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Short-Term Capital, Economic Transformation, and EU Accession

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Short-Term Capital, Economic Transformation, and EU Accession

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Abstract

One key focus of the on-going debate on the integration of international financial markets have been measures to lengthen the maturity of foreign debt, as short-term debt is typically considered to be highly volatile. The transition economies of Central and Eastern Europe are one group of countries for which policy lessons seem particularly urgent. Not only have these countries liberalized their capital accounts to a quite substantial degree already, membership in the European Union also implies that remaining controls to the free flow of capital will have to be abolished. This paper assesses the experience of the transition economies with liberalizing short-term capital flows, and it analyzes factors affecting the share of short-term capital.

JEL classification: F21, F23, G21

Keywords: Short-term debt, economic transformation, EU accession

Zusammenfassung

Da eine Verschuldung in kurzfristiger Form oft als sehr volatil angesehen wird, betrifft ein wichtiger Aspekt der gegenwärtigen Diskussion über die Integration der internationalen Finanzmärkte die Frage, wie man die Fristigkeit der Auslandsverschuldung verlängern kann. Für die Transformationsländer Zentral- und Osteuropa scheinen politische Lehren in dieser Beziehung besonders wichtig. Diese Länder haben ihren Kapitalverkehr schon zu einem großen Teil liberalisiert und die künftige Mitgliedschaft in der EU verlangt das Ende der noch bestehenden Kontrollen. Dieses Papier betrachtet die Erfahrungen der Transformationsländer bei der Liberalisierung des kurzfristigen Kapitalölverkehrs und analysiert die Faktoren, die den Anteil der kurzfristigen Verschuldung beeinflussen.

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Short-Term Capital, Economic Transformation, and EU Accession*

1 The Issue

One key focus of the on-going debate on the integration of international financial markets have been measures to lengthen the maturity of foreign debt, as short-term debt is typically considered to be highly volatile. High shares of short-term external debt expose countries to the risks of "sudden stops" or abrupt reversals of capital flows, to attacks on the domestic currency, and to banking crises, which ultimately leave the economy to bear the real costs of recessionary re-adjustments.

The transition economies of Central and Eastern Europe are one group of countries for which policy lessons seem particularly urgent. Not only have these countries liberalized their capital accounts to a quite substantial degree already, membership in the European Union also implies that remaining controls to the free flow of capital - including those which pertain to short-term capital flows - will have to be abolished. This, in turn, may have implications for the structure and the stability of capital flows to these countries, the conduct of monetary policy, and the stability of the financial system.

Yet, empirical evidence on the determinants of short-term capital flows and on the expected flows to transition economies is scarce. In this paper, we assess the experience of the transition economies of Central and Eastern Europe with liberalizing short-term capital flows, analyze factors affecting the share of short-term capital flows, and try to quantify the possible effects of EU enlargement. One particular goal of the analysis is to show to what extent domestic policies impact upon the structure of capital flows. We draw on earlier work on the determinants of short-term capital (Rodrik and Velasco 1999, Buch 2000, Buch and Lusinyan 2000) and the impact of EU enlargement on capital flows (Buch and Piazolo 2001).

The structure of the paper is as follows. Chapter 2 summarizes previous work on the determinants of short-term debt. Chapter 3 gives the institutional framework of EU accession, focusing in particular on the implications for short-term debt. Chapter 4 presents

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our own empirical estimates on the determinants of short-term debt. We use three different datasets which provide us with information about the maturity structure of international bank lending, domestic debt securities, and international debt securities. After establishing the determinants of short-term debt, we perform within-sample forecasts for the accession states and the current members of the EU. For international bank lending, our results suggest an increase in the share of short-term borrowing as the accession states develop. Forecasts of the share of short-term lending of banks show below-average for the accession states. Results for the maturity structure of domestic and international debt securities also support the positive relation between the level of economic development and the share of short-term debt instruments being issued.

2 Determinants of Short-Term Capital: Previous Work

In contrast to the vivid policy debate on the risks of short-term capital flows, there is surprisingly little theoretical and empirical evidence on the determinants of short-term capital. This chapter briefly outlines the current state of both the theoretical and the empirical literature.

2.1 Theoretical Work

Theoretical models on the determinants of short-term debt were confined to a closed-economy setting (Rajan 1992, Diamond 1993). More recently, the analysis has taken a more international perspective although a consistent framework, which allows for an analysis of the interplay between microeconomic factors (such as asymmetries in information) and macroeconomic factors (such as the role of monetary and exchange rate policies) is still lacking. Incorporating macroeconomic factors into the analysis would be important because, as Kaminsky and Reinhart (1998) have shown, a major factor behind changes in the composition of capital inflows away from long-term FDI towards short-term capital flows in Asia were sterilization policies which held domestic interest rates at high levels.

In contrast to closed-economy models, models of international lending need to take at least two specific features into account. First, foreign lending exposes banks and other intermediaries to foreign exchange risks. Even if investors such as banks are perfectly risk neutral, risk enters the objective function if international banking regulations such as those enshrined in the Basel Accord require banks to hold a certain amount of equity against their risky assets. Second, foreign lending also differs from domestic lending because asymmetries of information tend to be more pronounced in an international as compared to a domestic context.

Models on international financing choices in fact assume that risks and information costs are higher in an international than in a national setting. Rodrik and Velasco (1999) focus on the risk that a project becomes illiquid after one period. The project can be financed by short- and long-term debt but it yields only a fixed liquidation value after one period. The resulting liquidity risk drives a wedge between short- and long-term lending rates. Project returns are certain, hence there is no solvency risk. Lenders may, however, decide to withdraw their funds after one period. In this framework, the term structure of interest rate can be linked to the share of short term debt by distinguishing different scenarios. For high levels of short-term debt, i.e. when even short-term debt cannot be repaid fully, the interest rate on it will bear a risk premium. Thus, although short-term financing might be less expensive in the contractual sense, it is not necessarily so in the expected value sense.

Diamond and Rajan (2000) likewise focus on the liquidity risk of international investment projects. They emphasize that countries with a poorly developed institutional environment have a high demand for short-term borrowing. In their model, the greater the illiquidity of investment projects, the larger will be the share of short-term debt. This also implies that capital controls do not solve the problem of a build up of short-term debt since the latter is a reflection of the illiquidity and the poor quality of investment.

Whereas both of these papers focus on the liquidity risk of investment projects, solvency risk is at least as important for the choice of debt maturity. Buch and Lusinyan (2000) introduce solvency risk in the form of a random realization of project returns. This randomness of returns endogenously determines the probability of continuation versus liquidation of projects. The model focuses on the incentives of lenders to diversify the maturity of their (international) claims under conditions of uncertainty about future project returns. The model shows that the equilibrium share of short-term debt is a positive (negative) function of the interest rate on short-term (long-term) debt and a negative function of the costs of rolling over short-term debt.

These considerations suggest that we have two potentially countervailing impacts of the level of economic development on the share of short-term debt. On the one hand, as countries develop and as lenders become more certain about the economic conditions in a given country, they would be willing to lend at longer maturities. On the other hand, for advanced economies with developed financial markets, we can expect the costs of rolling-over short-term debt to be low, which would induce investors to lend more short-term.

2.2 Empirical Evidence

So far, the empirical literature has been concerned mainly with the volatility features of short- versus longer-term capital flows. Claessens, Dooley, and Warner (1993) have been among the first to draw attention to the fact that standard balance of payments labels provide relatively little information on the actual volatility of capital flows. Sarno and Taylor (1999) show that both private portfolio investments (comprising equity and debt flows) and official flows are driven by a very strong temporary component. Changes in the permanent component, in contrast, serve to explain a large fraction of the volatility of cross-border commercial bank credits and foreign direct investment flows.

In contrast to these papers, the focus of Chuhan et al. (1996) was on the interplay among alternative categories of capital flows. Bivariate tests for Granger non-causality for alternative pairs of capital flows indicate that (changes in) FDI might account for a substantial fraction of the subsequent variation of short-term investment. A further interesting result is that short-term investment flows tend to be more sensitive to changes affecting short-term investment flows to other countries whereas, in the majority of cases, similar conclusions cannot be drawn for FDI. Thus, disturbances hitting international financial markets might spill over more easily onto domestic short-term investment flows than onto domestic foreign direct investment flows.

Further evidence on the volatility of capital flows has been documented in Mussa et al. (1999). Using gross private capital flows to emerging markets, they find that the variance of capital flows has been higher in the second half of the 1990s than in earlier periods. However, no such general pattern is found when net capital flows are used. When breaking down total capital flows into their components, FDI turns out to be the most stable, followed by portfolio capital, and bank credits.

Buch and Pierdzioch (2001) obtain similar results for capital flows to OECD countries. With the exception of Portugal and Sweden, bank lending can be identified as the most volatile component of the capital account. Moreover, for most countries, the coefficients of variation of bank lending has increased over time. As regards the dynamics of the volatility of portfolio investment flows, seven out of the thirteen countries under investigation have experienced a monotonous decline in the volatility of this item of the capital account. Furthermore, while foreign direct investment seems to be the most stable component of capital flows, the coefficients of variations show neither a general tendency to increase nor to decrease.

In addition, there is evidence that the volatility of capital flows to developing countries exceeds that of developed economies (Edwards 2001), although general time trends seem to be similar: While overall volatility of capital flows has increased in the 1990s, this increase has been driven mainly by an increase in the volatility of debt flows. Volatility of FDI and portfolio capital flows seems to have declined, in contrast.

