Integration, Globalisation, Technology and Trade Patterns in the EU8

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Abstract

This paper discusses trade developments in EU8 economies: the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia. The objective of the study, based on a panel model estimated with modern techniques of pooled mean group estimation with common correlated effects (Pesaran, 2006), is to identify determinants of new members' exports and imports and assess commonalities (and idiosyncrasies) across countries. Having provided the empirical diagnosis, the paper discusses policy implications of the findings. The effectiveness of Single Market policies at stimulating new member states' trade is assessed as high. The analysis suggests strengthening of EU8 competitiveness policies, with particular focus on technology advancement whose role increases as the globalisation process intensifies. We show that an adequate policy environment – privatisation, restructuring of enterprises, reform of the banking sector, and improving the quality of infrastructure – helps maximise trade gains from liberalisation and technology advancement.

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1. Introduction

Trade patterns have been changing. Integration and globalisation processes have re-shaped international trade relations. The recent decade has witnessed a deepening integration of Central and Eastern European economies into the European market. At the same time, the entrance of the Asian emerging market economies to the global networks of production has re-defined the notion of competitiveness of the European economies.

This paper looks at developments in exports and imports of new members of the EU – the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia – in identifying forces driving Central and Eastern European trade. The paper presents an econometric diagnosis of trade performance and its determinants in an integrating and globalising knowledge-based world and gives a discussion of policy implications of the findings for new member states' competitiveness.

The key contribution of the paper is a quantitative assessment of the impact of liberalisation and technology on trade. Our estimates show that the ongoing (and constantly accelerating) processes of regional and global integration; as well as, innovation have stimulated trade in Central and Eastern Europe significantly. We show that the liberalisation and technology advancements may contribute to an improvement in new member states' current accounts. Speeding up this process is possible through a creation of a favourable policy environment in which exporters and importers operate. The paper attempts to identify a set of microeconomic policies that support trade growth obtained through liberalisation and technology channels. Our paper applies a new panel model with common correlated effects, estimated using a pooled mean group estimation technique. This allows us to test the similarity of trade patterns across countries.

The structure of the paper is the following. Section 2 briefly describes the economic theory behind the empirical model and discusses the dataset. Section 3 presents the econometric model used. Section 4 analyses the empirical results. Section 5 discusses policy implications of the findings, focussing on assessment of effectiveness of the liberalisation policies implemented and future challenges for competitiveness policies. The last section concludes.

2. Determinants of EU8 Trade

In recent decades, new EU member states have become much more open and active on global markets (compare Bussiere et al., 2005). Their export market share increased from 1.5 per cent in 1996 to 2.5 per cent of global trade in 2006. The high, double digit exports growth rates materialised despite strong appreciations of new member states' currencies. While the currency appreciation is an element of the catching up process in new member states, and as an equilibrium phenomenon should not hamper exports growth, there are also other important factors stimulating the trade of the new EU members. We argue that these factors relate to integration, globalisation and technological progress. The objective of the paper is to quantify the role of these factors for new member states' trade and assess how favourable the policy environment was in terms of maximisation of trade gains from liberalisation and technology advancement.

Our empirically testable export and import equations are derived from trade theory – as in Krugman (1995) and Goldstein and Khan (1985). Within an imperfect competition

framework imported goods are imperfect substitutes of goods produced domestically and exported goods are imperfect substitutes of goods produced abroad. Assuming that utility of a representative consumer of domestic and foreign goods can be described by a constant elasticity of substitution (CES) function, first order conditions determining export and import shares are functions of relative prices. To account for changing trade shares in liberalising economies, the standard relationships are augmented with variables mirroring integration, globalisation and technology intensity.

