A comparative study of Central Eastern European Countries' export performance using disaggregate data: A constant market share analysis

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Abstract

Central Eastern European Countries (CEECs), like others European Union countries, went through an economic process of transformation during the 1990s. This paper presents a general overview of the structural trade patterns of CEECs and their main trading partners during the period 1995-2005. It examines trade patterns, analysing the extent to which economic transformation has occurred. A constant market share analysis (CMSA) is used to examine CEECs relative export performance. This analysis is an accounting method for decomposition ex-post, a country's aggregate export share development. The methodology developed by Milana (1988) has been followed because it aims at finding a satisfactory solution to the problems encountered by the traditional approaches to CMSA (Richardson, 1971a and 1971b) given the recent developments in index number theory. According to this new formulation of the CMSA, the percentage changes in the aggregated export market share of a country, defined as the percentage ratio between the

country's exports and total world exports, have been disaggregated into four components: competitiveness effect, market effect, product effect and residual effect. There are ten SITC commodity groups and ten market groups specified.

This paper focuses on the period between 1995 and 2005, looking at "snapshots" of CEECs export structures in each year, and how these structures have changed over the 10-year period covered. One of the aims is to identify the extent to which CEECs' pattern of specialisation may have played a significant role in determining their relative export performance.

An interesting result of the paper suggests that the overall export performance of the CEECs during the period studied has been mainly influenced by a favourable competitiveness effect. The geographical specialization has played the main negative role in the case of the CEECs, but the product effect was also negative. Meanwhile, the contribution of the residual effect was slightly positive.

The geographical specialization has also played a negative role for the main European trading partners of the CEECs (Germany, France, the Netherlands, UK and Italy). Indeed, the main reason behind their loss in export market share was related to the negative contribution of the market effect. This was due to the high degree of intra-EU15 trade in a period during which the rate of economic growth in the EU15 was lower than total world growth rate.

Overall, the results provide an indication of changes in the CEECs' economies over the last 15 years, and offer an insight into the key question facing today's economic policy makers: where to next?

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European Union and Central Eastern European Countries' Trade Performance: an *Overview*

1. Introduction

Over the period 1995-2005, Central Eastern European Countries (CEECs)[2] experienced rapid trade integration with the European Union (EU15) area, which had two major implications. First, from a EU15 area perspective, the share of these countries in extra-EU15 area trade[3] has almost increased 50% between 1995 and 2005.[4] Taken as an aggregate, the CEE countries in 2005 represented the EU15 area's third largest trading partner behind North America Free Trade Agreement (NAFTA) trade block and the Asia Newly Industrialized Countries (NIC). Second, from the perspective of these countries, the EU15 represents the most important trading partner.

The fact that trade integration between CEE transition countries and the more mature economies of the EU15 area has increased in the 1990s should not, by itself, come as a surprise. The geographical proximity of these countries with the EU15 area, their robust economic growth rates, as well as the large economic weight of the EU15 area are likely factors that can account for this development. In addition, the transition process itself – combined with the removal of trade hurdles and accession to the European Union – most certainly further enhanced trade between these two groups of countries.

2. EU15 area trade with CEE countries: some facts

2.1 The CEE countries' perspective

For the Central and Eastern European Countries, the EU15 area represents the most important trading partner. In the case of Czech Republic, Hungary, Poland, Estonia and Slovenia, for instance, trade with the EU15 area in 2005


[2] The country list is presented in the data Appendix.
[3] Extra-EU15 area trade refers in this paper to the sum of total EU15 area exports and imports, excluding trade between EU15 area countries (referred to here as intra-EU15 area trade).
[4] This study focus on the period 1995-2005 as data for CEE countries before 1995 is scarce and volatile.

amounts to nearly 60% and for Romania 62% of their total trade respectively (see Chart 1).

Chart 1: The Importance of the EU15 area for CEE countries
Share of trade flows with the EU15 area as a percentage of total trade flows (exports + imports)
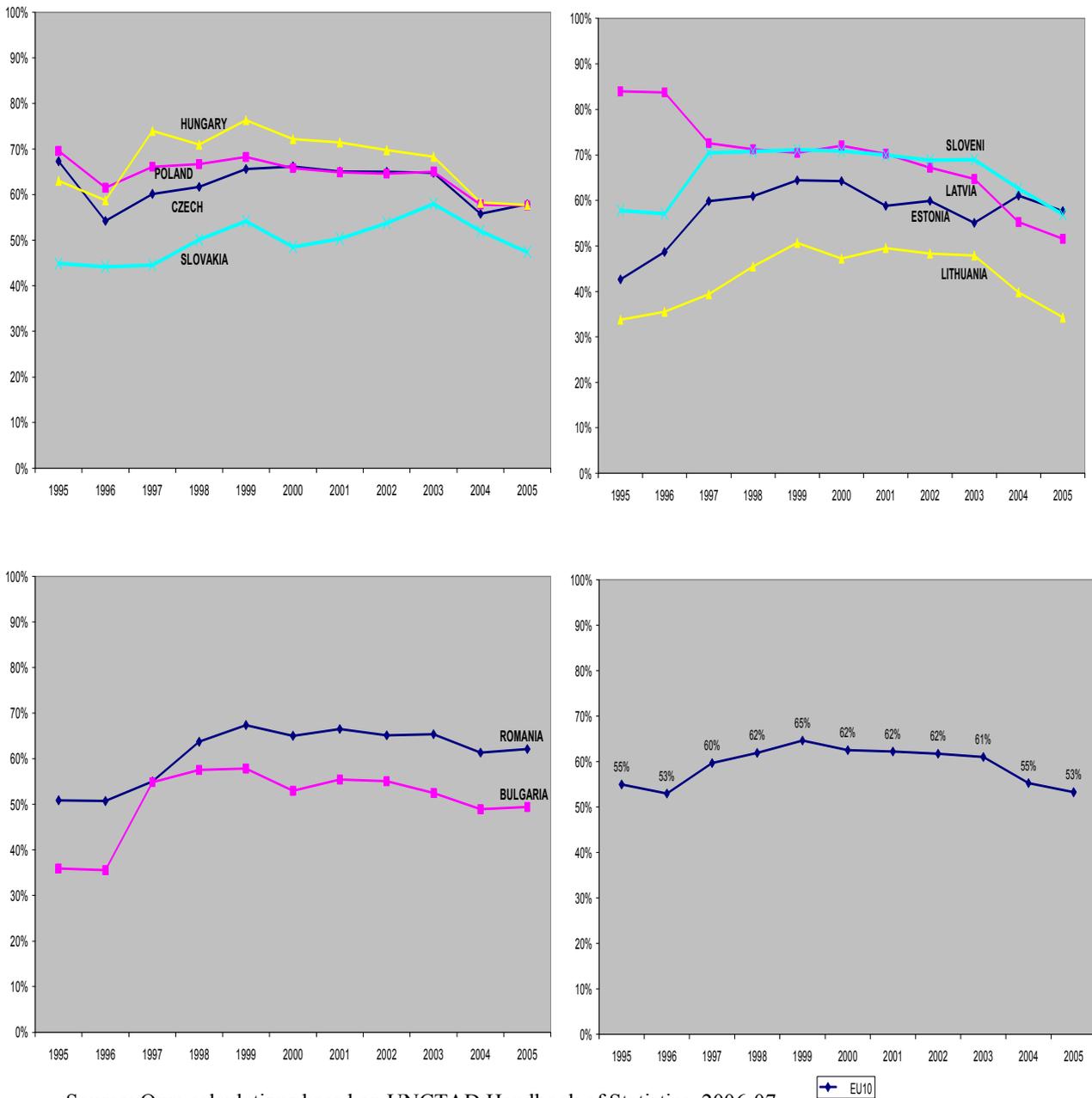
Source: Own calculations based on UNCTAD Handbook of Statistics, 2006-07

In the case of Bulgaria, Estonia and Slovakia, trade with the EU15 area started from a relatively low level in 1995 (35%, 42% and 44% respectively) and quickly increased in the following ten years. The magnitude of the increase was also high for Romania, whose trade share with the EU15 area rose from 50% to 62% over the same period. For the countries that were already trading a lot with the EU15 area in 1995 (like Slovenia, Latvia, Czech Republic, Hungary and Poland), the share of the EU15 area seems to have remained broadly stable over the past ten years. In the particular case of Hungary, the share of the EU15 area in foreign trade rose above 75% in the late 1990s but abated somewhat since then. The pattern observed on Chart 1 would therefore suggest that the share of the EU15 area external trade in the above mentioned countries tends to converge towards a similar level. However, there is a exemption to this general pattern. In the Baltic country of Lithuania, for example, the share of the EU15 area in foreign trade is significantly lower (around 34%) and seems to remain stable at that level.

