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Capital and Trade Flows in Europe and the Impact of Enlargement

by

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Abstract:
The Eastern enlargement of the European Union (EU) is likely to give a further boost to trade and capital flows, yet empirical evidence on the possible magnitudes is still scarce. This paper uses four different datasets to estimate the determinants of international asset holdings and trade flows. We find in most regressions that EU membership has a significant effect. Based on additional simulations of the expected flows to ten transition economies, we conclude that for the EU candidates actual values are still far below expected ones in most cases. Consequently, we anticipate rising capital and trade flows with the approach of EU accession, in particular for the seven EU candidates besides the Czech Republic, Hungary and Poland.

Keywords: EU Enlargement, International Asset Holdings, Trade, Gravity Model, Simulations.

JEL-classification: F15 (Economic Integration), F 17 (Trade Forecasting and Simulation), F21 (International Investment; Long-Term Capital Movements), F 36 (Financial Aspects of Economic Integration).

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1 Motivation

The transition process in Central and Eastern Europe has been one of the most encompassing and fascinating periods of economic change. Countries previously isolated from international trade and closed off from private international capital markets have dismantled the main barriers to the free flow of goods and services and have started to participate in the globalization process. Some of the most advanced reform countries have not only achieved a considerable degree of integration already, they are also about to enter a new stage of integration as they intend to join the European Union (EU).

The Czech Republic, Estonia, Hungary, Poland, and Slovenia have started negotiations with the EU about accession in March 1998 and have opened in summer 2000 the last of the 31 different chapters of the "*acquis communautaire*", which represents the complete framework of EU legislation. Bulgaria, Latvia, Lithuania, Romania, and Slovakia have followed behind, but eventually started negotiations about EU accession in February 2000. Under optimistic assumptions about the progress of the negotiations concerning the *acquis communautaire* and of the necessary reforms concerning the structure and functioning of the EU institutions, EU accession for the most advanced transition countries is said to be feasible in the year 2005 or 2006. In the cases of

extraordinary difficulties, joining members are granted transitional periods after accession until the *acquis* is 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 the EMU.

Despite the adjustments that have already taken place, EU accession could be expected to further stimulate trade and capital flows. The magnitude of these effects, in turn, has important implications for the effects integration has on labor markets, growth, and structural adjustments both in Eastern and Western Europe. Assessing the quantitative effects of EU accession is thus of key importance for policy makers both in the EU and in the accession countries. It requires, first of all, an assessment of how much of the adjustment due to the European integration process has already taken place. Ten years into the transition, it is thus time for taking stock.

Despite the urgency of these issues, relatively little robust evidence on the likely impact of integration on trade and international asset holdings in the transition economies is available. Although there has been some work on capital flows (see Buch et al. 1998, or Lankes and Stern 1999) and on the degree of trade integration achieved to date (UN 1998), assessing the impact of integration has hardly been the focus of econometric empirical work. Exceptions are papers on the likely impact of integration on FDI (Brenton et al. 1999) or general

assessments of the impact of EU membership on trade flows, migration, and the induced adjustments in both the existing and the new EU member countries (cf. Brücker et al. 2000, Weise et al. 1997). However, primarily due to data limitations, these studies have been unable to assess the impact of the integration process on, for instance, the structure of financial asset holdings.

The aim of the present paper is twofold. In a first step, we are using different cross-section datasets to assess the determinants of cross-border trade, FDI, and international asset holdings. Our particular aim is to show whether EU membership has a positive integration effect. In a second step, we are using the results from our empirical estimates to assess the degree of integration that the accession countries of Central and Eastern Europe have attained so far. In contrast to earlier work, we are using regionally disaggregated data, some of which have only recently been made available by the Bank for International Settlements (BIS) and the International Monetary Fund (IMF). These data allow us to look at bilateral asset holdings and trade flows and to single out the effect of EU membership.

The structure of the paper is as follows. The following Section 2 shows the expected impact of enlargement on trade and capital flows from a theoretical point of view and summarizes the available empirical evidence on the issue. Section 3 presents estimates of the determinants of cross-border bank loans, portfolio investments, foreign direct investment as well as trade flows, using a

variant of a gravity model. Section 4 simulates the impact of EU membership on these variables. Section 5 concludes and summarizes the main results.

2 Expected Integration Effects

Over the past decade, the transition economies of Central and Eastern Europe have integrated rapidly into international markets. They have liberalized their foreign trade regimes, have opened up for foreign capital, and have started to adapt their laws and regulations to the standards prevailing internationally, particularly in the European Union. These steps have precipitated a substantial reorientation of trade and capital flows. Membership in the EU is likely to lend a new quality to this process. Accession countries will not only have to liberalize fully their foreign trade relations with all EU partners and open up to capital flows, they will also have to adopt the entire institutional framework of the EU and will, eventually, be expected to join the European Monetary Union (EMU). In this section, we briefly review the theoretical insights and the empirical evidence on the expected integration effects.[1]

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[1] Of course, due to the broad scope of the topic at hand, we are unable to review fully the relevant literature on the issue. Fidrmuc and Nowotny (2000) offer a comprehensive survey of the current stage of discussion concerning the expected impact of the Eastern Enlargement of the EU.

2.1 Integration and Capital Flows

According to standard economic theory, the integration of lesser developed countries into the world economy through opening up the capital account of the balance of payments should precipitate flows of capital from capital-rich to capital-poor countries. According to the neoclassical framework, mobile capital would thus flow primarily out of capital-abundant developed economies and into capital-strapped developing and transition economies. This is because, by the law of diminishing returns, marginal returns to capital in the latter should exceed marginal returns in the former. Capital flows would be expected to continue until relative rates of return at home and abroad have been equalized, at which time there should be positive net asset holdings of the developed in the less-developed countries.[2]

However, the simple neoclassical framework does not (aim to) say anything about the structure of capital flows. In order to explain the structure, we would need a theory which focuses on differences in types of capital flows, in particular as regards their sensitivity to information costs. Just as the financial structure of a domestic corporation depends heavily on legal and institutional structures and on information costs, external financial structures are determined by these factors as well. Also, insights of portfolio theories, which show that asset holdings are

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2 Lucas (1990) argues that due to missing institutions capital flows to developing countries might be rather low.

determined not only by relative rates of return but also by return correlations and risks, are ignored by the standard model.

Recent empirical and theoretical research into the structure of international capital flows has particularly highlighted the links between information costs and the structure of international capital flows. Razin et al. (1998) develop a pecking order of capital flows, assuming that foreign investors are at an information disadvantage as compared to domestic investors when assessing the profitability of a domestic investment project. In their model, foreigners have three different types of capital at their disposal, i.e. debt and equity portfolio investment as well as foreign direct investment (FDI). Since, by assumption, FDI removes the information disadvantage, it is the preferred mode of finance at early stages of economic development if information costs are high. Foreign portfolio debt finance follows in the financial hierarchy while there would be no role for foreign portfolio equity investments because they would always be dominated by FDI. While Razin et al. (1998) disregard the special characteristics of bank loans, these are taken into account by Bolton and Freixas (2000) who argue that bank lending is likely to be observed at early stages of development while securitized (portfolio) finance becomes more important later on. Hence, the results of these papers would lead us to expect relatively high shares of FDI and bank lending at early stages of development and an increase in the share of portfolio investment as countries develop.

Empirical results presented in Hull and Tesar (2000) essentially confirm these results. They find that the external financial structure of developing countries essentially accords to the pecking order model. For these countries, the composition of capital flows tends to be skewed towards FDI and bank loans. For developed countries, to the contrary, bonds appear to be more important than bank loans and FDI. The fact that FDI is still important for developed markets also indicates that information asymmetries are important. In addition, for industrialized countries, the observations that capital in- and outflows are of a similar magnitude and tend to be reinvested in these countries support the view that portfolio diversification appears to be a motive behind international capital flows which the pecking order theory does not capture.

Empirical research has also stressed the role of trade openness, financial sector development, and economic development for external financial structures (Lane and Milesi-Ferretti 2000). Lane and Milesi-Ferretti find a positive relationship between the openness of an economy and its state of development, on the one hand, and the amount of external liabilities, on the other hand. While trade openness seems to favor particularly inflows of equity, the state of development of the financial system seems to have a positive impact mainly on portfolio investments.

In summary, the models reviewed above predict an impact of information costs on the structure of external capital flows. Information costs, in turn, can be

expected to change both as countries develop and as countries integrate into international capital flows, primarily because foreign investors gather experience in dealing with these countries. The process of enlargement of the EU is special in this regard because enlargement requires the adoption of common standards and institutions. This convergence of institutions, in turn, is likely to lower information costs for investors and thus to gradually tilt the structure of capital flows away from FDI and bank lending towards greater shares of securitized finance, i.e. portfolio investments.

