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THE IMPACT OF EU ACCESSION OF SELECTED CEECS ON BILATERAL ECONOMIC RELATIONS WITH THE EU

A DYNAMIC GRAVITY APPROACH

EU accession by CEECs is expected to give rise to growth effects on bilateral exports and FDI stocks. According to the projection for selected EU and CEE countries, additional FDI growth rates (+1½ percentage points) are about triple those for exports (+½ percentage point). As the model allowed no accounting for feedback effects and since no additional growth effects in the GDPs of the EU member states from the CEECs' accession were added to the model, the additional growth effects shown here appear to be rather the lower limit for what can actually be expected.

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Following the breakdown of the COMECON and the political and economic opening of the CEECs in the late 1980s and early 1990s, the demand soon arose for a projection of economic interlinkages between East and West. Various approaches to this end were attempted: some authors simply tried to update the international trade growth rates between countries; others looked back and analysed relations between countries prior to World War II. The most successful method to study economic links between Western Europe (or the OECD) and the CEECs, however, was by employing the so-called gravity approach. This is an application of Newton's Law of Gravity to bilateral economic relationships. Newton's equation depicts the force of attraction between two bodies in terms of their mass (+), a gravitation constant (+) and the square of the distance (–) between them. In international trade economics, many authors believe that this corresponds to an equation which describes bilateral trade (as a correlate for the economic attraction between two countries) as a function of the two GDPs (as a correlate for the "masses" of the two countries), a constant (which best corresponds to the gravitation constant) and the distance. International trade economists nevertheless hesitate to use such a lean model. Accordingly the term "gravity model" is applied to all types of models which attempt to estimate and

Figure 1: Export openness 1986-1996

Exports as a percentage of GDP, average percentage changes

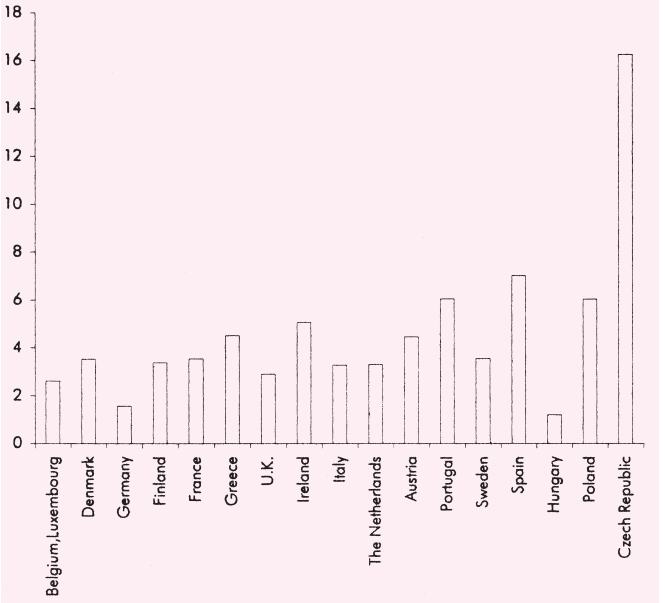
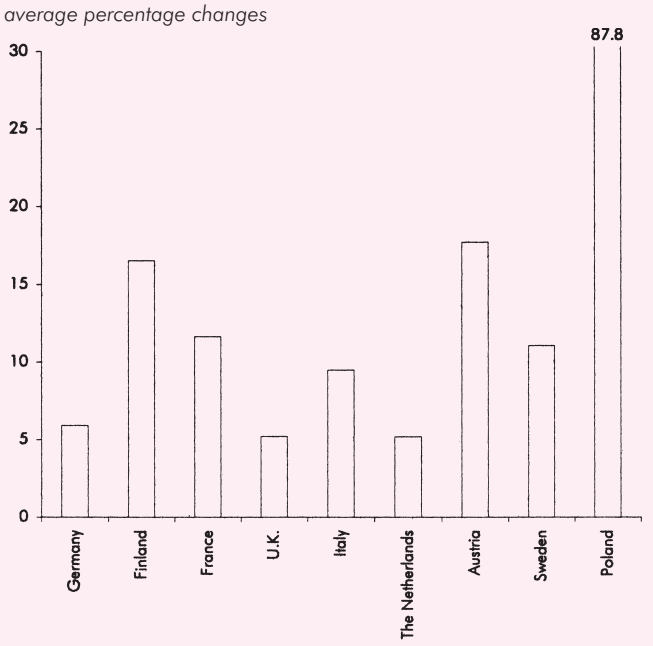


Figure 2: FDI openness 1986-1996

Stock of foreign direct investment abroad as a percentage of GDP, average percentage changes



theoretically explain bilateral trade flows (where using a distance variable is customary but not an absolute requirement).