The large share of EU15 area trade in the CEE countries reflects predominantly the high weight of Germany (See Table 7 in the Appendix).[5] Moreover, trade among the CEE countries is still large, particularly for the Czech Republic and Slovakia, which may be partially due to their common history. Also, the share of Commonwealth Independent States in the CEE countries remains high (10.86% on average, which is higher than that of the UK, the USA or even the China), reflecting the importance of distance and cultural links among the determinants of trade.

The strong concentration of these countries' foreign trade with the EU15 area raises the question whether the trade structure of some CEE countries is already "too heavily" oriented towards the EU15 area. Such a hypothesis appears to be also supported by the patterns of the Czech Republic and Hungary, which experienced a slight reduction of trade shares with the EU15 in recent years.

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[5] For instance, Germany accounts on average for 17.95% of total trade of the CEE countries, against 4.75% for France and 6.90% for Italy.

2.2   The EU15 area perspective

From a EU15 area perspective, the increase in the market shares[6] of the Central and Eastern European countries in the ten-year period of study (and possibly more recently with China) provided an unprecedented example of integration dynamics, while the share of Japan continuously decreased (see Chart 2). Between 1995 and 2005, the share of the CEE countries in extra-EU15 area trade has almost increased 50 per cent, from 8.52% to 12.27%.

Chart 2: Share of key EU15 area trading partners in EU15 area trade
Percentage of total extra-EU-15 area trade
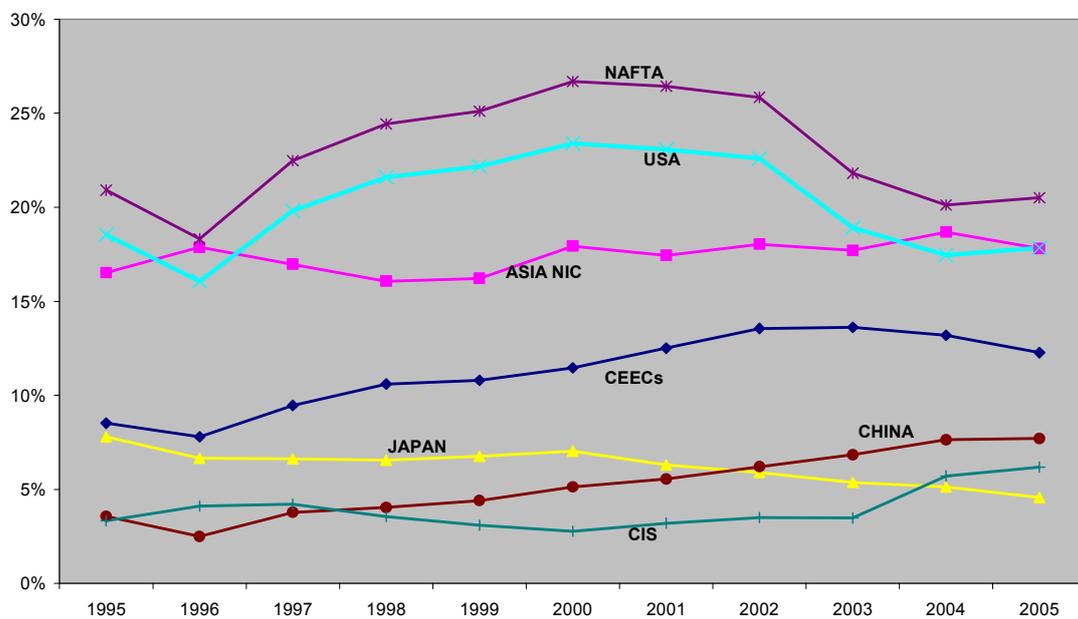
Source: Own calculations based on UNCTAD Handbook of Statistics, 2006-07

Note: Acronyms refer to North America Free Trade Area (NAFTA), Asian New Industrializes Countries (NIC), Central and Eastern European Countries (CEECs) and Commonwealth of Independent States (CIS), see definition of country aggregates in data Appendix.

Taken together, the Central Eastern European countries as a group, while being individually small trading partners of the EU15 area, are a fairly important trading partner of the EU15 area. In 2005, the share of the region as a whole in extra-EU15 area trade was

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[6] The term market shares in this section refers to the percentage of trade (imports + exports) with a particular country relative to total trade.

equal to 12.27%. This is almost 70% as much as the United States (17.84%) and significantly more than Japan (4.56%), China (7.70%), Africa (9.07%) or CIS (6.18%), but still significantly less than the Asian NIC (17.81%). Among the CEE countries, the market shares of Poland, the Czech Republic and Hungary in the EU15 area are between 2-3%, while shares of the other CEE countries are commonly below 1% (Chart 3). Among the latest newcomers, Romania accounts for the largest share (above 1%), followed by Bulgaria (0.4%).

Chart 3: Share of CEE countries in EU15 area trade
Percentage of total extra-EU-15 area trade
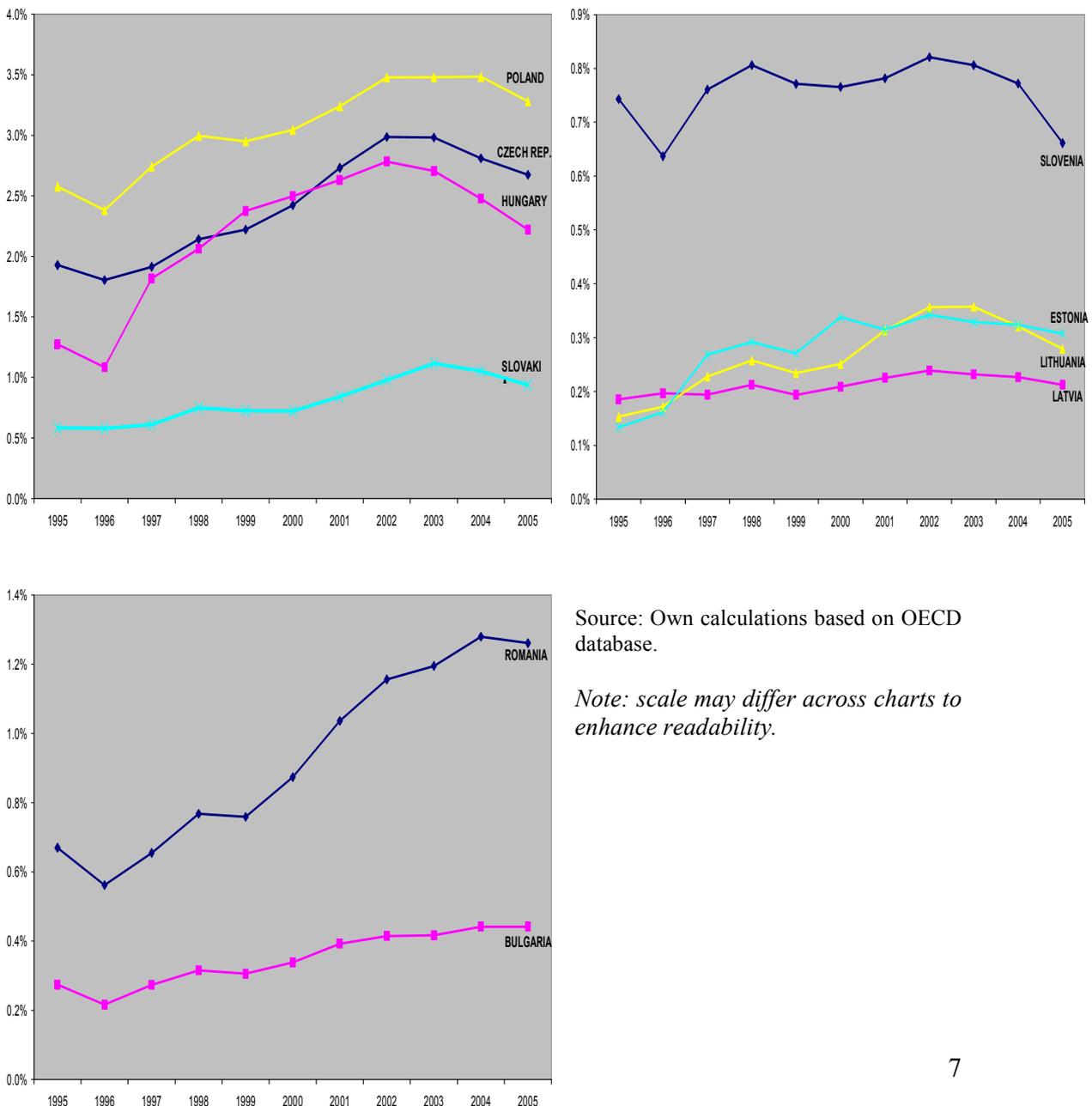
Source: Own calculations based on OECD database.