In order to derive policy implications from these studies, however, information not only on the volatility features of capital flows but also on the factors driving short-term capital flows is needed. On this count, the empirical record is even more scarce. Most earlier work dealing with the determinants of international capital flows focuses on the relative importance of push versus pull factors but does not break down capital flows by maturity (see, e.g. Fernandez-Arias 1996).

An exception is a recent paper by Rodrik and Velasco (1999) who empirically assess the determinants of short-term debt. For 32 developing countries, Rodrik and Velasco find that the share of short-term debt is related positively to income per capita and to the size of the financial system of the recipient country but not to foreign trade activities. The authors interpret the positive coefficient on GDP per capita in term of the fact that economic development is correlated with financial sector development.

Buch and Lusinyan (2000) complement this work using a different dataset, which includes also industrial countries. While most of the findings of Rodrik and Velasco (1999) are confirmed, the extended dataset also shows that the determinants of short-term bank lending do not differ significantly between developed and developing countries. The level of economic development and the importance of interbank lending are found to have a positive, OECD membership to have a negative impact on the share of short-term loans. The latter result is most likely due to the fact that the Basel Capital Accord assigns a lower risk weight to assets in these countries. At the same time, dummy variables, such as EU membership and the presence of a financial center, that are used to capture regulatory restrictions, are shown not to have a statistically significant impact on the maturity structure of international bank lending.

Buch (2000) studies the determinants of short-term asset holdings of German investors abroad, using a richer time-series and cross-section dataset. More specifically, she uses data on the foreign assets of German banks for a panel of up to 73 countries for the years 1985 through 1997 as well as time series data for the years 1969–1999. Both short- and long-term assets are shown to be highly correlated with foreign trade links. In relative terms, short-term assets are affected to a greater degree. As regards the impact of regulatory restrictions, the evidence has been mixed. While the presence of financial centers (and thus

a relatively liberal regulatory regime) was found to have a positive impact on foreign banking assets throughout, EU and OECD membership were of smaller statistical and economic significance.

Overall, the predictions for short-term capital flows to the transition economies that emerge from these empirical studies are not clear-cut: On the one hand, the share of short-term capital in total capital flows is likely to increase as the countries grow and increasingly integrate into international trade links. On the other hand, OECD membership would tend to have a counterbalancing effect.

Generally, the studies cited above do not take into account special features of the transition process of Central and Eastern Europe, and they do not allow an assessment of the degree to which an adjustment of the external liabilities of the transition economies to some "equilibrium" level has already taken place. In Buch and Piazolo (2001), this issue was picked up by performing simulations of foreign assets of the transition economies. The analysis proceeded in two steps. In a first step, different cross-section datasets were used to assess the determinants of cross-border trade, FDI, and international asset holdings. The particular aim was to show whether EU membership has a positive integration effect. In a second step, the results from these estimates were used to assess the degree of integration that the accession countries of Central and Eastern Europe have attained so far by performing out-of-sample forecasts for the reform states. The paper finds that, for most EU accession countries, actual levels of foreign assets are still far below the expected values. The Czech Republic, Hungary, and Poland stand out and have come relatively close to the expected values. However, if one accounts for an additional EU effect, also these three advanced transition countries have not yet reached the levels one would expect to see under full EU membership.

A study on the impact of Eastern Enlargement on employment in the present EU Member States conducted by the European Integration Consortium (2000) also addresses the possible impact of EU enlargement for capital flows. Regulatory changes implied by EU accession are expected to have a significant impact on portfolio and short-term capital flows. The authors of the study argue that these capital flows have so far remained relatively restricted. However, because of a largely different pattern of capital flows to the Central and Eastern European Countries (CEECs), especially between the first- and second-round candidates, the study refrains from including estimates of possible changes in capital inflows to the CEECs in the wake of their EU accession. At the same time, referring to the experience with the Southern enlargement of the EU, as well as using the estimated 'normal' trade potential still to be reached by the EU new members, the study concludes that the accession to the EU may double capital flows to the CEECs.

3 Short-Term Debt and EU Accession: The Institutional Framework

3.1 Legislative Framework

Capital account liberalization in the transition economies of Central and Eastern Europe has proceeded with an enormous speed over the past decade. In the late 1980s, the transition economies were virtually isolated from private international capital markets, they had highly regulated banking systems, which did not even separate commercial and central banking activities, and funds for investments were generally allocated according to the central production plan rather than being guided by market principles.

Nowadays, the more advanced transition economies are striving for EU membership under essentially the same conditions as the current members are facing. While earlier rounds of enlargement (Greece in 1981, Spain and Portugal in 1986) took place prior to the establishment of the Single Market and the introduction of a common currency, the accession states of Eastern Europe are essentially required to implement the entire institutional framework of the EU, and they may eventually also introduce the euro. In the cases of extraordinary difficulties, joining members are granted transitional periods after accession until the *acquis* has been implemented. However, the overall aim is the implementation of the complete *acquis*. Since the Maastricht treaty is also a part of the *acquis communautaire*, EU membership will eventually also imply membership in EMU.

In fact, the envisaged membership in the European Union and the concomitant participation in the Single Market is by far the most challenging commitment regarding capital account liberalization faced by the new members. The ground for membership was laid in December 1991 when the Visegrad countries signed Europe Agreements with the EU which were intended to promote the countries' accession to the Union. During the first phase of the association period, the preconditions for the full adoption of EU regulations concerning the free flow of capital had to be created, during the second phase, the need for the maintenance of restrictions on the capital account was assessed.

On its summit in Essen in December 1994, the EU went beyond the commitments laid down in the Europe Agreements and formulated an accession strategy for the new members. One essential part of this strategy is the *White Book* of May 1995 in which the EU outlined the prerequisites for accession to the Union (Table 1). Future members of the EU must accept the entire *acquis communautaire* and the regulations of the Single Market. Capital account liberalization follows a gradual strategy. In the first stage, only medium- and long-term capital flows must be liberalized, short-term capital flows follow in the

second stage. Restrictions can then be maintained only in exceptional cases and upon approval of the EU.

In March 1998, the process of enlargement reached its last stage for the time being. With the approval of so-called *Accession Partnerships* for ten applicant countries, the EU started the process of entry negotiations. In these Accession Partnerships, the EU's opinion on compliance with the requirements of the White Book was laid down (see also Section 3.2). The Czech Republic, Estonia, Hungary, Poland, and Slovenia started negotiations with the EU about accession in March 1998. In summer 2000, they opened the last of 31 different chapters of the *acquis communautaire*. Bulgaria, Latvia, Lithuania, Romania, and Slovakia lagged behind, but eventually started negotiations about EU accession in February 2000. Actual accession into the Union may take place in the not too distant future. A recent strategy paper published by the EU concludes that *"Provided their efforts are sustained, it should be possible to conclude the accession negotiations by the end of 2002 with those countries which fulfill the accession criteria. On this basis these countries would be ready to become members of the EU in 2004."*[1]

Apart from EU regulations, the statutes of the International Monetary Fund (IMF) and the General Agreement on Trade in Services (GATS) of the Uruguay Round deal with the liberalization of capital flows. However, the regulations of the EU concerning the internal market impose the most stringent requirements on the reform countries. Articles VIII and XIV of the IMF, for example, deal with current account and limited capital account convertibility only. Other external commitments are thus less binding and less comprehensive than EU membership. A partial exception is membership in the OECD which requires the adoption of the Code of Liberalization of Capital Movements. In fact, the deadline for liberalization of foreign entry into the banking and financial sector under the Code was in some cases been set prior to the deadline envisaged under the Europe Agreements.

3.2 Liberalization of Capital Flows

Obviously, an exact ranking of the countries by progress being made in converging to EU regulatory standards is difficult. One reason is that the degree of compliance with the regulations is of a qualitative nature and cannot be measured accurately. More importantly, however, there is often a large gap between legislation that has been implemented *de jure* and the *de facto* implementation due to administrative bottlenecks.

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[1] See http://europa.eu.int/comm/enlargement/report2001/index.htm#context

With regard to financial market reform and liberalization, different policy areas are being stressed in the most recent Progress Reports (November 2000) from the European Commission (Table 1). Most countries, including those with a relatively liberal capital account regime such as the Czech Republic and Estonia, still need to abolish restrictions concerning the acquisition of real estate by non-residents. Restrictions on short-term capital flows and on foreign direct investment in some sectors still need to be abolished in Hungary, Poland, and Slovenia. In the latter three countries, the control rights of the government in privatized companies, as well as restrictions on investments of institutional investors abroad continue to be in place. Additionally, some open issues with regard to restrictions in the field of portfolio investment remain to be addressed in Slovenia. Remaining restrictions to the free flow of capital and to the provision of financial services are even more severe in the second group of accession states.

With regard to short-term debt, the accession states have followed different strategies. Estonia is the only country under review which has fully liberalized the capital account of its balance of payments early on.[2] Among the three advanced reform states Czech Republic, Hungary, and Poland, the Czech Republic showed the most liberal attitude with respect to short-term capital flows than the other two countries (Backé 1996). Yet, even the Czech foreign exchange law contains a relative comprehensive safeguard clause which allows the Central Bank to impose deposit requirements on inward capital flows in times of severe balance of payments problems and to stop certain transactions entirely (CNB 1995). The Central Bank did in fact instruct commercial banks not to lend in koruna to nonresidents during the May-1997 crisis, but apparently this instruction was not enforced strictly.