INTRODUCTION

Even though the economic gravity equation achieved initial empirical success in the 1960s (*Tinbergen,* 1962, *Pöyhönen,* 1963, *Linnemann,* 1966), it was repeatedly met with criticism[1]: considering that classical (and mostly also more recent) economists of international trade start out from a spaceless concept for countries and are very sparse in their comments on multilateral relations (or bilateral relations in a multilateral world), criticism focused on the weak theoretical base for the gravity equation (*Leamer – Levinsohn*, 1995).

In this study, an equation has been used which is widely identical with *Helpman's* (1987) and which therefore follows the concept of the Heckscher-Ohlin model of the relevance of relative factor endowments. Accordingly, the primary point is to discuss this type of specification. It is a type of equation which was essentially derived from *Helpman – Krugman* (1985). In this model of two goods (one homogeneous and one differentiated), two production factors (capital and labour) and two countries, the core determinants for the trade volume are the size of the total economic area (the sum of the two GDPs), the relative country size (in terms of GDP) and the difference between countries in their relative endowments with capital and labour. Empirical applications used these variables to attempt to explain bilateral trade volumes (usually exports; *Egger*, 1999, 2000A, 2000B and 2000C) and the scope of intra-industry trade (*Helpman*, 1987, *Hummels – Levinsohn*, 1995). It should, however, be noted that these studies were interested simply in explaining the bilateral trade links rather than in projecting the potential for integration (*Breuss – Egger*, 1999). An equation consisting of these variables must be viewed as a reduced form for the volume of inter- and intra-industry trade.

Even though in the early phases of integration export dynamics played a major role, growth rates for FDI soon overtook export growth rates considerably. This applies generally for the openness regarding FDI compared to that for exports (Figures 1 and 2), once again reflecting, in bilateral relations, the fact that direct investment is generally more dynamic than the flow of foreign trade (Figures 1 and 2).

Most of the models cited deal with the decision by companies on whether they should access the market by founding subsidiaries (i.e., act as multinational companies) or by exporting their goods. A pay-off between factors will then produce a trade-off between multinationalisation and exports.

[1] The most quoted studies of CEECs' integration in the EU and Western market-economy system are solidly founded in the classic gravity theory. They are analyses which had aimed to project the potential (equivalent and future) international trade links between East and West as the outflow of integration (or rather political and economic opening). Emphasis should be given to *Wang – Winters* (1991), *Hamilton – Winters* (1992) and *Baldwin* (1994).

Obstacles to exports are the classical trade costs (costs of transport in the sense of tariff barriers to trade). The transport costs in the narrower sense (i.e., distance-dependent trade costs) so frequently mentioned in the empirical literature cannot play any direct role from a theoretical point of view since even the more recent international trade economy is really spaceless in the traditional meaning in spite of the importance of economic geography. Obstacles to multinationalisation typically are information flow problems between parent and subsidiary (*Ethier*, 1986) or the high fixed costs accruing from the establishment of a second plant abroad (*Markusen – Venables*, 1996). Many models produce corner solutions, however, which obtain their steady state exclusively from exporting or, alternatively, multinational companies. Nevertheless, some studies show that the co-existence of both types of companies can be theoretically depicted (*Brainard*, 1993, *Markusen – Venables*, 1996, *Pfaffermayr*, 1997).

