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Fragmentación Productiva e Integración Comercial en la Europa Ampliada: Cómo Triunfaron las EMNs donde Fracasó el CAME

Bartlomiej Kaminski

Resumen:

En el documento se examina la participación de los PECO-10 (Bulgaria, la República Checa, Estonia, Hungría, Letonia, Lituania, Polonia, la República Eslovaca y Eslovenia) en la división de trabajo canalizada por los procesos de outsourcing o del comercio intraindustrial. El foco de atención está en dos redes, la de la industria automotriz y la de las tecnologías de información y telecomunicaciones. Puesto que la entrada en los canales de abastecimiento de las redes de la industria automotriz y la de la IT no es posible sin la aportación de capital, tecnología y marketing por parte de las empresas multinacionales, a continuación nos referiremos a este tipo de redes comerciales como las impulsadas por empresas multinacionales.

En este documento obtenemos la conclusión evidente de que las empresas multinacionales han estado directamente vinculadas al comercio en redes. En primer lugar, las economías de los PECO-10 que experimentaron una mayor entrada de la

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IED demuestran también tener unos resultados comerciales más fuertes. En segundo lugar la fuerza de su comercio descansaba en los productos y componentes de redes. En tercer lugar, los países cuyas empresas entraron a formar parte de la nueva división de trabajo, basada en el comercio de redes impulsado por las corporaciones internacionales, también experimentaron un cambio hacia los productos intensivos en capital y mano de obra cualificada en sus cestas de exportación. En cuarto lugar, los países en la segunda línea de atracción económica en cuanto a la atracción de las entradas de la IED, es decir Bulgaria y Rumanía, parecen estar dando alcance a los PECO al haber obtenido unos buenos resultados en el transcurso de los últimos tres años, y también están reduciendo el gap entre las exportaciones e importaciones de piezas y productos de las redes. Las compañías multinacionales triunfaron donde el hoy ya difunto CAEM había fallado. Dichas compañías también estuvieron detrás del desarrollo del comercio intraindustrial en los PECO-10.

No obstante, la irrupción en la división de trabajo basada en la fragmentación productiva ha sido posible gracias a los progresos realizados en los PECO-10, referentes al establecimiento de mercados competitivos, a la aparición de una nueva arquitectura Pan-europea subyacente en sus relaciones económicas externas, siendo ésta el fruto del proyecto de ampliación de la UE hacia el Este. El proceso de entrada en la UE también ha allanado el terreno para la introducción de los ingredientes necesarios para la producción just-in-time (justo a tiempo) y para la gestión de existencias, es decir: las reformas del sistema de aduanas, del sistema de telecomunicaciones, etc., a falta de las cuales las empresas locales no tendrían la oportunidad de participar en las redes de comercio de las compañías multinacionales.

Palabras clave: comercio, empresas multinacionales, IED, integración económica, acceso a la UE, economías de transición.

Production Fragmentation and Trade Integration in Enlarged Europe: How MNCs Have Succeeded Where CMEA Had Failed*

Bartlomiej Kaminski**

Summary:

The paper examines CEEC-10 (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic and Slovenia participation in the division of labor driven by outsourcing or intra-product trade. The focus is on trade within

two networks, automotive and information and communication technology. Since the entry into supply chains of automotive and IT networks is inconceivable without MNCs bringing capital, technology and marketing, it is referred to as "MNC-driven" network trade.

The paper offers strong empirical evidence that MNCs have been directly linked to trade in networks. First, CEEC-10 economies that have attracted larger FDI inflows have also displayed a stronger trade performance. Second, the driving force of their trade growth has been trade in network products and parts. Third, countries whose firms have become parts of a new division of labor based on 'MNC-driven' network trade have also experienced the shift towards capital and skilled labor intensive products in their export baskets. Fourth, 'laggards' in attracting FDI inflows, i.e., Bulgaria and Romania, appear to have been catching up with top CEEC performers over the last three years, and they have also witnessed closing the gap between network imports and exports of parts and products. MNCs have succeeded where the now long ago defunct CMEA had failed. They have been behind the emergence of intra-product trade among CEEC-10.

But the entry into a division of labor based on production fragmentation has been made possible thanks to progress made in CEEC-10 in establishing competitive markets; the emergence of a new Pan-European architecture—the product of the EU-Eastern Enlargement project—underlying their external economic relations. The EU accession process has also paved the way to introduce ingredients necessary for 'just-in-time' production and inventory management, i.e., customs reforms, telecommunications, etc., without which local firms have no chance of participating in MNC-driven network trade.

Key terms: trade, MNCs, FDI, economic integration, EU accession, transition economies

Teléfono 91-3942404
Fax 91-3942499
Dirección postal
Papeles del Este.
Departamento de Economía Aplicada I. Pabellón de 2º Curso.
Universidad Complutense de Madrid. Facultad de Ciencias Económicas y Empresariales.
Campus de Somosaguas. Pozuelo de Alarcón. 28223 Madrid. España.
Correo electrónico
Información general: papeles@ccee.ucm.es
Administrador de Web: papeles@ccee.ucm.es

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Bartlomiej Kaminski

Introduction

The subtitle of this paper may suggest an unfairly low standard for assessing CEEC-10 integration among them[1], not to mention their integration into the world economy. For starters, the long ago defunct Council for Mutual Economic Assistance (CMEA) was not only an example—to borrow a phrase from Zdenek Drabek (1989)—of the primitive socialist integration but it had also failed rather miserably in integrating its member-economies. Except for orchestrating the economic dependence on the Soviet Union and partially decoupling its members from the world economy, the CMEA had not achieved anything more. The reasons were both systemic and political. The former boiled down to the autarchic nature of central planning, whereas the latter to resistance of smaller CMEA-members to abandon national sovereignty over economy to the CMEA authority. Given administrative controls at national levels, short of strong supranational authority subordinating national planning to Soviet region-wide planning, nothing could integrate them. The result was a radial pattern of economic interaction centered on the Soviet and fueled by oil, with rather limited trade among other CMEA members

Despite recurrent calls for horizontal integration among socialist enterprises, this had never happened and inter-industry trade has been CMEA's defining feature. Attempts at joint production that would amount to cross-border supply chains never succeeded. This was not because of the lack of information technology that has spurned production fragmentation in today's economy but because of impossibility of pricing inputs, as the failed case of Czechoslovak-Polish cooperation to manufacture tractors had shown (Kaminski 1990). In consequence, there was very little of two-way intra-industry trade.

Yet, setting a post-communist integration of CEEC-10 against the historical background is a fair game, as it allows for a sharp delineation of changes triggered by both the collapse of central planning and the EU accession process that had begun with signing of the European Association Agreements (EAs) beginning in December 1991. The latter has played a crucial role in motivating economic reforms efforts across CEEC-10. In a nutshell, contrasting the two offers a better understanding of the liberating impact that the demise of central planning and the Eastern Enlargement

project have had on CEEC-10 reintegration into global structures in general and Enlarged Europe in particular.

The focus on multinational corporations (MNCs) expressed in the subtitle can be easily explained by two reasons—the impact of accession on FDI and the emergence of MNC as a focal point of a new division of labor. The EU accession has had the most significant impact on capital flows. Dramatic reorientation of trade towards the EU would have occurred with or without EAs. As Kawecka-Wyrzykowska (1995) has showed, the largest gains in exports to the EU were originally in products not subject to extensive liberalization measures. Initially the pace of trade reorientation towards the EU depended largely on the speed of domestic liberalization not on improved market access.[2]

The crux of the matter is, however, not that preferential access was irrelevant but rather that it has operated through foreign direct investment. Preferential arrangements subsequently expanded into a single market for industrial products based on Pan-European Agreement on Cumulation of Rules of Origin has provided strong incentive to MNCs to establish production facilities in CEEC-10.[3] The prospect of duty-free access to the future EU-25 and several other European economies combined with the policy framework allowing unfettered distribution of production capacities in the territory of each signatory of the Pan-European Agreement has created a very attractive environment for MNCs.[4]

MNCs have clearly responded to new opportunities. Transition economies received on average more capital inflows in terms of per capita than most developing countries (Garibaldi et al. 2002). Within transition economies there was, however, a significant difference in favor of CEEC-10 over CIS (Commonwealth of Independent States) and Balkan transition economies excluding more recently Croatia. While over 1989-03 all transition economies received around US$ 252 billion in FDI, US$ 172 billion (or 68%) went to CEEC-10.[5] Considering that CEEC-10 account for less than half (47 percent) of aggregate GDP of all transition economies and one-fourth of aggregate population, the difference is startling. It can only be attributable to what has become called the "EU-factor."

