Economic Integration in Trade and FDI: Dynamic Considerations of Potentials and Adjustment

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Abstract

This paper uses the results of a dynamic panel study of intra-European trade and FDI to apply them to the issue of integrating the CEECs in the EU. The merit of a dynamic perspective is shown to be its capacity to discuss not only the long-run effects of shocks but also the speed of adjustment. The latter cannot be derived from cross-section studies, but is useful especially when potentials are to be projected.

Key words: gravity equation, panel econometrics
JEL: C33, F14, F15, F23

1 Introduction[1]

Projecting so-called natural trade flows or potential trade relations was a major task of empirical trade economics in the last decade. The aim of this kind of research was mainly to indicate potentials of economic integration with respect to trade which were not exhausted because of impediments of a mostly political but also economic type. This was usually based on the estimation of a gravity equation (Linnemann, 1966). The point of a gravity equation is that it represents a reduced form which comprises bilateral potential supply and demand (GDP and population numbers between two partner countries) as well as factors of trade preferences (common language and borders, etc.) and resistances (distance between economic centres, etc.). Most of the related studies tried to project the integration potential of the Central and Eastern European countries (CEECs) after the fall of the Iron Curtain (Wang & Winters, 1991; Hamilton & Winters, 1992; Rosati, 1992; Baldwin, 1994; etc.).

[1]I wish to thank F. Breuss, H. Egger and M. Pfaffermayr for helpful comments.

In a first step, bilateral trade relations between a sample of reference market economies were characterised. In a second step, it was assumed that trade relations between given countries, e.g. the CEECs and the reference market economies (mostly EU or OECD countries), in the long-run would exhibit similar relations given their cultural characteristics, geographical location and their stage of economic development.

The above mentioned pioneers of this type of studies discovered substantial deviations in actual bilateral trade between the West (EU or OECD) and the CEECs. On the other hand, relatively strong relationships were found for intra-CEEC trade. Thus, the high share of intra-CEEC trade and the closed nature of the respective economies facing their Western neighbours were seen to be stemming from pressures within the COMECON. Altogether this indicated large unexhausted East-West potentials of integration at the time these economies started to open up in the early 1990s, which were assumed to generate dramatic dynamic processes for their relations with Western Europe and the OECD.

Generally, it was pointed out that adjusting potential bilateral trade with the CEECs would be a medium- or even long-term phenomenon. Therefore, it was somewhat surprising that after a time span of less than a decade the entire gap between potential and real trade relationships between the EU and CEE countries was closed, and no integration effects were left unexploited (Gros & Gonciarz, 1996; Breuss & Egger, 1999).

The purpose of this paper is to look into the question of adjustment processes which are associated with different kinds of shocks in explaining factors of both bilateral exports and stocks of outward foreign direct investment (FDI). As a case study, the suggestions are based on bilateral relationships between the EU (as the sending countries) and three CEECs (Czech Republic, Hungary, and Poland as the receiving countries). Although no potentials of bilateral economic relationships are projected in the usual way, the paper demonstrates that a dynamic analysis provides information about the adjustment processes after shocks in the determinants which cannot be derived from simple static applications. A dynamic treatment of bilateral exports (and also of FDI) could perhaps help to better understand which time spans we should think of with regard to adjustment in the long-run after a shock or from actual to "natural" relationships.

2 Bilateral Trade and FDI

As mentioned above, the workhorse model for analysing potential economic relationships was the gravity model. It was chosen because of its simple structure, its intuitive appeal and its success in exploring the vol-

ume and destination of bilateral trade. Recently it has been applied not only to bilateral trade but also to FDI (e.g. Brenton et al., 2000). Yet although it has certainly demonstrated its goodness of fit, it nevertheless remains standing on theoretical foundations which are not entirely secure (Hamilton & Winters, 1992; Leamer & Levinsohn, 1995).

What's more, some of the work of the New Trade Theory explicitly focuses on the determinants of and relationship between multinational (MNE) and national (NE, i.e. exporters) enterprises (see Markusen & Venables, 1996 and 1998). As we will talk about both, we will therefore relate the empirical suggestions to this literature. This choice of the theoretical background involves a set of variables which mainly consists of overall bilateral country size, relative country size, relative factor endowments, trade resistances (transport costs) and multiplant economies of scale (fixed costs of running a second plant abroad). As it is difficult to find a sound measure for the last one at the aggregate level we only will draw on the former variables.