Note: scale may differ across charts to enhance readability.

Looking at developments in individual EU15 area countries (Chart 4), trade with the Cee countries rose particularly strongly for Germany, where the share of these countries together is now the highest (the share of these countries taken as an aggregate is already comparable with the share of France and higher than that of the United States). By contrast, the share of the CEE countries in Italy and France is lower than for Germany. For France and Italy, Germany is still the most important trading partner. In the case of Spain, it is remarkable that trade with other EU15 countries, the CEECs and Asian NICs rose markedly after Spain's EU accession in the second half of the 1980s while, correspondingly, trade with the United States and Latin America declined.

Chart 4: Share of key trading partners for major EU15 area countries
Percentage of total trade

Italy

Spain
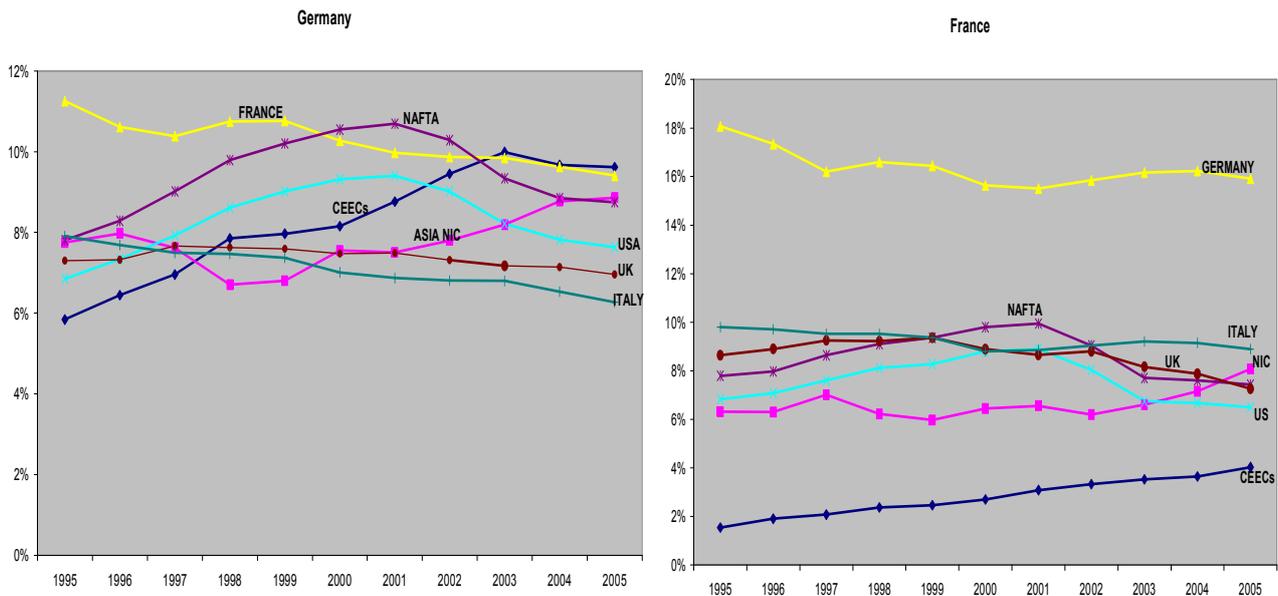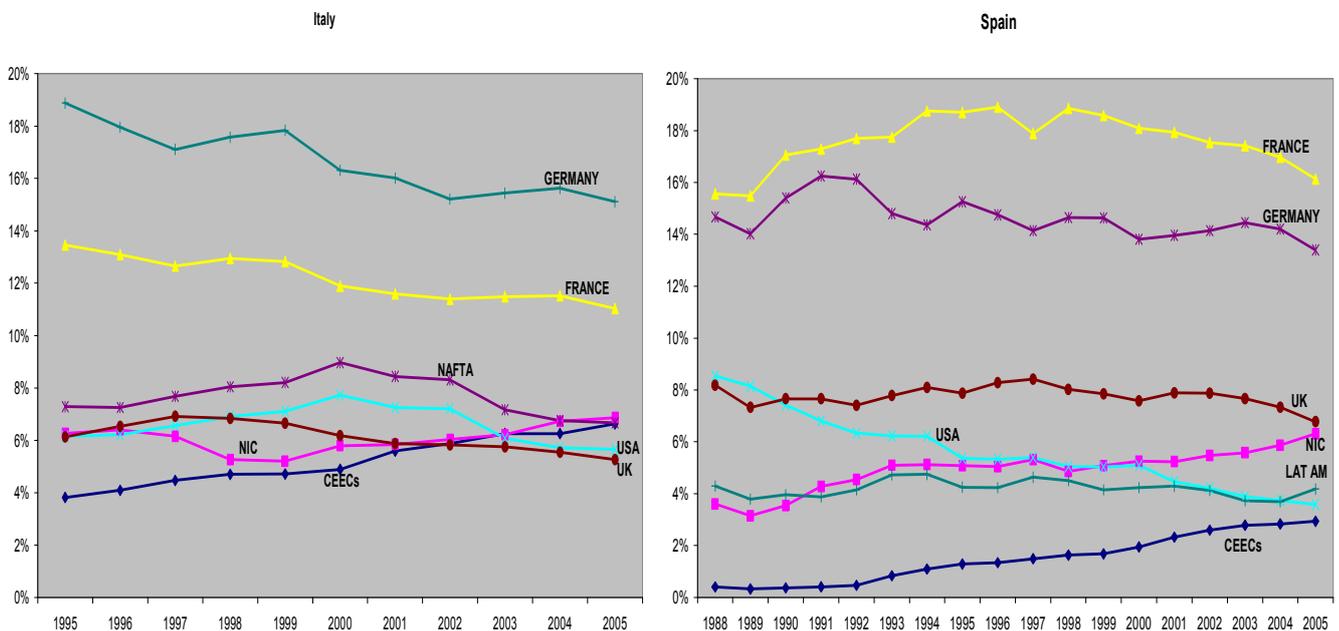
Source: Own calculations based on OECD database.
Note: scale may differ across charts to enhance readability.

Taken together, the facts on trade between the EU15 area and the CEE countries show significant adjustments over the past decade (see Djankov and Hoekman, 1997). These countries gained dynamically market shares in the EU15 and vice versa. This raises the question whether the CEE countries gained market shares, in the last decade, is due to the changes in their trade structures, more specific markets and products structures, or whether competitiveness played an important role in these changes. In the following, this is assessed quantitatively based on a Constant Market Share Analysis model, which explains trade structure between countries or regions as a function of other economic fundamentals.

3 Central Eastern European Countries' export performance: A constant market share analysis

3.1 Data and methodology

A constant market share analysis (CMSA)[7] is used to examine CEECs relative export performance. This analysis is an accounting method for decomposition ex-post, a country's aggregate export share development. The methodology developed by Milana (1988) has been followed because it aims at finding a satisfactory solution to the problems encountered by the traditional approaches to CMSA (Richardson, 1971a and 1971b) given the recent developments in index number theory. According to this new formulation of the CMSA, the percentage changes in the aggregated export market share of a country, defined as the percentage ratio between the country's exports and total world exports, have been disaggregated into four components: competitiveness effect, market effects, product effects and residual effects. The CMSA model can be expressed in a schematic representation as shown in Figure 1.