MNCs have been responsible for creating a new global division of labor based on production fragmentation made possible by the combination of technology and business friendly and efficient services environment (Jones and Kierzkowski 1990, Kierzkowski 2001). FDI and MNCs have historically intensified flows of products within the same industries. This trade has become known as intra-industry trade, particularly intensive among highly developed countries with similar per capita incomes. More recently, international outsourcing associated with production fragmentation has led to the emergence of what some call intra-product trade. The

difference between intra-industry and intra-product trade is that the latter encompasses also economies at different level of economic development. Hence, an interesting aspect of CEEC-10 reintegration into world markets is whether they have become parts of this division of labor.

While some forms of outsourcing do not require capital or complex technologies (e.g., clothing value chains or some services), others cannot take place without direct involvement of MNCs. The observed phenomenon of production fragmentation has been largely taking place within vertically integrated manufacturing industries. Examples include instance electronic semi-conductors, tuners, valves, engines, etc., assembled or processed in low-wage countries to be fed into further processing or for final sales. Main industries involved in this trade include automobiles, television and radio receivers, sewing machines, office equipment, electrical machinery, power and machine tools, typewriters, cameras and watches (USITC 1996).

Thus, it follows that developments in trade related to vertically integrated manufacturing industries can shed light on the extent of intra-product trade, that is, trade triggered by moving production facilities to CEEC-10. The best candidates are automotive network and IT (information and communication technology) network (Kaminski and Ng 2001 and 2004). While outsourcing in clothing, footwear or furniture has rarely been accompanied by significant inflows of FDI, although there have been exceptions,[6] this is not the case of entry into supply chains of automotive and IT networks. The entry into these sectors is inconceivable without MNCs bringing capital, technology and marketing. The empirically observed positive correlation between multinational activity and intra-industry trade would clearly point in this direction (Markusen 1998).

It would seem that network trade is the litmus test of a country's participation in the division of labor based on production fragmentation. The paper offers strong evidence that FDI (or read MNCs) can be linked to networks' trade, which, therefore, can be described as "MNC-driven" network trade in contrast to clothing or footwear global value chains. CEEC-10 economies that have attracted larger FDI inflows have also expanded more their trade in network products and parts. In fact, one suspects that their impact has been significantly larger than suggested in the analysis that follows, as the trade analysis does not capture all induced effects of MNCs' presence.[7] While without detailed data at firm level it is impossible to assess trade attributable to production fragmentation, it seems that tracing two-way trade within networks provides useful general information.

The remainder of the paper is organized as follows. Part two traces links between FDI and network trade. Part three examines differences and similarities in

network trade of CEEC-10 economies. Network trade among CEEC-10 is discussed in Part 4. Part 5 concludes.

Information technology and automotive networks: the crucial role of FDI

The combination of technology and business friendly and efficient services environment has spurred a new global division of labor. Its trademark is dividing up the value chain into smaller components and moving them to countries where their costs of production could be lower. Production fragmentation in vertically integrated sectors differs in several important respects from traditional global value chains. The latter include, among others, textiles and clothing, footwear or, to some extent, furniture. The former includes flows of parts and components across firms located in various countries for further processing and development. A historical example of production fragmentation at a regional level is the Canada-United States Automotive Products Agreement of 1965, which, followed by the significant reduction in trade barriers, led to an expansion of trade in auto parts (Jones et al. 2004).

Despite huge differences, both IT and automotive sectors share an important characteristic boiling down to the fact that with the arrival of Information Revolution "one stop shop" industrial structures have practically disappeared. Miniaturization, exponential growth in information processing and storage capacities combined with integration of Internet and imaging technologies have been the major driving forces behind transformation of both auto industry and IT (information technology) sectors worldwide over the last two decades. While several large MNCs coordinating production and marketing activities across the globe have traditionally dominated both sectors, MNCs in both of them have undergone dramatic change over the past two decades. Their common denominator has been either the disappearance or dramatic restructuring of global and vertically integrated firms. Thanks to new technologies making possible to trace parts and components moving through chains of production spread over several countries and continents, vertically integrate firms have been replaced by supply chain structures connected through complex and borderless supply chains. These chains include not only product manufacturing but also the front-end customer contact and support services. They usually consist of several layers including parent companies, subsidiaries and subcontractors.

With liberalization of foreign trade and the removal of barriers to FDI following the collapse of central planning, the indigenous IT and automotive sectors developed earlier had no chance of withstanding international competition unless taken over and restructured by foreign investors. But the critical part was liberalization and opening up to FDI inflows. As long as there was a soft budget constraint and high barriers protecting from competition from imports, 'post-communist' supply

chains had survived. Belarus manufacturers of automotive parts could continue feeding plants in Russia, relatively safe behind high tariff and non-tariff barriers. So could IT producers from Bulgaria and Latvia.

Ultimately, however, once reforms began to take hold in CIS countries and their markets become less distorted, they had to face competition from other suppliers. IT sectors in Estonia and Lithuania, on the one hand, and Latvia, on the other hand, offers two contrasting developments showing the importance of FDI. Both countries inherited from the Soviet era a relatively well developed IT industry that used to work for both civilian and also military sector. But while the Latvian electronic sector has practically eclipsed, electronic products have been among the best Estonian and Lithuanian export performers (see Section 3), as their firms have successfully integrated into global IT networks.

Developments in the automotive sector also show that without MNCs' involvement, local firms were doomed to failure. Before the collapse of communism many of them produced motor vehicles mostly on the basis of licenses (e.g., Fiat-Lada in Russia, Polish Fiat, Renault-Dacia in Romania). Czechoslovakia, with a strong tradition in automotive manufacturing going back to the beginning of the last century, produced a whole array of motor vehicles. So did the former Soviet Union and Yugoslavia. Czech Skoda, Yugoslav Yugo, Polish Fiat, Romanian Dacia or Soviet Lada (a modified Fiat model) were marketed in Western Europe but with not much success despite their low prices. Except for Lada or Volga in Russia, they are no longer manufactured. Skoda, as a brand name, flourishes but as an integral part of the Volkswagen Group.

Multinational corporations have been responsible for restructuring and subsequently impressive performance in the automotive network (Meyer 2000). Examples abound. In Slovakia, Volkswagen, Siemens (cable harnesses, lights), INA Werke Schaffeler (ball bearings), Sachs Trnava (coupling assemblies for passenger cars), just to name a few, have become household names (Kaminski and Smarzynska, 2003). Engines for Audi automobiles assembled in Hungary has set stage for Hungary's spectacular entry into supply chains of automotive sector. Skoda Auto of the VW Group and other car producers in the Czech Republic have attracted large international firms specializing in automotive parts and components. As of 2002, there were 270 firms operating in the Czech Republic representing 45 percent of the Top 100 World suppliers of automotive parts and components (USDS 2002).

Success in the IT sector also hinges critically on the presence of multinationals. Again the evidence is overwhelming. Firms such as Nokia, Thomson, Siemens, Philips, IBM, General Electric and their suppliers have been present in all countries that have attracted sizable FDI inflows.

Hence, while IT network is of more recent vintage and provides inputs into many other sectors including automotive network, both networks are capital-intensive and, especially the IT network, knowledge-intensive. Building from scratch a competitive sector in either IT or automotive without external involvement is virtually impossible. By the same token, exports of these two networks can be fully attributable to FDI, which, in turn, if invested there, should move a country's export basket towards that characterized by higher capital and skilled labor intensity.

Two questions are worth examining. First, is there a link between FDI and network trade? Second, is there a correlation between FDI and the change in factor content of exports? As for the first question, data tabulated in Table 2 and graphically presented in Diagram 1 indicate the existence of a powerful link between FDI stock in manufacturing and exports of IT and automotive network products, as demonstrated in trade and FDI in CEEC-10. Consider the following: First, the value of the correlation coefficient between the share of total network exports in exports of manufactures (excluding chemicals) in 2002 and the FDI stock in manufacturing (end-2002) is very high at 88 percent. R-square at 78 percent explains almost all variation (Diagram 1). Considering that two countries—Poland and Romania—have relatively large domestic markets, this is rather a surprisingly strong positive correlation between FDI inflows and exports of network products.