Buch (2000) provides an empirical test of the importance of EU membership on international banking assets and portfolio investments on the basis of bilateral data. The paper shows a positive impact of EU membership which tends to be robust against changes in the specification, particularly against including a variable capturing the geographical distance between creditor and debtor country as a proxy for economic distance.[3] One further result, which has also been robust across different specifications, is that GDP per capita and population size, as proxies for the state of development and of the size of an economy, respectively, have a positive impact on both types of investments. GDP per capita, in turn, tends to be more important for portfolio investments, thus supporting theoretical models yielding a pecking order of international capital

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3 This approximation has a good fit as shown for Europe by Fischer et al. (1997). The underlying idea and the associated (gravity) model are discussed later.

flows. Although there has been some evidence for a negative impact of the economic distance between creditor and debtor country and for a positive impact of the size of the financial system and of trade openness on cross-border asset holdings, these results have not been robust against changes in the specification. Also, a country's credit risk rating was insignificant in most equations.

As regards evidence on the structure of capital flows to transition economies, earlier work tends to use descriptive empirical models or to focus on the total volume of capital flows rather than their structure.[4] Empirical evidence provided in Buch (1999), for example, suggests that the main impact of EU enlargement on capital flows to the accession states would be expected to occur in qualitative rather than in quantitative terms. More specifically, while the accession countries and the southern members of the EU were found to be similar with regard to the degree of openness to foreign capital – measured as the correlation between domestic savings and investment –, they differed with regard to the structure of their capital flows. Portfolio flows, for example, were found to be less important for the eastern European countries than for southern Europe today.

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4 See Buch et al. (1998) or Lankes and Stern (1999) for comprehensive surveys of the evidence.

2.2 Integration and Trade Flows

Both regional and multilateral schemes of integration aim to reduce the various barriers to trade in order to increase the gains from trade stemming from an efficient use of resources. An increase in trade flows can work through various channels. The most important ones for the integration of the Central and Eastern European Countries (CEECs) into the EU are:[5]

1.) *Increase in Competition and Scale Economies*. New trade theory stresses the importance of imperfect competition and scale economies (Krugman 1994). Through regional integration, expansion of output in the sectors characterized by imperfect competition and scale economies raises welfare, since the cost of producing an additional unit is lower than its marginal value. Furthermore, regional integration increases the range of varieties available to producers and consumers, which might raise both productivity and utility (cf. Dixit and Stiglitz 1977). For the completion of the European Single Market, it has been attempted to quantify these effects with simulations based on Computable General Equilibrium models (cf. Smith and Venables 1987 and Gasiorek et al. 1992). Gasiorek et al. (1995) and Baldwin et al. (1997) extend this approach to the Eastern Enlargement of the EU and find a substantial increase in trade and considerable economic gains based on the increase in competition.

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5 See also Piazolo 2000.

2.) *Tariff Reductions and Reductions in Non-Tariff Barriers Between the Integrating Countries.* All goods and services traded within the present 15 EU are duty free and face no quantitative restrictions. The Europe Agreements between the present EU members and ten CEECs have already led to a substantial reduction in bilateral tariffs and have in fact created already a kind of regional trading area. By the end of 2000, only few industrial goods from the EU to Europe Agreement partner countries, or vice versa, will continue to face a tariff. For most joining CEECs, EU membership will also lead to a reduction of tariffs towards third countries through the adoption of a common external tariff.[6]

3.) *Reductions in the Costs of Trade Resulting from Borders.* It has been estimated that the border costs for trade between the member states of the European Community before the implementation of the Single Market have accounted for additional costs between 1.0 percent (European Commission 1997) and 1.7 percent of the value of trade (Cawley and Davenport 1988). These border costs stem from customs controls between the countries. With the Single Market in force, customs control have vanished and the remaining necessary forms documenting the flows of trade (e.g. for statistical purposes) can be completed in the European headquarters.

4.) *Reductions of Technical Barriers to Trade.* Exporters frequently have to modify their products in order to achieve compliance with the technical

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6 Estonia has lower tariff barriers than the EU. All other CEECs demand higher tariffs.

standards and regulations of the importing country. These procedures lead to substantial costs for the exporting company. The European Single Market Program attempts to reduce and eventually to abolish these technical barriers to trade between member countries in most cases by the European harmonization of standards and in fewer cases by enforcing the mutual recognition principle. The extra costs due to the technical barriers of trade may be regarded as additional costs of production for the export market. Harrison et al. (1996) estimate that the reduction in the real trade costs from decreases in border costs and standardization costs sum up to 2.5 percent of the value traded. Baldwin et al. (1997) assume in their study about the Eastern Enlargement of the EU that membership of the CEECs will lower east-west trading cost by up to 10 percent of the value of trade and experiment even with a 15 percent reduction in trading costs.[7]

This summary highlights the various channels through which regional integration can lead to an increase in trade. The next section attempts to move closer to reality by looking at empirical approaches to specify the determinants of trade flows and international asset holdings.

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[7] Other effects of joining the European Union do not primarily and directly affect the trade flows, but might increase trade through the stimulus of economic activity. These additional channels are migration (cf. Hille and Straubhaar, 2000), reduction in the risk premium (cf. Piazolo 1999), transfers to or from a common budget and demand side effects.

3 Determinants of Trade and Capital Flows

Cross-country OLS regressions are used in the following to derive the main determinants of foreign asset holdings and trade flows for OECD countries on the basis of bilateral data. For bank claims, portfolio investments, and (flows of) FDI, we assess the empirical importance of market size, state of development, or institutional restrictions as explanatory variables.[8] For trade flows, we employ the work-horse of empirical trade analysis – a traditional gravity model with a slightly different set of variables than the one used for capital flows.

3.1 International Banking Assets

This section uses data of the BIS for a cross-section of about 50 host countries, which are the recipients of about 95 percent of all international bank loans, to analyze the determinants of international banking assets. In contrast to Buch (2000), we exclude transition economies from our sample. Due to missing observations for others, ten reporting countries have been considered only. For each of these ten reporting countries (and once for total cross-border claims) a separate regression on up to 50 host countries has been run. The log of total claims of these countries on the recipient countries is used as a dependent variable in the following regression:

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8 The exact definitions and sources of the data are given in Table 1.

(1) $y_i = a_i + x_i b + e_i$

where y_i = log of total claims on country i, x_i = country-specific explanatory variables, and e_i = error term. We are using the log of GDP per capita as a proxy of the state of development of the host country. The ratio of imports over GDP proxies the importance of foreign trade financing, hence the expected coefficient would be positive. The ratio of M2 over GDP captures the size of the financial system, which we would expect to have a positive impact on cross-border financial claims. This is because the larger a financial systems nationally, the greater will be the potential also for cross-border financial activities.

A dummy for EU membership has been included because the adoption of the Single Market program and the adoption of the Second Banking Directive in 1992 have been intended to level the playing field for financial institutions across Europe. The adoption of the principles of mutual recognition, home country supervision, and the harmonization of banking regulations should have eased the provision of financial services abroad. In a similar vein, the abolition of capital controls can be expected to have fostered cross-border asset holdings. The same holds for the presence of financial centers. Finally, we include the (log of the) spatial distance between a lender and a borrower to account for "transportation costs" and cultural proximity.

Overall, our approach performs quite well, explaining about three quarters of the variance in cross-border asset holdings of banks for most donor countries. The exceptions are Spain and the United States, for which the explanatory power is below 50 percent (Table 4).[9]

The explanatory variables which are significant throughout are GDP per capita and population, the elasticities of cross-border lending being roughly between 0.6 and 1 percent. The share of imports is positive and significant in the majority of the equations; evidence for the significance of the financial sector variable (M2 over GDP) is somewhat weaker. The distance variable is significantly negative in about half of the equations; the notable exception being the UK which has a significant positive coefficient.

From the point of view of the present paper, the EU dummy is particularly interesting. We find indeed that, after controlling for income, size, trade relations, or the presence of a financial center, the fact that a country has been a member of the EU has an additional explanatory power for cross-border banking assets. More specifically, the EU dummy has had no explanatory power for Japan and the US. For all other countries, a positive coefficient has been found, which is significant except for Austria and Spain. These results may be taken to support

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9 For cases in which the assumption of homoskedastic error terms has been violated, robust standard errors have been generated using the White correction. Normal distribution of the residuals could have been ensured in most equations by including individual country-dummies. However, as including the dummies inflated the R^2 without changing the remaining results, we report the unadjusted estimates only.

the hypothesis that EU membership has had a positive impact on intra-EU capital flows.

3.2 Portfolio Investments

In a next step, we have run the same regressions as for international banking assets also for international portfolio investments. Hereby, we draw on a survey of international portfolio investments of 29 reporting countries recently compiled by the IMF. These investments comprise holdings of equity securities, long- and short-term debt securities, and derivatives. So far, data are available only for portfolio holdings at the end of 1997. In order to keep the analysis comparable to that above, we have restricted the analysis to the same group of countries and have included the same explanatory variables.

A priori, we would expect the variables capturing market size to have a similar positive impact on cross-border portfolio asset holdings as on bank lending. If it was true that the share of portfolio investment increases as countries develop, we would expect to find larger coefficients on per capita GDP than for bank lending. Bank lending, in contrast, can be expected to be more closely related to foreign trade activities than portfolio investment would be. As regards the importance of EU membership, we would again expect a positive impact as not only banking regulations but also institutional factors affecting other financial market segments have been harmonized.