In the case of Poland, cross-border financial credits to non-banks with a maturity of less than one year remain restricted. The Hungarian foreign exchange law foresees restrictions on short-term financial flows (OECD 1997). Similarly, the Slovak Republic and Romania took a gradual approach towards the liberalization of short-term capital flows.

Arguably, the most restrictive policies towards short-term capital were implemented by the Slovenian authorities (see also Buch and Hanschel 2000).[3] In February 1995, the Bank of Slovenia imposed controls on capital inflows that contained a registration requirement for foreign direct investments (FDI), special “custody accounts” at licensed banks for portfolio

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[2] However, in order to curb growth of domestic credit in response to heavy foreign borrowing of Estonian commercial banks, the Bank of Estonia temporally tightened reserve requirements for commercial banks in 1997.

[3] A similar form of capital controls was also in effect in Croatia in 1998.

investments, and an unremunerated reserve requirement (URR) for financial credits. This URR aimed particularly at discouraging short-term capital inflows. Starting in February 1995, 40 percent of each financial credit from abroad had to be put in a non-interest bearing account at the BOS for the period of two years if the financial credit had a maturity of up to seven years. For longer maturities, the deposit requirement was only 10 percent. In January 1999, the Bank of Slovenia set the URR to zero. As the system was not abandoned entirely, the Bank in principle has retained the option to raise the reserve requirement on short notice.

4 Determinants of Short-Term Debt: New Empirical Evidence

The rapid liberalization of capital flows undertaken by the transition economies, together with the substantial need for structural reforms that they are facing, suggests that these countries might be particularly vulnerable with regard to volatile, short-term capital flows. As Table 2 suggests, short-term capital inflows was indeed the most volatile type of capital investment for the most of the accession countries throughout the 1990s. In this section, we provide new empirical evidence on the determinants of short-term capital flows, and we try to forecast possible developments for the accession states.

4.1 Stylized Facts

The empirical analysis of this paper draws on two main sources of data. First, the IMF's Balance of Payments Statistics (IMF 2001a) provide us with information on the structure of capital in- and outflows of the transition economies. The data are broken down into foreign direct investment, portfolio investments, and other investments, which primarily comprise bank lending and trade credits. For this latter category, a breakdown into short-term capital (maturity of one year or less) and long-term capital is given as well.

The structure of capital inflows to the accession countries is shown in Graph 1, which depicts the average percentage of each type of flow in total inflows during the 1990s. While the first- and second-round candidates have been benefiting quite equally from foreign direct investments, the first-round candidates on average received more portfolio and less other investments than the second-round candidate countries. The share of short-

term liabilities in total liabilities was also on average slightly higher for the latter group of countries than for the ones more advanced in the integration process (Graph 2).[4]

Second, since flow data for short-term capital are not necessarily available on a consistent basis for a larger set of countries, we complement this information with data drawn from the *Quarterly Reports* of the Bank for International Settlements (BIS 2001). These statistics provide three pieces of information on short-term capital:

- The statistics on international bank lending break down consolidated cross-border claims in all currencies as well as local claims in non-local currencies into those with maturities of up to and including one year ("short-term" claims), those with maturities between 1 and 2 years, and those with maturities of more than 2 years (BIS 2001, Table 7).

- Data on the maturity structure of domestic and international debt securities were taken from Tables 17A and 17B, respectively, of the *BIS Quarterly Reports*. In particular, the Tables report data on short-term securities with remaining and original maturities of up to one year as well as long-term instruments which are due for final repayment within one year. Tables 16A and 12A provide information on total domestic and international debt securities, respectively. International debt securities include international money market instruments, bonds and notes. Although, for some countries, domestic debt securities include issues in both domestic and foreign currencies, in general, we can consider domestic debt securities to be those issued on domestic capital markets in local currency and foreign debt securities as those issued on international capital markets in foreign currencies. Hence, although the dividing line is not always defined very clearly, domestic debt securities tend to be those targeted to the community of domestic investors while international debt securities are typically bought by international investors. The sum of the two represents the total amount of securities raised by a given country.

Table 3 presents a snapshot of the maturity structure of international bank credit and debt securities for all ten accession counties as of the end 2000. The countries seem to share a common pattern as far as the maturity of international bank credit is concerned. On average, short-term bank lending accounts for about one third of total international bank lending to these countries. The two exceptions are the Czech Republic with a share of around 50 percent and Slovenia with a share of about 25 percent. This may reflect the

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[4] These stylized facts should be interpreted with some caution since time series may contain entries of opposite signs that would lower average capital inflows.

degree of capital liberalization achieved by these countries. In the Czech Republic, short-term borrowing from abroad was liberalized relatively early on. In Slovenia, controls on short-term bank borrowing were in place throughout much of the transition period.

However, the situation is rather different in the field of international debt securities. Some countries, such as Bulgaria and Latvia, have only negligible issues of total (relative to GDP) and short-term debt securities, whereas Hungary, the Slovak Republic and Slovenia have both sizeable amounts of total and short-term international debt securities outstanding.

Graph 3 gives the evolution of the share of short-term domestic debt securities for the current EU members and three accession states (Czech Republic, Hungary, Poland) over time. On average, the share of short-term debt was 27 percent for the current and 49 percent for the future EU members. One might thus expect a decline in the share of short-term domestic debt as the accession states develop and eventually join the EU. The fact that some EU member countries such as Finland, Greece, Italy, Portugal, or Spain have witnessed a quite substantial decline in short-term domestic debt over the past decade confirms this view. However, developments also differ quite substantially among the accession states. While the Czech Republic has by far the highest share of short-term domestic debt (76 percent), Hungary's share of 29 percent is fairly close to the EU average.

Graph 4 shows that the development of short-term international debt securities in the accession states looks fairly similar as compared to the current members of the EU. On average, the share of short-term international debt was 16 percent for the EU countries and thus smaller for this group of countries than the share of short-term domestic debt. The average for the transition economies was even below this value (11 percent for the Czech Republic, Hungary, and Poland, 15 percent if other transition economies are included as well), and the heterogeneity among these countries is much smaller than for short-term domestic debt. In addition, any downward trend in the share of short-term international debt for the current EU members is less pronounced than for the share of short-term domestic debt. The non-parallel development of short-term domestic and international debt is also confirmed by a negative correlation of these two shares across countries, and it suggests that the factors driving short-term domestic and international debt differ.

4.2 Determinants of Short-Term Debt

In this section, we analyze the determinants of short-term capital flows to transition economies and show the likely developments of short-term debt for these countries.

4.2.1 International Bank Lending

Data on the share of short-term foreign bank debt were available for recent years only and do not allow us to exploit the time series dimension of the data in the form of a panel analysis. Hence, we used information on the share of short-term bank lending in total international bank finance in 60 countries at the end of 2000 as the dependent variable. As an alternative measure for the vulnerability of countries to financial shocks, one could use the ratio of short-term debt over international reserves. However, we have decided against this measure for two reasons: First, results by Brüggemann and Linne (1999) show that the share of short-term debt is a relatively good indicator of currency crises. Second, we prefer a measure that reflects the decisions of international investors at which maturity to lend only and that is not influenced by other factors that might have an impact on international reserves.

Explanatory variables were not available for all countries for this year. Hence, we used log GDP per capita in US-dollar in 1999 as a proxy for the state of development of the recipient country, log population (in millions) in 1998 as a proxy for market size, and the share of lending to banks in total foreign debt as a proxy for the importance of the interbank market. Additionally, we included dummy variables for the presence of financial centers. We obtained the following results:

$$(1)\quad share_st = \underset{(2.05)}{0.02}\log(GDPCAP) + \underset{(2.60)}{0.02}\log(POP) + \underset{(3.30)}{0.32}\,share_bank + \underset{(2.97)}{0.11}FNC$$

(t-values in brackets), $\overline{R}^2 = 0.39$, White heteroskedasticity-consistent standard errors, $N = 60$.

According to these estimates, the share of short-term bank lending is increasing in the level of development, the size of the population as well as the importance of the interbank market. Countries that host international financial centers also receive more short-term bank lending. Interestingly, proxies for the exchange rate system of a given country did not add any explanatory power, and these proxies were insignificant throughout. Likewise, a dummy variable capturing EU membership was insignificant.[5]

In a second step, we used the results of this regression to perform within sample forecasts for both the current members of the EU as well as the accession states (including Russia).

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[5] A dummy variable for OECD membership was insignificant as well but had the negative sign found in earlier work.

Results are presented in Graph 5. Overall, the empirical model fits the data for the existing EU member countries quite well. On average, these countries have a share of short-term foreign liabilities vis-à-vis banks of 53 percent (unweighted average), and this is also what the model would predict. At the same time, some outliers are noticeable. Austria, Spain, and Greece have short-term bank liabilities which are about 6-8 percentage points below the forecast. Belgium and Finland are countries with short-term liabilities substantially above their expected values.

As for the transition economies, the picture looks different. Generally, their share of short-term bank lending is below the EU average (35 versus 53 percent), and the fit of the model in terms of the expected share is worse. On average, one would expect shares of short-term bank lending to these countries of about 40 percent. These results suggest that most of the transition economies in the sample actually have scope for raising more short-term debt given their current level of economic and financial development. This is mainly due to the fact that Russia and Slovenia have short-term liabilities which are 25 percentage points below the expected values. The Czech Republic is the only country for which actual short-term debt is significantly above the expected value.