Second, the contraction in network exports of Bulgaria and Latvia—two countries with lowest FDI stock in manufacturing per capita—in terms of value was precipitous. In 1999 their values stood respectively at 61 percent and 50 percent of their 1996 levels. Network exports from both Bulgaria and Latvia appear to have been recovering since 1999, although in 2003 the value of their exports was only 12 percent (Bulgaria) and 1 percent (Latvia) above the level in 1996 and 1995 respectively. It appears that capacities inherited from the Soviet of CMEA era had not attracted foreign capital until the late 1990s. As we shall see, both countries were quite dependent on CIS markets until around mid-1990s.

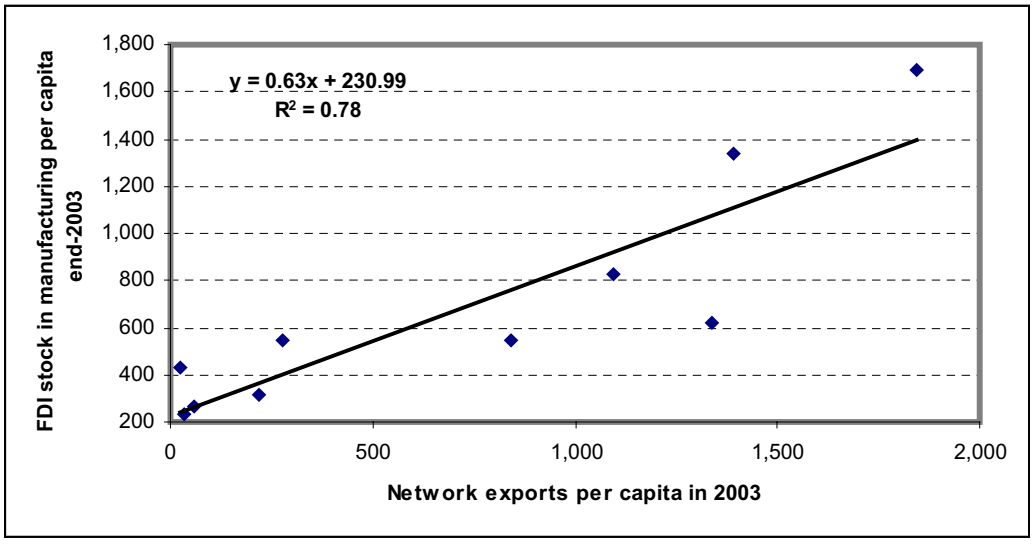
Table 1: Links between FDI stock in manufacturing and network exports in 2003 (in US dollars and percent)

	FDI in manufacturing per capita	Network exports per capita	Share in manufactured export (excluding chemicals)			Value of tota network exports	
	(in US dollars) 2003	(in US dollars) 2003	(in percent) 1995	1999	2002	Index 1999 1995=100	Index 2002 1999=100
Bulgaria	428	22	7.6	4.9	3.7	61	124
Czech R.	1,338	1,391	15.5	24.3	39.7	217	270
Estonia	548	844	25.1	27.8	27.8	197	158
Hungary	1,694	1,847	18.1	52.2	52.5	814	139
Latvia	230	32	10.9	3.3	4.2	39	175
Lithuania	314	220	18.5	13.8	20.9	104	289
Poland	547	275	11.9	19.5	25.7	219	207
Romania	262	59	4.1	5.7	9.5	164	284
Slovakia	624	1,339	11.2	30.5	32.2	362	155
Slovenia	824	1,094	19.7	21.5	22.5	112	125

Source: UN COMTRADE Statistics and FDI stocks as of 12/31/2003 calculated as a total net FDI inflows as reported in the IMF statistics. Share in manufacturing compiled from national sources.

Diagram 1: MNC-driven network exports per capita and FDI stock in manufacturing per capita in 2003

Source: As in Table 2.



On the other hand, the case of Romania illustrates that even with relatively small FDI stock in manufacturing it is possible to participate in IT/Automotive networks.[8] While Romania's network exports on a per capita basis were almost three-times larger than those of Bulgaria, despite higher FDI stock in manufacturing in Bulgaria, Romania has recorded the second largest increase after Lithuania in 1999-2003.

Turning to a second question about possible links between FDI and factor content of exports, two observations can be derived from data presented in Table 2. First, CEEC-10 that were the most successful in terms of attracting FDI into manufacturing sector have also the highest share of skilled labor- and capital-intensive products in their exports with or without natural intensive products. Slovenia and Latvia 'disrupt' an almost perfect correspondence between rankings in terms of capital and skilled labor intensities and FDI stock in manufacturing per capita. The values of correlation coefficients between FDI stock and respective shares are 84 percent for both shares.

Table 2: Exports in terms of factor intensities in 1996, 2000 and 2003 (in percent and US dollars)

Countries ranked in terms of FDI stock in manufacturing per capita in 2003	Share of skilled labor intensive and capital intensive products in total exports			exports minus natural intensive exports			Value of skilled labor and capital exports Index, 2003
	1996	2000	2003	1996	2000	2003	1996=100
Hungary	46%	73%	76%	65%	84%	87%	535
Czech Republic	61%	68%	73%	77%	80%	83%	267
Slovenia	61%	65%	67%	73%	76%	79%	169
Slovak Republic	49%	66%	70%	59%	76%	83%	353
Estonia	38%	50%	47%	59%	71%	71%	336
Poland	41%	52%	54%	59%	68%	68%	286
Lithuania	37%	30%	31%	64%	54%	52%	183
Bulgaria	41%	31%	32%	63%	44%	47%	120
Romania	35%	34%	37%	45%	43%	47%	225
Latvia	30%	24%	26%	53%	49%	54%	176

Source: Own calculations based on national trade statistics reported to the UN COMTRADE database.

Second, while Hungary together with Slovakia recorded the largest increase in the share of capital and skilled labor intensive in both total exports and exports excluding natural resource intensive products, there was a notable change in 1996-2000 and 2000-2003. The latter period witnessed the largest change in both directions: Exports of unskilled labor intensive products grew significantly faster than other exports from Lithuania, Bulgaria, Romania and Latvia. The reverse was the case for

the remaining countries that registered much stronger expansion in exports of capital and skilled labor intensive products. So did Romania, Latvia and Bulgaria, but in 2000-03. On the other hand, the difference in export growth rates between skilled labor and capital intensive products and other exports declined for the 'upper' group. It appears that 'catch-up' dynamics begins to work, as more FDIs have been flowing to these countries.

To sum up, both information technology (IT) and automotive sectors are at the very core of the new division of labor. Both networks are technologically sophisticated and capital and labor intensive. Both, as the evidence shows, are clearly 'MNC-driven' networks. Countries that have become significant participants in these networks are those that attracted larger FDI inflows and moved to capital and skilled labor intensive products.

'MNC-driven' network trade: cross-CEEC-10 differences

'MNC-driven' network trade has been a lever of CEEC-10 integration into global markets. Its share in CEEC-10 manufactures (excluding chemicals) exports increased from 19 percent in 1995 to 39 percent in 2003 and in imports from 25 percent to 31 percent. The value of aggregate CEEC-10 network exports increased from US$ 8 billion in 1995 to US$ 25 billion in 1999 and US$ 56 billion in 2003. The average annual growth rate was 32 percent in 1995-99 and 23 percent over 1999-2003. Simultaneously, CEEC-10 have moved from the status of a net importer to that of a net exporter of network products and parts in 2003 recording a surplus of US$ 15 billion.

But not all countries have moved at the same pace, although for most of them exports grew at double-digit levels. It is useful to distinguish two periods: 1995-99 and 1999-2003. Prior to 1995, except for automotive sectors in the Czech Republic and Poland and IT sector in Hungary, there were no indications of participation in production and distribution networks. The effects of industrial restructuring after the collapse of central planning became visible only in the mid-1990s. Except for Hungary, exports of other CEEC-10 contracted in 1999, as though preparing for the next phase. In consequence, the 1999-base lowers the dynamics of Hungarian exports and overstates that of other CEEC-10 in the 1999-2003 period.