Accordingly, the variables to explain the mobility of capital (including the differences in fixed costs between multinational and exporting companies) are identical with those used to explain the international trade volume (*Helpman – Krugman*, 1985). They should therefore be used also to explain flows of FDI. A first attempt to explain bilateral flows of FDI was made by *Martín – Velázquez* (1997), although they did not look at bilateral export flows simultaneously and used a static estimation rather than the dynamic one applied here. Our study is based on the following idea: in a foreign trade model grounded on differences in endowments, both direct investments and exports are determined by third factors (i.e., not dependent on each other) in the steady state. Activity levels of both variables can thus be described by two equations which contain the same explanatory variables. In order to account for the fact that many countries are in the process of moving towards a steady state, the probability of path dependencies is assumed, which allows distinguishing between long- and short-term parameters of exogenous variables. No modelling was made of the linkage effects (i.e., mutual dependencies of exports and FDI) because evidence to this end is insufficient at the aggregate level (*Egger*, 2000A)[2]. Consequently, the two equations for exports and FDI, respectively, can be specified as mutually independent.

DATA, SPECIFICATION AND ESTIMATIONS

This study does not start out from a static model, but rather uses a dynamic panel data approach. The latter model is preferable because it makes for a leaner specification: all time-independent variables are not dynamic per definitionem and are thus not included in the specification. They are in particular distances, trade preference variables (such as joint borders, joint language, etc.), as well as fixed export and import country effects, which are anyway difficult and problematic to project from a panel data model (regardless of whether fixed or random country effects are used; *Egger*, 1998, 1999).

From an empirical point of view it should be noted that any adjustment in theoretical models to a new equilibrium state, which is usually sudden for technical reasons, appears to be unsatisfactory. We will therefore assume that changes in exports and FDI occurring in the previous period will have an effect on the development in the current period together with exogenous variables. All variables are formulated in logarithmic differences. Logarithmic differences may be viewed as approximations of growth rates. They approximate particularly well when the growth is extremely large. For an overview and exact formulation of the variables used see Table 1 below. The two specifications are as follows:

$$(1)\quad EX_{ijt} = \alpha_0 + \alpha_1 EX_{ij(t-1)} + \alpha_2 GDT_{ijt} + \alpha_3 SIMI_{ijt} + \alpha_4 RLFAC_{ijt} + \kappa_t + u_{ijt}$$

$$(2)\quad FDI_{ijt} = \beta_0 + \beta_1 FDI_{ij(t-1)} + \beta_2 GDT_{jt} + \beta_3 SIMI_{ijt} + \beta_4 RLFAC_{ijt} + \lambda_t + v_{ijt},$$

$EX_{ij(t-1)}$ . . . lagged export growth rate, $FDI_{ij(t-1)}$ . . . lagged growth rate of FDI stock, GDT . . . growth rate of the sum of bilateral GDPs, $SIMI$ . . . growth rate of the similarity index for relative bilateral country size, $RLFAC$ . . . growth rate of bilateral difference in relative factor endowment with capital and labour (based on *Kaldor,* 1963, the GDP per head is used as proxy), κ_t, λ_t . . . fixed time effects, u_{ijt}, v_{ijt} . . . error terms, i . . . export country, j . . . import country, t . . . year.

It should be emphasised that fixed time effects appear in both specifications. They cannot be projected per se, but this is not necessary for the version proposed here. Time effects generally depict business cycle phenomena. The coefficients of exogenous (non-lagged) variables in both equations can be viewed as a short-term influence of their growth on the growth of dependent variables (EX_{ijt} and FDI_{ijt}). The coefficient of the respective lagged endogenous variables ($EX_{ij(t-1)}$ and $FDI_{ij(t-1)}$) could be viewed to mark the speed of adjustment (or adjustment costs) to a steady state since the lagged endogenous variable implements a path dependency. Endogeneity problems between lagged endogenous variables and the changes in GDPs (per head) could be argued, as numerous studies are available on export-driven (or FDI-driven) growth (*Feder*, 1982, *Islam*, 1998). This could be

[2] Linkage effects may be modelled by lagged exports in the FDI equation and lagged FDI in the export equation.