4.2.2 Debt Securities

Data on the maturity structure of domestic and international debt securities were available for a smaller cross-section of countries but for a much longer time period than data on the maturity structure of foreign bank lending. The datasets that we used cover 34 countries and span a time period of 10 years (1989–2000) for annual data on domestic debt securities and of 7 years (1993:4–2000:4) for quarterly data on domestic and international debt securities. The share of short-term securities in total securities of these countries was thus used as the dependent variable in the following panel regression:

$$(2) \quad y_{i,t} = \alpha_i + \delta_i t + x'_{i,t}\,\beta + e_{i,t}, \quad t = 1,2,...T; \quad i = 1,...,N,$$

where $y_{i,t}$ = share of short-term debt of country *i*, α_i = country-specific fixed effect, $x_{i,t}$ = country-specific explanatory variables, and $\varepsilon_{i,t}$ = error term.[6] The approach thus allows for member-specific fixed effects and deterministic terms. Since the dependent variable, the share of short-term debt, was found to be stationary (results are not reported), we used standard OLS panel estimation techniques to estimate equation (2). Particularly, we used

6 See Table 6 for data definitions and sources.

the fixed effects (within) estimator, since the appropriateness of random effects model has been rejected by Hausman's (1978) specification test. Results are presented in Table 5.

As before, we used the log of GDP per capita as a proxy of the state of development of the host country. An increase in GDP per capita would imply less country risk and hence would raise the share of investing into securities with longer maturities. However, as was argued above, by improving the efficiency and the liquidity of financial markets, economic development may also promote short-term financing. To control for this, we additionally included the ratio of M2 over GDP. Notice that a higher degree of financial sophistication, such as an existence of well-developed financial sector, may also make risk-hedging instruments available and thus encourage long-term investments.

In addition, Montiel and Reinhart (1999) suggested that monetary sterilization policies might increase the share of short-term debt and therefore have the adverse effect of making countries more vulnerable to financial crises. Their country sample includes some emerging markets but only one transition economy (Czech Republic). The sterilization index used by Montiel and Reinhart was constructed on the basis of information about a contraction in domestic credit associated with open market operations. The intensity of sterilization depended on the scale of open market sales of government paper and on whether they were accompanied by increases in reserve requirements or by the transfer of government deposits from commercial banks to the central bank.

Unfortunately, we did not have a readily available measure for the degree of monetary sterilization for the entire set of countries that we studied. Therefore, we tried to account for sterilization measures by including dummy variables for the exchange rate regime since only countries with fixed exchange rates would be in the need of sterilization policies. This dummy could have two effects on the share of short-term debt. First, the exchange rate dummy could proxy for the conduct of sterilization policies. As sterilization tends to tilt the term structure of interest rates towards relatively high interest rates on short term debt, countries with pegged exchange rates might have higher shares of short-term debt. On the other hand, pegged exchange rates imply less exchange rate volatility if they are deemed credible. If this effect dominates, countries with fixed exchange rates would have lower shares of short-term debt.

Domestic Debt Securities

Table 4 reports the results of the fixed effects estimation for short-term domestic debt securities from the yearly panel over the period 1989–2000 (columns 1-4) and from the quarterly panel over the period 1993:4–2000:4 (columns 5-7). In the base-line model

(column 1), the country-specific explanatory variables are GDP per capita, share of M2 over GDP, and the dummy variable for a pegged exchange rate regime. Both GDP per capita and the share of M2 over GDP positively affect the share of short-term securities, indicating that more developed economies with deeper financial markets would tend to be issuers of more short-term debt instruments. The effect of the exchange rate dummy suggests that the impact of exchange rate stability and credibility attributed to fixed exchange rates is stronger than the effect that sterilized interventions may play by changing the term-structure of interest rates. This is because the dummy variable for pegged exchange rate regimes is statistically significant and has a negative impact on the share of short-term domestic debt securities.

Several additional variables have been added to the base-line model both to check robustness and to control for the openness of the economies, for participation in the European Monetary System (EMS),[7] and for the effects of fiscal policy. The alternative specifications all support the robustness of the results obtained from the base-line model. While openness of a country, as proxied by the share of imports in GDP, has a negative but insignificant impact on the maturity structure of debt securities (column 2), the effect of EMS membership is highly significant (column 3). Taking into account that the latter is highly correlated with the dummy variable for the EU membership, the result suggests that being a EU member and participating in the European monetary integration process may result in a decline in the share of short-term domestic debt securities. Here, the credibility argument may play a decisive role in promoting more long-term financing. Finally, the budget deficit expressed as the share of GDP has a negative impact on the short-term debt instruments as well (column 4).

Using quarterly instead of yearly data but for a shorter time-period yielded substantially the same results, as shown in columns 5, 6 and 7 of Table 4. This once again points to the robustness of our results, with a slight difference that the share of M2 becomes less significant and the openness of the economy becomes significant.

International Debt Securities

The same base-line model as for domestic securities was estimated for the share of short-term international debt securities using quarterly panel data for the period 1993:4 to 2000:4. The results presented in Table 5 confirm the observations made from Graphs 3 and 4 that the determinants of domestic and international debt securities seem to differ.

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[7] More specifically, the dummy was set equal to one for countries that had cooperative arrangement under the EMS (before 1998) and which are members of the Euro Area (after 1998).

Although GDP per capita remains highly significant for and positively related to issuing short-term international debt instruments, the role of the degree of financial sophistication in the domestic economy substantially diminishes (column 1). At the same time, the openness of the economy has a significant role suggesting more short-term debt issued by more open economies (columns 2 and 3). The dummy variable for the pegged exchange rate regime is again negative but only marginally significant, which can be explained by the fact that international debt instruments are mainly issued in foreign currencies and the stability and credibility of the domestic exchange rate is of a very limited importance. In contrast to the domestic debt securities, the EMS dummy becomes insignificant.

Generally, the explanatory power of the model for international debt securities is poor . This suggests that more research is needed in explaining determinants of short-term international debt securities and the differences in determinants of debt maturity for domestic and international financial debt instruments.

Summary of Results

High shares of short-term debt can make countries vulnerable to financial crisis. If investor sentiment changes, short-term debt can be withdrawn faster than long-term debt. Emerging markets which lack a track record on international financial markets might be particularly vulnerable to swings in their external indebtedness. At the same time, a further integration into international capital flows and the development of institutional structures may make the structure of capital flows inherently more stable.

These considerations are especially relevant for the transition economies of Central and Eastern Europe. Not only are these countries among the group of emerging markets which has rapidly integrated into international capital flows during the past decade, their envisaged membership in the European Union will require to further lower barriers to financial integration.

From a theoretical point of view, economic development can have different effects on the share of short-term debt and thus the financial stability of countries. On the one hand, economic development reduces uncertainty and may thus make lenders more willing to lend long-term. On the other hand, economic development goes hand in hand with the development of the financial system. This reduces the costs of rolling over short-term debt and may make lenders more willing to lend short-term. Also, borrowers will find it easier to re-finance their contracts on short-notice, and they would offer more short-term contracts.

This paper used three different datasets to assess the determinants of short-term debt and to forecast its development in the reform states. As regards the impact of economic development on the maturity structure of (foreign) debt, the results we obtain for short-term international bank lending, domestic and international debt securities do point into the same direction. We find that the share of short-term debt increases in the state of development of countries. Hence, the effect of an improvement in the development of the financial system seems to dominate while the reduction in uncertainty that economic development brings about seems to be of lesser importance.

In addition, we found evidence that economic policy has an impact on the share of short-term debt. More specifically, countries with pegged exchange rates seem to have lower shares of short-term debt securities, indicating that the exchange rate regimes are deemed credibly. Interpreting the exchange rate regime as a proxy for the importance of sterilization measures, our results would thus contradict the findings of Montiel and Reinhart (1999) that sterilization policies raise the share of short-term debt. However, a better measure of sterilization policies would certainly be needed to confirm this result. In addition, a high borrowing need of the government tends to lower the share of short-term debt, possibly because of a higher solvency of official borrowers.

While we could not establish a statistically significant impact of EU membership on the share of short-term bank lending, the impact on short-term domestic debt securities seems to be negative. As the accession states join the EU and the EMS, we would thus expect a decline in their share of short-term debt securities. Yet, the overall effect of EU membership and of further economic development goes beyond these direct effects. In fact, if additional indirect effects are taken into account, the net effect is less clear-cut. Generally, economic development and an increase in GDP per capita can be expected to raise the share of short-term debt. Also, a possible reduction in government deficits would tend to increase the share of short-term debt.For international bank lending, we have also performed within-sample forecasts of the share of short-term debt. For this type of liability, our results clearly indicate that the countries under study currently have lower shares of short-term debt than our regression results would suggest. Hence, as they develop and further integrate into the EU and international capital markets, we would expect an increase in the share of short-term international bank lending.

As regards avenues for future research, one immediate challenges arise from this paper. In future empirical work, it would be useful to quantify the welfare implications of short-term debt such as, for instance, the link between the volatility of macroeconomic aggregates and short-term capital flows. Without such information, it would be somewhat premature to draw any far-reaching policy implications from this paper.