Variation in network trade performance in respective periods points to a catch-up dynamics on export and import side alike. Bulgaria and Latvia witnessed the collapse of network exports, which, however, was accompanied by the double-digit expansion in imports of network parts and products. These countries, with the shares of network exports in manufactured exports below five percent, remain outliers in terms of their participation in 'MNC-driven' network trade. (As we shall see, reorientation of trade from CIS economies might have been responsible for it. It

appears that for similar reasons Lithuania exports were flat in 1995-99.) Slovenia's performance was lackluster both on export and import side. Other countries experienced double digit growth rates, with Hungary outperforming them all. Its exports grew at an annual growth rate of 68 percent. The share of network exports in exports of manufactured goods excluding chemicals increased from 18 percent in 1995 to 52 percent in 1999. In contrast to significant variation during the first period, each CEEC-10, except for Hungary grew at average rates exceeding 10 percent. While no other countries reached growth rates of Hungary during the first period, three of them—Lithuania, Slovak Republic and Romania—had average annual rates of network export growth exceeding 30 percent (Table 3).

Table 3: Dynamics of total network trade and its share in manufactured goods excluding chemicals of CEEC-10 in 1996-2003 (in percent)

	Average annual rate of growth of network				Share in manufactured goods					
	exports		imports		exports			imports		
	1995-99	1999-03	1995-99	1999-03	1995	1999	2003	1995	1999	2003
Bulgaria x/	-15.2	16.4	31.8	-0.6	7.6	4.9	3.9	19.0	27.6	12.5
Czech Republic	21.4	27.8	7.5	17.1	15.5	24.3	34.4	22.2	24.1	25.2
Estonia	18.5	22.3	11.2	10.8	25.1	27.8	29.9	30.1	27.9	19.9
Hungary	68.9	15.8	41.4	10.0	18.1	52.2	53.8	22.6	39.0	34.3
Latvia	-21.2	27.1	18.8	-0.7	10.9	3.3	4.9	23.3	25.2	13.4
Lithuania	0.9	35.4	8.5	3.9	18.5	13.8	19.1	25.5	22.4	12.0
Poland	21.6	29.1	26.0	-2.5	11.9	19.5	26.2	21.6	31.2	19.2
Slovak Republic	37.9	32.1	19.5	17.7	11.2	30.5	40.5	24.0	31.0	27.6
Slovenia	2.9	10.2	4.1	-9.8	19.7	21.5	22.0	31.8	32.1	16.1
Romania	13.1	38.9	8.5	19.1	4.1	5.7	9.7	14.4	15.7	13.3

x/ Data not available for 1995 but available for 1996 and thereafter.
Source: UN COMTRADE database.

Not surprisingly, considering its early success in attracting huge FDI inflows, Hungary, whose network exports in terms of value were still in 1995 below those originating in the Czech Republic, Poland and Slovakia, has become the regional powerhouse accounting now for around one third of CEEC-10 MNC-driven exports (Table 4).

Table 4: Share of CEEC economies in CEEC-10 total exports of MNC-driven networks (in percent and billion of US dollars)

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Bulgaria	n.a	1.6	0.8	0.4	0.4	0.2	0.2	0.3	0.3
Czech Republic	30.0	31.0	23.2	23.6	21.7	20.8	25.1	32.1	25.2
Estonia	3.2	2.9	3.3	2.5	2.1	3.5	3.0	1.8	2.0
Hungary	15.6	10.6	34.6	37.1	42.4	39.0	35.8	32.3	33.2
Latvia	0.9	0.6	0.3	0.2	0.1	0.1	0.1	0.1	0.1
Lithuania	2.7	4.1	2.8	1.7	0.9	1.0	1.5	1.5	1.4
Poland	21.2	22.2	16.1	15.2	15.4	18.5	19.0	17.5	18.7
Romania	2.6	2.2	1.6	0.9	1.4	2.5	2.2	2.2	2.3
Slovak Republic	8.0	10.1	8.8	10.9	9.6	9.5	8.5	8.2	12.8
Slovenia	15.9	14.8	8.5	7.5	5.9	4.7	4.4	4.1	3.8
Total (in US$ bill.)	8.2	9.5	16.0	22.4	24.5	31.2	34.6	44.8	56.2

Source: Derived from data in UN COMTRADE Database as reported by CEEC-10.

Although some CEEC-10 clearly followed the path pioneered by Hungary, others—in spite of a fast growth—are yet to catch up. Consider that variation in the weight of network products in manufactured product exports has remained quite large. However, it slightly fell between 1999 and 2003. The simple average of shares of networks increased from 20 percent to 24 percent over this period, with the coefficient of variation falling from 73 percent to 66 percent. While in 1995 the share of network products in manufactured exports exceeded 25 percent only for Estonia, this share was larger than 25 percent in 2003 for four other countries—Czech Republic, Hungary, Poland, and Slovakia.

Countries with a higher share of network exports in manufactured exports also import relatively more of network products and parts. This appears to indicate reliance on imports in export activities. First, both shares are highly correlated—the value of correlation coefficient increased from 75 percent in 1999 to 2004. Second, the composition of import demand of CEEC-10 economies displays a much lower variation than that of exports. Hence, those that import relatively more use them in processing and assembly operations.

Indeed, a more detailed examination of data broken down by each network corroborates these observations. Import intensity happens to be below 100 percent, which indicates engagement in MNC-driven networks, for countries with the shares of network exports above 20 percent, that is, Czech Republic, Estonia, Hungary, Poland, Slovakia and Slovenia (Table 5). Relatively high shares of parts in network exports of parts and final products also suggest the involvement of domestic firms not only in assembly but also processing operations. This share significantly fell in exports of automotive network from Slovakia because of the VW final production platform established there.

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Table 5: Import intensities of network exports and share of parts in network exports in 1995, 1999 and 2003(in percent)

	Automotive Network						**Information Technology Network**					
	Share of parts in exports			*Import intensity*			*Share of parts in exports*			*Import intensity*		
	1995	1999	2003	1995	1999	2003	1995	1999	2003	1995	1999	2003
Bulgaria	42.2	65.6	60.3	151	400	675	49.8	49.4	40.7	121	315	194
Czech Republic	44.4	47.0	57.4	46	70	53	70.3	56.1	26.1	150	123	56
Estonia	39.5	52.2	44.8	70	53	47	89.0	58.1	53.8	117	66	54
Hungary	56.1	71.0	79.3	53	51	44	64.8	30.0	20.7	82	59	50
Latvia	27.2	62.2	55.6	506	400	675	17.6	56.7	24.5	136	378	191
Lithuania	23.5	27.8	13.9	97	506	370	71.7	73.1	73.5	45	59	49
Poland	34.3	41.4	66.4	120	97	38	60.1	39.6	42.4	168	110	90
Romania	34.8	83.5	88.6	93	118	140	85.1	78.3	18.8	2124	225	121
Slovak Rep.	73.7	29.7	37.2	51	97	38	26.8	46.1	43.6	191	104	85
Slovenia	35.3	36.8	46.8	50	120	42	58.2	34.7	25.1	108	118	91
CEEC-10	42.8	51.0	60.2	53	64	43	66.6	37.1	27.5	140	78	61

[x/] Data not available for 1995 is not available for Bulgaria but available for 1996 and thereafter.
Source: Derived from data in UN COMTRADE Database as reported by CEEC-10.

Gleaning over the data concerning trade in IT network leads to interesting observations. First, note that except for Hungary and Lithuania the values of import intensity of IT exports were below 100 percent only for two countries—Hungary and Lithuania. While Hungary was clearly a part of the IT 'MNC-driven' network, the case of Lithuania is less clear, as almost half of its IT exports went then to the CIS. By 1999, the share of CIS fell to 15 percent, while that of the EU went up from 32 percent in 1995 to 43 percent in 1999. Second, there are clear indications that by 2003 most CEEC-10, except Bulgaria, Latvia and Romania followed Hungary and have become involved in IT-related outsourcing and production fragmentation. Last but not least, the increase in the share of IT parts in IT network exports for most CEEC-10 indicates the growing importance of assembly operations.

One may thus conclude that trade data strongly suggest that most CEEC-10 have either become or are becoming incorporated into a new global division of labor driven by production fragmentation. Exceptions are Bulgaria, Latvia and Romania, although they seem to following the 'flying geese pattern," Romania in both automotive and IT network and Bulgaria and Latvia in IT network.