Quantitative measurement of globalisation and integration is complex. Both processes are to some degree qualitative phenomena. The literature suggests various approximants of integration and globalisation, and amongst them indicators of FDI (Barrell and Dees, 2005; Fic et al., 2008), or different measures of non-price competitiveness (Baumann and di Mauro, 2006; di Mauro and Anderton, 2005). Our analysis introduces three measures of trade liberalisation quantifying closer integration of economies both at a European and a global level. A Single Market variable (ESM) captures increased market access as a result of gradual adjustments of new member states' laws to the EU regulations. The variable reflects country *i*'s progress in negotiations with the EU (approximated by a number of economic chapters closed – see Table 1). Accession to the EU is defined as a step dummy variable (taking value 1 in 2004 Q2 and onwards). Trade liberalisation materialising at a global level is described by share of trade of the World Trade Organisation members in total world trade (WTO). The WTO variable accounts for various dates of accession to the WTO by individual members. The speed of the integration processes differed across individual new member states, as is shown in our ESM variables that differ in cross section. The globalisation variable does not vary in cross section mirroring the external character of the globalisation process.

Technology competitiveness is another important determinant of exports. Technology intensity is measured as a ratio of expenditures on research and development to GDP (RD). The literature proposes various technology controls, and among them the share of FDI inflows to GDP. We argue that using our liberalisation and innovation variables enables us to make an important distinction between the two phenomena which would not be possible should we approximate both of them by one control of the share of FDI inflows to GDP (FDI variable would encompass both liberalisation and innovation).

Our import equations are also augmented with tariffs (TAR).

Table 1. Single Market Variable

ESM	Progress in negotiations. Number of chapters closed by:		
	2001	2002	2003
Czech Republic	21	25	31
Estonia	19	28	31
Hungary	22	26	31
Latvia	18	27	31
Lithuania	18	28	31
Poland	18	27	31
Slovakia	20	27	31
Slovenia	21	28	31

Source: European Commission, after Lauresen (2005)

We estimate two cross-country panels in attempting to identify the key driving forces of exports and imports. The analysis is based on quarterly data encompassing the sample 1995-2007. Data on export and import volumes and import and export competitiveness come from NIGEM database. Data on R&D are derived from EUROSTAT and data on tariffs come from UNCTAD.

3. The Panel Model: CCE PMG

Modern panel data techniques enable identification of commonalities across countries not necessarily assuming that the macroeconomic relationships investigated display the same characteristics (Pesaran, 2006). Instead of imposing common dynamics across all countries, which may result in severe biases (Pesaran and Smith, 1995), our country equations are estimated as a system of individual regressions. We test whether common parameters may be imposed trying to uncover the largest defendable set of commonalities. As there can be common factors omitted from the specification, to reduce bias that would result from omitted variables, we use common correlated effects estimator. Our trade panel models are thus estimated using pooled mean group (PMG) estimation accounting for common correlated effects (CCE) (Pesaran, 2006, further extensions of the model and related issues can be found in Kapatenios et al., 2006; Pesaran and Yamagata, 2008; Breitung and Pesaran, 2008; Binder et al., 2005; Pesaran, 2007; Pesaran et al., 1999; Pesaran and Smith, 1995).

Let y_{it} be the observation on the i-th cross-country variable (export or import volume) for $i = 1, 2, \ldots, N$ where N denotes the number of countries (EU8) and $t = 1, 2, \ldots, T$ (the sample covers quarterly data of the period 1997-2007). The behaviour of the y_{it} can be described by the following error correction model (Pesaran et al., 1999; Pesaran, 2006):

$$\Delta y_{i,t} = \boldsymbol{\alpha}'_i \mathbf{d}_t + \phi_i (y_{i,t-1} + \boldsymbol{\beta}'_i \mathbf{x}_{i,t}) + \sum_{j=1}^{p} \lambda_{i,j} \Delta y_{i,t-j} + \sum_{j=1}^{q} \boldsymbol{\delta}_{i,j} \Delta \mathbf{x}_{i,t-j} + \varepsilon_{i,t} \quad (1)$$