Figure 1. Schematic representation of the CMSA model.
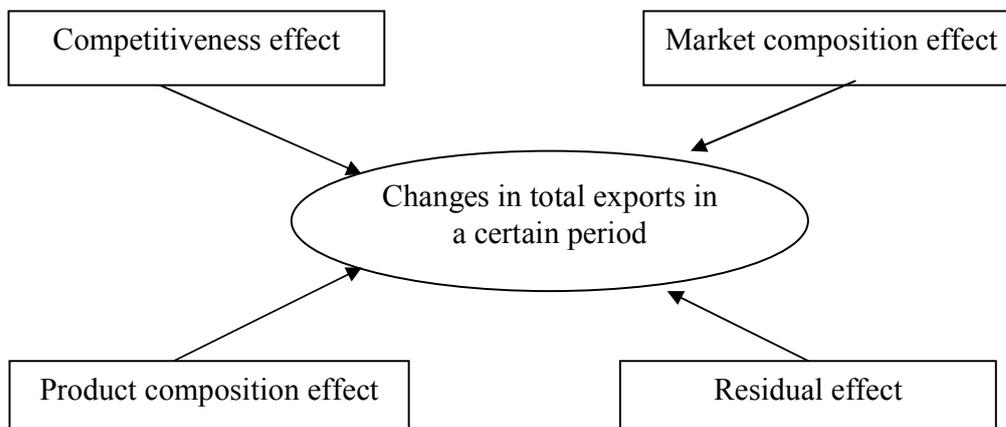
A *competitiveness effect* reveals the capacity of a country to increase its market share due to competitiveness factors only, independently of structural developments in the market or in the product trade pattern.

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[7] See Appendix 1 for more details.

A *product effect* reveals whether a country has concentrated on the export of commodities for which markets have been expanding rapidly, or on commodities for which markets have been expanding less rapidly. This effect reflects the factor endowment of the export country and the income and price elasticities on demand for the products in which that country specializes.

A *market effect* indicates a country's ability to concentrate on relatively rapidly growing countries. The change in exports due to market distribution depends on trade policies and income growth in foreign countries,

A *residual effect* indicates the positive or negative impact of specific market-product combinations in comparison to the market and product mean distribution of a given country's exports.

The time period selected for the analysis is ten years and, was guided primarily by the availability of data. The study utilizes the SourceOECD Database, which tracks world trade flows between 1995 and 2005 disaggregated at four digit-level (i.e. 1120 sectors and 12 markets or geographical areas) in order to get the best information to evaluate the four different effects. The overall change in export market shares is disaggregated further to take account of the geographical trade patterns and the commodity trade patterns of the countries considered. The results are presented in tables and in figures below.

The sample period is significant not only because it witnessed a surge in CEECs exports, but also because it encompassed significant structural change in terms of the relative importance of primary commodities and technology. In 1995, the aggregate value of exported food items and agricultural raw materials commodity groups accounted for approximately 9% of CEECs exports, while electronic commodity accounted for only 2.6%. By 2005, however, the share of electronics had increased to 12.16%, whereas the share of food items and agricultural raw materials had declined to 5.14%.

The SourceOECD database provides data on values expressed in US dollars. It is impossible to distinguish between the volume and the price components in the evolution of the market shares. Therefore, the interpretation of

the results should be made with extreme caution, as changing exchange rates and prices have an impact on price competitiveness and on export performance.

3.2   Summary of key results: Geographical and Sector.

The Central Eastern European Countries (CEECs) geographical export pattern (Table 1) reflects its reorientation of trade towards the west, especially the European Union countries. According to the OECD database, exports to European countries accounted for about 79.54 per cent of CEECs total merchandise exports in 2005, with Germany being the most important export market for the CEECs. The importance of trade relations between CEECs and the European Union demonstrates the high degree of integration that these countries have reached with Europe. Among other regions of the world, the former Soviet Union (Commonwealth of Independent States, CIS) remains an important trading partner, while the group of the Asian countries (Including China and India) and the countries of North and South America represent relatively small markets for the CEECs.

Table 1 – Geographical distribution of exports from Central Eastern European Countries 1995-2005, in percentage of total

	2005	1995	1985
North America*	3.66	2.47	2.89
Asia*	0.56	0.71	0.60
Europe*	**76.00**	**67.54**	**44.05**
Oceania*	0.13	0.09	0.15
Africa**	1.00	1.67	4.40
South and Central America**	0.58	0.80	1.51
Eastern/Sothern/Western Asia**	5.63	5.34	11.36
CIS**	**6.93**	**16.44**	**27.10**
Unallocated, unspecified or other economies	5.52	4.94	7.93
Total	100.00	100.00	100.00

Source: Own calculations based on UNCTAD Handbook of Statistics, 2006-07, and UNECE, Economic Survey of Europe, 2004, No. 1, Table B.14
* Developed economies, **Developing Economies

Note: Total exports do not include the intra-regional trade among the Central Eastern European Countries.

The overall CEEC export market has been disaggregated further to take account of the geographical trade patterns of the countries considered. As a result, the following Tables 1A and 1B present, for each country, its contribution to the different markets.

Table 1A - Geographical distribution of exports from Central Eastern Europe 2005 (Individual Countries)

2005	BUL	CZE	EST	HUN	LAV	LITHU	POL	ROM	SLVK	SLV
North Ame*	3.49	2.82	3.82	3.17	3.13	7.56	2.69	4.41	3.31	2.16
Asia*	0.72	0.67	0.38	0.85	0.99	0.20	0.34	0.81	0.36	0.25
Europe*	**57.78**	**86.02**	**82.74**	**78.48**	**80.69**	**68.29**	**80.33**	**69.16**	**86.63**	**69.90**
Oceania*	0.11	0.15	0.14	0.16	0.08	0.07	0.22	0.04	0.13	0.22
Africa**	2.08	0.72	0.56	1.06	0.66	0.24	0.86	2.08	0.58	1.17
S&C Ame**	0.97	0.61	0.46	0.49	0.72	0.39	0.86	0.56	0.35	0.37
ESW Asia**	15.21	3.52	2.73	5.18	0.93	5.08	3.73	13.85	2.73	3.32
CIS**	**3.17**	**3.13**	**8.65**	**3.69**	**12.21**	**17.72**	**8.69**	**3.48**	**3.15**	**5.43**
Others	16.47	2.37	0.53	6.91	0.58	0.45	2.27	5.61	2.76	17.20
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Own calculations based on UNCTAD Handbook of Statistics, 2006-07
* Developed economies, **Developing Economies
Eastern Sothern Western Asia**
Others: Unallocated, unspecified or other economies

Table 1B – Geographical distribution of exports from Central Eastern Europe 1995

1995	BUL	CZE	EST	HUN	LAV	LITHU	POL	ROM	SLVK	SLV
North Ame*	3.55	2.07	2.50	3.38	1.40	0.81	3.01	2.88	1.49	3.56
Asia*	1.46	0.70	0.54	0.99	0.31	0.11	0.28	2.00	0.37	0.35
Europe*	42.12	81.35	70.27	72.86	58.88	53.73	78.80	59.72	84.28	73.39
Oceania*	0.08	0.23	0.00	0.18	0.00	0.00	0.08	0.09	0.06	0.21
Africa**	3.43	1.07	0.43	0.87	0.31	0.15	1.32	7.54	0.91	0.69
S&C Ame**	1.83	0.63	0.11	0.42	0.08	0.33	1.35	2.11	0.72	0.43
ESW Asia**	15.09	4.07	0.82	3.54	0.78	1.96	3.99	17.60	3.50	2.05
CIS**	17.37	5.20	25.05	9.49	38.08	42.28	10.21	5.59	6.77	4.33
Others	15.06	4.67	0.27	8.27	0.16	0.63	0.97	2.47	1.90	14.98
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

The CEECs sector export pattern (Table 2) reflects the importance of three groups products: vehicles, mechanical products, electrical and electronic. The sectors of wood and paper, textiles and chemical products also represent substantial shares of exports. CEECs' exports are rather strong in the electronic sector, one of the most rapidly expanding sectors of world trade. This situation has

improved[8] during the period under review. However, if CEECs is compared with the Asian New Industrialized Countries (NICs), these countries show much larger trade shares of the electronic sector.