The results for nine reporting countries for which data have been available are summarized in Table 5. Although the explanatory power of the equations is somewhat lower than for banking assets, our model still explains more than 50 percent in the variation of international portfolio investments. For all countries GDP per capita and population have a significant and positive impact on portfolio asset holdings. As in Buch (2000), portfolio investment seems to be influenced by GDP per capita to a greater degree than banking assets. Foreign trade activities are positively related to portfolio investments only for one reporting country (the Netherlands).

With the exception of Spain (insignificant) and the US (negative), the EU dummy enters with a positive sign in all equations. This largely confirms the results for cross-border banking assets. Distance, in contrast, seems less important as a determinant of portfolio investment as compared to bank lending. As regards the magnitude of the EU dummy, there is no clear pattern. In about half of the cases, the coefficient is higher for portfolio investment than for banking assets. In the remaining cases, either the reverse holds true or no clear ranking has been possible. Hence, there is no clear-cut evidence concerning the impact of the integration process in the EU on the structure of foreign asset holdings.

3.3 Foreign Direct Investment

The same approach as for the international banking assets and international portfolio investment has also been used for foreign direct investment. Unfortunately, comprehensive data on the bilateral stocks of FDI in our sample of host countries have not been available. Hence, we are using the International Direct Investment Statistics Yearbook of the OECD (2000a) and the Direct Investment Book of the European Union (1999) to construct a database for FDI flows from nine OECD countries to the main host countries of FDI. Due to the somehow limited availability of bilateral FDI flow data (and excluding FDI flows to transition countries), we can use only between 27 and 38 observations. We complement this by an analysis of the determinants of the total stocks of FDI in 50 host countries.

Overall, the fit of the regressions for bilateral FDI flows is quite satisfactory with an R^2 between 0.33 for the US and 0.67 for Germany (cf. Table 6). Our approach explains about two-thirds of the cross-country variation in total FDI stocks. Qualitatively, results are similar to those found for bank claims and portfolio investments. GDP per capita and population are significant in all regressions. The elasticity of FDI is similar to the one found for cross-border lending and lies between 0.5 and 1 percent. Foreign trade activities appear to be complements to FDI for Italy, Japan, and the Netherlands. The coefficient of the

EU dummy is significant (and positive) for five of the nine countries as well as for total stocks of FDI.

Generally, there are relatively few differences between the results for FDI flows and stocks. The coefficients on GDP per capita and population are of similar magnitude, while the trade share and, for some countries, the EU dummy seems to be higher than for total FDI stocks.

If anything, the size of the host country's financial sector (M2 over GDP) seems to exert a negative effect on the volume of FDI, however, this variable is significant in only one equation (France). A possible explanation of this negative link is that the more developed the domestic financial sector, the more scope there is to finance operations abroad through foreign savings.

The distance between the investing country and the host country seems to have no impact on FDI. This result is surprising since, even more so than for bank lending and portfolio investment, cultural proximity could be considered a factor driving FDI flows. One partial explanation could be that, since foreign trade activities are both significant determinants of FDI flows in about half of the equations and are affected by the distance between two countries, the trade variable might capture part of the effect. A counterbalancing effect to the (cultural) proximity impact might be that domestic market oriented FDI becomes the more interesting for firms with products that demand relative high

transportation costs and thus face disadvantages under the "direct export" alternative to FDI. Transportation costs, in turn, are the higher the greater the distance to the destination market. Consequently, the "proximity effect" (inducing FDI due to cultural proximity and low information costs) and the "distance effect" (inducing FDI due to high transportation costs otherwise) might level out against each other.[10]

Comparing the coefficients for total banking assets and FDI provides some interesting insights concerning the impact of different explanatory variables on the structure of foreign liabilities. While GDP per capita, population, and the import share seem to have a greater impact on FDI than on banking assets, while the coefficient on the EU dummy appears lower, Wald tests (not reported) have shown that only the difference in the coefficients on population has been statistically significant. This suggests that neither the state of development nor the fact whether a country has been a member of the EU has a statistically significant impact on the relative shares of bank credit and FDI in total external liabilities. This is also confirmed by regressions using the ratio of banking assets over FDI as dependent variable which yield insignificant coefficients on GDP per capita and the EU dummy. Note, however, that because of the lack of comprehensive data on total portfolio investments, we cannot derive implications concerning the entire financial structure.

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[10] The complements versus substitutes issue for FDI and trade is also examined by Fontagné (1999).

3.4 Trade

There are, as has been argued above, many potential influences that affect the size of trade flows. Hence, it is rather difficult to account for all possible determinants within one empirical model to derive the "expected" or "normal" size of trade flows between two countries. A widely used approach for estimating the "normal" size of bilateral trade is the so-called gravity model.[11]

In the present paper, data on trade between OECD countries and partner countries are examined in a regression that includes gross national product, per capita income, geographical distance, and a EU dummy only. We make use of a comprehensive database that was employed in Piazolo (2001) to derive one overall trade equation on the basis of 1655 bilateral trade relations. For this paper, we focus on bilateral trade of nine OECD countries with 69 partner

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11 The gravity model derives its name from the analogy of trade flows to gravitational forces between objects depending on their mass and the distance between them. Gravity models were developed in the early 1960s as a framework for the empirical analysis of trade phenomena. Although the theoretical foundation of the gravity model has sometimes been called into question, its robustness and high explanation power in empirical applications are undisputed. Deardorff (1995) showed that a simple gravity equation can be derived from standard trade theories. Gravity models have been employed frequently to examine various trade relationships and have not lost their attractiveness over the decades. For a more detailed discussion of the gravity approach and its application see Piazolo (2001). The correct specification of gravity models are examined in detail by Feenstra et al. (1998) and Egger (2000).

The gravity model approach explains bilateral trade as a function of the "mass" of two countries and "distance". "Mass" is reflected in the national product and GNP per capita of both the supplier country and of the destination country and captures supply potential and absorptive capacity. "Distance" captures all factors that restrict (or stimulate) trade by increasing (or reducing) transaction costs of trade between the two countries. Factors that restrict trade include transportation costs, protectionist measures, and costs of covering uncertainty with respect to exchange rate changes; factors stimulating trade include regional preference zones, a common border, a common language, cultural similarities, or historical links. In the gravity model approach, it is possible to estimate the specific influence of various additional explanatory variables besides GNP and geographical distance, like a shared language, colonial ties, membership of a preference zone and a common border. These variables, however, provide seldom additional explanatory power (Schumacher 1995).

countries (all of which are non-transition countries). Also in contrast to Piazolo (2001), we include a dummy in the regression accounting for the EU membership of the partner country.

The results for nine reporting countries are given in Table 7 (exports) and 8 (imports). Again, the explanatory power of the estimated equations is satisfactory (with R^2s up to 0.82 for Belgian exports and 0.73 for Japanese imports).

The explanatory variables GDP of the partner country and distance between the countries for the export and import equations are highly significant in almost all cases. These findings underline the idea of the gravity model: trade links between two countries are larger, the higher their GDP and the smaller the economic distance between these two countries. The EU dummy is significant for six of the nine countries for imports. The coefficient of the EU dummy is positive for the EU countries Austria, Germany, Italy and Spain, but negative for Japan and the US. This implies that these EU countries import more from EU partners than one would "normally" expect and that Japan and the US imports less from EU countries than expected.

For the export side, this finding concerning the existence of an EU effect can not be replicated. There is only one significant (negative) coefficient for the exports of the US, i.e. the US export less to EU countries than one would "normally" expect. Consequently, this exercise finds only mild evidence for

"super-natural" trade between EU members.[12] In that respect, it seems that trade, and in particular exports, is somewhat less dependent on the existence of a regional bloc than theoretical considerations might suggest.

4 Simulation of EU Accession

This section uses data from the accession countries to analyze the difference between actual capital stocks and trade flows, on the one hand, and those that would be expected based on the empirical model above, on the other hand. For each item, we report the difference between actual and simulated values, taking the effect of possible EU membership into account separately.

4.1 International Banking Assets

Excluding the EU effect, total stocks of bank claims on the transition economies in mid-1999 were, on average, less than 70 percent of what would be expected based on our empirical results (Table 9). However, this aggregated figure clouds important differences between the recipient countries. Most importantly, Russia – which has been included as an additional reference country – has been the only transition economy for which the actual amount of lending already exceeded the expected value by a substantial margin. Of course, this to a large extent is due to

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[12] Frankel et al. (1995) use this term to describe above average bilateral trade among regional blocs.

the fact that Russia has received loans which were not always guided by market forces and that Russia has assumed responsibility for loans granted to the former Soviet Union.

While countries such as Bulgaria, Latvia, or Lithuania had received only about 10-20 percent of expected foreign bank loans, countries such as the Czech Republic, Hungary, or Poland reported values of more than 50 percent of their "potential". Interestingly, the dividing line is not between "first" and "second" round accession states: whereas actual bank lending to Estonia, a "first round" candidate, was only about 22 percent of the expected value, the latecomer Slovakia has reached already 38 percent of the expected level.

