction models	Monthly net US equity flows; Data the same as in Chuhan et al (1993)	Country-specific: country credit rating; black market exchange rate premium. Global: treasury bill rate and government bond yield; level of real US industrial production	
Fedderke and Liu (2001)	ARDL error correction version	Four different measures of cap flows in annual form	Rate of return variables: exchange rate adjusted interest differentials; % change of GDP. Risk variables: over/undervaluation of the exchange rate in term of PPP, political rights index, political instability index.	Dummies
Fiess (2003)	Multivariate cointegration analysis	Cap flows data comprises monthly records of bond, equity and syndicated loan flows.	Global factors: US long-term interest rates; first principal component. Pull factors: residual from a regression of the country EMBI component on the first principal component; ratio of total public debt to GDP; primary balance to GDP ratio.	
Alfaro et al (2005)	Cross-country regressions	Inflows of total equity investments per capita	Domestic variables: years of total schooling in total population; International Country Risk Guide (ICRG) political safety variables as a measure of institutional quality; distance using GDP shares as weights; inflation volatility; capital controls; sovereign risk; corporate tax; share of credit provided by deposit money banks	
Kim (2000)	Structural decomposition analysis	Balance on capital and current accounts.	Domestic variable: terms of trade; domestic income; real exchange rate; real money supply; domestic price level. External factors: foreign income; foreign interest rate.	

Bekaert and Harvey (1998)		Net US equity flows	1) Cost of capital, correlation with world market return, volatility; 2) Asset concentration ratios, market size and liquidity; 3) foreign exchange volatility, real exchange rate, real GDP per capita, inflation, interest rate, size of trade sector, fiscal deficit; 4) Country risk.	43
Carlson and Hernandez (2002)	Panel data regression with fixed effects; SUR	Portfolio equity investment	Economic Fundamentals: GDP; GDP deflator; stock of international reserves; inflation rate; exchange rate; stock of domestic credit to Central Bank; interest rate paid on deposits; LIBOR; real exchange rate appreciation; yield on government US bonds; growth rate of real GDP in USA, ratio of reserves to M2; expansion of bank credit;	
Odedokun (2003)	Panel regression with fixed effects	Total portfolio capital flows as a fraction of GDP	Variables expressed for the source country, all developing countries and destination country of cap flows: *Per capita income*; *interest rate*; *economic growth*; *phase of economic cycle*; *openness in the BOP cap account*; *inflation rate* and *monetary growth*; *private debt to GDP ratio*; *public debt to GDP ratio*.	

Appendix 2. **Sample Statistics**

	Valid N	Mean	Minimum	Maximum	Std.Dev.
Portfolio Investment Liabilities, million USD					
Armenia	42	0.348	-12.120	9.130	3.058
Belarus	42	0.662	-58.900	53.900	17.762
Kazakhstan	42	79.142	-108.843	703.501	160.287
Kyrgyzstan	42	4.695	-11.206	101.000	22.020
Moldova	42	-2.174	-39.670	15.670	8.195
Russia	42	481.045	-11426.100	8061.940	2952.543
Ukraine	42	28.881	-825.000	1347.000	471.356
Portfolio Investment Liabilities as a Ratio of GDP, %					
Armenia	42	0.076	-2.457	1.533	0.613
Belarus	42	0.043	-2.079	2.516	0.599
Kazakhstan	42	0.750	-1.665	6.513	1.756
Kyrgyzstan	42	-0.031	-2.364	2.288	0.682
Moldova	41	-0.594	-13.508	3.786	2.458
Russia	42	0.191	-18.013	8.705	3.714
Ukraine	42	-0.210	-7.229	8.118	3.635
Global Explanatory Variables, %					
Yield on US Treasure securities	42	3.724	0.930	6.200	1.755
Yield on SP500	42	2.092	-17.634	20.867	8.509
US GDP growth	42	3.310	-1.400	7.500	2.069
Portfolio flows to CEEC	39	1907.829	-1063.348	9790.267	2625.735
Domestic Deposit Interest Rate, %					
Armenia	42	16.535	4.526	42.867	10.095
Belarus	42	21.705	7.600	49.900	10.862
Kazakhstan	39	11.959	5.400	31.900	6.067
Kyrgyzstan	42	15.289	3.780	39.590	12.376
Moldova	41	17.581	9.920	28.767	5.832
Russia	42	12.680	3.367	61.700	15.276
Ukraine	42	14.724	6.574	48.700	8.868
Exchange Rate Changes					
Armenia	42	0.238	-5.939	7.959	2.829
Belarus	42	15.623	-0.623	138.662	28.329
Kazakhstan	42	1.796	-6.093	40.397	6.771
Kyrgyzstan	42	3.433	-6.231	31.737	8.094
Moldova	42	2.885	-7.466	51.134	9.183
Russia	42	5.232	-3.853	90.543	16.212
Ukraine	42	2.782	-4.219	45.326	8.017
Political Risk Index, points					
Armenia	32	58.380	54.000	61.000	2.044
Belarus	33	61.000	56.667	65.000	2.460
Kazakhstan	31	70.720	68.000	74.500	1.613
Kyrgyzstan	0				
Moldova	31	65.468	55.333	69.000	3.521
Russia	42	61.373	42.667	68.833	6.672
Ukraine	33	62.227	56.167	69.000	4.254
Financial Risk Index, points					