TABLE 2 - Sector distribution of exports from Central Eastern European Countries 1995-2005, in percentage of total

Sectors	2005	1995
Food items and Agricultural raw materials	5.14	8.92
Textiles,	10.03	16.66
Fuels	3.99	5.07
Wood and Paper	11.38	13.27
Chemicals	7.40	10.10
Iron & Steel Industry	5.03	8.53
Non ferrous	2.04	4.32
Machinery	12.91	13.72
Vehicles	15.04	7.18
Electrical	14.70	8.82
Electronic	12.16	2.63
Not Elsewhere Specified	0.17	0.78
Total	100.00	100.00

Source: Own calculations based on OECD database.

4   RESULTS OF THE CMSA (1995 – 2004)

Firstly, I present the global results for the CEE countries. It is compared to those of its main European trading partners (Germany, France, the Netherlands, United Kingdom and Italy), as well as the Unites States, Japan and the Asian NICs. Following this, the overall change in export market shares is disaggregated further to take account of the geographically trade patterns and the sector trade patterns of the countries considered.

4.1   CMSA (1995 – 2005) – Global results

The global results for each country or bloc of countries presented in Table 3 are expressed in absolute terms. They are the sum on the rows and the columns of the components resulting from the decomposition method. They are also expressed as a percentage of 1995 export shares (in Table 4) in order to get the contribution of

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[8] Market share of electronic sector has raised from 2.63% in 1995 to 12.16% in 2005.

each effect to the rate of change of exports and to compare the performance of the different countries.

In the period under review, EU-10 countries' global export market share increased from 1.61% in 1995 to 2.63% in 2005. As shown in Table 4, this was mainly the result of the positive contribution of the competitiveness effect (+70.3 per cent of 1995 export share). In the early stages of the process of transition, the impact of the sharp initial currency devaluations, which accompanied the liberalization of trade, on the competitiveness of domestic manufacturers served to prop-up demand in order to offset the effects of economic recession. It also facilitated the reorientation of trade towards the West following the collapse of intra-Council for Mutual Economic Assistance (CMEA) flows. The negative contribution of the product specialization effect was substantial (-4.38) while the negative contribution of the market specialization effect was of lesser importance. This means that during the period under review the geographical orientation of CEECs exports has been mainly towards markets with a lower growth rate relative to world trade growth. However, the positive contributions of the competitiveness effect and the residual effect were sufficient to compensate for the remaining effects.

TABLE 3 – Global results of the CMSA (1995 - 2005) in absolute terms

COUNTRIES	Export Market Share	Export Market Share	Total effect	Competiv Effect	Market Effect	Prodt Effect	Resid Effect
	2005	1995					
AUSTRIA	1.1481	1.1852	-0.0392	0.0267	0.0071	-0.0631	-0.0098
FRANCE	4.3957	5.9167	-1.5145	-1.3517	0.0351	-0.1799	-0.0181
GERMANY	9.7272	10.8827	-1.1516	-1.0147	0.0056	-0.0809	-0.0616
UK	3.9059	4.8247	-0.9202	-1.0634	0.0611	0.0562	0.0260
ITALY	3.5872	4.9699	-1.3609	-1.0764	0.0945	-0.3863	0.0073
NETHERLANDS	3.2038	3.4771	-0.2640	-0.1168	-0.1315	-0.0715	0.0558
NICs	**13.4429**	**11.3039**	**2.1400**	**2.8795**	**0.0509**	**-0.8080**	**0.0176**
USA	9.5992	12.5401	-2.9764	-2.6090	-0.2878	-0.1032	0.0236
JAPAN	6.1119	9.5244	-3.4020	-3.3186	-0.1482	0.2134	-0.1487
EU-10	**2.6312**	**1.6107**	**1.0228**	**1.1323**	**-0.0387**	**-0.0705**	**-0.0003**
CIS	2.2678	1.3702	0.8923	0.6094	-0.0673	0.3777	-0.0275

Source: Own calculations based on OECD database.

TABLE 4 - Global results of the CMSA (1995 - 2005) in percentage of the 1995 exports

COUNTRIES	Export Market Share	Export Market Share	Total effect	Competiv Effect	Market Effect	Prod Effect	Resid Effect
	2005	1995					
AUSTRIA	1.1481	1.1852	-3.305	2.252	0.598	-5.325	-0.830
FRANCE	4.3957	5.9167	-25.598	-22.845	0.593	-3.040	-0.306
GERMANY	9.7272	10.8827	-10.582	-9.324	0.052	-0.744	-0.566
UK	3.9059	4.8247	-19.073	-22.042	1.266	1.165	0.538
ITALY	3.5872	4.9699	-27.384	-21.659	1.902	-7.773	0.147
NETHERLANDS	3.2038	3.4771	-7.592	-3.360	-3.782	-2.055	1.606
NICs	**13.4429**	**11.3039**	**18.931**	**25.474**	**0.450**	**-7.148**	**0.156**
USA	11.6674	14.9823	-23.735	-20.805	-2.295	-0.823	0.188
JAPAN	6.4257	10.2158	-35.719	-34.843	-1.556	2.241	-1.561
EU-10	**2.6312**	**1.6107**	**63.502**	**70.302**	**-2.405**	**-4.378**	**-0.017**
CIS	2.2678	1.3702	65.124	44.476	-4.910	27.564	-2.006

Source: Own calculations based on OECD database.

By contrast, in the case of Germany, the negative competitiveness effect (-9.32%) was the main driving forces behind the fall in the export market share. Moreover, this effect was accompanied by a negative product effect (-0.74), while the positive effect of Germany markets was not sufficient to compensate for these adverse effects. This resulted in a sizeable fall in Germany's export market share from 10.8% in 1995 to 9.72% in 2005 (i.e. -10.58% of 1995). In the case of France, the large negative contribution of competitiveness effect was reinforced by the impact of a negative product effect and a small negative residual effect, explaining the reduction in its export market share from 5.92% in 1995 to 4.39% in 2005. Only the market effect had a positive contribution. In the case of the Netherlands, the negative contribution of competitiveness effect and market specialization was accompanied by a small negative contribution of the product effect. However, the small positive residual effect reduced the impact of these negative effects. This is the reason behind the rather limited decrease in the export market share from 3.47% in 1995 to 3.20% in 2005. Between 1995 and 2005, Austria registered the smallest decrease in the export market share among the European countries considered. This was the result of opposing forces: the negative influence of the product effect was partially offset by the combined

positive influence of the competitiveness effect and the market specialization effect. In the case of Italy, the global export market share decreased from 4.96% in 1995 to 3.59% in 2005. This was mainly the result of the negative contribution of the competitiveness effect (-21.65% of 1995 export share), while the negative contributions of the product effect was of lesser importance. Italy shows a small but positive market and residual effect. The United Kingdom registered the third biggest decrease in the export market share (after Italy and France) among the European countries considered. This was the result of a large negative contribution of the competitiveness effect. Despite the UK produced a positive market, product and residual effect. In the case of Italy, the global export market share decreased from 4.96% in 1995 to 3.59% in 2005. This was mainly the result of a large negative contribution of competitiveness effect (-27.38% of 1995 export share), while the negative contribution of product effect was of lesser importance.

In the United States, the negative contribution of competitiveness effect and market specialization was accompanied by a small negative contribution of the product effect. However, a small positive residual effect is observed. The global export market share decreased from 14.98% in 1995 to 11.67% in 2005.

By contrast, in Japan a positive product effect was insufficient to compensate for the substantial loss in competitiveness and market specialization effect. This was the main reason behind the substantial fall in the global market export share from 10.22% in 1995 to 6.43% in 2005.

In the Asian NICs, all the effect have combined their positive influence, but product effect (-7.14 of 1995 export share) so that the global export market share increased from 11.30% in 1995 to 13.44% in 2005 (i.e.+18.93% of 1995 export share). The main contributions to this global result came from the positive competitiveness and market effects, while the positive impact of the residual effect was very small.