However, so far only static (cross-section as well as panel) analyses have been undertaken and used to analyse and project bilateral economic relationships[2]. This did not allow to model the inertious change of both exports and FDI because of changes in their determinants (theoretically motivated by the impact of adjustment costs of investment). On the other hand, the impact of linkages between trade and FDI (see Caves, 1996) were similarly neglected[3]. However, if adjustment costs do play a role, then the relationship between trade and FDI should exhibit an inertious change after a shock as well.

I propose to undertake an experiment of thought, applying the parameter estimates derived by Egger (2000) also for EU-CEEC relations and analysing the model projections for shocks in several determinants for the bilateral economic relations between the EU and three CEECs (Czech Republic, Hungary, and Poland), with respect to both the long-run and the dynamic paths of adjustment[4]. The theoretical model behind the analysis is one which is derived from (static) general equilibrium

[2] As far as I know, Egger (2000) is an exception analysing intra-EU exports and FDI in a dynamic panel framework. The results presented in this paper regarding long-term influences and adjustment paths are based on this work.

[3] This holds true albeit recently some authors have studied the relationship between exports and FDI by the analysis of residuals in the tradition of Graham (1996). Examples in this tradition are Brenton & Di Mauro (1999) and Brenton et al. (1999).

[4] More precisely, I should define the "long-run" as the cumulative impact of a shock (either in exports, FDI or an exogenous determinant) on the depending variables (bilateral exports and stocks of outward FDI). The cumulative impact is simple the integral of the resulting changes between periods ($t = 1$), i.e. the period where the shock occurs, and ($T = \infty$).

models on trade and multinationals in the tradition of Markusen & Venables (1996 and 1998; see Egger, 2000, for a more detailed discussion of the implications). The main determinants of such models are seen to be overall (bilateral) country size, relative country size (similarity of the size in terms of GDP), differences in relative factor endowments, transport costs, and the difference between economies of scale at the firm (multiplant) and plant levels. As mentioned above, information on the latter is not available or rather poor at an aggregate level, and we will therefore focus on the former determinants.

< Table 1 about here >

Table 1 summarises the parameter results from Egger (2000) for a specification in which the difference in the relationship of physical capital to unskilled labour (low enrolled people) and of human capital (high enrolled people) to unskilled labour was implemented in a separate way and the underlying country sample consisted just of EU countries. It should be noted that only the long-run effects of changes in the exogenous determinants on both exports and stocks of outward FDI are based on the above-mentioned theoretical background. However, for a smooth process of adjustment we would also expect the (short-run) effects of the lagged endogenous variables to exhibit a positive sign and a coefficient smaller than one. The third column for both the export and the FDI results indicates the sign of the impact of a positive shock in the several exogenous determinants on bilateral exports and stocks of outward FDI as expected theoretically. In sum we mostly have identical signs of the long-run effects of a shock in the exogenous determinants on both exports and FDI. Only relative corporate tax rates and transport costs are an exception, where the former would not be expected by theory, whereas the latter is consistent. Of course, a larger bilateral economic space (sums of GDP) influences both exports and FDI positively. On the other hand there are positive effects on both from a higher degree in similarity in terms of relative sizes of the two countries. The more different countries become in terms of difference in the physical capital to unskilled endowment ratio the higher will both exports and FDI be, while the opposite holds true for the high-skilled to low-skilled ratio. See Egger (2000) for more details on the theory, estimation results and test statistics.

Taking the presented parameter estimates as given and assuming that they are also valid for EU-CEEC relations, we now can turn to their application: Given the corresponding variables for an average EU country and the three CEECs, we will undertake some experiments of thought, assuming a shock in the variables on the side of the CEECs (mostly changing them to the EU average). We will derive information

of the long-run effects on bilateral exports and FDI from the average EU (as the sending countries) to the CEECs (as the receiving countries) and the associated speed of adjustment which can be simulated knowing the relevant parameters for lagged exports and stocks of outward FDI in both the equation of bilateral exports and FDI.