Armenia	33	31.616	9.833	39.500	6.965
Belarus	33	34.828	28.500	40.500	4.129
Kazakhstan	31	37.016	28.000	40.000	2.684
	Valid N	Mean	Minimum	Maximum	Std.Dev.
Kyrgyzstan	0				
Moldova	31	29.667	20.000	36.500	5.037
Russia	42	37.548	23.167	47.000	5.847
Ukraine	33	36.859	25.833	42.000	4.919
Ratio of country GDP to total GDP of CIS, %					
Armenia	42	0.519	0.182	1.271	0.229
Belarus	42	3.109	2.130	4.275	0.416
Kazakhstan	42	5.769	3.695	10.429	1.306
Kyrgyzstan	42	0.372	0.179	0.742	0.127
Moldova	41	0.436	0.261	2.347	0.324
Russia	42	79.812	66.956	84.879	3.358
Ukraine	42	9.993	7.729	15.621	1.748

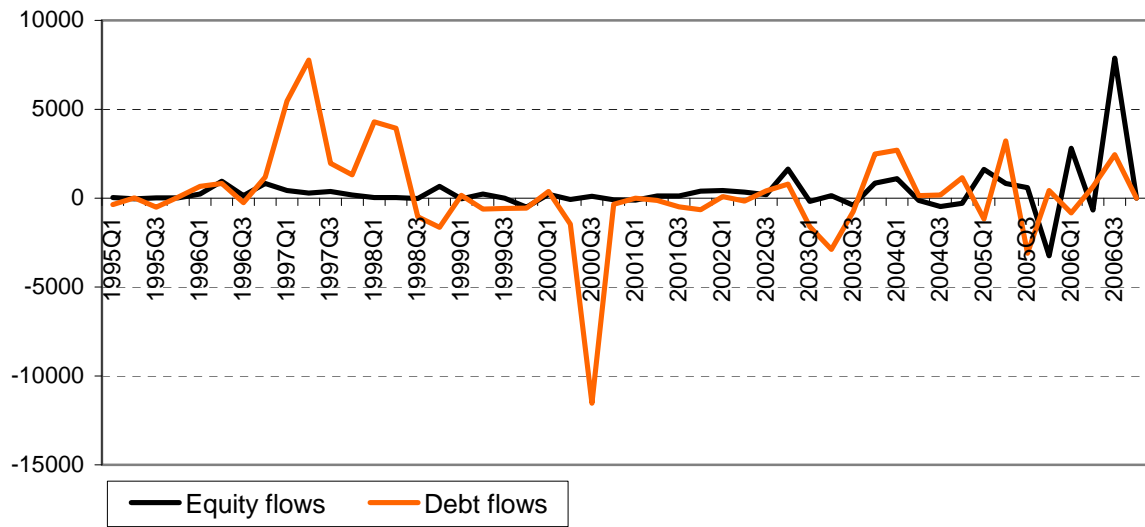*Figure A1.* **Debt and Equity Flows to Russia, million USD**

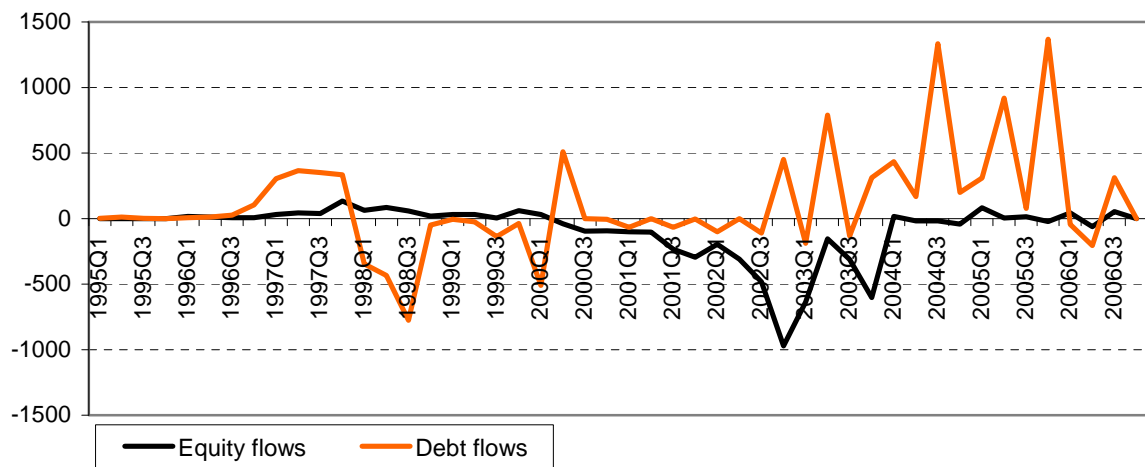*Figure A2.* **Debt and Equity Flows to Ukraine, million USD**

*Figure A3. **Debt and Equity Flows to Kazakhstan, million USD***