For all countries, the gap between actual and expected bank lending widens substantially if the impact of EU membership is taken into account. On average, the actual stocks are only about 23 percent of the stocks one would expect if the given country were a member of the EU. Again, the average would be much lower if Russia was excluded.

As regards the difference between actual and expected stocks for individual donor countries, a quite interesting picture emerges. For Germany, Italy, and, particularly, Austria, lending to transition economies has been two to three times higher already than the typical pattern of foreign bank lending would lead us to expect. Again, the countries which have benefited the most are the Czech

Republic, Hungary, Poland, and Russia (and, for Austria, also Slovenia). For Austria, this pattern prevails even if expected EU membership of the partner is taken into account. This suggests that the opening up of Central and Eastern Europe has provided Austrian banks with an opportunity to expand across borders and to exploit cultural proximities which has not been available previously.

4.2 Portfolio Investments

Due to gaps in the data, differences between individual donor countries, and a lack of time series for total investments, results for portfolio investments are less clear-cut than those for international banking assets (Table 10). The first observation that is striking is that the differences between actual and simulated exposure to given countries are much larger across donor and recipient countries than this has been the case for international banking assets. A possible explanation is that, on average, the scale of portfolio investment is smaller than that of banking lending. Hence, relatively small investments from the point of view of a donor country are large from the point of view of the recipient country, which inflates the actual investments relative to the optimum. Japanese portfolio investment in Romania is a case in point. According to our estimates, it already stands at 10 times the expected value. However, its overall size is only

about 400 million US-Dollar and thus substantially less than one percent of total Japanese portfolio investment worldwide.

Despite these caveats, some interesting patterns emerge from the data. There is, again, a tendency that countries like the Czech Republic, Hungary, and Poland have received already quite a lot of portfolio investment. A similar observation, however, holds also for Bulgaria or Russia.

4.3 Foreign Direct Investment

Similar to the caveats about the simulation for the portfolio investment, the use of the simulated results for FDI flows requires caution. Due to a large negative constant, the "simulated" logarithm of FDI flows to some EU candidates is actually negative in some cases and, accordingly, the final simulated FDI flows are very small. Consequently, the ratio of actual to simulated FDI is then rather large (Table 11). However, this problem of very small simulated FDI flows is reduced if the EU effect is included in the simulation exercise.[13] Consequently, the second batch of data with the EU effect in Table 11 is more suitable for comparison between the EU candidates.

For the snapshot of the FDI flows for the year 1997, we find that the Czech Republic, Hungary, and Poland are the countries that have already attracted on

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[13] For Belgium we simulated for all EU candidates huge ratios of actual to expected FDI flows (due to the large negative constant in the regression for Belgium). To derive a meaningful average of the simulated FDI flows, we had to eliminate Belgium from Table 11.

average the most FDI relative to the expected level. The actual FDI flows are well above the expected influx (between 345 and 560 percent) from the simulation. For Latvia, only the actual data for the FDI flows from Austria and Germany are available, which is almost 250 percent of the expected FDI flows. According to the ratio Slovenia, Slovakia and, perhaps surprisingly, Romania follow next and have surpassed the expected level. For the other EU candidates, actual FDI ranges between 33 percent and 80 percent of the expected FDI flows. These ratios can only give a rough indication and should not be overemphasized, since the calculations rests on flow data, which can be severely skewed by outliers for a particular year. As it was mentioned before, FDI stock data would be more appropriate, but bilateral FDI stock data for the ten Eastern European EU candidate countries are still rather patchy.

However, total FDI stock data are available for all EU candidate countries, and these data can be compared with the simulation based on the estimates of the determinants for total FDI stocks. Essentially, our results confirm the conventional wisdom that FDI has flown mainly into the most advanced reform countries: Hungary, the Czech Republic, and Poland have inward stocks of FDI which already exceed what we would expect to see for the average non-EU-member. If EU-membership is taken into account, however, there is still some potential even for these countries. Finally, we essentially confirm earlier results of Brenton et al. (1999) who use a modified gravity model approach for five EU

candidates (Bulgaria, the Czech Republic, Hungary, Poland, and Romania) to assess the expected FDI stock relative to actual FDI stock and conclude that the stocks of FDI in these advanced transition countries diverge little from the expected pattern.

4.4 Trade

Simulations for the trade flows to and from the ten EU candidate countries are given in Table 12 (OECD exports to EU candidates) and Table 13 (OECD imports from EU candidates). The comparison between the actual and the expected average data (inclusive of the EU effect) shows that Hungary is the only country that has already reached (and actually passed) its expected level for exports from the OECD countries. Poland, Romania, and the Czech Republic follow and reach between 86 and 72 percent of the expected exports from the OECD countries. For all other countries, the ratio of actual to expected exports from the OECD is less than 67 percent.

Examining the differences between the OECD countries, Austria and Germany are the outstanding countries that export almost in all cases far more to the ten EU candidates than we would expect after controlling for the main determinants of trade flows according to the gravity model. In contrast to this, the seven other included OECD countries have reached on average only about half of expected exports to the EU candidates.

The situation is roughly similar for OECD imports from the EU candidates. However, the quality of the simulation results and the comparison with the actual values for imports appears to be inferior to the one for exports. This might be due to the fact that the gravity model neglects the natural endowments of the partner country (e.g. petroleum), which are important determinants for imports of the OECD countries. Bulgaria (94 percent) and Hungary (69 percent) appear to be the two countries where the OECD imports are closest to the expected levels. All other EU candidates feature actual values of less than 50 percent of the expected levels. From the OECD countries, again Austria and Germany seem to be the ones with the actual imports closest to the expected values. All other OECD countries have imported from the EU candidates far less than expected.

5 Conclusions

This paper has shown that international bank claims, portfolio investments, trade, and FDI flows share a number of common determinants. In particular, we have highlighted the importance of EU membership for asset holdings and trade flows, using bilateral data. Our findings suggest that countries that join the EU are thus likely to become more attractive for capital from other EU countries and to rely more on other EU partner countries as a source of imports than on those countries which are not members of the Union.

In a next step, the estimated coefficients have been used for the simulation of the expected effects of EU membership for asset holdings and trade flows to the ten EU candidates in Eastern Europe. We find that, for most EU accession countries, actual levels are still far below the expected values. The Czech Republic, Hungary, and Poland stand out and have come close to the expected values in several cases. However, if we account for an additional EU effect, also these three advanced transition countries have not yet reached the levels we would expect to see under full EU membership.

For these three countries, we would expect only an albeit comparatively modest increase in capital and trade flows through EU accession. For the other seven accession states, there generally remains a substantial gap between the actual data and the expected levels. Consequently, our simulation results lead us to anticipate considerable integration effects with regard to trade and capital flows, particularly for these seven countries.

6 References

Baldwin, R.E., J. Francois, and R. Portes (1997). The Costs and Benefits of Eastern Enlargement: The Impact on the EU and Central Europe. *Economic Policy* 24: 127–170.

Bank for International Settlements (BIS) (2000). Quarterly Review: International Banking and Financial Market Developments. February. Basle.

Bolton, P., and X. Freixas (2000). Equity, Bonds, and Bank Debt: Capital Structure and Financial Market Equilibrium under Asymmetric Information. *Journal of Political Economy* 108(2): 324–351.

Brenton, P, F. Di Mauro, and M. Lücke (1999). Economic Integration and FDI: An Empirical Analysis of Foreign Investment in the EU and in Central and Eastern Europe. *Empirica* 26: 95–121.

Brücker, H., P. Trübswetter and C. Weise (2000). EU–Osterweiterung: Keine massive Zuwanderung zu erwarten. *Wochenbericht* 21/2000. German Institute for Economic Research (DIW), Berlin: 315–326.

Buch, C.M. (1999). Capital Mobility and EU Enlargement. *Weltwirtschaftliches Archiv* 135(4): 629–656.

— (2000). Determinants of cross-border bank lending and portfolio investment: Evidence from Cross-Section Data. Kiel Working Paper. Mimeo.

—, R.P. Heinrich, and C. Pierdzioch (1998). *Foreign Capital and the Transformation Process – Risks and Benefits of Free Capital Flows*. Kiel Study, 295. (Tübingen, J.C.B. Mohr).

Cawley, R., and M. Davenport (1988). Partial Equilibrium Calculations of the Impact of Internal Market Barriers in the European Community. *Research on the Cost of Non-Europe Basic Findings 2*. European Commission, Brussels.

Deardorff, A. (1995). Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World? NBER Working Papers 5377. National Bureau of Economic Research, Cambridge, Mass.

Dixit, A.K., and J. Stiglitz (1977). Monopolistic Competition and Optimum Product Diversity. *American Economic Review* 67 (3): 297–308.

Economist Intelligence Unit (2000). GDP-Data (via DataStream). London.

Egger, P. (2000). A Note on the Proper Econometric Specification of the Gravity Equation. *Economic Letters* 66: 25–31.

European Bank for Reconstruction and Development (EBRD) (1999). *Transition Report*. London.

European Commission (1997). *Customs and Fiscal Formalities at Frontiers*. Brussels.