where $\mathbf{d}_t$ is an n x 1 vector of observed common effects (including deterministics) and $\mathbf{x}_{it}$ is a k x 1 vector of country-specific exogenous variables. Further, it is assumed that error $\varepsilon_{i,t}$ has the multifactor structure:

$$\varepsilon_{i,t} = \boldsymbol{\gamma}'_i \mathbf{f}_t + \xi_{i,t} \quad (2)$$

and $\mathbf{f}_t$ denotes an m x 1 vector of unobserved common effects (m does not have to be known a priori), and $\xi_{i,t}$ is an individual-specific error distributed independently of ($\mathbf{d}_t$, $\mathbf{x}_{it}$). To allow for possible correlation between $\mathbf{f}_t$ and ($\mathbf{d}_t$, $\mathbf{x}_{it}$) the following model for the country-specific regressors is adopted:

$$\mathbf{x}_{i,t} = \mathbf{A}^T_i \mathbf{d}_t + \boldsymbol{\Gamma}^T_i \mathbf{f}_t + \boldsymbol{\upsilon}_{i,t} \quad (3)$$

in which $\mathbf{A}_i$ and $\boldsymbol{\Gamma}_i$ are n x 1 and m x 1 factor loading matrices with fixed components and $\boldsymbol{\upsilon}_{it}$ are the specific components of $\mathbf{x}_{it}$ distributed independently of the common effects across i. Both $\mathbf{x}_{it}$ and $\mathbf{y}_{it}$ are non-stationary, and one or more of the common effects in $\mathbf{d}_t$ or $\mathbf{f}_t$ have unit roots and/or deterministic trends.

The system of country equations with common correlated effects (CCE) can be estimated with the help of auxiliary regressions; where the right-hand variables are augmented with cross-country averages of the dependent variable and the individual specific regressors:

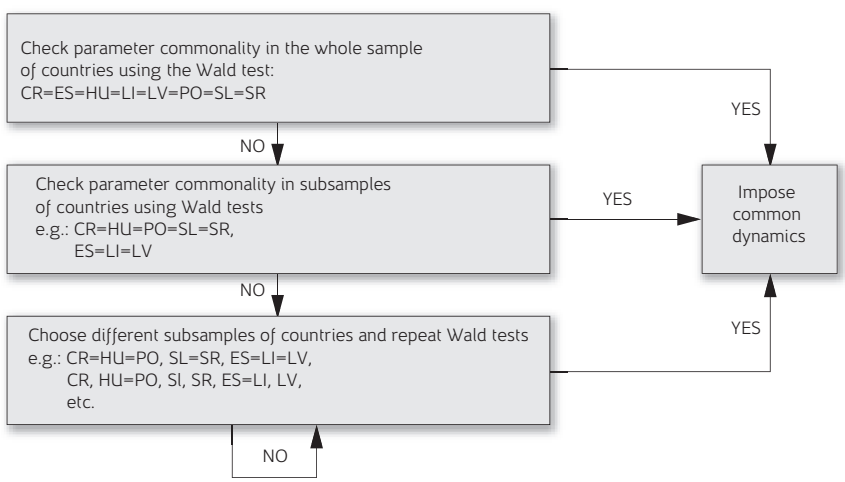
$$\Delta y_{i,t} = \boldsymbol{\alpha}'_i \mathbf{d}_t + \phi_i (y_{i,t-1} + \boldsymbol{\beta}'_i \mathbf{x}_{i,t}) + \sum_{j=1}^{p} \lambda_{i,j} \Delta y_{i,t-j} + \sum_{j=1}^{q} \boldsymbol{\delta}_{i,j} \Delta \mathbf{x}_{i,t-j} + \psi \Delta y^{avg}{}_t + \sum_{k=1}^{K} \psi_k \Delta x_k{}^{avg}{}_t + \xi_{i,t} \qquad (4)$$