Table 1: Dynamic panel estimation: regression results

Two-step GMM estimation

	Dependent variable: EX_{ijt}			Dependent variable: FDI_{ijt}		
	Coefficient	t value	p value	Coefficient	t value	p value
Independent variables						
$EX_{ij(t-1)}$	0.601	18.67	0.000	–	–	–
$FDI_{ij(t-1)}$	–	–	–	0.714	24.40	0.000
GDT_{ijt}	0.466	2.84	0.005	3.524	6.08	0.000
$SIMI_{ijt}$	0.410	3.27	0.001	1.966	6.31	0.000
$RLFAC_{ijt}$	–0.165	–1.56	0.119	0.907	2.79	0.005
Constant	0.034	4.89	0.000	–0.022	–0.64	0.525
		Statistics[1]	p value		Statistics[1]	p value
Sample period		1988-1996			1988-1996	
Number of observations		655			655	
Number of cross sections		86			86	
R^2 (from one-step estimation)		0.26			–0.19	
Standard deviation		0.06			0.31	
Wald test: joint significance of time dummies		2,845.28 (9)	0.000		261.97 (9)	0.000
Wald test: joint significance of outlier dummies[2]		330.94 (9)	0.000		123,352.05 (9)	0.000
Sargan test		59.31 (38)	0.015		49.12 (38)	0.107
Robust test for first-order serial correlation		–4.17 (86)	0.000		–4.30 (86)	0.000
Robust test for second-order serial correlation		–1.48 (86)	0.069		–0.40 (86)	0.345

Variables in first differences of logs, real figures in 1995 USD. $EX_{ij(t-1)}$ . . . lagged export growth rate, $FDI_{ij(t-1)}$ . . . lagged growth rate of FDI stock, GDT . . . growth rate of the sum of bilateral GDPs, $SIMI$ . . . growth rate of the similarity index for relative bilateral country size, $RLFAC$ . . . growth rate of bilateral difference in relative factor endowment with capital and labour, i . . . export country, j . . . import country, t . . . year. – [1] Degrees of freedom in parentheses. – [2] 10 outlier dummies in the FDI equation.

countered by the argument that some contributions use GDP growth as a determinant of export growth (*Prasad – Gable*, 1998), and that some authors point out that growth need not be unequivocally export-led in all cases (*Buffie*, 1992, *Riezman – Whiteman – Summers,* 1996). What's more – and this is a key argument – we are talking about bilateral economic relations here. So we can assume that the average country penetrates the average foreign market insufficiently to have any notable effect on the latter's GDP growth.

The data were sourced mainly from OECD (exports, export prices, FDI stocks, investment deflator, population, GDP, GDP deflator), IMF (exchange rates), WIIW (data from CEECs) and WIFO. It should be pointed out that all data are shown in real values. This was relatively unproblematic for exports and GDP. With regard to FDI stocks, the stocks of nominal direct investments published by OECD were seen as replacement values (in actual fact they are book values) and converted simply to values at constant dollar prices by using the investment deflator and exchange rate.

In order to provide an impression of the economic situation of the countries during the period of observation (1986-1996), a few salient features of the explanatory variables for the estimation and the trade interlinkages between the relevant countries should be pointed out. With regard to the exogenous variables, it is noticeable that the average annual population growth is extremely low (less than 0.8 percent) in all countries. In Portugal, Hungary and the Czech Republic, the population on average shrank between 1986 and 1996. Average annual growth of real GDP was about 1 to 3 percent for most countries, with the exception of top-ranking Ireland. There, the average annual growth of almost 6 percent in real terms is probably due to knowledge transfer from abroad, extensive investments by multinationals in consequence of the country's excellent location (ports, EU member country, good relative wage level, good starting point for economic relations with the USA, etc.)[3].

An estimation of equations of the type used here cannot be done by OLS, since lagged endogenous variables are correlated with the error term. It was thus performed based on the studies of *Arellano – Bond* (1988, 1991). Table 1 summarises the results for both specifications.