One important message that one should take from this paper though is that short-term capital may not only be more volatile than other forms of capital flows, but that it also fulfills an important economic role. When discussing the costs and benefits of taxes on short-term capital flows, this aspect should be taken into consideration. In a similar vein, taxes on short-term capital flows cannot substitute for structural reforms and might be curing symptoms rather than causes of financial instabilities. In any case, the accession states have relatively little leeway in deciding whether controls on short-term capital flows would be useful for them since membership in the EU severely constrains their choices. In this scenario, it is useful to keep in mind that higher shares of short-term debt might be a by-product of economic development and might thus not warrant necessarily policy action. In order to avoid an 'over-shooting' of short-term capital, structural reforms at the domestic level are crucial, and an overvalued exchange rate should be avoided. Moreover, transparent, timely, and reliable information should be disseminated to the international investment community, the prudential supervision of banks should be strengthened to avoid excessive foreign borrowing of banks, and mechanisms to prevent coordination failure of short-term creditors could be considered.

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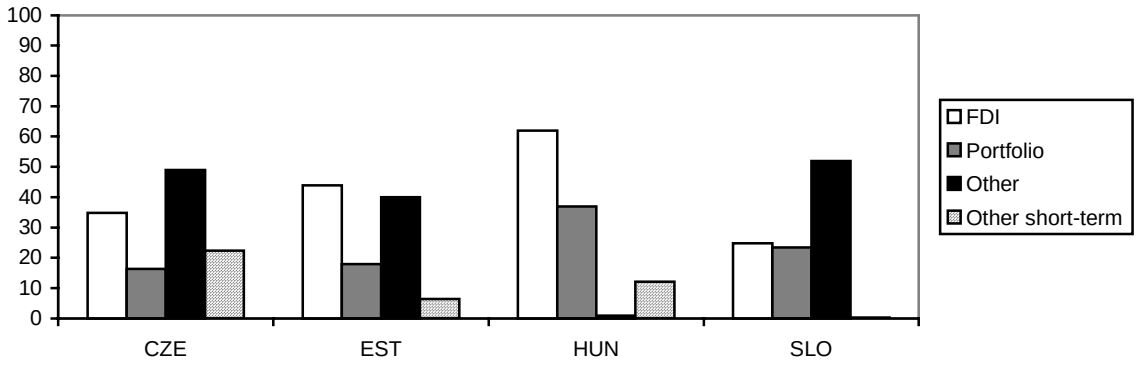
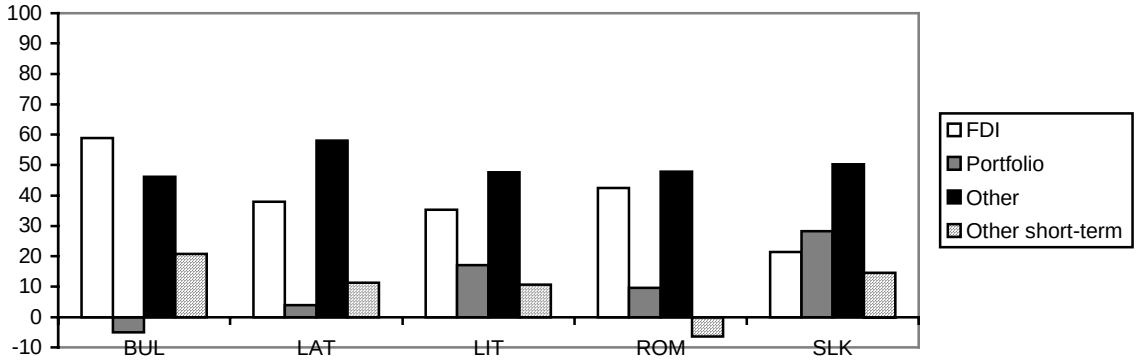
Graph 1. Structure of Capital Flows

This Graph gives the structure of capital flows in percent of total inflows of foreign capital. Data are quarterly averages for the 1990s. Capital inflows to Poland are not reported because of data incompleteness. Data do not add up to 100 percent because "other short-term" is included in "other" capital flows.

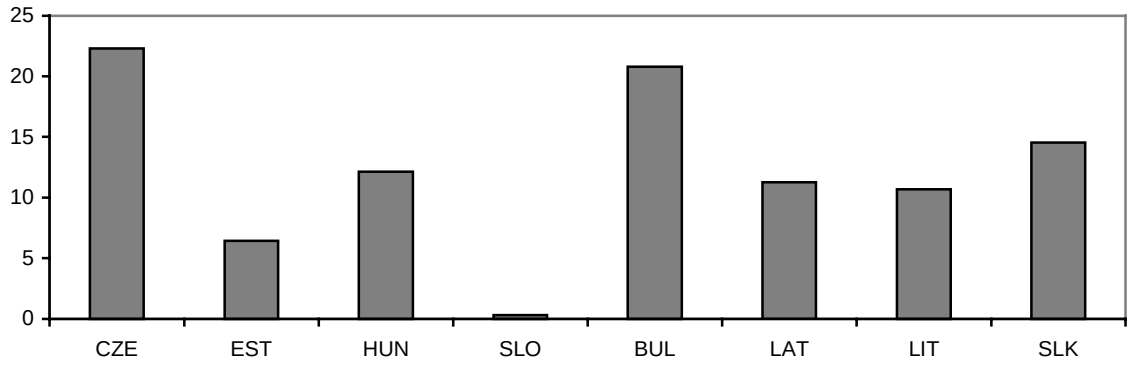




Source: IMF (2001a)

Graph 2. Share of Short-Term Liabilities in Total Liabilities

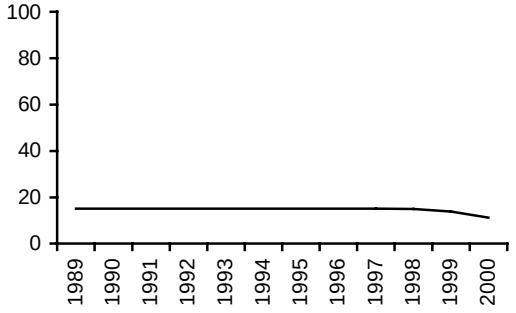
This Graph gives the average percentage share of short-term other investments in capital inflows for the transition economies during the 1990s.



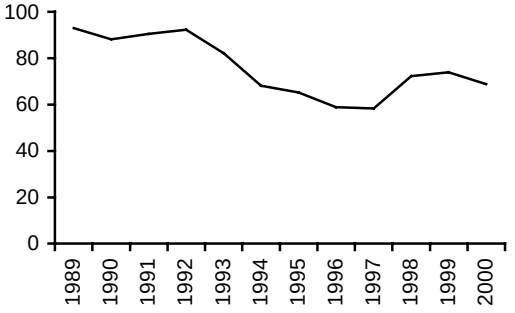
Source: IMF (2001a)

Graph 3. Share of Short-Term Domestic Debt Securities in Total (%), 1989-2000

Austria



Czech Republic



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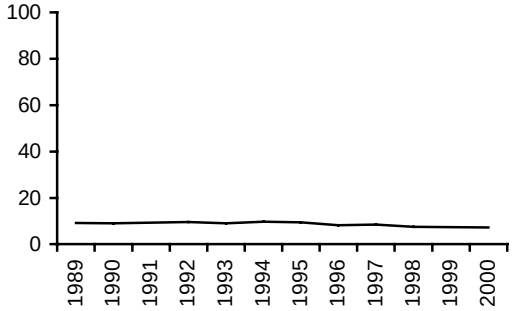
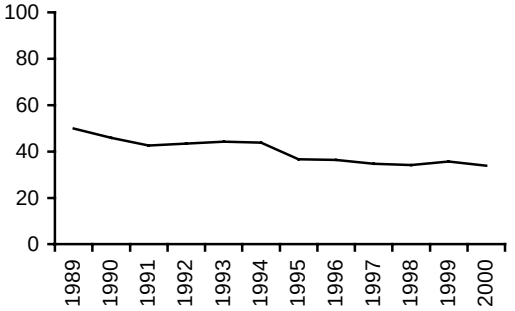


Finland



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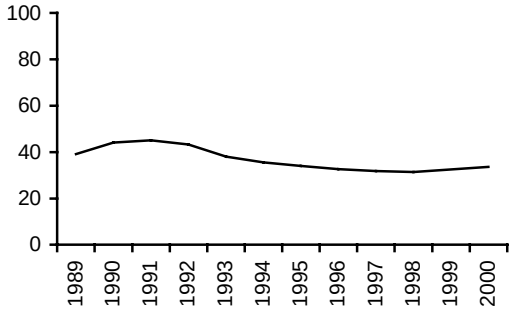

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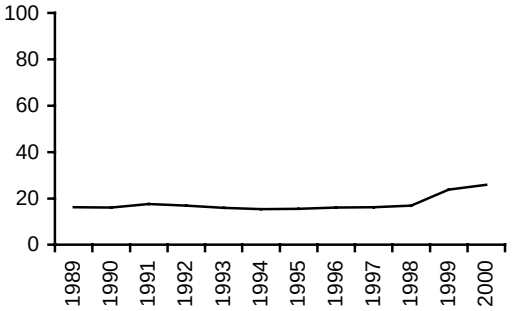
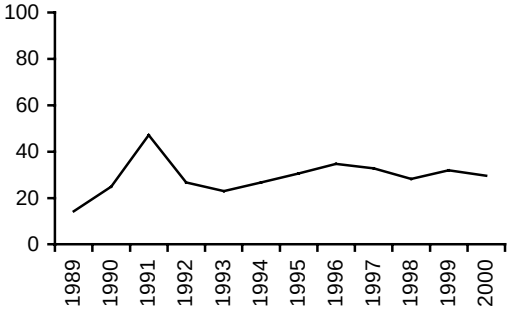
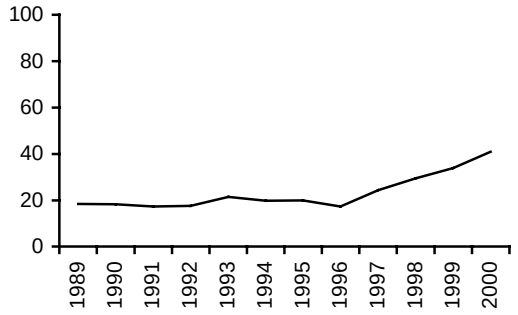


