

# **Hungary's Integration into EU Markets: Production and Trade Restructuring \*/**

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## 1. INTRODUCTION

The path of industrial restructuring in transition economies--as observed through the lenses of export performance--has had unique features. During the first stages of the transition, most exports came from firms with already established links with abroad and/or through redirection of exports from former CMEA markets (Kaminski 1993). Subsequently, sustainability of foreign trade and economic growth would depend on facilitating the entry of "second generation" firms, i.e., those which were either newly established or successfully restructured. Thanks to the supply of high quality services and favorable investment climate, the shift to a "second generation" firms, mostly foreign-owned, was already well-advanced in Hungary before 1994, albeit the revival of a temporarily stalled privatization in the second half of 1995 has clearly accelerated it.

Indeed, the developments in Hungarian foreign trade seem to suggest that Hungary has achieved impressive results in both production and trade reorientation. A cursory examination of exports to the EU points to two different phases—1989-92 and 1993-present. The first phase witnessed an initial expansion in exports followed by their contraction in 1993. The expansion in exports to the EU, triggered by the collapse of former CMEA markets and the liberalization of imports and exchange rate regime, was mainly driven by a redirection of manufactures exports to Western, mostly EU, markets. The value of exports increased by 84 percent between 1989 and 1992.<sup>1</sup> This expansion lost steam in 1993 at which time the value of EU-oriented exports fell by 12 percent. But exports subsequently regained their dynamism, registering an exceptionally strong performance over 1994-97 with the value of exports increasing by 132 percent.

It seems that the rapid pace of turn around has a lot to do with the emergence of 'second generation' firms--mostly foreign owned. Foreign-owned firms tend to be more export oriented and more profitable than domestic-owned firms are. Thanks to a friendly environment to FDI since the outset of transition, Hungary has been the most successful transition economy in terms of attracting foreign investors. Over 1990-97 Hungary absorbed around one-half of all foreign capital invested in Central Europe. The inflows did not concentrate in the more recent period (as they did in Poland) but were already large in terms of GDP over 1990-94, which allowed a considerable lead-time to have an impact on the economy.

FDI has played a pivotal role in reintegrating the Hungarian economy into international markets. A huge portion of investment has come from large MNCs (multinational corporations) with global networks of production and marketing. As a result, a significant share of Hungary's

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<sup>1</sup> This analysis is based on mirror statistics, i.e., data on Hungarian exports and imports as reported by its EU trading partners to the UN COMTRADE database.

domestic business activity has been incorporated into these networks. Moreover, most FDI has come to Hungary not as a way of jumping trade barriers but to take advantage of the overall economic environment including location, the cost of factors of production and transaction costs. The data on profitability and export-orientation of foreign owned firms appears to confirm this observation. As a result, the proportion of FDI in inefficient industries supported by unearned “rents,” which usually roils the social and political atmosphere seems to be negligible.

The export response was impressive, while the changes in its composition bear out dramatic progress in industrial restructuring. Exports, helped by recovery in import demand in the EU, soared by 26 percent in 1994, that is, even before the introduction of a stabilization package in 1995, and continued to grow at double-digit growth rates. Export basket has become more diversified with a notable shift toward high value-added products. The share of unskilled labor intensive products in exports has fallen. So has the share of environmentally dirty products.

The focus of this analysis is on changes in exports to the EU. Neither the choice of the EU nor the emphasis on export changes needs detailed elaboration. For one, the EU is Hungary’s natural largest trading partner. Furthermore, with the entry into force of all trade provisions of the European Association Agreements and the establishment of a single European Trading Block in 2001, Hungarian producers will be exposed to unrestricted competition from 31 European countries—members of the Pan-European Cumulation system.<sup>2</sup> Last but not least, the focus on export basket is because the scope and depth of a country’s integration into EU markets for goods offers important insights about the ability of its firms to compete in a Single Market.

The remainder of this paper is organized as follows. First, we discuss broad developments in Hungarian exports. Then we examine two dimensions of Hungary’s competitiveness in EU markets, i.e., changes in the share of Hungarian products in EU imports and shifts in Hungary’s revealed comparative advantage. Hungary’s comparative advantage profile has acquired significant maturity moving towards more sophisticated manufactures. The next section explores whether this shift has had any discernible impact on relative factor intensities of Hungarian exports. Then we address two questions: Considering that Hungary seems to have comparative advantage in agriculture as well as in some other commodity production, has there been any increase in the level of processing of commodity exports? Taking into account the prospect of moving to EU environmental standards, have Hungarian exports become ‘cleaner’? The last section concludes that empirical evidence analyzed here seems to suggest that Hungary

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<sup>2</sup> Pan-European Cumulation system, established at the request of the Copenhagen European Council (22-23 June 1993), includes EU, EFTA and CEFTA members as well as the Baltic States and Bulgaria. Thirty-one states are members. Czech Republic, Slovak Republic, Slovenia, Bulgaria and Romania joined the system in March 1997. Estonia, Latvia, Lithuania, Hungary and Poland joined on July 1, 1997 (Nell 1997).

would be able to withstand competitive pressures of a Single Market while simultaneously enjoying a rising standard of living.