European Union (1999). European Union Direct Investment Data 1988 - 1998. Eurostat. Luxembourg.

Feenstra, R.C., J.R. Markusen, and A.K. Rose (1998). Understanding the Home Market Effect and the Gravity Equation: The Role of Differentiating Goods. CEPR Discussion Paper Series 2035. Centre for Economic Policy Research, London.

Fidrmuc, J., and T. Nowotny (2000). The Effects of the EU's Eastern Enlargement on Austria. Focus on Transition 1/2000: 100–131.

Fischer, S., R. Sahay, and C.A. Vegh (1997). How Far is Eastern Europe from Brussels? In: Siebert, H. (ed.), *Quo Vadis Europe*? Mohr (Siebeck), Tübingen.

Fontagné, L. (1999). Foreign Direct Investment and International Trade; Complements or Substitutes? Directorate for Science, Technology and Industry Working Paper. (99)3. OECD. Paris.

Frankel, J., E. Stein, and S. Wei (1995). Trading Blocs and the Americas: The Natural, the Unnatural, and the Super-natural. *Journal of Development Economics* 47: 61–95.

Gasiorek, M., A. Smith, and A. Venables (1992). 1992: Trade, Factor Prices and Welfare in General Equilibrium. In L.A. Winters (ed.), *Trade Flows and Trade Policy after 1992*. Cambridge: Cambridge University Press.

Gasiorek, M., A. Smith, and A. Venables (1995). Modelling the Effect of Central and East European Trade on the European Community. In European Commission – Directorate-General for Economic and Financial Affairs: *The Economic Interpenetration between the European Union and Eastern Europe, European Economy – Reports and Studies* 6: 519–538.

Harrison, G.W., T.F. Rutherford, and D.G. Tarr (1996). Increased Competition and Completion of the Market in the European Union: Static and Steady State Effects. *Journal of Economic Integration* 11 (3): 332–365.

Hille, H., and T. Straubhaar (2000). Assessment of the Amount of Potential CEEC–EU Migration and Analysis of its Effects Using a Computable General Equilibrium Model. Paper presented at the Workshop "Borders, Migration and Labour Market Dynamics in a Changing Europe" at the University of Kent at Canterbury.

Hull, L., and L. L. Tesar (2000). Structure of International Capital Flow. In: Siebert, H. (ed.) *The World's New Financial Landscape: Challenges for Economic Policy*. (forthcoming).

International Monetary Fund (IMF) (1999). Results of the 1997 Coordinated Portfolio Investment Survey. Washington DC.

— (2000). *International Financial Statistics on CD-ROM* (IFS). Washington, DC.

Krugman, P.R. (1994). *Rethinking International Trade*. Cambridge, Mass.: Massachusetts Institute of Technology Press.

Lane, T., and G. M. Milesi-Ferretti (2000). External Capital Structure: Theory and Evidence. In: Siebert, H. (ed.) *The World's New Financial Landscape: Challenges for Economic Policy* (forthcoming).

Lankes, H. P., and N. Stern (1999). Capital Flows to Eastern Europe. In: Feldstein, M. (ed.). *International Capital Flows* (University of Chicago Press) 57–110.

Lucas, R.E. (1990). Why Doesn't Capital Flow from Rich to Poor Countries? *American Economic Review* 80 (2): 92–96.

Organisation for Economic Cooperation and Development (OECD) (2000a). International Direct Investment Statistics Yearbook 1999. Paris.

— (2000b). OECD Statistical Compendium. CD-ROM. Paris.

Piazolo, D. (1999). Growth Effects of Institutional Change and European Integration. *Economic Systems* 23 (4): 305–330.

— (2000). Poland's Membership in the European Union: An Analysis with a Dynamic Computable General Equilibrium (CGE) Model. LICOS Discussion Paper 89, Centre for Transition Economics, Leuven.

— (2001). The Integration Process between Eastern and Western Europe. Kiel Study. Institute of World Economics, Kiel (forthcoming).

Razin, A., Sadka. E., and Yuen, C.-W. (1998). A Pecking Order of Capital Inflows and International Tax Principles. *Journal of International Economics*, 44: 45–68.

Schumacher, D. (1995). Impact on German Trade of Increased Division of Labour with Eastern Europe. Discussion Papers 116. German Institute for Economic Research (DIW), Berlin.

Smith, A. and A. Venables (1987). Completing the Internal Market in the European Community: Some Industry Simulations. *European Economic Review*, 32 (7): 1501–1525.

United Nations (1998). The integration of selected economies in transition into the international trading system, and its implications for their trade with developing countries. UNCTAD. Geneva.

— (1999). World Investment Report 1999. UNCTAD. New York.

Weise, C., H. Brücker et al. (1997). Ostmitteleuropa auf dem Weg in die EU. DIW-Analysis 167. German Institute for Economic Research (DIW), Berlin.

World Bank (2000). World Development Indicators on CD-ROM. Washington, DC.

Table 1 — Data Definitions and Sources

Variable	Definition	Source
Cross-border bank claims	International asset holdings of commercial banks, mid-1999	BIS (2000)
Cross-border portfolio investment	Portfolio asset holdings (equity securities, long- and short-term debt securities, derivatives), end of 1997	IMF (1999)
EU	dummy variable for EU members (= 0 for non-members, = 1 for members)	
Financial center	dummy variable for financial centers (Bahamas, Great Britain, Hong Kong, Ireland, Luxembourg, Singapore, Switzerland) (= 0 for non-financial centers, = 1 for financial centers)	
Foreign direct investment	international direct investment to or from another country (bilateral data for 1997, total data for 1998)	OECD (2000a), European Union (1999), UN (1999)
GDP per capita	gross domestic product in billion current national currency, converted into US-dollar with the average annual exchange rate of the national currency to the US-dollar (end 1998, if not available: end 1997 converted by the respective exchange rate). Population as of 1997.	IMF (2000), World Bank (2000), EBRD (1999), Economist Intelligence Unit (2000)
Imports	merchandise imports in billion US-dollar (1998)	IMF (2000)
OECD imports and exports	trade between the 24 OECD countries and 69 partner countries	OECD (2000b)
Population	Population size	IMF (2000)
M2	broad money (billion national currency, end 1998)	IMF (2000)
Distance	computed as the shortest line between two countries' commercial centers according to the degrees of latitude and longitude.	kindly provided by Dieter Schumacher from the German Institute for Economic Research (DIW)

Table 2 — Correlation Matrix

	EU dummy	Financial centre dummy	GDP per capita	Imports / GDP	M2 / GDP	Population
EU dummy	1.00					
Financial centre dummy	0.06	1.00				
GDP per capita	0.51*	0.33*	1.00			
Imports / GDP	–0.04	0.55*	0.20	1.00		
M2 / GDP	0.23	0.50*	0.37*	0.25	1.00	
Population	–0.16	–0.16	–0.38*	–0.23	0.03	1.00

* = significant at the 10-percent level, critical values calculated from $2/\sqrt{n}$.

Table 3a — Country Sample for the Analysis of Financial Asset Holdings

Algeria	Hong Kong	Norway
Argentina	India	Pakistan
Australia	Indonesia	Panama
Austria	Iran	Peru
Bahamas	Ireland	Philippines
Belgium	Israel	Portugal
Brazil	Italy	Saudi Arabia
Canada	Japan	Singapore
Chile	Korea South	South Africa
China	Kuwait	Spain
Colombia	Liberia	Sweden
Denmark	Luxembourg	Switzerland
Egypt	Malaysia	Thailand
Finland	Mexico	Turkey
France	Morocco	United Arab Emirates
Germany	Netherlands	United States
Great Britain	Netherlands Antilles	Venezuela
Greece	New Zealand	

Table 3b — Country Sample for the Analysis of Trade Flows

Algeria	Ecuador	Korea	South Africa
Angola	Egypt	Kuwait	Spain
Argentina	Finland	Libya	Sri Lanka
Australia	France	Malaysia	Sweden
Austria	Germany	Mauritius	Switzerland
Bangladesh	Ghana	Mexico	Syrian Arab Republic
Belgium + Luxembourg	Greece	Morocco	Thailand
Brazil	Guatemala	Netherlands	Tunisia
Cameroon	India	New Zealand	Turkey
Canada	Indonesia	Nigeria	United Arab Emirates
Chile	Iran, I.R. of	Norway	United Kingdom
(China, P.R.:) Hong Kong	Ireland	Pakistan	United States
Colombia	Israel	Peru	Uruguay
Congo, Dem. Rep. of	Italy	Philippines	Venezuela
Costa Rica	Jamaica	Portugal	Zambia
Côte d Ivoire	Japan	Saudi Arabia	Zimbabwe
Denmark	Jordan	Senegal	
Dominican Republic	Kenya	Singapore	

Table 4 — Determinants of Stocks of Cross-Border Claims of Banks (mid-1999)[a]