The common correlated effects' (CCE) estimators of parameters of interest are shown (Pesaran, 2006) to be unbiased and consistent. The system of country specific equations is estimated in keeping with the pooled mean group (PMG) estimation philosophy. The objective of the pooled mean group estimation is to identify a subset of long run coefficients that are the same across countries, allowing other coefficients (describing short-run dynamics) to differ (Pesaran et al., 1999). Restricting the long run coefficients, a priori, may produce biased estimates; as the homogeneity assumption may not be statistically – or economically - justifiable. Thus, before imposing common restrictions on the long run parameters, we apply a sequence of Wald tests (one at a time, see also Barrell et al., 2007), verifying whether the long-run commonality hypotheses are supported by the data. Should all tests pass, our set of long-run parameters is identical across all countries:

$$\hat{\boldsymbol{\beta}}_i = \hat{\boldsymbol{\beta}} \qquad (5)$$

(and our $\hat{\boldsymbol{\beta}}$ estimates would be the same as the ones obtained in PMG estimation). An advantage of our approach, is that in case of significant long-term idiosyncracies, we avoid biases which may severely blur our understanding of macroeconomic mechanisms in play. We impose only such commonalities that are quantitatively defendable. Graphical illustration of our testing algorithm based on Wald tests is shown in Figure 1.

Figure 1. Wald Test Algorithm



Source: Authors' illustration

4. Empirical Results

The country *i* export equation is as follows:

$$\Delta\log(X_{i,t}) = ect_i\,(\log(X_{i,t-1} - \alpha_{0,i} - \alpha_{1,i}\log(S_{i,t-1}) - \alpha_{2,i}\log(RPX_{i,t-1}) - \alpha_{3,i}ESM_{i,t-1} + \\ - \alpha_{4,i}EU_{i,t-1} - \alpha_{5,i}WTO_{t-1} - \alpha_{6,i}RD_{i,t-1}) + \sum_j \beta_{i,j}\,dynamics_{i,t-j} + \xi_{i,t} \qquad (6)$$

where *X* denotes export volume of country *i*, *S* - its foreign demand measured as a sum of imports of individual new member states' trading partners, *RPX* – export competitiveness (a ratio of export prices to a weighted average of competitors' export prices) and *ESM, EU* and *WTO* are integration and globalisation variables, and *RD* denotes expenditures on research and development expressed as a percentage of GDP.

To obtain CCE PMG estimators, we augment the above equations with cross-country averages of dependent and exogenous variables and follow the modified PMG procedure described in the previous section. Estimates of parameters of the above equation are shown in Table 2. The long-term demand elasticity of exports is assumed to be equal to 1 (which means that we may interpret the export equation in terms of Armington's share equation). Results show that long run elasticities, as well as error correction terms, can be regarded as identical across all countries – see results of Wald tests in Table 3.[1] In almost all cases the Wald tests suggest that the parameters can be assumed equal (the only exception constitutes the Slovak response to the globalisation process).

The long run price elasticity of exports in the new members amounts to 0.47 and is comparable to export competitiveness elasticities observed in the old member states (which fluctuate around 0.5, see Barrell et al., 2007).

A vital determinant of exports of the EU8 economies has been the process of European integration. The consecutive changes in law that started in 1999 and reflected the gradual introduction of the single market capped with the accession to the EU in 2004 stimulated exports significantly. The effects of integration were comparable across countries, except for Estonia and Slovakia, for which the impact of the gradual implementation of single market policies ESM was not statistically significant from zero. For the remaining countries, the effects of the EU accession (EU) were somewhat stronger than the effects of the implementation of single market policies (ESM).

The gradual liberalising of the global economy (WTO) has had effects on exports in the larger countries: Poland, Hungary, the Czech Republic and Slovakia. Investing in research and development has stimulated exports of Hungary, the Czech Republic and Estonia. As these countries have spent relatively more on R&D than other economies of the region and the R&D expenditures constitute one of the elements of the quality of business environment, more favourable conditions for foreign direct investments could have been created. This has translated into higher exports. In other countries the effects of R&D did not prove to be significant over the analysed sample.