But the 'leading geese' are not clearly the best performers among CEEC-10 but highly developed countries. Their trade in IT products has expanded faster than that in automotive products over the last two decades. An interesting question is how CEEC-10 have been faring in IT network driven distribution of labor. Using

metaphors from studies of East Asian economic development coined originally by Akamatsu (1961), the question is who is a 'flying geese' and who is a 'cooked geese.'

The general answer is that the region has been clearly following the path taken by more developed economies, although the mid-1990s witnessed what looked like 'cooked geese' but in retrospect turned out to be successful restructuring. Exports and imports of IT products and parts have expanded faster than those of automotive products. In consequence, the share of IT network in CEEC-10 network exports in 2003 was 14 percentage points higher and in imports 16 percentage higher than in 1995 (Table 6).

Table 6: Shift towards the IT Network: share in MNC-driven exports and imports in 1995, 1999, 2003 and average annual growth in 1995-99 and 1999-03 (in percent)

	Share of IT network in 'MNC-driven' exports			Share of IT network in 'MNC-driven' imports			Average rate of growth of IT network				***Memorandum***: average growth rates of automotive exports	
							Exports		Imports			
	1995	1999	2003	1995	1999	2003	1995-99	1999-03	1995-99	1999-03	1995-99	1999-03
Bulgaria	27	28	64	44	38	78	-13	43	26	19	-16	-2
Czech R.	20	13	36	53	45	65	9	65	3	29	24	18
Estonia	54	80	72	56	62	84	31	19	14	20	-4	34
Hungary	42	52	58	48	52	70	78	19	44	18	61	12
Latvia	32	58	61	38	47	76	-8	29	25	12	-30	24
Lithuania	53	57	41	35	41	76	3	25	13	21	-1	47
Poland	23	30	22	48	43	60	29	20	23	6	19	33
Romania	7	42	43	53	70	77	60	40	13	22	0	38
Slovak R.	17	14	12	51	31	34	32	26	5	21	39	33
Slovenia	11	9	12	24	27	45	-2	18	7	3	3	9
CEEC-10	24	34	38	47	45	63	34	26	16	17	21	21

[X/] Data 1995 not available for Bulgaria but available for 1996 and thereafter.
Source: Derived from data in UN COMTRADE Database as reported by CEEC-10.

However, there were differences among CEEC-10 economies. First, for some countries the increase in the share of IT products in MNC-driven network exports took place against the background of stagnating or falling exports of both IT and automotive products and parts. This was the case of Bulgaria and Latvia in 1995-99. Although the share of IT increased, this was only because the automotive exports contracted more than the IT exports did over the 1996-99 period. While exports of automotive network products from Bulgaria continued falling in 1999-2003, those of IT network products strongly rebounded in this period.

Second, IT exports have been levers of MNC-driven networks' exports in 2000-03. While over 1995-99 there was a considerable reshuffling mainly due to a spectacular performance of Hungary, whose share in total IT network exports of

CEEC-10 increased from 19 percent in 1995 to 64 percent in 1999, in 2000-03 other CEEC-10 succeeded in entering IT networks. They all recorded double-digit growth rates in exports and, except for Poland and Slovenia, also in imports. In 2000-03 the fastest grower was the Czech Republic, whose share in regional IT network exports rose at the expense of Estonia, Hungary and Poland.

In all, Czech Republic, Estonia and Hungary have acquired regional export specialization in network trade and have outperformed other CEEC-10 countries in terms of integrating into supply chains of IT networks. They export relatively more than they import, with their shares in CEEC-10 exports exceeding their shares in imports. The Czech Republic acquired this distinction only in 2002, whereas both Estonia's and Hungary's export shares have been constantly higher then their import shares. It is interesting to note that this was also the case of Lithuania in 1995-97 and Slovenia in 1995-96. It appears that their firms subsequently were 'dropped off' the supply chains.

'MNC-driven' network trade: who and with whom?

An interesting question to which we shall now turn is whether there any similarities and differences between two networks in terms of assembly operations as distinct from processing. However, in order to address this question, let us first briefly discuss developments in direction of 'MNC-driven' network trade. EU is the most important market for CEEC-10 network products and parts taking overall 78 percent of their network exports and supplying 59 percent of all network products and parts imported by CEEC-10. But there are important cross-country differences. In general, one may distinguish between two groups of countries: those that rely on both imports from the EU and exports to the EU and those that rely on imports but not on exports. Bulgaria (27 percent of total going to the EU), Latvia (22 percent) and Lithuania (12 percent) belong to the latter group.

One suspects that firms in these countries are involved in processing to serve the needs mainly of CIS markets, although a final judgment would call for a more detailed analysis. Except for Lithuania, their participation in networks has so far been rather limited, with their shares in manufactured exports below 5 percent (see Table 3 above). For Latvia and Lithuania, CIS markets are the most important outlets for their exports taking 57 percent and 76 percent respectively in 2002. CIS countries take 29 percent and CEEC markets 12 percent of Bulgaria's network exports. The EU accounted in 2002 for 71 percent of Bulgaria's network imports, 74 percent of Latvia's imports, and 65 percent of Lithuania's imports. Their imports from CIS countries have been miniscule amounting to around 2 percent of total network imports.

As for the remaining, 'dominant' group, accounting for around 98 percent of CEEC-10 total networks' trade, the share of the EU in their exports is particularly high for Hungary and Poland (both 86 percent in 2002), followed by Slovenia (78 percent), Slovakia (77 percent) and the Czech Republic (74 percent). Considering relatively large FDI stocks, firms located in these countries are firmly entrenched in EU-based production and distribution networks.

But there are considerable differences between the two "MNC-driven' networks. Each network is discussed thereafter. We shall begin with a 'more dynamic' network, i.e., information technology.

Information Technology Network

Exports and imports of IT products and parts have been the drivers of 'MNC-driven' network trade. As noted earlier, the best export performers have been the Czech Republic, Hungary and Estonia, with the former two accounting for almost three-fourths of CEEC-10 IT network's exports. But others have been catching up since 2000, as each CEEC-10 recorded a double-digit growth in IT exports. The question addressed here is who traded with whom and in what.

Data tabulated in Table 7 shed some light on this question. CEEC-10 appear to be going global in exports of parts and imports of final products, i.e., beyond markets in the EU, while simultaneously their level of intra-CEEC-10 trade has significantly increased. The share of other markets (i.e., excluding CEEC-10, EU and CIS) in CEEC-10 exports of parts increased from 7 percent in 1999 to 23 percent, but the share of these markets in exports of final IT network products fell from 21 percent to 10 percent over the same period. Trade in parts has been also a driver of a rapid expansion in intra-CEEC trade within IT networks. CEEC markets took almost 10 percent of their total exports of IT parts and accounted for 6 percent of their imports in 2002. Considering that the respective shares were at around 4 percent three years earlier, this is a significant change.

Table 7: Developments in IT network trade in 1999 and 2002 (in percent and million of US dollars)