	Total	Austria	Belgium	France	Germany	Italy	Japan	Netherlands	Spain	UK	US
Constant		–6.08* (–1.91)	–12.98*** (–5.00)	–7.29*** (–3.70)		–5.36*** (–3.12)	–10.26** (–2.56)	–5.00 (–1.37)	–6.91 (–1.45)	–13.37*** (–7.11)	
Log GDP per capita	0.53*** (7.93)	0.66*** (3.66)	1.12*** (7.02)	0.76*** (7.21)	0.40*** (7.31)	0.65*** (4.96)	1.14*** (8.49)	0.55** (2.17)	0.84*** (2.92)	0.97*** (10.45)	0.87*** (6.99)
Log population	0.54*** (11.34)	0.80*** (7.02)	1.01*** (9.23)	0.96*** (10.28)	0.47*** (10.60)	0.57*** (5.69)	1.22*** (8.88)	0.67*** (4.21)	0.89*** (3.95)	0.88*** (10.46)	0.78*** (5.91)
M2 / GDP		0.56** (2.31)		0.49* (1.98)	0.25 (1.38)		0.86** (2.40)			0.24 (1.07)	0.64* (1.81)
Imports / GDP	0.49 (1.29)	1.14*** (2.87)	1.36** (2.08)	1.35** (2.56)			1.92*** (2.39)	1.48*** (3.26)		1.65*** (3.49)	
Distance		–0.34* (–1.92)	–0.19 (–1.10)	–0.26* (–1.78)			–0.65* (–1.96)		–0.49 (–1.27)	0.34** (2.47)	–0.95*** (–4.06)
EU	1.10*** (5.06)	0.56 (1.65)	1.37*** (3.69)	0.74* (1.87)	1.60*** (7.36)	1.56*** (4.08)		1.64*** (4.38)	1.24 (1.33)	1.16*** (3.14)	
Financial center	1.42*** (5.34)	1.07*** (3.76)	1.09*** (2.82)	0.51 (1.19)	1.33*** (4.75)	1.77*** (3.88)	0.68 (1.17)	1.31*** (3.87)	1.34 (1.52)	0.94** (2.16)	
R^2	0.74	0.77	0.84	0.81	0.72	0.67	0.74	0.63	0.43	0.83	0.49
Jarque Bera (prob.)	0.00***	0.29	0.16	0.00***	0.00***	0.65	0.18	0.01**	0.44	0.33	0.00***
White[b] (prob.)	0.00***	0.09*	0.08*	0.62	0.00***	0.63	0.36	0.00***	0.24	0.57	0.90
N	51	45	44	45	50	50	47	50	45	44	47

t-values in brackets. *** (**, *) = significant at the 1 (5, 10)-percent level. – [a] Explanatory variables for 1998. – [b] White-heteroscedasticity consistent standard errors are reported for equations with heteroscedastic errors.

Table 5 — Determinants of Stocks of Cross-Border Portfolio Investments (end-1997)[a]

	Austria	Belgium	France	Italy	Japan	Netherlands	Spain	UK	US
Constant	–8.55** (–2.47)	–11.37*** (–3.75)	–12.79*** (–3.36)	–9.77*** (–3.81)	–17.88** (–2.66)	–20.27*** (–7.21)	–12.43** (–2.36)	–24.11*** (–7.88)	–6.95** (–2.33)
Log GDP per capita	0.96*** (5.03)	1.24*** (5.44)	1.42*** (6.76)	1.37*** (6.87)	1.81*** (5.98)	1.66*** (8.44)	1.89*** (7.99)	1.31*** (8.15)	1.25*** (10.15)
Log population	0.49** (2.42)	0.55*** (3.44)	0.60** (2.53)	0.37** (2.67)	1.45*** (5.76)	1.00*** (6.22)	0.82** (2.60)	1.25*** (9.14)	0.86*** (8.41)
M2 / GDP			0.37 (1.21)		1.15* (1.98)	0.44 (1.14)		0.64 (1.67)	
Imports / GDP						2.82** (2.49)			
Distance					–0.78 (–1.40)		–1.14*** (–4.02)	0.82*** (3.68)	–0.38 (–1.58)
EU	1.15** (2.61)	1.86*** (3.46)	1.53*** (3.25)	0.76 (1.28)	1.20* (1.77)	1.26*** (3.73)		2.96*** (4.88)	–0.49* (–1.82)
Financial center		0.70 (1.06)						1.84*** (2.73)	0.67* (1.94)
R^2	0.56	0.66	0.64	0.62	0.63	0.81	0.55	0.79	0.79
Jarque Bera (prob.)	0.71	0.38	0.00***	0.66	0.00***	0.92	0.88	0.00***	0.79
White (prob.)[b]	0.00***	0.12	0.01**	0.26	0.49	0.00***	0.00***	0.88	0.53
N	40	42	46	45	41	44	43	44	40

t-values in brackets. *** (**, *) = significant at the 1 (5, 10)-percent level. – [a] Explanatory variables for 1998. – [b] White-heteroscedasticity consistent standard errors are reported for equations with heteroscedastic errors.

Table 6 — Determinants of Foreign Direct Investments (1997 and 1998)[a]

	Stocks of inward FDI (1998)	Outflows of FDI of reporting country (1997)								
	Total	Austria	Belgium	France	Germany	Italy	Japan	Netherlands	UK	US
Constant	–5.32*** (–2.78)	–8.87** (–2.09)	–16.74* (–2.08)	–13.75*** (–4.15)	–12.78*** (–4.71)	–18.77*** (–5.02)	–18.13*** (–3.88)	–14.29*** (–3.49)	–10.97*** (–2.76)	–5.85 (–1.22)
Log GDP per capita	0.70*** (5.33)	0.51* (1.79)	0.77 (1.39)	1.05*** (4.29)	1.04*** (5.77)	0.92*** (3.99)	0.83*** (3.29)	1.01*** (4.16)	1.04*** (4.77)	0.67** (2.36)
Log population	0.87*** (7.58)	0.54** (2.39)	1.17*** (2.90)	1.00*** (5.40)	0.86*** (5.84)	1.26*** (6.12)	1.41*** (5.35)	0.93*** (3.99)	0.69*** (3.11)	0.70*** (2.95)
M2 / GDP				–2.30*** (–2.93)						
Imports / GDP	1.33** (2.17)					2.31** (2.09)	4.53*** (3.94)	2.38** (2.12)	1.76 (1.49)	
Distance										0.00 (1.29)
EU	0.67* (1.74)	1.82*** (3.02)	3.08** (2.58)	1.19* (1.95)	0.80* (2.00)	1.45** (2.73)		0.65 (1.08)		
Financial center		1.82** (2.34)	2.84** (2.26)	3.34*** (3.57)	0.97* (1.95)	1.18 (1.50)				
R^2	0.63	0.49	0.53	0.55	0.67	0.58	0.47	0.43	0.35	0.36
Jarque Bera (prob.)	0.00***	0.53	0.81	0.00***	0.80	0.33	0.41	0.07*	0.27	0.28
White (prob.)[b]	0.22	0.94	0.90	0.76	0.39	0.11	0.33	0.72	0.90	0.62
N	50	28	27	38	32	38	32	32	36	35

t-values in brackets. *** (**, *) = significant at the 1 (5, 10) percent level. – [a] Explanatory variables for 1998. – [b] White-heteroscedasticity consistent standard errors are reported for equations with heteroscedastic errors.

Table 7 — Determinants of OECD Exports (1998)[a]

	Austria	Belgium	France	Germany	Italy	Japan	Spain	UK	US
Constant	3.56 (0.92)	6.58*** (2.89)	7.55*** (3.29)	4.84 (1.50)	6.59** (2.14)	12.55*** (3.07)	6.81*** (2.72)	4.21 (1.37)	2.51 (0.58)
Log Distance in miles between the countries	–1.03*** (–4.76)	–0.89*** (–7.23)	–0.95*** (–6.68)	–0.77*** (–4.71)	–0.97*** (–5.78)	–1.59*** (–4.83)	–1.03*** (–6.84)	–0.58*** (–3.24)	–1.06** (–2.33)
Log GDP of partner country	0.77*** (6.02)	0.65*** (6.59)	0.60*** (5.79)	0.72*** (6.36)	0.61*** (5.67)	0.62*** (4.84)	0.56*** (5.09)	0.53*** (4.87)	0.92*** (5.38)
Log GDP per capita of partner country	0.02 (0.10)	–0.12 (–0.94)	–0.001 (–0.01)	0.02 (0.16)	0.09 (0.63)	0.15 (1.09)	0.10 (0.68)	0.13 (0.91)	0.49** (2.46)
EU	0.16 (0.50)	0.24 (0.87)	–0.20 (–0.61)	0.32 (1.37)	–0.08 (–0.27)	–0.14 (–0.31)	0.17 (0.48)	0.39 (1.10)	–1.43** (–2.31)
R^2	0.78	0.82	0.77	0.81	0.77	0.77	0.74	0.73	0.66
Jarque Bera (prob.)	0.84	0.35	0.91	0.44	0.87	0.76	0.95	0.50	0.00***
White (prob.)[b]	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.97
N	69	69	69	69	69	69	69	69	69

t-values in brackets. *** (**, *) = significant at the 1 (5, 10) percent level. – [a] Explanatory variables for 1998. – [b] White-heteroscedasticity consistent standard errors are reported for equations with heteroscedastic errors.