3 Long-Run EU-CEEC Relations and Speeds of Adjustment

Table 2 presents descriptive statistics for the relevant variables in our context[5]. First we find that the ratio of real exports (stocks of outward FDI) between typical EU countries in terms of GDP is much higher than for trade (foreign investment) of a typical EU member state with one of the selected CEECs. Second, we admit that the average GDP is of course much higher for the average EU country than for any of the three CEECs. Third, the physical capital to unskilled labour ratio for a typical EU member state is significantly higher than the corresponding value for a CEEC. Fourth, the ratio of high-skilled to unskilled labour is slightly lower for all CEECs than for the EU. Lastly, transport costs[6] are significantly lower for intra-EU exports than for trade with the CEECs, with EU trade with Poland being the sole exception.

< Table 2 >

In our experiment of thought we will focus on six different types of shocks. We will assume ceteris paribus a shift in the respective variables for the relations of a typical EU member state as the sending country

[5]The following data sources were used: OECD Statistics of Foreign Trade (nominal bilateral exports of EU countries). The Vienna Institute for Comparative Economic Studies Data Base (nominal bilateral imports of CEECs). OECD International Direct Investment Statistics Yearbook (stocks of outward FDI. Reported bookvalues were deflated by the use of the corresponding investment deflator and exchange rate index; see Egger, 2000, for a justification). OECD Economic Outlook (export price indices). IMF International Financial Statistics (exchange rate index). OECD National Accounts, Volume 1 (GDP, GDP deflator, gross fixed capital formation, and investment deflator). OECD Education Statistics 1985-1992, Education at a Glance and UNESCO Statistical Yearbook (school enrolment, defining secondary ore higher enrolled people as high skilled and less enrolled as low skilled). All variables are expressed in constant prices and dollars taking 1995 as the base year. See Egger (2000) for further details on the construction of variables.

[6]Measured as the difference between cost insurance freight (c.i.f.) and free on board (f.o.b.) values from bilateral trade statistics. To give an example: The difference between German exports to Hungary (reported in German export statistics) and Hungarian imports from Germany (reported in Hungarian import statistics) should be interpreted as transport costs (costs of exports) for German exports to Hungary. Of course, if there are huge differences in the reporting quality between Germany and Hungary, it would bias this measure.

with each of the CEECs in period t (i.e. 1996) and compare the outcome for exports and stocks of outward FDI with the base year values, again 1996. However, we are interested not only in the size of the shock but also in the time span which such a shock takes until its impact becomes negligible. This depends both on the estimated parameters for adjustment costs (lagged endogenous effects) and linkages (cross-effects), and on the parameter size of the respective exogenous determinant. We will not collect information about this directly, but will instead refer to the cumulative impact on the depending variables as a percentage of the long-run effect with respect to different periods of time.

< Table 3 >

We will generate ceteris paribus shocks in the following way: First, based on the gap in openness of both exports and FDI between typical intra-EU relations and relations between the EU countries and the selected CEECs, we will envisage the effect of narrowing that gap by one percent (always assuming that the GDP figures remain constant). This means simply changing EU exports (FDI) to the respective CEECs exogenously and looking for the long-run effect which is generated by the endogenous impacts over time. Next, we observe a significant difference in GDP per capita between the average EU and CEE countries. Hence, we will search for the impact of a reduction of the difference between them by one percent (always assuming that population numbers remain fixed). This shock is critical as we alter two rather than just one variable: We should notice that both the bilateral sum of GDPs as well as the index of similarity in country size is affected by such a change. In a similar way we can proceed for the physical capital to unskilled and the high-skilled to unskilled labour ratios, never assuming a change in the endowment with low-skilled workers. The last shock to analyse will be one which narrows the gap in transport costs by one percent.