	Share of CEEC-10 in				Share of EU in				Share of CIS in				Memorandum:	
	exports		Imports		exports		imports		exports		imports		Exports	Imports
Parts	1999	2002	1999	2002	1999	2002	1999	2002	1999	2002	1999	2002	2002	2002
Bulgaria	3.5	7.6	0.9	0.9	56.2	52.3	75.0	76.5	11.2	3.5	0.6	0.5	27	171
Czech Republic	8.9	21.0	2.6	2.1	84.1	49.2	76.5	72.4	2.1	0.9	5.6	0.1	1,291	1,836
Estonia	1.9	2.4	0.5	2.3	93.8	89.0	95.9	68.1	0.4	0.9	0.1	0.1	305	288
Hungary	0.6	1.8	1.4	8.1	95.8	83.7	66.3	45.1	0.1	0.5	0.3	0.1	1,835	3,318
Latvia	42.3	24.9	6.7	6.6	21.6	42.4	55.5	54.3	32.9	22.5	16.0	0.8	9	93
Lithuania	8.4	8.4	7.6	5.3	39.6	26.4	57.8	73.1	15.4	15.7	4.6	5.4	181	125
Poland	4.0	13.1	1.0	3.6	80.5	57.2	70.8	62.1	4.3	8.6	0.4	0.2	621	1,656
Romania	26.6	3.8	1.9	5.5	70.2	28.8	77.7	74.5	0.1	0.3	0.1	0.1	256	306
Slovak Republic	9.5	16.7	9.5	9.5	84.7	76.3	60.3	59.3	0.2	0.2	0.3	0.5	269	538
Slovenia	6.0	8.6	3.9	6.7	43.2	42.8	74.7	69.4	5.0	21.0	0.0	0.0	45	201
CEEC-10	4.1	9.7	2.1	5.5	87.7	65.3	70.3	72.3	1.6	2.4	1.2	0.2	4,839	8,532
Final products	.													
Bulgaria	6.8	16.1	4.2	10.8	34.0	48.3	81.3	67.6	23.2	4.6	0.2	0.1	42	247
Czech Republic	10.3	3.5	6.0	7.2	82.1	87.4	79.2	63.5	2.9	0.6	0.9	0.0	3,825	1,384
Estonia	4.5	14.9	2.0	4.5	88.6	75.5	89.4	77.6	5.5	6.4	0.9	0.2	273	168
Hungary	1.3	3.5	3.1	8.9	71.3	83.2	79.6	52.4	0.0	0.2	0.0	0.3	6,272	1,598
Latvia	29.1	43.6	8.7	13.2	31.4	34.8	64.0	76.7	3.0	11.3	5.3	0.2	16	184
Lithuania	30.8	26.1	7.5	7.2	53.5	46.3	61.7	80.8	12.7	24.0	18.4	1.3	53	248
Poland	9.1	9.7	2.5	6.1	87.6	83.4	79.1	77.2	1.6	3.5	0.0	0.0	1,321	1,887
Romania	0.6	2.6	3.2	9.8	86.7	85.3	80.7	68.6	2.9	0.8	0.1	0.1	284	489
Slovak Republic	29.5	22.6	10.3	21.6	66.5	69.8	78.0	70.4	1.7	5.2	0.2	1.2	222	337
Slovenia	12.3	2.7	2.9	6.0	30.4	31.3	80.3	82.1	28.0	46.8	0.3	0.0	174	233
CEEC-10	4.3	4.9	4.0	8.5	73.6	83.1	78.8	67.1	1.3	1.7	0.9	0.2	12,482	6,776

Source: Derived from data in UN COMTRADE Database as reported by trade partners.

Yet, while the increase in geographical diversification in trade in IT parts may indicate that CEEC-10 firms have become parts of supply chains of IT networks with the reach beyond the EU, three features stand out: EU remains the major 'target' of CEEC-10 IT network trade, CEEC-10 are significant suppliers to EU IT markets, and there are indications of the change in specialization profile. If one takes IT network's both parts and products, the share of the EU in CEEC-10 exports has been at around 64-65 percent since 1995 and in imports fell from 75 percent in 1999 to 67 percent. On the other hand, CEEC-10 dramatically expanded their presence in EU markets: their share in external imports (excluding intra-EU trade) of IT final products increased from 7 percent in 1999 to 18 percent in 2002 and from 5 percent to 6 percent in imports of parts over the same period. CEEC-10 purchased 14 percent of EU external exports of IT parts and 13 percent of IT final products.

Trade data suggest the change in specialization profile driven mainly by Hungarian and Czech IT firms, with the EU increasingly specializing in parts and CEEC-10 in final products not only vis-à-vis the EU but also other markets. Consider

the following: First, as far as the specialization in trade with the EU is concerned, the decline in 1999-2002 in the value of the index of horizontal trade specialization (HTS) in a two-way IT trade with the EU points to the change in respective profiles (Kaminski and Ng 2004). Second, the region as a whole has huge surplus in trade in final products accompanied by a significant deficit in trade in parts (Table 7). Third, the values of import intensity indicators are well below 100 for major exporters among CEEC-10 (see Table 5 above), which points in the same direction, i.e., growing specialization in assembly operations. The exceptions are Bulgaria, Latvia and Romania, but their respective import intensities have been on decline since 1995. Last but not least, exports of final IT products increased much more than these of IT parts—the former stood in 2002 at 236 percent of their value in 1999, while the latter at 155 percent.

CEEC-10 have not only gone global but they have also shifted away from the CIS and increased trade among themselves. Despite a slight increase in the share of the CIS in CEEC-10 exports of both parts and products, their share in imports rather dramatically declined. The shift points to the ongoing restructuring of the IT sector in some CEEC-10 economies as well as the change in demand in CIS towards more sophisticated products. While between 1999 and 2003, the contraction characteristic of the 1992-99, was reversed, there was a marked shift in CIS IT import demand towards products manufactured in countries with modernized capacities. (Table 8). Bulgarian and Latvian exports continued falling throughout the whole period, while those from other countries—in particular Hungary and Poland—significantly expanded. Overall, CEEC-10 share in CIS total imports of IT network products increased from 4 percent in 1999 to 5.2 percent in 2002.

Table 8: Export performance of CEEC-10 economies in CIS markets in 1995, 1999 and 2002 (in percent and million of US dollars)

	Share in CIS-destined CEEC 10 exports			Index 1999	Index 2002	Share of final products		
Exports to CIS	1995	1999	2002	1996=100	1999=100	1995	1999	2002
Bulgaria	9.8	3.9	0.9	23	61	54	68	67
Czech Republic	12.0	14.3	10.1	69	194	37	53	65
Estonia	3.7	8.7	6.2	137	196	79	92	86
Hungary	7.1	1.8	5.8	15	862	70	53	56
Latvia	8.7	4.4	1.2	29	73	82	42	49
Lithuania	22.9	16.0	12.6	40	217	61	23	31
Poland	9.4	25.4	30.8	155	333	81	37	47
Romania	1.1	0.9	0.9	47	283	16	87	75
Slovak Republic	3.2	2.9	3.7	53	348	51	89	96
Slovenia	22.2	21.7	27.9	56	353	15	91	90
CEEC-10 (in mill. of US dollars)	206	119	326	58	275	52	57	64

Source: Derived from data in UN COMTRADE Database.

Intra-CEEC trade in IT network products has also expanded. Its value tripled between 1999 and 2002, and its share increased in both exports and imports from 4 percent to 10 percent and from 2 percent to 6 percent respectively. Final IT products manufactured in CEEC-10 accounted in 2002 for 9 percent of their total imports up from 4 percent in 1999.

An examination of intra-CEEC-10 IT trade points to the emergence of Hungary as a focal point using inputs manufactured in other CEEC-10 economies. Its rise to prominence in this new role has not only been swift but spectacular. Hungary has become the largest consumer. Hungary accounted in 2002 for 40 percent of intra-CEEC IT imports, up from 5 percent in 1995. Hungarian IT network imports from CEEC-10 increased from US$ 66 million in 1999 to US$ 436 million in 2002. Its imports from the Czech Republic increased from US$ 5 million in 1999 to US$ 200 million in 2002, from Poland from US$ 20 million to US$ 125 million and from Slovakia from US$ 7 million to US$ 23 million. Parts were dominant in these imports, with the average share in Hungary's imports from CEEC-10 amounting to 62 percent in 2002: they accounted for 79 percent of imports from the Czech Republic, 38 percent from Poland and 93 percent from neighboring Slovakia.

Thus, it appears that some producers in these countries have become part of supply chains feeding parts for further processing in Hungary.

Automotive Network

Despite a strong growth of trade in IT network products and parts, exports and imports of automotive network products and parts still account for the bulk of 'MNC-driven' network trade and CEEC-10 as a group exports more automotive products and parts than it imports (Table 9). Automotive networks are highly geographically concentrated, with the Czech Republic, Hungary, Poland and Slovakia accounting for 92 percent of CEEC-10 exports of parts and 88 percent of exports of automotive vehicles. The Czech Republic (41 percent of total CEEC-10 exports) followed by Slovakia (18 percent) is the largest exporter of motor vehicles, whereas Hungary (32 percent of total CEEC-10 parts exports) followed by the Czech Republic (28 percent) is the largest exporter of parts. In consequence, they determine performance of the CEEC-10 as a region.

Automotive network trade flows are highly geographically concentrated, with the EU providing and taking around 80 percent of CEEC-10 automotive network exports and imports. If anything, the geographic concentration in automotive network trade, except for exports of motor vehicles, further increased between 1999 and 2002 almost for each CEEC-10. There are, however, exceptions indicating that some firms

increasingly serve either as suppliers of parts to chains outside the EU or as export platforms. One suspects that the decline in the share of the EU in Czech or Slovak exports of motor vehicles can be explained by global strategy of the Volkswagen Group.