Table 8 — Determinants of OECD Imports (1998)[a]

	Austria	Belgium	France	Germany	Italy	Japan	Spain	UK	US
Constant	2.45 (0.55)	3.10* (1.87)	6.60** (2.56)	4.54 (1.26)	7.21** (2.25)	8.48** (2.26)	5.04* (1.74)	1.40 (0.41)	0.42 (0.08)
Log Distance in miles between the countries	–0.80*** (–2.66)	–0.51*** (–2.83)	–0.84*** (–5.07)	–0.61*** (–2.99)	–0.89*** (–4.60)	–1.45*** (–3.96)	–0.73*** (–5.13)	–0.32 (–1.44)	–0.81 (–1.54)
Log GDP of partner country	0.91*** (5.31)	0.75*** (7.53)	0.67*** (5.59)	0.71*** (5.50)	0.75*** (6.18)	0.77*** (6.39)	0.76*** (6.14)	0.56*** (4.22)	1.06*** (5.41)
Log GDP per capita of partner country	–0.31 (–1.44)	–0.22* (–1.81)	–0.12 (–0.83)	–0.11 (–0.65)	–0.30* (–1.93)	0.23 (1.55)	–0.25 (–1.50)	0.17 (1.02)	0.28 (1.24)
EU	1.40** (2.39)	0.71 (1.32)	0.21 (0.54)	0.90** (2.22)	0.76** (2.19)	–0.76* (–1.82)	0.92** (2.17)	0.88 (1.52)	–1.23* (–1.72)
R^2	0.62	0.72	0.71	0.72	0.71	0.73	0.70	0.64	0.59
Jarque Bera (prob.)	0.13	0.84	0.99	0.50	0.73	0.25	0.71	0.54	0.00***
White (prob.)[b]	0.00***	0.18	0.00***	0.00***	0.00***	0.03**	0.00***	0.00***	0.96
N	69	69	69	69	69	69	69	69	69

t-values in brackets. *** (**, *) = significant at the 1 (5, 10) percent level. – [a] Explanatory variables for 1998. – [b] White-heteroscedasticity consistent standard errors are reported for equations with heteroscedastic errors.

Table 9 — Simulation Results: Stocks of Cross-Border Claims of Banks (mid-1999)

	Bulgaria	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Poland	Romania	Russia	Slovakia	Slovenia	Average
	Actual claims in % of simulated claims (no EU effect)											
All countries	17.30	56.46	21.61	89.79	10.84	13.76	65.23	23.42	142.88	38.43	30.37	69.05
Austria	175.72	298.59	121.54	400.14	18.97	84.37	281.31	94.48	474.48	142.74	450.17	303.07
Belgium	84.13	88.79	119.92	171.61	39.13	n.a.	84.95	47.74	37.43	86.93	155.53	79.45
France	26.72	48.84	3.69	46.05	12.24	9.61	40.61	66.89	92.32	44.64	15.70	57.36
Germany	27.97	146.76	38.56	249.44	24.69	28.07	135.39	35.73	496.94	73.52	51.88	192.40
Italy	130.36	80.76	28.90	440.40	18.01	13.23	140.00	74.18	622.48	46.91	51.80	259.22
Japan	97.49	41.35	26.14	96.92	23.06	119.33	18.57	6.88	25.67	180.64	40.86	43.99
Netherlands	67.32	57.90	4.34	99.41	3.50	16.20	157.10	107.15	110.24	49.11	16.64	87.37
Spain	27.12	34.42	5.78	135.50	n.a.	n.a.	21.17	22.13	78.77	13.82	9.77	51.44
UK	n.a.	32.55	n.a.	84.07	n.a.	14.98	84.36	24.28	58.42	13.04	30.43	51.81
US	37.78	23.26	20.90	76.54	6.98	18.01	81.81	33.91	78.50	52.25	6.63	59.22
	Actual claims in % of simulated claims (including EU effect)											
All countries	5.75	18.77	7.18	29.85	3.60	4.57	21.68	7.79	47.49	12.77	10.09	22.95
Austria	99.49	169.05	68.81	226.55	10.74	47.77	159.27	53.49	268.64	80.81	254.87	171.59
Belgium	21.34	22.52	30.42	43.53	9.93	n.a.	21.55	12.11	9.49	22.05	39.45	20.15
France	12.81	23.42	1.77	22.08	5.87	4.61	19.47	32.08	44.27	21.40	7.53	27.51
Germany	5.65	29.64	7.79	50.37	4.99	5.67	27.34	7.21	100.35	14.85	10.48	38.85
Italy	27.28	16.90	6.05	92.17	3.77	2.77	29.30	15.52	130.27	9.82	10.84	54.25
Japan	85.29	39.34	28.01	91.27	23.15	117.07	15.49	5.62	18.33	175.79	46.23	36.50
Netherlands	13.09	11.26	0.84	19.33	0.68	3.15	30.55	20.84	21.44	9.55	3.24	16.99
Spain	7.87	9.99	1.68	39.33	n.a.	n.a.	6.15	6.42	22.87	4.01	2.84	14.93
UK	n.a.	10.17	n.a.	26.26	n.a.	4.68	26.35	7.58	18.25	4.07	9.51	16.18
US	37.78	23.26	20.90	76.54	6.98	18.01	81.81	33.91	78.50	52.25	6.63	59.22

Table 10 — Simulation Results: Stocks of Cross-Border Portfolio Investments (end 1997)

	Bulgaria	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Poland	Romania	Russia	Slovakia	Slovenia	Average
	Actual Cross-Border Portfolio Stocks in % of simulated Cross-Border Portfolio Stocks (no EU effect)											
Austria	126.98	184.33	86.01	1190.98	n.a.	33.03	290.50	116.48	341.15	167.31	179.45	325.22
Belgium	143.15	159.47	112.18	402.08	6.59	13.73	132.00	n.a.	13.44	152.42	67.61	126.90
France	95.81	5.74	14.23	149.56	4.13	n.a.	32.14	22.59	249.45	5.18	9.19	71.00
Italy	893.55	22.79	n.a.	132.58	n.a.	12.05	48.77	67.38	444.32	50.02	2.85	102.16
Japan	2352.70	266.49	n.a.	3463.04	n.a.	n.a.	30.56	1019.97	41.67	912.39	8.68	308.14
Netherlands	726.17	5228.78	n.a.	86.48	n.a.	n.a.	87.57	25.86	113.65	n.a.	1.37	75.36
Spain	286.25	n.a.	n.a.	n.a.	n.a.	n.a.	14.45	n.a.	154.41	n.a.	n.a.	n.a.
UK	4130.21	1793.88	2718.49	2735.13	263.33	494.89	612.66	347.96	1072.73	1503.13	803.53	1100.97
US	171.76	16.56	4.95	123.16	0.70	4.68	47.94	10.48	96.45	10.44	9.04	60.83
	Actual Cross-Border Portfolio Stocks in % of simulated Cross-Border Portfolio Stocks (including EU effect)											
Austria	39.84	57.83	26.99	373.66	n.a.	10.36	91.14	36.54	107.03	52.49	56.30	102.03
Belgium	22.32	24.87	17.49	62.69	1.03	2.14	20.58	n.a.	2.09	23.77	10.54	19.79
France	20.76	1.24	3.08	32.41	0.89	0.00	6.97	4.89	54.06	1.12	1.99	15.39
Italy	416.48	10.62	n.a.	61.79	n.a.	5.61	22.73	31.40	207.09	23.31	1.33	47.62
Japan	707.25	80.11	n.a.	1041.03	n.a.	n.a.	9.19	306.61	12.53	274.27	2.61	92.63
Netherlands	204.25	1.65	n.a.	24.32	n.a.	n.a.	24.63	7.27	31.97	n.a.	0.38	16.83
Spain	286.25	n.a.	n.a.	n.a.	n.a.	n.a.	14.45	n.a.	154.41	n.a.	n.a.	n.a.
UK	212.38	92.24	139.79	140.64	13.54	25.45	31.50	17.89	55.16	77.29	41.32	56.61
US	281.04	27.10	8.09	201.51	1.15	7.66	78.44	17.15	157.82	17.09	14.80	99.53

Table 11 — Simulation Results: Foreign Direct Investments (1997 and 1998)