TABLE 4A - CEECs results of the CMSA (1995 - 2005) in absolute terms

Countries	Total Effect	Competitiveness Effect	Market Effect	Product Effect	Residual Effect
EU10 agg	1.022804	1.132332	-0.038735	-0.070517	-0.000276
POL	0.228592	0.250417	-0.000735	-0.021194	0.000104
CZECH	0.250694	0.269372	-0.011884	-0.009587	0.002793
HUN	0.229993	0.245734	-0.006452	-0.001625	-0.007664
SLVK	0.113398	0.113359	-0.002002	-0.002367	0.004408
BUL	0.018014	0.029558	-0.002508	-0.009478	0.000442
EST	0.032625	0.034727	-0.001647	-0.000167	-0.000287
LAV	0.007915	0.006620	-0.001454	0.002774	-0.000026
LTH	0.031240	0.033017	-0.001650	-0.000178	0.000051
ROM	0.121365	0.149713	-0.006543	-0.020643	-0.001162
SLV	-0.012637	-0.002748	-0.005168	-0.006060	0.001339
TOTAL	1.021200	1.129769	-0.040043	-0.068524	-0.000002

Source: Own calculations based on OECD database.

4.2 Central Eastern European Countries: CMSA (1995 – 2004) – Contributions of the different geographical areas.

The overall change in export market shares has been disaggregated further to take account of the geographical trade patterns of the countries considered. As a result, the following Table 5 presents, for each country, the contributions of the different areas to the global results presented in Table 3. They correspond to the sum on the columns of the components resulting from the decomposition method. They are expressed in absolute terms.

In the wake of the de facto disintegration of the CMEA in mid-1990, following the introduction of dollar-based settlements, the switch-over to world prices in intra-CMEA trade from the 1 January 1990 and the economic difficulties of the former Soviet Union, trade both between the CEECs and with the former Soviet Union collapsed. This collapse of intra-CMEA trade is one of the causes of the deep recession, which hit the CEECs at the beginning of the transition process.

The high level of trade in the CMEA area and its scheme of specialization made these economies highly interdependent although this situation varied from country to country. By 1989, trade with the West already represented half of the

total trade flows of Poland and Hungary, but only 35 per cent in the case of Czechoslovakia. This situation was accompanied by a dependence on the Soviet Union, the principal supplier of energy and raw materials and an important outlet for manufactured products, machinery and capital goods. Central Europe's exports to the industrialized countries were concentrated on traditional products, raw materials and energy-intensive products.

The liberalization of trade and the abandonment of the traditional CMEA trading system mean an end to preferential trading links and a reorientation of trade towards the West. In view of its geographical proximity, the European Union rapidly became the main outlet for the exports and a source of consumer and capital goods supplies. The share of the EU in CEECs trade flows increased rapidly between 1988 and 1992, whereas that of the former Soviet Union fell dramatically. With the European Agreements, the CEECs opted for a strategy of free trade vis-avis the EU, ultimately designed to open the door to full EU membership (Lavigne, 1999, pp. 281-82).

These evolutions are reflected in the results presented in Table 5.

TABLE 5 - Central Eastern Europe: CMSA (1995-2004) Geographical breakdown

	Export Market Share 2005	Export Market Share 1995	Total Effect	Competiv Effect	Market Effect	Product Effect	Residual Effect
EU-15	2.083552	1.295889	0.786940	0.936353	-0.086874	-0.058116	-0.004423
North America *	0.160184	0.071383	0.088498	0.076114	0.013674	-0.001820	0.000530
Aust/NZ	0.007029	0.003310	0.003712	0.004172	-0.000104	-0.000176	-0.000180
Japan	0.017199	0.012020	0.005237	0.011119	-0.004448	-0.001271	-0.000164
Other Europe	0.135127	0.055189	0.079901	0.082846	-0.002191	-0.002375	0.001621
CIS	0.124214	0.108364	0.018633	-0.016279	0.040369	-0.007075	0.001618
Asian NICs	0.056988	0.040896	0.016229	0.011932	0.004664	-0.000326	-0.000041
Africa/ME	0.038204	0.016735	0.021514	0.020943	-0.000259	-0.000033	0.000864
C&S A	0.008753	0.006887	0.002140	0.005131	-0.003566	0.000675	-0.000099
Total	2.631249	1.610674	1.022804	1.132332	-0.038735	-0.070517	-0.000276

Source: Own calculations based on OECD database.

- The main result concerning the **total effect** is related to the important role that the countries of the EU15 have in explaining the total gain of export

market by the CEECs. This influence came from the combined positive contribution of the competitiveness effect and the negative contributions of the market effect, and, to a lesser extent, the product effect.

- Concerning the **competitiveness effect**, the CEECs registered a positive contribution from the countries of the EU15 and, to a lesser extent, from the countries of North America. The contributions from other areas were positive, with the exception of the CIS. The global competitiveness effect was nonetheless positive.

- Concerning the **market effect**, it appeared that the main trading partners of the CEECs, the countries of the EU15, induced a negative market effect, while the contributions from the other areas were slightly positive. As a result, the global market effect was nonetheless negative.

- The global **product effect** for the CEECs was negative due to the negative contributions from the EU15 and the former Soviet Union.

- Concerning the **residual effect**, the CEECs registered a negative contribution of each area, especially that of the EU15 and the CEECs, with the exception of North America. The global residual effect is negative.

4.3 *Central Eastern European Countries: CMSA (1995 – 2005) – Contributions of the different sectors.*

The overall change in export market shares has been disaggregated further to take account of the commodity trade patterns of the countries considered. As a result, the following Table 6 presents, for each country, the contributions of the different sectors to the global results presented in Table 3. They correspond to the sum on the columns of the components resulting from the decomposition method. They are expressed in absolute terms.

The collapse of intra-CMEA trade in 1991 was further accompanied by significant changes in the sector composition of the trade flows of the CEECs. The share of machinery and capital goods in intra-CMEA trade flows plummeted. The share of energy and the raw materials in imports from the former Soviet Union

greatly increased in value, reflecting the price increase of these products on a dollar basis and a certain inelasticity of domestic demand. Trade with other ex-CMEA countries collapsed. As for trade between the EU and the CEECs, empirical studies (i.e. see Djankoz, S 1996) generally indicate that, during the period 1988-1992, no major sector realignment took place, with trade remaining concentrated on exports from sectors with a high intensity of labour. However, the figures posted by a number of CEECs (in particular Hungary) in trade with the EU since 1992 indicate a certain degree of product diversification in the exports (Smith, 2000).

These evolutions are reflected in the results presented in Table 6.

TABLE 6 - Central Eastern Europe: CMSA (1995-2004) Sector breakdown

Sectors	Export Market Share 2005	Export Market Share 1995	Total Effect	Competiv Effect	Market Effect	Product Effect	Residual Effect
	2005	1995					
Food items and Agricultural raw materials	0.135347	0.143686	-0.007190	0.038416	0.004846	-0.040023	-0.010430
Textiles,	0.263882	0.268411	-0.003838	0.073706	-0.008444	-0.068274	-0.000826
FUELS	0.105087	0.081606	0.026837	-0.009461	-0.001744	0.041560	-0.003518
Wood and Paper	0.299421	0.213699	0.086079	0.126769	-0.005678	-0.037861	0.002849
Chemicals	0.194713	0.162727	0.031853	0.003271	0.001430	0.019995	0.007157
Iron & Steel Industry	0.132317	0.137357	-0.005094	0.004108	-0.002949	-0.000906	-0.005348
Non ferrous	0.053804	0.069592	-0.015825	-0.001450	-0.001898	-0.013993	0.001516
Machinery	0.339625	0.220943	0.118931	0.142053	-0.003567	-0.025448	0.005893
Vehicles	0.395870	0.115672	0.278995	0.243464	-0.007035	0.011940	0.030627
Electrical	0.386748	0.142107	0.243636	0.252075	-0.008374	0.021877	-0.021943
Electronic	0.320085	0.042325	0.276661	0.266315	-0.005244	0.022219	-0.006630
Not Elsewhere Specified	0.004351	0.012549	-0.008240	-0.006935	-0.000078	-0.001603	0.000377
Total	2.631249	1.610674	1.022804	1.132332	-0.038735	-0.070517	-0.000276

Source: Own calculations based on OECD database.