Table 9: Developments in automotive network trade in 1999 and 2002 (in percent and million of US dollars)

	Share of CEEC-10 in				Share of EU in				Share of CIS in				Memorandum:	
	exports		imports		exports		imports		exports		imports		Exports	Imports
Parts	1999	2002	1999	2002	1999	2002	1999	2002	1999	2002	1999	2002	2002	2002
Bulgaria	5.1	14.1	24.2	19.6	15.9	36.6	49.0	59.2	63.9	6.4	20.6	11.7	23	112
Czech Republic	18.7	11.9	13.5	13.1	73.3	79.3	83.2	84.5	1.4	1.6	0.3	0.4	4,140	2,795
Estonia	9.5	7.6	5.0	4.1	23.7	45.2	78.8	77.0	61.1	42.3	7.7	4.9	108	114
Hungary	3.4	6.5	4.0	4.1	92.1	84.3	83.1	88.6	0.2	0.4	0.9	0.2	4,776	4,019
Latvia	15.8	24.0	19.0	18.7	18.5	31.7	60.8	59.0	59.4	39.9	15.5	15.6	13	92
Lithuania	25.8	23.6	12.6	17.8	12.9	24.2	62.4	56.4	55.4	37.5	19.3	12.9	44	171
Poland	8.5	5.5	13.7	7.8	81.6	86.8	73.7	82.0	3.1	2.8	0.8	0.6	3,788	2,885
Romania	42.5	8.6	12.4	13.5	35.7	77.8	34.3	62.3	0.1	0.1	0.6	1.1	383	372
Slovak Republic	23.5	17.9	11.0	20.1	66.0	76.0	87.7	79.1	2.0	1.1	1.0	0.3	966	1,701
Slovenia	3.5	4.2	3.8	6.1	75.1	75.7	90.8	86.9	0.3	0.2	0.0	0.0	673	801
CEEC-10	10.6	8.5	10.5	9.7	80.5	81.9	79.7	83.2	2.0	1.8	1.2	0.8	14,913	13,063
Final products														
Bulgaria	20.4	17.5	4.1	4.3	26.2	33.8	78.3	85.6	34.7	16.9	2.9	2.2	26	323
Czech Republic	13.8	16.6	3.2	5.3	75.0	69.6	83.5	85.9	2.1	4.0	0.3	0.1	5,111	1,809
Estonia	35.5	44.9	4.0	2.4	17.8	21.9	85.2	88.7	45.1	30.4	2.2	2.4	117	338
Hungary	2.2	2.4	9.6	12.4	86.1	92.2	74.6	74.8	2.6	0.3	2.5	0.9	1,584	2,001
Latvia	27.3	24.8	14.0	22.3	40.5	36.3	62.7	68.0	31.9	33.7	13.5	3.6	12	305
Lithuania	16.5	3.7	13.6	6.8	19.9	4.1	65.9	83.4	62.7	91.6	15.1	4.7	376	534
Poland	7.0	6.0	1.2	12.3	88.9	87.6	69.0	82.8	0.4	2.9	0.7	0.1	2,116	3,199
Romania	19.4	13.0	5.4	8.2	15.8	3.1	81.0	78.9	0.3	2.8	0.1	1.2	84	941
Slovak Republic	2.7	6.5	54.7	44.9	90.3	80.2	39.9	53.4	0.4	0.2	0.1	0.2	2,195	745
Slovenia	1.9	8.1	8.1	5.0	93.3	85.7	77.0	78.5	0.0	0.1	3.1	6.2	926	786
CEEC-10	7.3	10.5	8.0	12.0	83.2	75.6	72.6	79.1	2.2	5.3	1.9	1.2	12,547	10,982

Source: Derived from data in UN COMTRADE Database as reported by trade partners.

In fact, countries that have become parts of EU-based networks and attracted significant inflows into automotive sector tend to be not only much larger exporters of automotive network products but also their trade is more concentrated on the EU, albeit with a caveat.[9] The share of non-EU markets for the Czech Republic, Hungary and Poland supplying around 10 percent of all parts imported into the EU is around 20 percent or less and—except for Hungary—slightly fell. On the other hand, it is significantly higher for marginal 'players' in automotive networks, i.e., Bulgaria, Estonia, Latvia and Lithuania, although it has been falling (Table 10). As for exports of automotive vehicles, the share of other than EU markets was significantly higher than for parts. Furthermore, it significantly increased, which indicates increasing participation in global networks.

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While the weight of intra-CEEC trade in automotive parts appears to have contracted, the conclusion about the demise of links among CEEC-10 firms would not be warranted. The contraction in the share of intra-CEEC exports of parts in total parts exports between 1999 and 2002 was the result of spectacular growth of trade in parts with the EU. The value of intra-CEEC trade in parts in 1999 was 63 percent above its level in 1995 and 46 percent in 2002 above its 1999 level. In 1999-2002 intra-CEEC imports of parts at least doubled in terms of value for Hungary, Lithuania, Romania, Slovakia and Slovenia and exports for Hungary, Latvia and Poland. Except for Poland (imports) and Romania (exports), the values of intra-CEEC trade substantially increased in 1999-2003.

Table 10: Importance of CEEC-10 automotive networks to the EU. Share of CEEC-10 in EU external imports in 1999 and 2002 (in percent)

	Share in EU external imports of				**Memorandum:** share of other than EU in CEEC							
	parts		motor vehicles		exports of parts		Exports of vehicles		imports of parts		imports o vehicles	
	1999	2002	1999	2002	1999	2002	1999	2002	1999	2002	1999	2002
Bulgaria	0.0	0.0	0.0	0.0	84	63	74	66	51	41	22	14
Czech Republic	5.7	9.3	5.5	11.0	27	21	25	30	17	15	16	14
Estonia	0.0	0.1	0.0	0.1	76	55	82	78	21	23	15	11
Hungary	11.6	11.4	3.7	4.5	8	16	14	8	17	11	25	25
Latvia	0.0	0.0	0.0	0.0	81	68	59	64	39	41	37	32
Lithuania	0.0	0.0	0.0	0.0	87	76	80	96	38	44	34	17
Poland	3.2	9.3	4.1	5.7	18	13	11	12	26	18	31	17
Romania	0.2	0.8	0.0	0.0	64	22	84	97	66	38	19	21
Slovak Republic	1.4	2.1	3.9	5.5	34	24	10	20	12	21	60	47
Slovenia	1.3	1.4	2.3	2.5	25	24	7	14	9	13	23	21
CEEC-10	23.4	34.4	19.7	29.4	20	18	17	24	20	17	27	21

Source: Derived from data in UN COMTRADE Database as reported by trade partners.

But not only, as there are indications of other emerging clusters around and between major regional automotive powerhouses, with the intensity of intra-CEEC trade in automotive parts undergoing change. Note first that most of intra-CEEC trade in automotive parts takes place mostly among the Czech Republic, Hungary, Poland and, to a lesser extent, Slovakia. Trade among them accounts for more than 80 percent of intra-CEEC trade in automotive parts (Table 11). Almost 100 percent (97 percent) of Czech imports of parts from CEEC-10 came from the other Big Three, 91 percent of Hungarian imports, 87 percent of Polish imports and 99 percent of Slovak imports have the same origins. On the export side, around 90 percent of Czech, Hungarian and Slovak CEEC-directed exports went to respective Big Three and three-fourths of Polish CEEC-destined exports went there.

Second, the Czech-Slovak dyad, which accounted for 54 percent of intra-CEEC trade in parts in 1995, fell to 21 percent in 1999, but increased 30 percent in

2002. Despite the unavoidable contraction following the dissolution of Czechoslovakia and uneven pace of industrial restructuring (Kaminski, Smarzynska 2003), there are signs that the rebound will continue in the future. With around 300 firms operating in the Czech Republic that represent 45 percent of the Top 100 World suppliers of automotive parts and components (USDS 2002), one may expect they will become levers of expanding regional ties especially in servicing the Volksvagen-based automotive network present in both countries.