[1] We start with estimating a system of country-specific equations (allowing all parameters to differ). Then, on the basis of Wald statistics we identify the scale of commonalities in new member states' exports. Restrictions on parameters are imposed one at a time and the objective is to identify as many commonalities as possible.

A common speed of adjustment to equilibrium (as measured by error correction terms) can be imposed across countries. Following an external shock export, volumes of new member states adjust to their long term equilibria after 6-7 quarters.

Our import equation for country i is described by:

$$\Delta\log(M_{i,t}) = ect_i\,(\log(M_{i,t-1} - \alpha_{0,i} - \alpha_{1,i}\log(TFE_{i,t-1}) - \alpha_{2,i}\log(RPM_{i,t-1}) + \\ -\alpha_{3,i}ESM_{i,t-1} - \alpha_{4,i}EU_{i,t-1} - \alpha_{5,i}WTO_{t-1} - \alpha_{6,i}TAR_{i,t-1}) + \sum_j \beta_{i,j}\,dynamics_{i,t-j} + \xi_{i,t} \qquad (7)$$

with M_i denoting import volume of country *i*, *TFE* – total final expenditures, *RPM* – relative prices (ratio of import deflator to GDP deflator), *ESM, EU* and *WTO* correspond to European and global trade liberalisation, and *TAR* denotes tariffs.

Estimation results are presented in Table 4. The long-run elasticities, as well as error correction terms, can be assessed as equal across all countries. Results of the Wald tests are shown in Table 5 – the tests pass in all cases.

The common elasticity of imports in respect to total final expenditures remains relatively close to 1. The long run elasticity of import competitiveness of around 0.43, is comparable to price elasticities observed in the old members (see Barrell et al., 2007). Over the sample period, the European integration process contributed to import expansion in most of the new member states. Its scale was, however, weaker than in the case of exports. The analysis of the period 1995-2007 does not reveal any significance of globalisation for new member states' imports. The globalisation process should, however, be assessed in view of future rather than past phenomena[2]. Our analysis also shows that reductions in tariffs supported imports of Poland, Hungary and the Czech Republic.

Table 2. Exports – Panel Estimates

	ECT	t-Stat.	RPX	t-Stat.	ESM	t-Stat.	EU	t-Stat.	WTO	t-Stat.	RD	t-Stat.	DS	t-Stat.	DRPX	t-Stat.
CR	-0.15	-7.62	-0.47	-3.93	0.09	3.57	0.10	5.47	1.09	1.79	0.32	2.80	0.83	3		
ES	-0.15	-7.62	-0.47	-3.93			0.10	5.47			0.32	2.80	0.72	2.33	-0.26	-1.75
HU	-0.15	-7.62	-0.47	-3.93	0.09	3.57	0.10	5.47	1.09	1.79	0.32	2.80	0.83	5.28		
LI	-0.15	-7.62	-0.47	-3.93	0.09	3.57	0.10	5.47								
LV	-0.15	-7.62	-0.47	-3.93	0.09	3.57	0.10	5.47					0.62	2.59	-0.79	-8.78
PO	-0.15	-7.62	-0.47	-3.93	0.09	3.57	0.10	5.47	1.09	1.79					-0.71	-11.35
SL	-0.15	-7.62	-0.47	-3.93	0.09	3.57	0.10	5.47							-0.25	-2.43
SR	-0.15	-7.62	-0.47	-3.93			0.10	5.47	4.02	113.07					-0.26	-4.07

Note: Empty cells correspond to insignificant variables
Source: Authors' calculations

[2] Future accession of Russia to the WTO (if not averted by political turbulences) would probably constitute one of the factors positively affecting Central European imports and exports.