The equations for estimating bilateral export dynamics and for the dynamics of active FDI stocks both found that the growth rates of variables in the previous period have a significantly positive effect (an indication of path dependency and adjustment costs). A change of exports by more

[3] It needs to be noted that in static gravity estimations, Ireland must be seen as a country whose foreign trade linkages are extremely difficult to explain with the classical variables (GDP, population, distance and preference/resistance variables; *Breuss – Egger*, 1999).

than 1 percent in the previous period results in an additional effect of 0.6 percent in the current period; for FDI stocks, the respective effect is 0.7 percent. This means that FDI is more strongly path-dependent than exports. Adjustment pressure towards a (new) steady state appears to be greater for exports. Of particular interest are the algebraic signs for the changes in the sum of bilateral GDPs (*GDT*) and the index to measure the similarity in size (*SIMI*): the positive signs in both equations match expectations from an endowment-based model of the *Helpman* (1984) type. Both the growth of a bilateral economic area and an approximation in the size of two economic partners have a positive effect in the trade volume (and thus exports) as well as the scope of multinational activities (here measured in terms of FDI), as predicted by Helpman's theoretical approach[4].

The signs for the coefficients for changes in the bilateral relative factor (capital and labour) endowments (*RLFAC*) partly correspond to the theoretical concept: basically, the *Helpman* (1984) model provides a complementary relationship between exports and multinational activities when two countries have similar relative factor endowments. Both exports and multinational activities should increase with a rise in factor endowment differences. In other words, specialisation gains should be achieved for both exports and multinational activities from differences in factor endowments (regardless of the expected decline in the share of intra-industry trade; see *Helpman*, 1987, *Hummels – Levinsohn*, 1995). This theoretical expectation is countered by the negative sign in the export equation for *RLFAC*, although the significance level is so low that the coefficient cannot be viewed as significantly different from zero. There is certainly no empirical evidence for specialisation gains in bilateral exports in intra-EU trade at an aggregate level. The theoretical expectations from the *Helpman* (1984) model are, however, met by the significantly positive sign of *RLFAC* in the FDI equation. This could be a pointer towards a motive (albeit probably not the main one) for the market entry of multinational companies being the employment of foreign production factors because of differences in factor remuneration, which in turn could be especially relevant for Eastern Europe, because it has substantial potentials from its enormous wage differentials vis-à-vis Western Europe.

[4] It should be noted that in the *Helpman* (1984) model multinational activities are not linked to capital flows across country boundaries (direct investments), but that multinational companies utilise for their production process the foreign labour force which is relatively well endowed with labour. As argued by *Egger* (2000B), *Helpman* (1984) can nevertheless be used as an underlying model when a relationship is assumed between capital stock in foreign hands (FDI stock) and output produced.

FORECASTING BILATERAL TRADE AND FOREIGN DIRECT INVESTMENT

In projecting future bilateral economic interlinkages in terms of real exports and real active FDI stocks, the following procedure is used: projections for the exogenous variables were mostly based on publications of EU, OECD, WIIW and, especially, of IIASA. The variables to be projected were the population and the real GDP (at 1995 dollar prices). The former was obtained by simply using average annual growth rates of the period 1998-2000 also for 2000-2010 for each country. The latter required projections for the real GDP in the country currencies. For the GDPs in the EU countries, EU projections were available up to 2010, which were primarily used as a foundation. For Hungary, the Czech Republic and Poland, IIASA projections were used.

The actual projection of dependent variables (first differences of levels in logarithms of real bilateral exports and FDI stocks) was performed by using the coefficients estimated in the two above specifications. It would thus appear at first glance that many of the usual variables have no influence in gravity equations, specifically the time-invariant variables such as distances, common borders and languages, etc. Yet this is only conditionally true. We should not forget that the projection is based on static values of a given year (1995 or 1996). Yet we know from static gravity equations that bilateral exports are certainly influenced by the above variables. All that is claimed is that a change in bilateral economic relations (exports or FDI) is not due to solely static variables. Existing high levels of bilateral trade interlinkages act far into the future which is due to path dependencies, although the influence of past high levels is getting increasingly weaker.

The projection was made annually up to 2010, in order to adequately account for the relatively important aspect of path dependency. Both for exports and for FDI, two projection scenarios were calculated: the first representing a situation when the CEECs do not join the EU up to 2010; the second assuming that they join in 2005.