Greece

Hungary

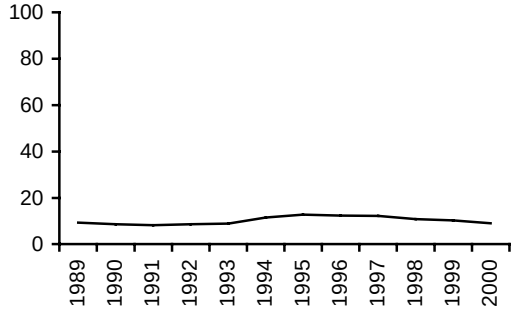


Ireland



Italy

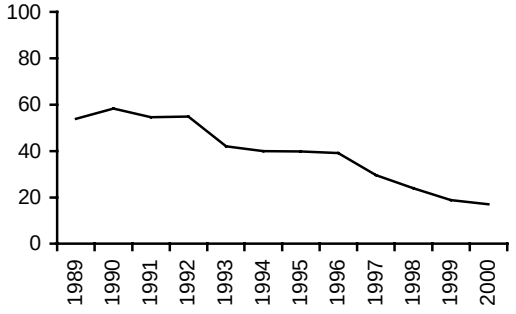
Netherlands



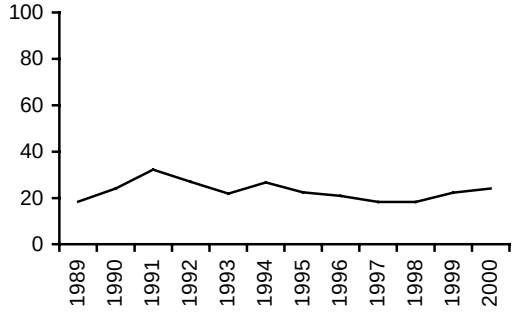
Poland

Poland

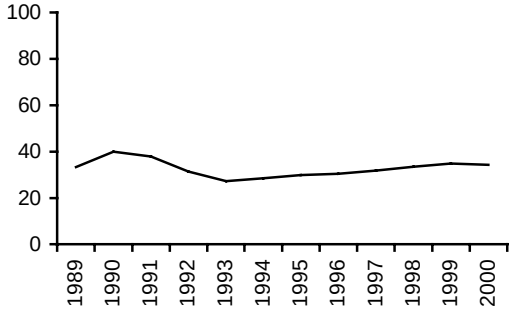
Spain



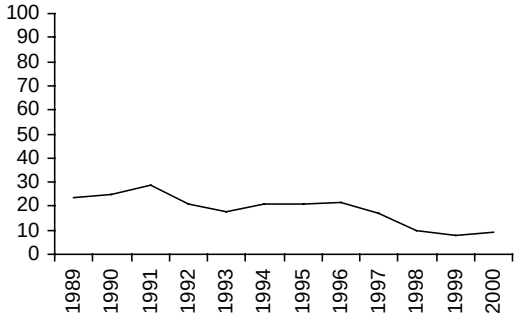
Sweden



United Kingdom



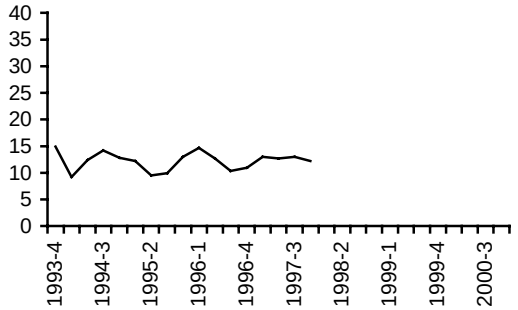
Portugal



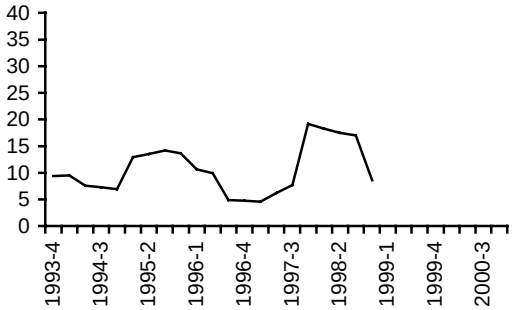
Source: BIS (2001)

Graph 4. Share of Short-Term International Debt Securities in Total (%), 1993-2000

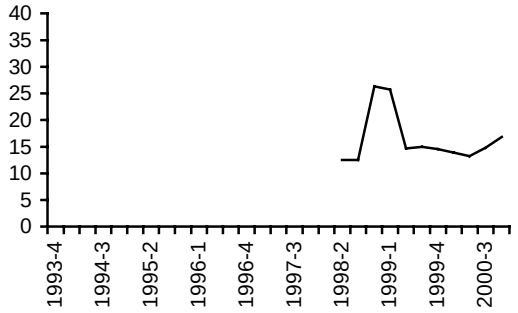
Austria



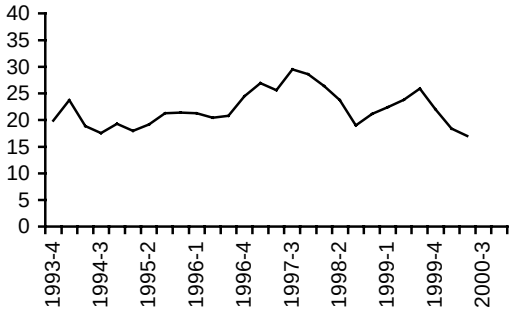
Belgium



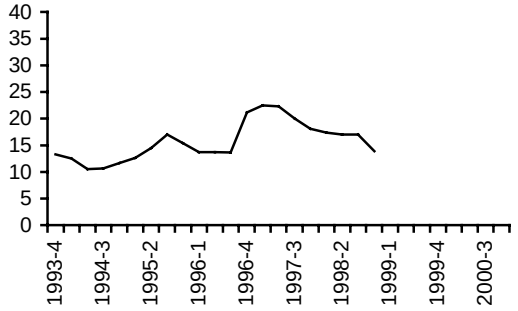
Czech Republic



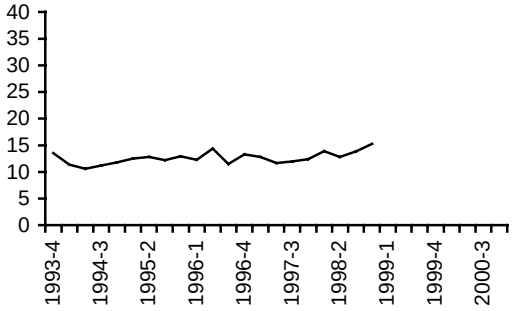
Denmark



Finland



France



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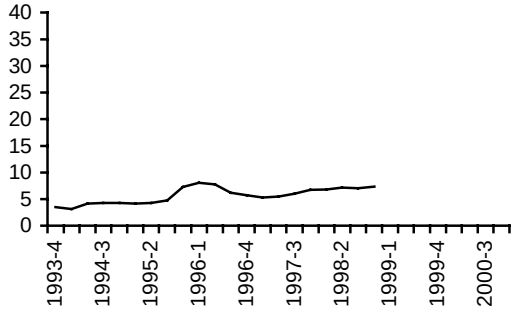

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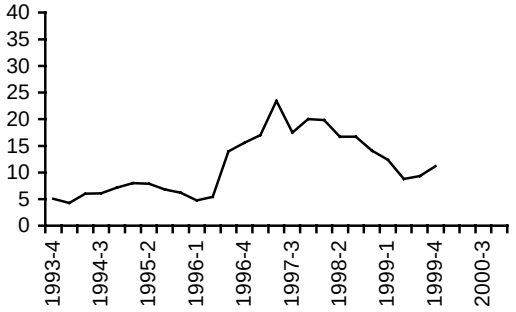

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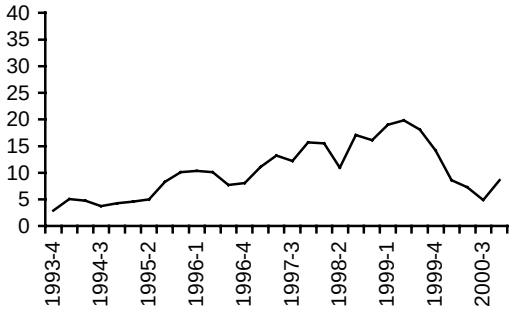

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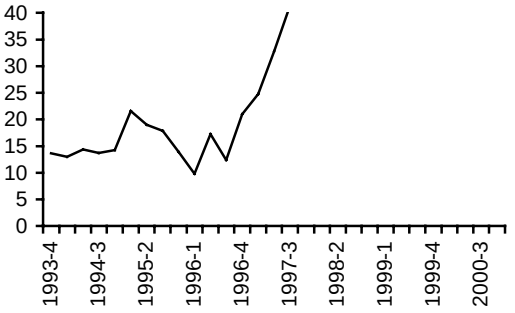