- The main point concerning the **total effect** for the CEECs is the role of the following sectors mechanical products, vehicles, electrical

products, electronics, energy, chemicals products and wood and paper, in explaining the total gain of export market share. This positive influence was mainly the result of a positive competitiveness effect. A loss in export market share was registered in the sector of textiles, food industry, iron and steel industry, non-ferrous and not elsewhere specified sector. In the sector of food industry, this was due to be negative influence of the product and residual effects while the competitiveness and market effect were positive. In the case of the energy sector and steel industry, this was due to the negative influence of the market, product and residual effects, while the competitiveness effect was positive.

- Concerning the **competitiveness effect**, the CEECs registered a positive contribution from each sector, with the exception of the energy sector, non-ferrous and not elsewhere specified sectors. However, the global competitiveness effect was nonetheless positive.

- The global market effect was negative for the CEECs. It was the result of the negative contributions of most of the sectors. Food industry and chemicals products were positive.

- The global **product effect** registered by the CEECs was negative. The positive contributions from a few sectors (mainly electric products, vehicles, chemicals, energy and electronics) were offset by the negative contributions from more traditional industries (notably, textile and steel industry) but also wood and paper, as well as negative contributions from machinery and food industry.

- Concerning the **residual effect**, the CEECs registered a global negative effect.

4   Conclusion

In the Constant Market Share Analysis (CMSA) model, differences in export growth among countries are explained on the basis of four general components: competitiveness, market, product and residual effects. Using CMSA model for the period 1995-2005, it was found that competitiveness effect was the most important component leading to increased in market shares among CEE countries. In fact, all countries, with the exception of Latvia, showing an increase in market share between 1995 and 2005 had a positive competitiveness effect.

The geographical specialization has played the main negative role in the CEECs, but the product effect was also negative. The contribution of the residual effect was slightly negative.

The geographical specialization has also played a negative role for the main European trading partners of the CEECs (Germany, France, the Netherlands, the United Kingdom and Italy). Indeed, the main reason behind their loss in export market share was related to the negative contribution of the market effect. This was due to the high degree of intra-EU15 trade in a period during which the rate of economic growth in the EU15 was lower than total world growth rate. Only in the case of Germany was the negative contribution of the competitiveness effect still more important than the market effect. By contrast, some European countries registered an important positive contribution of the competitiveness effect (the Netherlands and the United Kingdom). Some European countries also registered a moderate positive contribution of the product effect (Germany and the United Kingdom).

In comparison with the Asian NICs, the export performance of the CEECs was hindered by the unfavourable product specialization, in particular a much lower export share in the sector of electronics. The concentration of the geographical trade pattern of the CEECs also partly explains why their export performance did not benefit directly from the

strong import demand from the Asian NICs, and the Americas. The main impact of this increasing demand on CEEC's exports came through indirect effects via its main European trading partners.

However, because of rapidly changing conditions within the Asian NICs and within the other emerging countries, the results presented above have to be taken with extreme caution. Nevertheless, in the long run, CEECs should remain aware of the trade growth potential associated with the Asian NICs and the other emerging economies (specifically China and India) and tend to a greater diversification of exports.

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APPENDIX 1. Constant Market Shares Analysis (CMSA)

Total effect $\cong$ Competitiveness effect + Market effect + Product effect + Residual effect

1. Total effect

$$\left[\frac{\sum_m \sum_p X_{m,p}^{t1}}{\sum_m \sum_p XW_{m,p}^{t1}} - \frac{\sum_m \sum_p X_{m,p}^{t0}}{\sum_m \sum_p XW_{m,p}^{t0}} \right] * 100$$

Where

$X_{m,p}^{t}$ = element (m, p) of the matrix of the reporting country's exports at time t,
$XW_{m,p}^{t}$ = element (m, p) of the matrix world exports[9] at time t,
m = market index, p = product index,
$t0$ = initial period, $t1$ = final period.

The total effect measures the change (positive or negative) over the period under review of the aggregated export share of a country. The decomposition method has to be applied to trade data at the most disaggregated level with respect to markets and products.

The total effect is divided into two main effects: the competitiveness effect and the structural effect. The competitiveness effect summarises the influence of changes in price competitiveness (assessed by the real effective exchange rate) and changes in non-price competitiveness (expressed by qualitative factors reflecting product differentiation) on export performance. The sum of the other three effects (market effect, product effect, residual effect) represents the structural effect, largely

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[9] If the reporting country is part of the reference group, the data have to be corrected in order to prevent distortions. This correction has a small influence on small market shares, but it can be very influential when the country considered has larger market shares.

reflecting changes in the market and in the product specialization on the country considered.

2. *Competitiveness effect*

$$\sum_{m} \sum_{p} 0.5 * \left[\frac{XW_{m,p}^{t0}}{\sum_{m} \sum_{p} XW_{m,p}^{t0}} + \frac{XW_{m,p}^{t1}}{\sum_{m} \sum_{p} XW_{m,p}^{t1}} \right] * \left[\frac{X_{m,p}^{t1}}{XW_{m,p}^{t1}} - \frac{X_{m,p}^{t0}}{XW_{m,p}^{t0}} \right] * 100$$

The competitiveness effect reveals the capacity of a country to increase its market share due to competitiveness factors only, independently of structural developments in the market or in the product trade pattern. It is calculated by aggregating the changes in the export shares of a country for each market and for each product (second term between brackets), weighted by the relative import shares of the partner countries in world trade.

The system of weights in this version of the CMSA is calculated using an average of the weights of the initial year and final year. This choice reflects the fact that a country's export structure and total world trade are changing over time, but that there is no reason to believe that either the structure at the beginning or end of period was dominant throughout the period.

3. *Market composition effect*

$$\sum_{m} \sum_{p} 0.5 * \left[\frac{X_{m,p}^{t0}}{\sum_{p} XW_{m,p}^{t0}} + \frac{X_{m,p}^{t1}}{\sum_{p} XW_{m,p}^{t1}} \right] * \left[\frac{\sum_{p} XW_{m,p}^{t1}}{\sum_{m} \sum_{p} XW_{m,p}^{t1}} - \frac{\sum_{p} XW_{m,p}^{t0}}{\sum_{m} \sum_{p} XW_{m,p}^{t0}} \right] * 100$$

The market effect measures the effect stemming from the geographical breakdown of a country's exports. It is calculated by aggregating the changes in the individual market shares (sum over the products) of total world trade (second term

between brackets), weighted by the export shares of the country concerned in these geographical markets.

4. *Product composition effect*

$$\sum_m \sum_p 0.5 * \left[\frac{X_{m,p}^{t0}}{\sum_m XW_{m,p}^{t0}} + \frac{X_{m,p}^{t1}}{\sum_m XW_{m,p}^{t1}} \right] * \left[\frac{\sum_m XW_{m,p}^{t1}}{\sum_m \sum_p XW_{m,p}^{t1}} - \frac{\sum_m XW_{m,p}^{t0}}{\sum_m \sum_p XW_{m,p}^{t0}} \right] * 100$$

The product effect defines the influence of the product composition of a country's exports. It is calculated by aggregating the changes in the individual product shares (sum over the markets) of total world trade (second term between brackets), weighted by the export shares of the country concerned in these sector markets.

5. *Residual effect*

$$\sum_m \sum_p 0.5 * \left[\frac{X_{m,p}^{t0}}{XW_{m,p}^{t0}} * \frac{\sum_m XW_{m,p}^{t0}}{\left(\sum_m \sum_p XW_{m,p}^{t0} \right)^2} + \frac{X_{m,p}^{t1}}{XW_{m,p}^{t1}} * \frac{\sum_m XW_{m,p}^{t1} * \sum_p XW_{m,p}^{t1}}{\left(\sum_m \sum_p XW_{m,p}^{t1} \right)^2} \right] *$$

$$\left[\frac{XW_{m,p}^{t1} * \sum_m \sum_p XW_{m,p}^{t1}}{\sum_m XW_{m,p}^{t1} * \sum_p XW_{m,p}^{t1}} - \frac{XW_{m,p}^{t0} * \sum_m \sum_p XW_{m,p}^{t0}}{\sum_m XW_{m,p}^{t0} * \sum_p XW_{m,p}^{t0}} \right] * 100$$

The residual effect embodies all second-order factors. It represents the positive or negative impact of specific market-product combinations in comparison to the market and product mean distribution of a given country's exports. It is calculated by aggregating the relative changes in world export shares of individual products on individual markets in comparison to the average change of the world export shares for the same individual products and the same individual markets taken separately (second term between brackets). These relative changes are weighted

by the export shares of the country concerned, weighted themselves by the relative importance of these products and these markets to total world trade.