Due to the available instruments, the estimation includes only bilateral economic relations for which an unbroken time series of at least five years could be developed (which was relevant only for FDI). Such a procedure is not necessary for the projection. Accordingly the projection also included bilateral relations which offered a time series of at least two years, so that a full data set for 1995 and 1996 could be prepared as the starting point. This was necessary because the projection of growth rates for bilateral economic interlinkages (exports and stocks of active FDI) in the first year of the projection (1997) required at least

information on the growth rates for the previous period (1995-96).

Tables 2 and 3 illustrate projections for the additional average annual bilateral growth rates for exports and FDI in the event of the CEECs joining the EU.

The OECD Yearbook of International Direct Investment Statistics does not report all the data required for all countries and all bilateral relations included in the estimation, as outlined above. Accordingly, projections of bilateral openness and average annual FDI growth rates could be performed for fewer country pairs and they were partly incomplete. Here, findings for the bilateral interlinkages between Germany, Italy and Austria, and those between Hungary, the Czech Republic and Poland are discussed. In addition, the projection needed to be limited to a hypothetical year of accession (2005). It needs to be emphasised that the projected growth rates must be read as the difference to the basic solution (no EU membership of the CEECs). For simplifying reasons, it was assumed that the CEECs' accession will not trigger any additional growth effect in the current EU member states. This may have distorted the calculated growth rates downwards[5].

In computing the projection, not only future values of the explanatory variables were used. It is important to note that the (customary) assumption was made that all bilateral interlinkages (both for intra-EU relations and for relations between the EU countries and the CEECs) are determined in a manner as shown from the estimated parameters (for intra-EU relations). It is thus assumed that in the course of the integration process a state will be or has been achieved which has the effect that exports in all countries concerned depend in exactly the same way on the growth paths of the GDP and population as is the case for the "average" country.

The calculation used here takes into account that annually varying country-specific cyclical developments will always cause shocks which constantly act as a new impetus for bilateral economic interlinkages. The dynamic formulation of the equations allows lagging adjustment to the new steady state and thus sketching the effects of such cyclical (and other) influences on several periods.

First of all it needs to be stressed that previous analyses on the utilisation of trade potentials between the EU and the CEECs deviate from the findings of this study. More recent work on the subject had claimed that the potential between the two blocks had already been exhausted in the past years and that no further leaps to a new integrative steady state could be expected (*Gros – Gonciarz*, 1996, *Breuss – Egger*, 1999). These conclusions had, however, been obtained from static models (partly from cross-section analyses, partly from panel analyses) which did not make any additional assumptions on changes in the explanatory variables. As will be shown later, when the underlying model and internationally available GDP and population growth projections are used, export (and FDI stock) growth rates can be projected between the EU member states and the CEECs which are, at least in part, noticeably higher than those between (average) EU countries. This projection also corresponds fully to the experience made in 1993 to 1996. Previous findings could furthermore have been massively distorted by the static approach.

Yet the qualification needs to be made that the projection period is extremely long (1997-2010), even longer than the period of estimation (1986-1996). The projected levels should therefore be interpreted carefully. Furthermore, no restrictions could be modelled regarding the degree of openness. In theory, neither exports nor FDI of a country need to be smaller than its GDP. In addition, the "rest of the world" was not analysed, due to the lack of requisite data. It is therefore obvious that we have probably reached the limits of partial analysis. More qualified statements might be possible by calibrating a general equilibrium model. Yet even though the absolute values of the projected levels of exports and FDI need to be questioned, we nevertheless obtain an interesting picture of the projected importance of countries and country blocks for the various states. Attention should therefore be directed (mainly) to the countries' geographical composition of foreign trade and FDI relations over time.

On the projections for exogenous variables it should be noted that Germany, Austria, Portugal, Sweden, Spain and Poland were assumed to have an average annual population growth of about 0.1 percent between 1996 and 2010. The rate ranges from 0.3 to 0.6 percent for the remaining EU countries. The Czech Republic and even more Hungary were assumed to have shrinking populations. Of the EU countries, Germany and Italy were given comparatively below-average growth rates in their real GDP. Austria's GDP is projected to grow by 2.4 percent on average up to 2010. In the CEECs, the GDP is expected to grow more strongly than the EU average, and will be 3.1 percent for the Czech Republic (up to 2010), 4 percent for Hungary and 5.2 percent for Poland. Between 2005 and 2010, all three CEECs are expected to enjoy relatively brisk economic growth, regardless of whether or not they

[5] An assumption of positive growth effects of about 1 percentage point in the EU countries was tested and resulted in slightly higher growth rates for the bilateral exports to the CEECs of about 0.1 percentage point. Markedly higher effects were found regarding FDI. In view of the ad-hoc assumptions for this growth effect on the EU countries, no presentation has been made of these findings.