Table 3 provides information on the shocks in different variables (exports and FDI, GDP, stocks of capital and human capital, and transport costs, respectively) which are associated with the narrowing of gaps as suggested above. We will shock the respective determinants in an arbitrary base year (1996 in our case) and analyse the long-run effects and the adjustment processes with respect to the base year. Of course, reducing the difference between a typical EU member and each of the CEECs in the above-mentioned variables means inducing different shocks of a different size for the bilateral economic relationships between the EU and the CEECs. The inclusion not only of lagged endogenous effects (lagged exports in the export specification and lagged FDI in the FDI specification) but also of cross-effects[7] (lagged exports in the FDI spec-

[7] The interaction of FDI and exports along their adjustment paths.

ification and lagged FDI in the export specification) in the estimated specification generates two different effects for both exports and FDI. We should note that any kind of shock we envisage can be discussed as a simultaneous shock in exports and FDI (of different size) in, say, period t. Therefore, Table 3 provides data on these effects and the overall change of exports is seen to consist not only of a multiple of the shock in exports in period t (the own effect: XX) but also of a multiple of the shock in FDI in period t (the cross-effect: FX). The results show us that the own effects are much higher than the cross-effects and, hence, that none of the cross-effects outweighs the respective own effect (which could be the case in terms of parameter signs as the short-run effects of FDI on exports is negative). Of course, in terms of the long-run impact of a shock on exports and FDI the overall effects (X and F) are the sums of the two: $X = XX + FX$ and $F = FF + XF$, respectively. Therefore, the own effect of FDI is higher than the overall change of FDI after a shock, because it is (slightly) reduced by the negative cross-impact of exports.

< Figure 1 >

As noted above, the advantage of a dynamic framework goes beyond the difference between short-run and long-run analysis. It also permits looking at speeds of adjustment between the short-run effect of a change and the long-run. Figure 1 shows the transformed adjustment paths for exports, stocks of outward FDI and their components (see the footnote to Figure 1). We should note that these paths are solely determined by the 2x2 parameter matrix for lagged exports and FDI in both the export and the FDI specification. Hence, different sizes of shocks or shocks in different exogenous determinants only affect the cumulative impact of the shock on bilateral exports and FDI but not the associated speed of adjustment. As the parameter estimates are derived from a panel estimation where the pooling assumption was applied (homogeneous parameters for all countries and periods of time), the adjustment paths are equal for all bilateral relationships and types of shocks.

Lines X and F in Figure 1 mark the respective adjustment lines for overall (bilateral) real exports and real stocks of outward FDI. The slopes of the curves demonstrate the associated speed of the adjustment process. The steeper a curve, the faster will adjustment be. Hence, FDI adjusts at a slower pace than exports. From the different components we should recognise first that the own effects (XX and FF) are exhausted much faster than the cross-impacts (XF and FX). Secondly, both the cross-effect of exports on FDI and that of FDI on exports exhibit an equivalent speed of adjustment although their impact in size is different. The latter is independent of the fact that, in our case, the two cross-

effects exhibit the opposite sign. Looking at the intersection points of the several lines in Figure 1, we can see that the underlying dynamic system yields rather fast speeds of adjustment so that the overall effect of a shock is adjusted by 95% within four years for exports and in about six years for FDI. With respect to the discussion of potentials and adjustment we would conclude from our analysis that speeds of adjustment after shocks (as was the fall of the Iron Curtain for the CEECs in terms of sinking trade costs, etc.) are faster than was perhaps expected and suggested by previous work in that field. This, of course, does not say anything about the speed of the catching-up process in terms of per capita GDP and other variables, but it can help us understand the adjustment of bilateral relations to their "natural" levels given their exogenous determinants and the information about the parameters of the dynamic system.

4 Concluding Remarks

Empirical research of economic integration in the last decade was mainly concerned with estimating (static) gravity models of trade and afterwards applying the estimated parameters and given exogenous determinants to project "natural" (i.e. potential) trade flows between a sample of reference (mostly EU or OECD) countries and other countries to be integrated (mostly Central and Eastern European economies). It was the merit of that literature to be a pioneer in figuring out the scope of the effects that we should expect. On the other hand, its disadvantage (at that time surely also because of a lack of longer time series) was that it could not answer the question of how long adjustment to the long-run should last. Additionally, some authors have shown that after a few years the - initially rather high - potential to actual trade flow relations were exhausted, which perhaps could be related to a stationarity problem in the data of the static approaches used.