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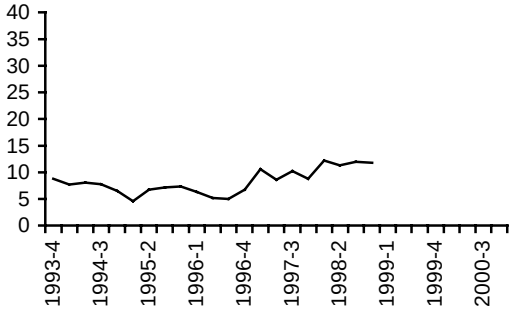
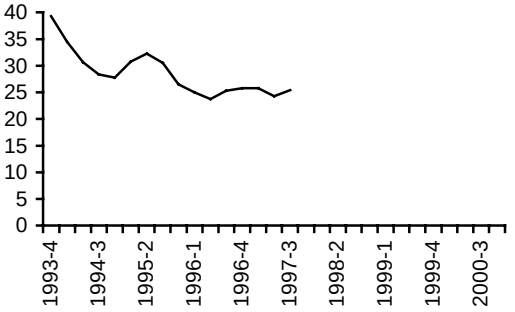


Netherlands



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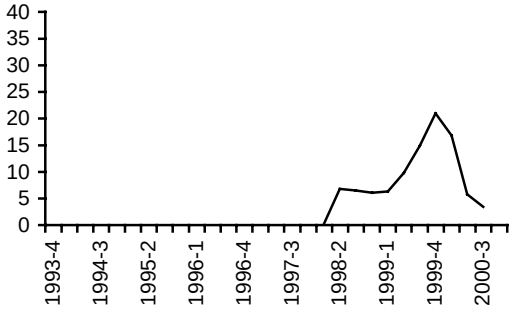
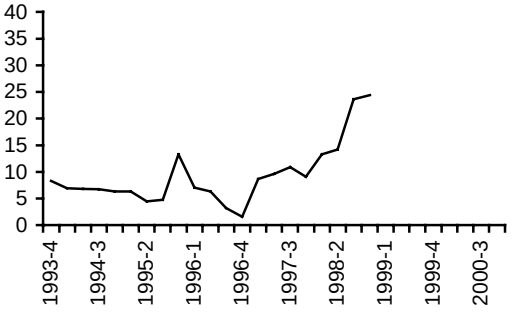


Portugal



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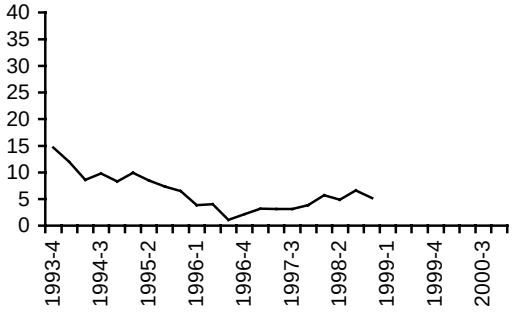

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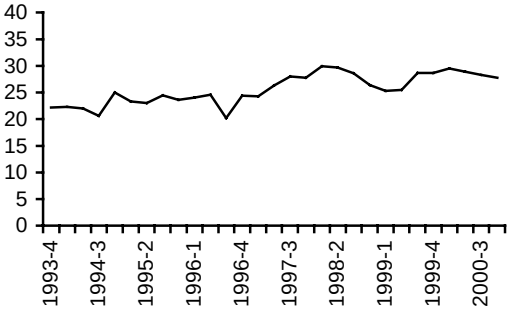
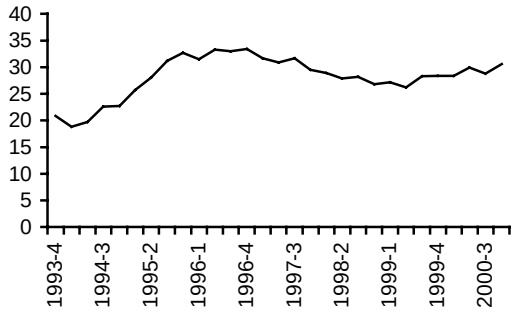


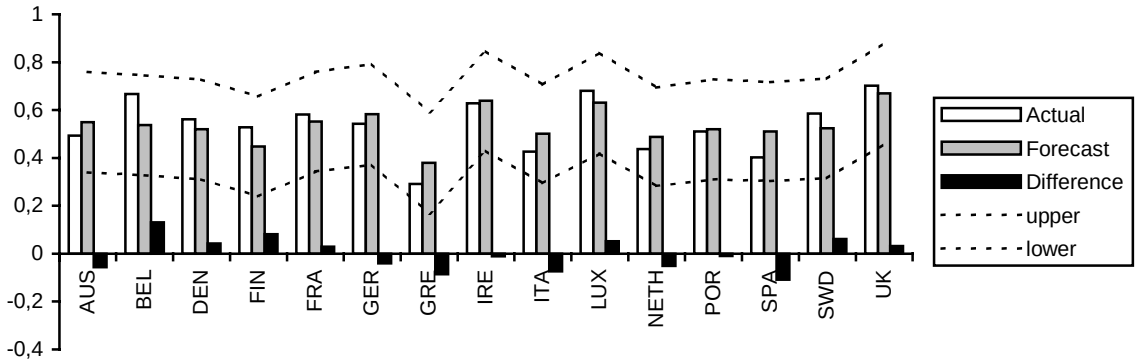
United Kingdom



Source: BIS (2001)

Graph 5. Share of Short-Term Bank Lending: Actual versus Forecast

The Graph shows the actual share of short-term debt and the within-sample-forecast based on equation (1). Negative entries for the difference between the actual and the forecasted values imply that the share of short-term debt is below the values the model would predict. 'Upper' and 'lower' give the error bands, defined as ± 2 standard deviations.



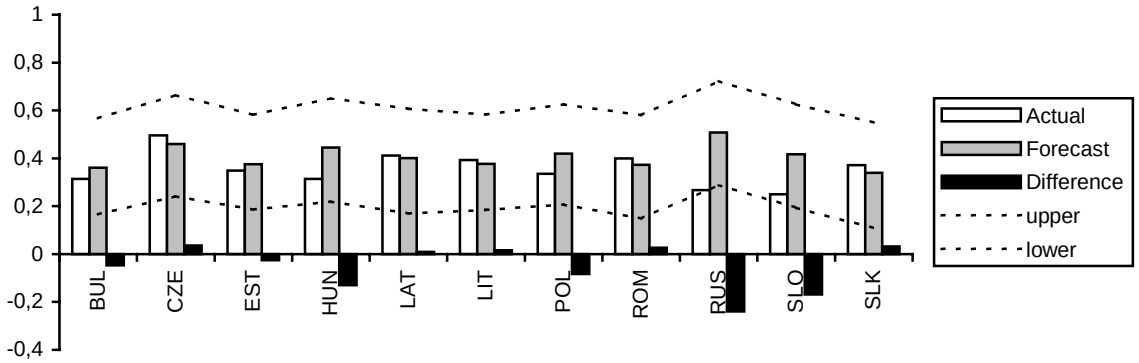


Table 1. Free Movement of Capital and of Financial Services in the EU

Regulations of the White Book: *Stage I*: Current account convertibility and liberalization of medium- and long-term capital flows. *Stage II*: Full capital account convertibility, incl. liberalization of short-term capital flows.

Bulgaria: A substantial degree of liberalization was introduced through the Foreign Exchange Act, which has been in force since January 2000. This included provisions which completely liberalized inward and outward direct investment. A number of transactions, mainly outflows, are not yet fully liberalized and require prior registration with the Bulgarian National Bank. The main remaining restriction on capital movements concerns the constitutional ban on the acquisition of real estate by foreigners.

Czech Republic: Liberalization in line with the *acquis* is almost completed. The main remaining restrictions concern acquisition of real estate by non-residents and foreign direct investment in air transport as well as the full alignment of rules relating to placement of assets of institutional investors.

Estonia: Estonia is well advanced in the alignment with the *acquis* in this area. However, some restrictions still remain. The acquisition of real estate by foreigners or investment in security services should be aligned with the *acqui*s.

Hungary: The liberalization of short-term capital flows was accelerated recently in connection with the widening of the exchange rate band of the Hungarian forint. Most restrictions on foreign exchange operations and transactions were lifted, thereby establishing the conditions for full convertibility of the national currency.

Latvia: The liberalization of capital flows has largely been accomplished. However, a number of restrictions on capital movements remain. With regard to the acquisition of real estate, Latvia still has to adopt legislation in order to end the restrictions concerning acquisition of land by foreign natural persons. Also, further adjustment of legislation and of effective compliance with the *acquis* needs to be made in a number of areas.

Lithuania: Overall, Lithuania has achieved a high degree of liberalization of capital movements, and there are no restrictions on the inflow and expatriation of capital by investment companies. Legislation on direct investment and on the operation of foreign insurance companies has been substantially aligned. Yet, further adjustment of legislation and of effective compliance with the *acquis* needs to be made in a number of areas.

Poland: The overall level of alignment with the *acquis* is high. In the area of short term capital movements, no progress towards further liberalization was made in comparison to the 2000 regular report of the EU. Investments by Polish occupational pension funds in foreign assets are still severely restricted.