Table 2: EU accession of the CEECs and its impact on real bilateral exports 1996-2010

	Export country																
	Hungary	Poland	Czech Republic	Belgium, Luxembourg	Denmark	Germany	Finland	France	Greece	U.K.	Ireland	Italy	The Netherlands	Austria	Portugal	Sweden	Spain
	Additional average annual change in percentage points																
Import country																	
Belgium, Luxembourg	+0.47	+0.47	+0.54														
Denmark	+0.44	+0.42	+0.50														
Germany	+0.51	+0.58	+0.58														
Finland	+0.43	+0.39	+0.49														
France	+0.50	+0.59	+0.59														
Greece	+0.43	+0.42	+0.48														
U.K.	+0.50	+0.56	+0.56														
Ireland	+0.40	+0.38	+0.47														
Italy	+0.50	+0.56	+0.57														
The Netherlands	+0.48	+0.49	+0.54														
Austria	+0.46	+0.44	+0.52														
Portugal	+0.43	+0.38	+0.47														
Sweden	+0.46	+0.44	+0.52														
Spain	+0.50	+0.52	+0.56														
Hungary		+0.48	+0.46	+0.47	+0.44	+0.52	+0.43	+0.52	+0.43	+0.51	+0.41	+0.50	+0.49	+0.46	+0.45	+0.45	+0.51
Poland	+0.47		+0.50	+0.47	+0.43	+0.60	+0.40	+0.60	+0.38	+0.58	+0.38	+0.56	+0.50	+0.44	+0.41	+0.44	+0.54
Czech Republic	+0.48	+0.50		+0.54	+0.51	+0.59	+0.51	+0.60	+0.47	+0.59	+0.47	+0.58	+0.56	+0.52	+0.50	+0.53	+0.58

will join the EU. These effects would of course be even more pronounced in the event of their joining the EU.

Table 2 lists the annual average growth projections for the real bilateral exports of all 17 countries (Belgium and Luxembourg were considered as a single country for data reasons) which would be due solely to EU accession (in 2005). It was assumed that the growth projections of the EU countries would not be affected by such accession. This may be assumed (at least for a projection period up to 2010) because the CEECs' share in the foreign trade of EU countries is relatively low (which applies to an even greater extent to FDI). If we grant some additional growth dynamics within the EU in consequence of the accession, the findings shown here may be viewed as lower limit: actual additional dynamics for exports and FDI would – according to the model – be slightly greater. Based on the above assumptions on the growth dynamics in the countries, there will obviously be different growth effects for each country when the CEECs join the EU. As already described, the growth rates shown in Table 2 depict the growth differences in bilateral exports as a comparison to the baseline scenario (no accession of the CEECs to the EU).

A comparison between Germany, Italy and Austria shows that Germany could achieve the greatest growth effects in its exports to the three selected CEECs. Austria would (according to the model) record the lowest additional bilateral export growth rates (ranging from about 0.4 percentage point for exports to Poland to 0.5 percentage point for exports to the Czech Republic). In general, the model suggests that the expected additional growth effects are relatively low for exports. It should be remarked that feedback effects, such as they are included in the calibrated general equilibrium (CGE) models, have no influence (*Keuschnigg – Kohler*, 1997). This could mean that the effects shown here may be lower than those actually to be expected.

In addition, the additional imports from the CEECs (i.e., additional exports by CEECs into the EU) to be expected under the model are less dynamic than exports by the EU into the CEECs. This matches experience with countries which are in the middle of transforming their system and economy.

Even though no projections are shown for the bilateral degree of opening, the dynamics shown here means implicitly that there will be a slight reversal of the importance of some countries for exporters in the course of the observation period: generally it can be expected that in some EU member states the selected CEECs will become more important than other EU countries.