Table 3. Exports – Wald Tests

	Country coefficients	Wald test	Chi Square	Probability
RPX	cr≅es≅hu≅li≅lv≅po≅sl≅sr	pass	11.9	0.1
ESM	cr≅hu≅li≅lv≅po≅sl	pass	4.15	0.53
EU	cr≅es≅hu≅li≅lv≅po≅sl≅sr	pass	10.62	0.16
WTO	cr≅hu≅po≅sr	fail	76.29	0
	cr≅hu≅po	pass	3.83	0.15
RD	cr≅es≅hu	pass	5.54	0.06
ECT	cr≅es≅hu≅li≅lv≅po≅sl≅sr	pass	12.33	0.09

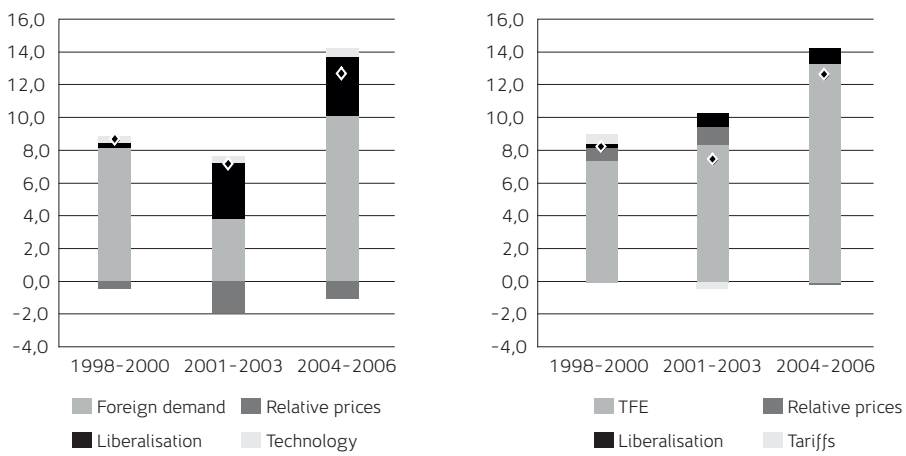
Note: Tests pass at the probability level of 0.05
Source: Authors' calculations

The speed of adjustment to equilibrium after a shock is similar to that observed in the case of exports. Exports tend to adjust to equilibrium slightly faster than imports. Having experienced a shock, import volumes reach their long term paths after about 7 quarters.

The relative importance of particular trade determinants varies over time and across countries. Figure 2 illustrates a decomposition of export and import annual growth rates into the following components: demand, competitiveness, liberalisation (encompassing both integration and globalisation processes), technology intensity and tariffs.

Both foreign and domestic demands are important drivers of new member states' trade. The substantial role of total final expenditures for generating imports may reflect the gradual improvement of the material status of the Central and Eastern Europeans. Despite the relatively strong appreciations of new member states' currencies that materialised over the period analysed, the impact of import and export prices on foreign trade volumes remained rather limited. This may have resulted from the equilibrium character of the real appreciation.

Figure 2. Decomposition of Export and Import Growth



Source: Authors' illustration

Trade liberalisation contributed to exports growth considerably. Its impact on imports was less strong. Technology intensity did not prove to be a decisive factor helping new member states' exports to gain shares in foreign markets over the period 1995-2007. The larger countries of Central Europe seized on liberalisation more than the small Baltic economies. Over the last decade around a 30 per cent increase in Polish, Hungarian, Czech and Slovak exports materialised as a result of closer integration of the EU8 economies with the Western European markets. In annualised terms the liberalisation added about 3.4 percentage points to exports' growth over 2001-2003 and 3.5 percentage points on average over 2004-2006. Increases in imports were somewhat smaller and amounted to 0.8 and 0.9 percentage points on average, over analogous periods. Across countries, the impact of liberalisation on export volumes is highly correlated with the impact of liberalisation on import volumes.