This paper tried to apply the results of a dynamic panel data analysis to the question of economic integration between the EU and three CEECs (Czech Republic, Hungary, and Poland). As usual, the parameter values for a panel of EU countries were assumed to be valid also for EU-CEEC relations. Based on more recent theoretical work, this was done not only for trade (exports) but also for bilateral stocks of outward FDI. We studied in particular the long-run effects of partial catching-up in several determinants such as openness to exports and FDI from the EU as well as GDP per capita and other variables. Due to the dynamic structure of the underlying model, it was found that the long-run effects on exports and stocks of outward FDI from the EU to the CEE countries are composites of own and cross-effects, which so far had not been derived from dynamic panel data analysis in this context.

In addition, the analysis also looked into the dynamic nature in terms of speeds of adjustment for overall exports and FDI. This goes beyond previous work which was exclusively based on static approaches. However, it was shown that we should expect exports to adjust more rapidly to their long-run level than (stocks of outward) FDI after a shock. It was demonstrated that exports would be expected to reach 95% of their long-run level after fewer than four years and stocks of outward FDI after about six years. This could help us understand better why, within a rather short period of time (between 1991 and 1996), potential trade flows (always given their exogenous determinants) were shown to be fully adjusted, which initially had by no means been expected to occur at such a rapid pace.

5 References

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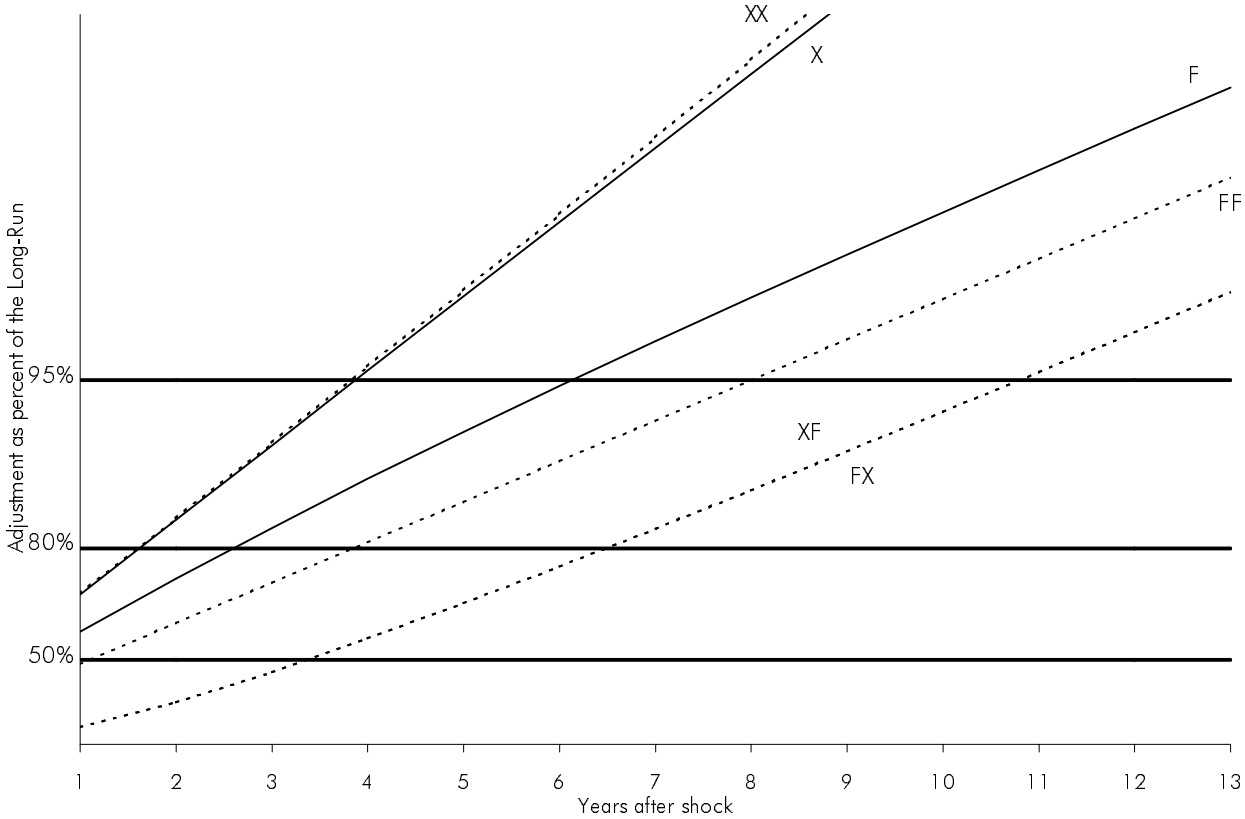
Figure 1: Speeds of Adjustment to the Long-Run