A justification for concentrating on Germany, Italy and Austria is also provided by the fact that these countries are – in comparative terms – the main foreign trade partners for the CEECs.

A comparison between the projected FDI growth by Germany, Italy and Austria in the CEECs furnishes essentially

Table 3: EU accession of the CEECs and its impact on real bilateral FDI stocks abroad 1996-2010

	Export country						
	Germany	Finland	France	U.K.	Italy	The Netherlands	Austria
	Additional average annual change in percentage points						
Import country							
Hungary	+1.43	+2.29	+1.38	+1.35	+1.36	+1.37	+1.27
Poland	+1.75	+1.55	+1.69	+1.64	+1.60	+1.59	+1.45
Czech Republic	+1.62	+1.86	+1.58	+1.70	+1.58	+1.62	+1.49

the same picture as was obtained for exports: in view of the generally higher projected cyclic dynamics, under the model Germany's stocks of FDI in the three CEECs will grow at a faster pace (from 1.4 percentage points in Hungary to 1.8 percentage points in Poland) than those of Italy (from 1.4 percentage points in Hungary to 1.6 percentage points in Poland) and those of Austria (from 1.3 percentage points in Hungary to 1.5 percentage points in the Czech Republic). In view of the restricted data available, there are generally fewer projection data provided for FDI than for exports. The additional growth effect in 2005 from the accession of the CEECs to the EU is, according to the model, notably higher than for exports (Table 3). Additional FDI growth rates (in terms of stocks) are about triple those for exports. Recent experience regarding higher growth rates of FDI thus is also reflected in the projection.

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The Impact of EU Accession of Selected CEECs on Bilateral Economic Relations with the EU

A Dynamic Gravity Approach – Summary

The projection looked at the dynamics of integration for selected EU and CEE countries. The latter (Hungary, the Czech Republic and Poland) were assumed to join the EU in 2005, in order to project the additional effects of their accession on average annual bilateral growth rates for exports and (stocks of) FDI between the EU and the three CEECs. The choice of the theoretical model to be used was decided in favour of a traditional gravity model. The empirical approach employed was a dynamic panel data approach. In contrast to the static specification, the dynamic specification offered the advantage of being able to distinguish between long-term equilibrium states of the growth paths and short-term adjustment processes. Even though geographical, regional economic and socio-cultural variables were not explicitly modelled because of the lack in variation in the time dimension, it was pointed out that these act implicitly in the model through growth dynamics and the levels of previous periods. In this manner, projections could be obtained which match important insights of the past years: additional (bilateral) export growth from the CEECs' accession to the EU was projected to be lower in the medium term than FDI growth. Mainly because of differences in the projected dynamics of the GDP between countries, future growth effects of EU accession by the CEECs were calculated to be bilaterally divergent for exports and FDI.

In conclusion, it may be said that, based on the model projection, exports and FDI will grow for the EU countries and the CEECs on their accession to the EU in both target markets. The additional growth effect is about 0.5 percentage point for exports, and about 1.5 percentage points for stocks of foreign direct investment at the bilateral level.

As the partial analysis model allowed no accounting for feedback effects (as would be the case in calibrated general equilibrium models) and since no additional growth effects in the GDPs of the EU member states from the CEECs' accession were added to the model, the additional growth effects shown here appear to be rather the lower limit for what can actually be expected.

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- *Scope and objectives*
- *Overview on the legal frameworks in the participating countries*
  Austria – Belgium – Finland – Greece – Luxembourg – Portugal – Sweden – USA – Georgia – Canada – Quebec – Australia – Victoria
- *Definition and evaluation of benchmarks*
  Input benchmarks – Output benchmarks – Process benchmarks
- *Best practices for enablers*
  Finland: improving licensing procedures – Victoria: regulatory reform – Austria: efficiency award for public managers – Luxembourg: follow-up to the benchmarking project – USA
- *Recommendations to administration*
  Information and communication – Organisation of the licensing administration
- *Recommendations to policy makers*
  Ongoing monitoring of legislation – Decentralisation of decisions or contracting out – Appeal provision – Establishing industrial zones
- *Recommendations to enterprises and entrepreneurs' associations*
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