The usefulness of the CMSA is to separate and quantify the contribution of a country's trade pattern (market and product composition) to trade performance and to quantify the contribution of other factors. For an explanation of the size of the components, the CMSA can be combined with complementary analysis (time-series, cross-section or panel data analysis).

APPENDIX 2. Geographical breakdown

North America: Canada, Mexico, United States.

EU-15: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Ireland,
        Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.

CEECs: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak
        Republic, Slovenia, Romania.

Other Europe: Norway, Switzerland, Iceland, Turkey.

Asian NICs: China, Hong Kong China, Chinese Taipei, South Korea, India, Singapore,
        Malaysia, Philippines, Thailand, Indonesia.
Japan.

Africa and Middle East.

Oceania: Australia, New Zealand.

CIS: Armenia, Azerbaijan, Belarus, Georgia, Kazakstan, Kyrgyzstan, Republic of
        Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan

Central and South America.

APPENDIX 3. Sector breakdown

1 Food items and Agricultural raw materials: Live animals other than animals of division 03 (SITC 00); Meat and meat preparations (SITC 01); Dairy products and birds' eggs (SITC 02); Fish, crustaceans, molluscs and preparations thereof (SITC 03); Cereals and cereal preparations (SITC 04); Vegetables and fruits (SITC 05); Sugar, sugar preparations and honey (SITC 06); Coffee, tea, cocoa, spices, and manufactures thereof (SITC 07); Feedstuff for animals (excluding unmilled cereals) (SITC 08); Miscellaneous edible products and preparations (SITC 09); Beverages (SITC 11); Tobacco and tobacco manufactures (SITC 12);Hides, skins and furskins, raw (SITC 21); Oil seeds and oleaginous fruits (SITC 22); Crude animal and vegetable materials, n.e.s. (SITC 29); Animal oils and fats (SITC 41); Fixed vegetable oils and fats, crude, refined or fractionated (SITC 42); Processed Animal and vegetable oils and fats (SITC 43).

2 Textiles: Textiles fibres and their wastes (SITC 26); Leather, leather manufactures and dressed furskins (SITC 61); Textile yarn and related products (SITC 65); Travel goods, handbags, etc. (SITC 83); Articles of apparel & clothing accessories (SITC 84); Footwear (SITC 85).

3 Fuels:: Coal, coke and briquettes (SITC 32); Petroleum, petroleum products and related materials (SITC 33); Gas, natural and manufactured (SITC 34); Electric current (SITC 35).

4 Wood and Paper: Cork and wood (SITC 24); Pulp and waste paper (SITC 25); Cork and wood manufactures (excluding furniture) (SITC 63); Paper and paper manufactures (SITC 64); Furniture and parts thereof (SITC 82); Miscellaneous manufactured articles, n.e.s. (SITC 89)

5 Chemicals: Organic chemicals (SITC 51); Inorganic chemicals (SITC 52); Dyeing, tanning and colouring materials (SITC 53); Medicinal and pharmaceutical products (SITC 54); Essential oils for perfume materials and cleaning preparations (SITC 55); Fertilizers other than group 272 (SITC 56); Plastics in primary forms (SITC 57); Plastics in non-primary forms (SITC 58); Chemical materials and products, n.e.s.(SITC 59); Rubber manufactures, n.e.s. (SITC 62); Crude rubber (including synthetic and reclaimed) (SITC 23)**;** Crude fertilizers other than division 56, and crude minerals (SITC 27);

6 Iron & Steel Industry: Iron and steel (SITC 67); Metalliferous ores and metal scrap (SITC 28).
7 Non-ferrous metals: Non-ferrous metals (SITC 68)

8 Machinery: Specialised machinery (SITC 72); Metal working machinery (SITC 73); Other industrial machinery and parts (SITC 74); Prefabricated buildings, sanitary, heating and lighting fixtures, n.e.s. (SITC 81); Manufactures of metal, n.e.s. (SITC 69); Non metallic mineral manufactures, n.e.s. (SITC 66).

9 Vehicles: Road vehicles (SITC 78); Other transport equipment (SITC 79).

10 Electrical: Power generating machinery and equipment (SITC 71); Electrical machinery, apparatus and appliances, n.e.s.(SITC 77).

11 Electronics: Professional and scientific instruments, n.e.s. (SITC 87); Photo apparatus, optical goods, watches and clocks (SITC 88); Office machines and automatic data processing machines (SITC 75); Telecommunication and sound recording apparatus (SITC 76).

12 Not Elsewhere Specified: Postal packages not classified according to kind (SITC 91); Special transactions & commodities not classified (SITC 93); Coin (other than gold coin), not being legal tender (SITC 96); Gold, non-monetary (excluding gold ores & concentrates (SITC 97).

EU10 share of trade flows with the EU15 area as a percentage of total trade flows (exports + imports)

YEAR	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	
Bulgaria	35.92	35.54	54.85	57.51	57.84	52.97	55.42	55.03	52.46	48.92	49.39	**Bul**
Czech Republic	67.30	54.25	60.14	61.68	65.60	66.17	65.04	65.00	64.74	55.79	57.88	**Czech Rep**
Estonia	42.60	48.65	59.80	60.92	64.43	64.25	58.80	59.87	55.03	61.03	57.68	**Est**
Hungary	63.03	58.72	73.97	70.95	76.30	72.15	71.45	69.71	68.26	58.24	57.73	**Hun**
Latvia	83.93	83.74	72.58	71.21	70.43	72.03	70.24	67.19	64.73	55.25	51.56	**Lat**
Lithuania	33.79	35.48	39.37	45.47	50.64	47.21	49.49	48.28	47.89	39.82	34.29	**Lith**
Poland	69.54	61.50	66.10	66.66	68.23	65.79	64.86	64.59	65.01	57.79	57.61	**Pol**
Romania	50.89	50.71	55.02	63.71	67.37	65.01	66.50	65.13	65.36	61.33	62.08	**Rom**
Slovakia	44.88	44.18	44.56	50.09	54.14	48.53	50.32	53.78	57.92	51.98	47.38	**Slok**
Slovenia	57.75	57.06	70.44	70.74	71.10	70.86	69.97	68.83	68.93	62.59	56.97	**Slov**
EU10	**54.96**	**52.98**	**59.68**	**61.89**	**64.61**	**62.50**	**62.21**	**61.74**	**61.03**	**55.27**	**53.26**	**EU10**

Total Trade	1995		2005
NAFTA	20.91%	NAFTA	20.51%
United States	18.53%	United States	17.84%
CEECs	**8.52%**	**CEECs**	**12.27%**
Switzerland	7.84%	Africa	9.07%
Africa	7.83%	China	7.70%
Japan	7.80%	CIS	6.18%
South America	4.12%	Switzerland	5.69%
Norway	3.97%	Japan	4.56%
China	3.57%	Norway	3.45%
CIS	3.34%	South America	3.15%
Korea	2.19%	Turkey	2.69%
Turkey	2.11%	Korea	1.96%
Hong Kong	1.81%	India	1.51%
Singapore	1.75%	United Arab Emirates	1.41%
Chinese Taipei	1.72%	Chinese Taipei	1.36%
Malaysia	1.62%	Singapore	1.36%
Australia	1.45%	Australia	1.21%
Thailand	1.32%	Hong Kong	1.21%
Israel	1.30%	Mexico	0.98%
India	1.09%	Malaysia	0.95%
Indonesia	1.02%	Iran	0.92%
Iran	0.84%	Israel	0.83%
United Arab Emirates	0.68%	Thailand	0.79%
Philippines	0.44%	Indonesia	0.58%
Kuwait	0.38%	Philippines	0.39%
Central America	0.36%	Central America	0.34%
Mexico	0.34%	Kuwait	0.29%
New Zealand	0.32%	New Zealand	0.24%
Iceland	0.15%	Iceland	0.15%
Jordan	0.11%	Jordan	0.10%