Adjustment Paths in Figure 1 are yielded by the following transformation: $-\ln(1-Y/100)=-at$. Y is the percentage of the long-run which is already reached after t years and (-a) is the corresponding speed of adjustment (i. e. the slope of the above lines) with $a<0$. The steeper the corresponding locus, the faster is the adjustment to the long-run. X is real exports consisting of an own effect (XX) and a cross-effect by a change in FDI (FX). F is real stocks of outward FDI consisting of an own effect (FF) and a cross-effect by a change in exports on FDI (XF). Percentage lines (50%, 80%, 95%) indicate at their intersection with the respective adjustment lines, how long it lasts until the corresponding effect has reached 50%, 80% or 95% of ist long-run value (see Table 3).

Table 1: Determinants of Intra-EU-Stocks of Outward FDI 1988 - 1996

Dynamic Panel Regression Results (First differences; dependent variables are exports and stocks of outward FDI)

Short-Run and Long-Run Effects of a 1% Change in the Associated Determinants on Exports and Stocks of Outward FDI, respectively

	Exports			FDI		
	Short-Run	Long-Run	Theoretically expected sign	Short-Run	Long-Run	Theoretically expected sign
Variable[1]						
Lagged exports[2]	0.539 **)	2.167	+	-0.116	-0.886	?
Lagged FDI[3]	0.001	0.008	?	0.717 **)	3.535	+
Sum of bilateral GDPs	0.578 **)	1.291	+	4.555 **)	16.780	+
Similarity in country size4)	0.316 **)	0.698	+	1.883 **)	6.551	?
Capital/low-skilled ratio[5]	0.177 **)	0.386	?	0.487 **)	1.570	?
High-skilled/low-skilled ratio[5]	-0.147 **)	-0.319	?	-0.250 **)	-0.748	?
Relative corporate tax rates	-0.127 **)	-0.273	-	0.024	0.196	-
Transport cost factor[6]	-0.229 **)	-0.490	-	0.469 **)	1.868	+
Constant	0.040 **)			-0.082 **)		

1) Two-step GMM-estimation results as presented in Egger (2000). -2) The value for the Long-Run of Exports (FDI) represent the cumulative own (cross) effects, i. e. the dynamic multipliers for a respective shock in exports. -3) The value for the Long-Run effects of FDI (Exports) represent the cumulative own (cross) effects, i. e. the dynamic multipliers for a respective shock in FDI. -4) This is an index of bilateral relative size in terms of GDP. It reaches its Minimum at 0 (maximum difference in relative size) and its maximum at 0.5 (equal country size). See Egger (2000) for further details. -5) Absolute difference in bilateral relative factor endowments. See Egger (2000) for further details. -6) Relation between c.i.f. and f.o.b. values in bilateral trade. See Egger (2000).

? = expected sign crucially depends on the theoretical context; **) significant at 5 percent

Source: Egger (2000).

Table 2: EU-Exports, Stocks of Outward FDI and their Determinants: Relations with selected CEECs

	EU[1)]	3 CEECs[1)]	Czech Republic	Hungary	Poland
Average real EU-exports as % of GDP[1)]	1.04	0.22	0.21	0.15	0.30
Average real stocks of EU outward FDI as % GDP[1)2)]	0.50	0.07	0.08	0.09	0.05
Real GDP per capita in prices and US$ 1995	23,253	3,944	5,233	4,442	3,469
Capital labor ratio in prices and US$ 1995	146,451	25,007	29,372	32,734	21,738
Ratio of real stocks of capital to low-enrolled employment	356,615	46,209	75,310	79,856	34,949
Ratio of high-enrolled to low-enrolled employment	2.44	1.65	2.35	2.23	1.42
Transport costs as % of exports for trade with the EU	6.30	10.70	8.37	23.28	6.07

1) Country average. - 2) Only 7 EU-members are reporter (Germany, Finland, France, United Kingdom, Italy, Austria, Sweden).
See footnote 5 for data sources and the construction of variables.