Table 4. Imports – Panel Estimates

	ECT	t-Stat.	TFE	t-Stat.	RPM	t-Stat.	ESM	t-Stat.	EU	t-Stat.	TAR	t-Stat.	DTFE	t-Stat.	DRPM	t-Stat.
CR	-0.14	-8.85	1.06	29.23	-0.43	-6.79	0.07	4.65			-0.02	-4.63	1.98	26.99	-0.22	-3.98
ES	-0.14	-8.85	1.06	29.23	-0.43	-6.79							1.57	28.81	-0.14	-1.84
HU	-0.14	-8.85	1.06	29.23	-0.43	-6.79			0.07	2.67	-0.02	-4.63			-0.74	-4.49
LI	-0.14	-8.85	1.06	29.23	-0.43	-6.79			0.07	2.67			2.11	22.61	-0.18	-2.4
LV	-0.14	-8.85	1.06	29.23	-0.43	-6.79							2.28	37.9		
PO	-0.14	-8.85	1.06	29.23	-0.43	-6.79	0.07	4.65			-0.02	-4.63	2.73	20.05	-0.26	-5.05
SL	-0.14	-8.85	1.06	29.23	-0.43	-6.79	0.07	4.65					1.91	35.58		
SR	-0.14	-8.85	1.06	29.23	-0.43	-6.79	0.07	4.65								

Note: Empty cells correspond to insignificant variables
Source: Authors' calculations

Table 5. Imports – Wald Tests

	Country coefficients	Wald test	Chi Square	Probability
TFE	cr≅es≅hu≅li≅lv≅po≅sl≅sr	pass	10.03	0.17
RPX	cr≅es≅hu≅li≅lv≅po≅sl≅sr	pass	8.3	0.31
ESM	cr≅po≅sl≅sr	pass	5.2	0.16
EU	hu≅li	pass	0.92	0.32
TAR	cr≅hu≅po	pass	3.54	0.17
ECT	cr≅es≅hu≅li≅lv≅po≅sl≅sr	pass	5.36	0.61

Note: Tests pass at the probability level of 0.05
Source: Authors' calculations

5. Policy Implications

The role of liberalisation factors for new member states' trade began to be visible at the end of the 1990s when single market agreements started coming into force. The removal of

barriers of movements of goods and capital enabled the integration of the Central and Eastern European countries into EU-based networks of production and distribution, contributing to increased specialisation in production (Kaminski and Ng, 2005). Improving new member states' exports more than imports, the liberalisation added positively to net trade. The scale of benefits from liberalisation varies across countries, with larger countries gaining relatively more than smaller economies. The process of integration was accompanied by a greater dispersion of industries with low skill industries concentrated in low wage countries of the EU. At the same time high technology industries were located in the core of Europe, with centres of RD concentration being the major attractor (Barrell et al., 2003).

The effects of liberalisation and technological progress for new member states' trade may be supported by structural and institutional policies. In particular we investigate effects of privatisation, enterprises reform, competition policy, banking sector reform, and infrastructure reform as elements of the policy environment maximising export gains from liberalisation and innovation.

To assess the role of complementary structural policies for the effectiveness of liberalisation, we apply a two level modelling strategy. First, on the basis of the panel model, we compute the value of exports benefits gained in regards to liberalisation and innovation by individual new member states (see Table 2). Then, we regress the liberalisation- and innovation-driven export gains against structural policy indicators. To quantify structural policies in new member states we use EBRD transition indicators: privatisation index, indicator of enterprises and banking sector reforms, competition policy index and index of infrastructure reforms. The privatisation index encompasses both large-scale, as well as small scale privatisation. The enterprises restructuring indicator assesses the quality of corporate governance. The competition policy index measures entry restrictions and abuse of market power. The banking reform quantifies the degree of coherency of domestic banking sector regulations with BIS standards. The infrastructure reform index is calculated as the average of five infrastructure reform indicators measuring the level of development of the following sectors: electric power, railways, roads, telecommunications, water and waste water. We construct two panel models (for liberalisation and innovation gains in exports) and estimate them with the cross section SUR method.