	Bulgaria	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Poland	Romania	Russia	Slovakia	Slovenia
	Stocks of FDI in transition economies: Actual in % of simulated (1998)										
No EU effect	41.65	115.30	70.94	176.35	77.35	52.15	104.43	57.92	38.13	33.59	56.28
Including EU effect	21.12	58.47	35.97	89.42	39.16	26.44	52.96	29.37	19.33	17.03	28.54
	FDI flows to transition economies: Actual in % of simulated (no EU effect) (1997)										
Austria	1 510.99	11 177.78	243.67	16 524.60	2 088.21	n.a.	9 770.79	3 817.04	1 632.84	5 571.36	6 131.06
France	8.78	965.55	n.a.	310.21	n.a.	n.a.	363.85	754.83	24.43	135.59	203.87
Germany	274.26	1 536.23	77.25	1 244.90	342.95	111.79	1 133.04	256.89	123.43	349.93	92.75
Italy	91.18	206.97	n.a.	657.74	n.a.	n.a.	74.84	488.29	75.96	344.01	821.22
Japan	n.a.	n.a.	n.a.	109.18	n.a.	n.a.	43.25	13.62	2.79	n.a.	n.a.
Netherlands	n.a.	272.40	25.96	595.92	n.a.	n.a.	425.15	81.94	461.57	124.87	76.43
UK	85.68	241.96	n.a.	67.30	n.a.	n.a.	36.71	n.a.	462.59	4.82	24.91
US	1.42	n.a.	n.a.	12.70	n.a.	n.a.	36.64	4.81	38.56	3.40	1.08
Average	328.72	2 400.15	115.63	2 440.32	1 215.58	111.79	1 485.53	773.92	352.77	933.43	1 050.19
	FDI flows to transition economies: Actual in % of simulated (including EU effect) (1997)										
Austria	244.82	1 811.09	39.48	2 677.41	338.34	n.a.	1 583.12	618.46	264.56	902.70	993.39
France	2.67	293.74	n.a.	94.37	n.a.	n.a.	110.69	229.63	7.43	41.25	62.02
Germany	123.23	690.27	34.71	559.37	154.10	50.23	509.11	115.43	55.46	157.24	41.68
Italy	21.39	48.55	n.a.	154.29	n.a.	n.a.	17.56	114.54	17.82	80.69	192.63
Japan	n.a.	n.a.	n.a.	109.18	n.a.	n.a.	43.25	13.62	2.79	n.a.	n.a.
Netherlands	n.a.	272.40	25.96	595.92	n.a.	n.a.	425.15	81.94	461.57	124.87	76.43
UK	85.68	241.96	n.a.	67.30	n.a.	n.a.	36.71	n.a.	462.59	4.82	24.91
US	1.42	n.a.	n.a.	12.70	n.a.	n.a.	36.64	4.81	38.56	3.40	1.08
Average	79.87	559.67	33.38	533.82	246.22	50.23	345.28	168.35	163.85	187.85	198.88

Table 12 — Actual and Expected Exports from the OECD Country to the EU Candidates (in mill. US$) (1998)

EU Candidates		Austria	Belgium	France	Germany	Italy	Japan	Spain	UK	US	**Unweighted Average**
Bulgaria	Actual	203	119	236	794	436	18	144	133	115	
	Expected	98	280	700	733	938	309	210	416	272	
	Act./Exp. (%)	**206.5**	**42.6**	**33.7**	**108.3**	**46.5**	**5.9**	**68.9**	**32.0**	**42.4**	**65.2**
Czech Rep.	Actual	1768	657	1236	10656	1426	195	334	1184	568	
	Expected	988	1382	3376	6179	2693	981	714	1636	2392	
	Act./Exp. (%)	**179.0**	**47.5**	**36.6**	**172.5**	**53.0**	**19.9**	**46.7**	**72.4**	**23.8**	**72.4**
Estonia	Actual	29	69	82	433	115	21	20	110	87	
	Expected	30	156	406	388	271	261	110	315	222	
	Act./Exp. (%)	**98.6**	**44.4**	**20.3**	**111.7**	**42.5**	**8.0**	**18.2**	**35.1**	**39.3**	**46.4**
Hungary	Actual	3099	1036	1168	8692	1841	575	383	829	482	
	Expected	1031	837	2154	3033	2492	874	560	1195	1787	
	Act./Exp. (%)	**300.5**	**123.8**	**54.2**	**286.5**	**73.9**	**65.8**	**68.3**	**69.3**	**27.0**	**118.8**
Latvia	Actual	35	83	113	625	139	10	18	144	187	
	Expected	41	195	483	482	329	275	126	344	225	
	Act./Exp. (%)	**86.0**	**42.6**	**23.4**	**129.5**	**42.4**	**3.6**	**14.6**	**41.9**	**83.0**	**51.9**
Lithuania	Actual	47	119	159	1025	202	7	74	193	62	
	Expected	76	270	671	737	517	373	176	456	368	
	Act./Exp. (%)	**62.2**	**44.2**	**23.7**	**139.1**	**39.0**	**1.9**	**42.0**	**42.4**	**16.9**	**45.7**
Poland	Actual	1004	1579	2768	13732	3789	302	401	2003	882	
	Expected	951	1746	3934	6277	3327	1873	913	2111	4836	
	Act./Exp. (%)	**105.5**	**90.4**	**70.4**	**218.7**	**113.9**	**16.1**	**44.0**	**94.8**	**18.2**	**85.8**
Romania	Actual	414	232	793	2318	1960	20	96	391	340	
	Expected	206	538	1270	1552	1499	666	362	742	817	
	Act./Exp. (%)	**201.2**	**43.1**	**62.4**	**149.4**	**130.8**	**3.0**	**26.5**	**52.6**	**41.6**	**78.9**
Slovak Rep.	Actual	770	203	406	3431	709	23	114	174	111	
	Expected	1661	556	1459	1917	1624	492	368	789	749	
	Act./Exp. (%)	**46.3**	**36.5**	**27.8**	**179.0**	**43.7**	**4.8**	**31.0**	**22.0**	**14.8**	**45.1**
Slovenia	Actual	1052	174	1207	2258	1860	78	81	226	123	
	Expected	433	514	1623	1995	2769	521	466	911	1144	
	Act./Exp. (%)	**242.9**	**33.9**	**74.4**	**113.2**	**67.2**	**14.9**	**17.5**	**24.8**	**10.8**	**66.6**

Table 13 — Actual and Expected Imports of the OECD Country from the EU Candidates (in mill. US$) (1998)

EU Candidates		Austria	Belgium	France	Germany	Italy	Japan	Spain	UK	US	**Unweighted Average**
Bulgaria	Actual	95	198	202	593	602	41	144	130	219	
	Expected	45	150	473	560	627	130	160	282	234	
	Act./Exp. (%)	**211.3**	**132.3**	**42.6**	**106.0**	**96.0**	**31.5**	**90.0**	**46.1**	**93.6**	**94.4**
Czech Rep.	Actual	1613	538	887	9785	974	93	334	956	672	
	Expected	4874	1290	5612	9739	38423	290	8904	727	11467	
	Act./Exp. (%)	**33.1**	**41.7**	**15.8**	**100.5**	**2.5**	**32.1**	**3.7**	**131.4**	**5.9**	**40.8**
Estonia	Actual	14	35	49	295	25	8	20	263	125	
	Expected	152	153	618	777	2964	53	986	151	758	
	Act./Exp. (%)	**8.9**	**22.9**	**7.9**	**38.0**	**0.9**	**14.7**	**2.0**	**173.9**	**16.5**	**31.7**
Hungary	Actual	2239	700	1086	8307	1368	308	383	925	1567	
	Expected	4772	913	3682	5407	34575	251	7005	578	8472	
	Act./Exp. (%)	**46.9**	**76.6**	**29.5**	**153.6**	**4.0**	**122.5**	**5.5**	**159.9**	**18.5**	**68.5**
Latvia	Actual	12	31	35	405	42	8	18	494	115	
	Expected	207	192	743	950	3669	58	1153	165	795	
	Act./Exp. (%)	**5.8**	**16.3**	**4.7**	**42.6**	**1.1**	**13.5**	**1.6**	**300.4**	**14.4**	**44.5**
Lithuania	Actual	31	77	197	548	92	15	74	244	81	
	Expected	395	279	1067	1430	6139	85	1773	222	1410	
	Act./Exp. (%)	**7.9**	**27.7**	**18.4**	**38.3**	**1.5**	**17.9**	**4.2**	**109.8**	**5.8**	**25.7**
Poland	Actual	652	724	1377	9370	1651	74	401	1133	783	
	Expected	6416	2173	7367	11293	56073	636	14968	1067	26781	
	Act./Exp. (%)	**10.2**	**33.3**	**18.7**	**83.0**	**2.9**	**11.7**	**2.7**	**106.3**	**2.9**	**30.2**
Romania	Actual	286	223	598	1817	1881	47	96	386	393	
	Expected	1269	689	2240	3071	20655	185	4608	396	3833	
	Act./Exp. (%)	**22.5**	**32.4**	**26.7**	**59.2**	**9.1**	**25.6**	**2.1**	**97.5**	**10.3**	**31.7**
Slovak Rep.	Actual	733	143	428	3452	777	19	114	124	166	
	Expected	5303	531	2320	3337	19846	125	3801	362	3146	
	Act./Exp. (%)	**13.8**	**27.0**	**18.4**	**103.5**	**3.9**	**15.1**	**3.0**	**34.4**	**5.3**	**24.9**
Slovenia	Actual	606	95	884	2465	1202	21	81	172	287	
	Expected	1846	474	2530	3434	32294	132	4539	409	4765	
	Act./Exp. (%)	**32.9**	**20.0**	**34.9**	**71.8**	**3.7**	**16.2**	**1.8**	**41.9**	**6.0**	**25.5**