Table 11: Intra-CEEC trade in automotive parts in 2002 (in percent and million of US dollars)

Exports (lines)	Bulgaria	Czech R.	Estonia	Hungary	Latvia	Lithuania	Poland	Romania	Slovak R.	Slovenia	CEEC-10 (US$ mill)
Bulgaria	0.0	**21.6**	0.6	**32.8**	1.2	0.1	13.7	**21.4**	8.5	0.1	3
Czech Republic	1.6	0.0	0.2	8.9	0.5	1.5	**27.4**	2.1	**53.5**	4.3	492
Estonia	0.7	4.8	0.0	7.0	**42.1**	**39.7**	0.8	0.0	0.0	5.0	8
Hungary	2.3	**57.3**	0.1	0.0	0.1	0.6	13.4	5.8	**19.7**	0.6	310
Latvia	0.1	0.0	**22.9**	2.7	0.0	**71.6**	2.6	0.0	0.0	0.0	3
Lithuania	1.5	1.8	**16.9**	7.1	**62.3**	0.0	10.3	0.0	0.1	0.0	10
Poland	1.5	**31.9**	0.4	**36.5**	2.0	6.1	0.0	4.1	6.2	11.3	207
Romania	1.3	14.4	0.0	17.0	0.0	0.0	**62.0**	0.0	4.5	0.8	33
Slovak Republic	1.6	**63.6**	0.1	17.4	0.2	0.5	10.0	5.5	0.0	1.0	173
Slovenia	1.4	20.0	0.2	23.0	0.1	6.9	28.1	12.4	8.1	0.0	28
Share in intra CEEC-10 exports	1.7	**28.8**	0.4	13.0	1.3	2.4	17.6	4.0	**26.9**	3.9	100
Memorandum: share of CEEC-10 in country's exports of parts											
	14.1	11.9	7.6	6.5	24.0	23.6	5.5	8.6	17.9	4.2	10.6
Imports (columns)	Bulgaria	Czech R.	Estonia	Hungary	Latvia	Lithuania	Poland	Romania	Slovak R.	Slovenia	CEEC-10
Bulgaria	0.0	0.2	0.4	0.6	0.2	0.0	0.2	1.3	0.1	0.0	0.2
Czech Republic	**35.8**	0.0	18.7	26.8	**13.4**	**25.0**	**60.2**	**20.4**	**77.2**	**43.4**	38.8
Estonia	0.3	0.1	0.0	0.3	**20.2**	10.7	0.0	0.0	0.0	0.8	0.6
Hungary	**32.5**	**48.6**	8.3	0.0	1.9	6.2	**18.6**	**35.7**	17.9	3.7	24.4
Latvia	0.0	0.0	**15.2**	0.1	0.0	7.3	0.0	0.0	0.0	0.0	0.2
Lithuania	0.7	0.0	**37.0**	0.4	**37.6**	0.0	0.5	0.0	0.0	0.0	0.8
Poland	**14.4**	18.1	**17.1**	**46.0**	**24.5**	**41.6**	0.0	16.8	3.8	47.8	16.3
Romania	2.0	1.3	0.0	3.4	0.0	0.0	9.1	0.0	0.4	0.5	2.6
Slovak Republic	**12.6**	**30.1**	2.3	18.4	2.0	2.9	7.8	18.9	0.0	3.7	13.6
Slovenia	1.7	1.5	1.0	3.9	0.1	6.3	3.5	7.0	0.7	0.0	2.2
CEEC-10 (in US$ million)	22.0	365.4	4.7	164.4	17.1	30.5	223.7	50.2	341.6	49.0	1,269
Memorandum: share of CEEC-10 in country's total imports of parts											
Share of CEEC	19.6	13.1	4.1	4.1	18.7	17.8	7.8	13.5	20.1	6.1	9.7

Source: Derived from data in UN COMTRADE Database as reported by trade partners.

Another case of more intense intra-CEEC bilateral exchanges is the Czech Republic and Slovakia: two-thirds of Slovak CEEC-directed exports of parts go to the Czech Republic, and Slovakia takes one-fifth from the latter. Czech parts account for 77 percent of Slovak imports from CEEC-10, and Slovak parts for 30 percent of Czech imports.

But there are also local clusters: the most visible, although tiny, is the Baltic cluster—inter-Baltic exports accounted in 2002 for 83 percent of their total CEEC-destined exports. Baltic states export mostly to each other. Latvia and Lithuania took 82 percent of Estonia's CEEC-oriented exports, Estonia and Lithuania 95 percent of Latvian exports, and Estonia and Latvia 79 percent of Lithuanian exports. Baltic imports accounted for only 43 percent of their aggregate imports of parts from CEEC-10.

'MNC-driven' networks and intra-CEEC-10 trade

The most striking development has been a significant growth in trade in networks' parts among CEEC-10. While in both networks the radial pattern of trade concentrated on the EU is a dominant form of interaction within networks, there are clear indications of the emergence of supply chains spanning across CEEC-10 but only in IT networks. Especially IT firms located in Hungary appear to rely increasingly on supply of parts from other CEEC-10. Suppliers of automotive parts located in CEEC-10 have their eyes on EU markets, as CEEC-10 has emerged as a major exporter of parts. On the other hand, the importance of CEEC-10 markets for producers of motor vehicles operating in CEEC-10 has significantly increased.

Conclusions

To review the main points of this paper, one can make the following observations. First, the EU Eastern Enlargement has had dramatic impact on FDI inflows into CEEC-10. Countries that moved fast with first- and second-generation reforms had attracted investments from MNCs even during the initial stages of transition.

Second, FDI had profoundly impacted trade and a mode of integration into global markets. There is a strong positive relationship between accumulated stocks of FDI in manufacturing indicating presence of MNCs and trade performance. Larger presence of MNCs implies stronger two-way trade in network trade referred to, for this reason, as 'MNC-driven' trade. Furthermore, it also implies a switch from dominance of unskilled-labor intensive products in a country's export basket to that of skilled labor and capital intensive products.

Third, differences in 'MNC-driven' network trade performance can be explained in part by the timing of liberalization and opening to FDI inflows. While geography may matter, countries that attracted significant FDI inflows only in the second half of the 1990s saw the increase in network trade.

Returning to the issue flagged in the subtitle of this paper, MNCs have largely contributed to intra-product trade. It was absent in intra-CMEA trade, which was dominated by inter-industry trade. Entry into a division of labor based on production fragmentation has been made possible thanks to progress made in CEEC-10 in establishing competitive markets and the emergence of a new Pan-European architecture underlying economic relations. The latter has been the product of the Eastern Enlargement project. But the EU accession process has also paved the way to introduce ingredients necessary for 'just-in-time' production and inventory management, i.e., customs reforms, telecommunications, etc.

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** Department of Government, University of Maryland, College Park, MD 20742, USA; e-mail address: bkaminski@gvpt.umd.edu.

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[1] CEEC-10 consists eight 'new' EU members, that is, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic and Slovenia and Bulgaria and Romania—two countries scheduled to accede in 2007. Although this stage of EU 'Eastern Enlargement' enlargement may also include Croatia, given Croatia's unique circumstances, the analysis is limited to CEEC-10 countries that have been already several years into the accession process.

[2] Another factor that drove—together with the implementation of radical stabilization cum transformation measures—was the previous "undertrading" with the EU (Kaminski, Wang and Winters, 1996)

[3] The so-called pan-European cumulation program—adopted by the EU Council in July 1996—linked CEEC-10 and European Economic Area countries through a system of diagonal cumulation allowing imports in these countries to be treated as local inputs (WTO 1997). The Agreement, which went into effect on January 1, 1997, has set the stage for formation of a single European trading bloc as of January 1, 2002.

[4] The countries covered by the 'cumulation' framework are EU-25, Bulgaria, Iceland, Norway, Romania, Switzerland and Turkey.

[5] Derived from the IMF data on net FDI (Simma database).

[6] A good example is Romania's clothing sector, characterized by much higher foreign penetration than in other CEECs (Hunya 2002, p. 391). A large number of small Italian firms appear to dominate both clothing and leather industries in Romania (Cristescu-Voica 2003).

[7] Raw trade data used in this paper cannot fully monitor trade related to production fragmentation. For instance, the use of electronic components and products is not constricted to the Information Technology sectors, as these are increasingly used in a range of other products including household appliances or automobiles. For a more detailed discussion, see Kaminski and Ng (2004a).

[8] For a discussion of idiosyncrasies of Romanian recent integration into EU markets and the role of FDI, see Kaminski and Ng (2004b).

[9] The caveat is that the variation is much smaller on the import than on the export side. The coefficient of variation (ratio of standard deviation to the average) for exports of parts was 64 percent in 2002, for exports of vehicles 64 percent and for their imports 48 percent and 48 percent respectively.