Results of the estimation (for both liberalisation and innovation) are shown in Table 6.

Table 6. Policy Environment

	Privatisation	Banking sector reform	Enterprises reform	Infrastructure
Liberalisation	0.39 (3.46)	0.34 (6.95)		0.46 (4.82)
Innovation	1.28 (14.35)		0.26 (15.46)	

Source: Authors' calculations

The estimation shows that export opportunities created by liberalisation and technology advancement may be better exploited if accompanied by an adequate structural policy. Privatisation, infrastructure improvement and reform of the banking sector allow for maximisation of gains from liberalisation. Privatisation and enterprises restructuring may support exports of high tech products (with the former factor playing the crucial role), there is a positive correlation between the share of high tech products in a country's total exports and its expenditures on research and development expressed in percent of GDP.

Summarising, we have shown that the introduction of the single market has been a success and the new member states seem to have exploited opportunities of increasing their exports and gaining shares in European markets well (compare also to trade effects of bilateral trade agreements between the EU15 and CEE4, estimated by Caporale et al., 2009). Further integration of the new member states with the old EU countries will ensure at the moment of accession to the euro area and will boost trade even more (see expected gain estimates by Karam et al. (2007) for the new member states or ex post estimates for the current euro area members by Badinger and Breuss (2009)).

As distinct from relatively well exploited single market opportunities, the globalisation process has had less impact on new member states' trade over the last decade. As the process of globalisation evolves further, its role will increase. The exploitation of globalisation opportunities will, however, depend on whether the EU8 countries remain competitive on global markets. Globalisation changes relative weights of price and technology competitiveness in the countries' overall export attractiveness. The sustainable competitiveness of the new member states in the era of globalisation will require technological advancement and the ability to move up in the value added chain.

At present the share of high technology exports in total exports of the new member states is lower than the EU27 average (the only exception is Hungary, for data see Eurostat). This may result from their industry structure (with larger shares of low-technology industries creating the value added) and insufficient investments in research and development activities. Increasing R&D expenditures should improve new member states' technology competitiveness. Our estimates suggest that Hungary, the Czech Republic and Estonia may have already started to benefit from investments in knowledge intensive industries. In the majority of the new EU members, however, policies aimed at technological advancement do not envisage sufficient increases in public spending dedicated to research and development activities, neither seems to provide effective incentives for the private sector to invest in knowledge and new technologies. Increasing expenditures on R&D would be one of the elements supporting new member states' competitiveness.

6. Conclusions

This paper analyses determinants of exports and imports of eight new member states of the EU. Using panel cointegration techniques, we identify factors significant for the long term trade performance. In particular, we determine the role of regional integration and globalisation processes for exports and imports developments. Our results suggest that liberalisation has had a positive influence on new members' trade. In recent years – over the period 2004-2007 – liberalisation was responsible for about 3.5 percentage points of the average annual new member states' export growth and about 1 percentage point of the average annual import growth, contributing to improvement in new member states' current accounts. The larger countries have gained relatively more from liberalisation than the smaller member states. This may have resulted from the proximity to the European market and adequate quality of the labour force, attracting foreign direct investments. So far the effects of innovation on new member states trade growth have been relatively small, materialising in only three out of eight countries that joined the EU in 2004. Over 2004-2007 the technology advancement generated about 0.5 percentage point to the average new member states' export growth.

Long term prospects for new member states competitiveness and trade growth depend on their ability to adjust to a changing global environment and to move up in the value added chain. We show that an adequate policy environment – privatisation, restructuring of enterprises, reform of the banking sector, and improving the quality of infrastructure – may help to maximise trade gains from liberalisation and technology advancement.

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