Table 3: Long-Run Effects of Shocks in Different Determinants on Exports and Stocks of Outward FDI of the Average EU Country to Selected CEECs

Changes of Exports and FDI with respect to 1996

	Shock[1]	X	XX	FX	F	FF	XF	Shock[1]	X	XX	FX	F	FF	XF
	Average CEEC							Czech Republic						
Shock in Exports (directly)[2]	3.70	**4.33**	4.33	0.00	**-3.19**	-1.47	-1.72	3.90	**4.57**	4.57	0.00	**-3.36**	-1.55	-1.81
Shock in Stocks of Outward FDI (directly)[3]	5.90	**0.05**	0.01	0.03	**15.64**	15.65	-0.01	5.40	**0.04**	0.01	0.03	**14.26**	14.27	0.00
Shock in Real GDP[4]	4.90	**1.08**	1.06	0.03	**12.41**	12.85	-0.43	3.44	**0.55**	0.53	0.01	**6.17**	6.39	-0.22
Shock in Real Stocks of Capital[5]	6.72	**1.44**	1.42	0.01	**5.99**	6.56	-0.58	3.74	**1.10**	1.09	0.01	**4.56**	5.00	-0.44
Shock in Number of Higher Enrolled People[6]	0.47	**2.11**	2.09	0.01	**5.08**	5.92	-0.84	0.04	**1.18**	1.18	0.01	**2.82**	3.30	-0.48
Shock in Transport Costs[7]	-0.41	**0.23**	0.23	0.00	**-0.87**	-0.78	-0.10	-0.25	**0.02**	0.02	0.00	**-0.07**	-0.06	-0.01
	Hungary							Poland						
Shock in Exports (directly)[2]	5.90	**6.92**	6.92	-0.01	**-5.01**	-2.31	-2.70	2.50	**2.92**	2.93	0.00	**-2.18**	-1.00	-1.17
Shock in Stocks of Outward FDI (directly)[3]	4.60	**0.04**	0.01	0.03	**12.08**	12.08	0.00	9.00	**0.07**	0.02	0.05	**24.42**	24.42	-0.01
Shock in Real GDP[4]	4.23	**0.57**	0.56	0.01	**6.45**	6.68	-0.23	5.70	**2.02**	1.96	0.05	**23.78**	24.58	-0.80
Shock in Real Stocks of Capital[5]	3.47	**1.39**	1.38	0.01	**5.79**	6.34	-0.56	9.20	**1.38**	1.36	0.01	**5.72**	6.27	-0.55
Shock in Number of Higher Enrolled People[6]	0.09	**1.10**	1.09	0.01	**2.62**	3.06	-0.44	0.71	**2.86**	2.85	0.02	**6.96**	8.11	-1.14
Shock in Transport Costs[7]	-0.73	**0.05**	0.05	0.00	**-0.18**	-0.16	-0.02	0.04	**0.35**	0.35	0.00	**-1.31**	-1.17	-0.14

1) Shocks and long-run effects on real exports and stocks of outward FDI are expressed as percentage change of the respective variables with respect to 1996. Import-openness vis-á-vis an average EU country. - 2) Changing EU-exports in a way which closes the gap between the export-openness of the average EU country for intra-EU trade and EU-CEEC trade by 1 percent. - 3) Changing EU-stocks of outward FDI in a way which closes the gap between the export-openness of the average EU member state for intra-EU trade and EU-CEEC trade by 1 percent. - 4) Changing the GDP of the respective CEEC so that the gap in GDP per capita between the EU and the CEECs is closed by 1 percent. - 5) Changing the real stock of capital of the CEECs in a way which closes the gap between the physical-capital-to-low-skilled ratio of the average EU country and the CEECs by 1 percent. - 6) Changing the number of higher enrolled people in the CEECs in a way ehich closes the gap between the high-skilled-to-low-skilled ratio of the average EU country and the CEECs by 1 percent. - 7) Changing the gap in transport costs between intra-EU trade and EU-CEEC trade by 1 percent.