Romania: While Romania has aligned with some of the *acquis,* a comprehensive system of exchange controls and other restrictions on capital movements still exists. While there are no specific restrictions on inward direct investment, current laws are ambiguous and open-ended as concerns undefined "sensitive" sectors where prior authorization can be imposed through "special laws." The Romanian Constitution forbids the purchase of real estate by non-nationals.

Slovakia: Further efforts are still required to achieve full compliance with the *acqui*s, notably on short-term capital movements. As for short-term capital movements, Slovakia has confirmed its timetable for the elimination of remaining restrictions. Certain restrictions remain concerning the acquisition of non-agricultural or forestry land.

Slovenia: The Foreign Exchange Act, adopted in March 1999, brought the scope and concept of capital movements in line with the *acqui*s. Slovenia has continued to abolish the remaining restrictions gradually in accordance with the liberalization timetables.

Source: European Commission (2001).

Table 2. Volatility of Capital Inflows

This Table gives the volatility of capital inflows, calculated as the coefficient of variation = standard deviation over mean (in absolute terms). Quarterly data for the 1990s are used. The large coefficient of variation of other capital flows to Hungary is due to a presence of sizable negative entries in other capital flows that results in a very small mean for this type of capital flow. The same holds true for other short-term capital inflows to Slovenia.

	Bulgaria	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Poland	Romania	Slovenia	Slovak Republic
FDI	1.3	0.9	0.7	1.1	0.7	1.4	0.8	1.4	0.8	0.8
Portfolio	4.8	1.4	2.4	1.9	3.1	2.0	n.a.	1.9	2.4	1.9
Other	3.4	1.0	1.1	61.6	0.8	1.0	0.9	2.8	1.3	2.8
of which: short-term	5.4	1.2	2.3	2.3	1.9	2.2	1.8	4.5	30.6	4.5

Source: IMF (2001a)

Table 3. Short-Term Debt Stocks

This Table gives the maturity structure of debt in total international bank lending as well as domestic versus foreign securities. Data for international bank credit and debt securities are for the end of 2000. The figures for bank credit do not add up to 100 percent because some credits remain unallocated. Total debt securities are given in percent of GDP (for Bulgaria, GDP for 1999), whereas the short-term debt securities are in percent of total debt securities.

	International bank credit (shares in % of total)			Debt securities			
				Domestic		International	
	Short-term (< 1 year)	Medium-term (1-2 years)	Long-term (>2 years)	Total (% of GDP)	short- term (% of total)	Total (% of GDP)	short-term (% of total)
Bulgaria	31.5	5.0	48.3	…	…	0.8	0.0
Czech Republic	49.6	4.9	29.0	46.1	68.8	3.7	16.8
Estonia	35.0	11.2	47.2	...	...	6.0	0.0
Hungary	31.5	6.3	34.7	35.5	29.6	23.0	8.6
Latvia	41.2	7.6	18.5	...	...	2.8	0.0
Lithuania	39.3	17.5	28.6	...	...	8.9	0.0
Poland	33.6	7.9	48.8	20.4	17.8	3.3	2.9
Romania	40.0	10.0	48.9	...	...	3.0	28.3
Slovak Republic	37.2	14.2	33.9	...	...	15.0	7.4
Slovenia	24.9	9.4	51.7	...	...	9.4	19.1
Total	32.6	8.9	46.2	...	...	...	...

Source: BIS (2001), IMF (2001b)

Table 4. Determinants of Short-Term Domestic Debt Securities

The dependent variable is the share of short-term domestic debt securities in total domestic debt securities for 34 developed and developing countries (in shares) (BIS 2001). GDP per capita is measured in billions US-Dollar, M2 over GDP, imports over GDP, and government deficit over GDP are in percent. Pegged exchange rate regime is a dummy variable which equals 1 for countries that have pegged exchange rates and 0 otherwise. EURO is a dummy variable which equals 1 for countries that had cooperative arrangement under the EMS (before 1998) and are in the Euro Area (after 1998), and 0 otherwise. Columns 1-4 correspond to the yearly panel that covers the time period of 1989-2000, while columns 5 to 7 correspond to the quarterly panel over 1993:4 to 2000:4. Regressions include time fixed effects for the years 1989-1997 for the yearly panel estimations and for the quarters 1993:4-1999:3 for the quarterly panel, which are all highly significant (not reported). Seasonal dummies were statistically insignificant in the quarterly panel estimations (not reported). t-values in brackets. *** (**, *) = significant at the 1 (5, 10)-percent level.

	1	2	3	4	5	6	7
Log GDP per capita	0.11***	0.11***	0.12***	0.23***	0.07***	0.07***	0.07***
	(3.04)	(2.93)	(3.33)	(6.28)	(3.16)	(3.01)	(3.10)
M2 / GDP	0.30***	0.31***	0.30***	0.27***	0.03**	0.03**	0.02**
	(4.60)	(4.60)	(4.56)	(3.92)	(2.41)	(2.38)	(2.04)
Pegged exchange rate regime	–0.11***	–0.11***	–0.12***	–0.12***	–0.13***	–0.13***	–0.15***
	(–6.20)	(–6.24)	(–6.70)	(–6.76)	(–11.26)	(–11.15)	(–12.65)
Imports / GDP		–0.09				–0.10*	–0.10*
		(–0.83)				(–1.85)	(–1.92)
EURO			–0.07***	–0.08***			–0.10***
			(–2.66)	(–3.18)			(–5.96)
Government deficit / GDP				–0.01**			
				(–2.71)			
R^2 overall	0.16	0.16	0.13	0.10	0.18	0.17	0.09
Number of obs. (countries)	351 (34)	351 (34)	351 (34)	303 (32)	850 (34)	850 (34)	850 (32)

Table 5. Determinants of Short-Term International Debt Securities

The dependent variable is the share of short-term international debt securities in total domestic debt securities for 34 developed and developing countries (in percent of total) (BIS 2001). GDP per capita is measured in billions US-Dollar, M2 over GDP, and imports over GDP are in percent. Pegged exchange rate regime is a dummy variable which equals 1 for countries that have pegged exchange rates and 0 otherwise. EURO is a dummy variable which equals 1 for countries that had cooperative arrangement under the EMS (before 1998) and are in the Euro Area (after 1998), and 0 otherwise. Regressions include seasonal dummies, which are all significant (not reported). Time fixed effects are also included for the quarters 1993:4-11994:2, which increases the significance of the dummy variable for the peg exchange rate regime, but does not change considerably other estimates. t-values in brackets. *** (**, *) = significant at the 1 (5, 10)-percent level.

	1	2	3
Log GDP per capita	0.14***	0.15***	0.14***
	(5.27)	(5.54)	(5.49)
M2 / GDP	0.01		
	(0.88)		
Pegged exchange rate regime	–0.02*	–0.02*	–0.02
	(–1.66)	(–1.79)	(–1.34)
Imports / GDP		0.31***	0.31**
		(4.69)	(4.67)
EURO			0.02
			(1.15)
R^2 overall	0.04	0.04	0.04
Number of obs. (countries)	850 (34)	850 (34)	850 (34)

Table 6. Data Definitions and Sources

Variable	Definition	Source
Short-term domestic debt securities	Domestic debt securities with remaining maturities up to one year by all issuers, in billions of US dollars, end of period amounts outstanding	BIS (2001), Table 17A
Total domestic debt securities	Domestic debt securities by all issuers, in billions of US dollars	BIS (2001), Table 16A
Short-term international debt securities	International debt securities with remaining maturities up to one year by all issuers, in billions of US dollars, end of period amounts outstanding	BIS (2001), Table 17B
Total international debt securities	International debt securities by all issuers, in billions of US dollars	BIS (2001), Table 12A
GDP	Gross domestic product, in billions of national currency. For Austria, Canada, France, Germany, Italy, Japan, Mexico, Netherlands, New Zealand, Spain, Switzerland, the United Kindgom and United States GDP is seasonally adjusted.	IMF (2001b)
ER	Exchange rate vis-a-vis US dollar, in units of national currency, period average	IMF (2001b)
POP	Population, in thousands	IMF (2001b)
M2	Broad money defined as the sum of Money (IFS, line 34) and Quasi-Money (IFS, line 35), in billions of national currency. For France, Italy, Portugal and Sweden national definitions of money are used. For Austria, Belgium, Finland, Greece, Ireland and Spain the broad money is calculated as the sum of Currency in circulation (IFS, line 34a) and Quasi-Money (IFS, line 35).	IMF (2001b)
Imports	Merchandise imports, CIF, in billions of US dollar	IMF (2001b)
Government deficit	Government deficit (-) or surplus (+), in billions of national currency	IMF (2001b)
PEG	Dummy variable for pegged exchange rate regimes, as of June 30 of the given year. Includes also currency board arrangements, pegged exchange rates within horizontal bands, crawling pegs and exchange rates within crawling bands (according to the IMF classification).	IMF (2001b)
EURO	Dummy variable for the cooperative arrangement under the EMS (before 1998) and for Euro Area (after 1998), as of June 30 of the given year	IMF (2001b)

Table 7. Country Sample

Argentina
Australia
Austria
Belgium
Brazil
Canada
Czech Republic
Denmark
Finland
France
Germany
Greece
Hong Kong
Hungary
India
Ireland
Italy
Japan
Korea South
Malaysia
Mexico
Netherlands
New Zealand
Norway
Poland
Portugal
Russia
Singapore
Spain
Sweden
Switzerland
Turkey
United Kingdom
United States

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