## 2. REORIENTATION OF EXTERNAL ECONOMIC RELATIONS

The initial conditions of the Hungarian transformation had unique features rooted in developments under central planning, both internal and external. Their uniqueness stemmed from a long history of market reforms, as well as membership in non-communist international economic institutions, including the GATT (1973), IMF and World Bank (1982). Reforms under central planning or participation in international economic regimes had not produced competitive markets.<sup>3</sup> The rules of engagement of Hungary in international institutions were different than those of countries with market economies. The crisis of the end of the 1980s proved to be not only a demonstration of the shortcoming of Hungarian-style gradualism but also of little relevance of international multilateral institutions for economies with a widely divergent economic regime (James 1996:561-563).

Following the demise of communism, the process of normalization of Hungary's engagement in external commercial relations has progressed rapidly. In 1989 the EU granted Hungary the GSP (General System of Preferences), which significantly improved conditions in access to EU markets. The interim trade agreement of the EA, which was signed in December 1991, came into effect in March 1992. The preferential trade agreement with EFTA (European Free Trade Association) in 1992, modeled after the EA, was followed by CEFTA (Central European Free Agreement) which entered into force in 1993. As a result of the implementation of these agreements combined with the new European-wide system of cumulation of rules of origin, almost 60 percent of Hungary's trade are subject to preferential arrangements.<sup>4</sup> In 1998, all its exports of manufactures have unfettered duty-free access to EU-markets.

With the entry into force of the Pan-European Cumulation Agreement on July 1, 1997, Hungary has become part of a multilateral free trade area encompassing the EU, EFTA and nine other Central and East European Countries--Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Poland, Romania, Slovak Republic, and Slovenia. The Agreement, adopting schedules of tariff reductions of the Europe Agreements, puts an end "... to the partition of Europe into several

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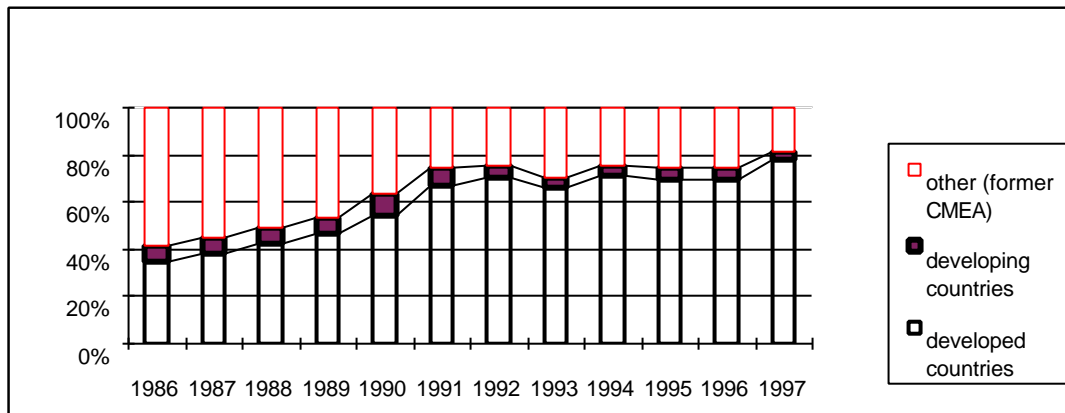
<sup>3</sup> A gradual incremental liberalization supported by the Bretton Woods institutions was not encouraging, as growth rates had fallen sharply in the second half of the 1980s. Moreover, reforms have failed to reverse the trend of a growing share of low value-added, natural resource-intensive products in Hungarian exports to OECD markets over 1981-89. Hungary was successful in improving its share in OECD imports of mineral fuels, ores and nonferrous metals, and raw materials. Its share in imports of manufactures substantially declined in the 1980s (Kaminski 1993).

<sup>4</sup> In consequence, parts and components produced in any country of a single European trading bloc are treated as domestic inputs.

regional trading zone in the early 1990s” (Nell 1996:131). By the year 2001 all tariff barriers on manufactures will be removed. This is both a challenge and an opportunity: the challenge is for policy makers to create conditions so that domestic producers are able to cope with new competitive pressures; and the opportunity is take advantage of a single preferential market of 487 million consumers.

Thus the catalyst for a reorientation of Hungary’s commercial relations was the demise of whatever was left of central planning associated with the rapidly declining Soviet capability to sustain “soft” settlements in intra-CMEA (Council for Mutual Economic Assistance) trade which eventually led to its dissolution.<sup>5</sup> In the second half of the 1980s the combination of the falling oil price in intra-CMEA trade and cuts in Soviet deliveries encouraged former CMEA-members to restrain exports to the FSU and increase exports to hard-currency markets. This heralded a return to trade patterns determined by economic rather than political considerations. The share of former CMEA fell from 60 percent in 1986 to 38 percent in 1990 and to 20 percent in 1997 (Figure 1).<sup>6</sup>

**Figure 1: Geographic patterns of Hungarian trade, 1996-97**



**Source:** *Statistical Yearbook of External Trade*, Ministry of Industry, Trade and Tourism, Budapest 1997 and Newsletter Vol. 10, No. 1, Ministry of Industry, Trade and Tourism, Budapest, 1998.

<sup>5</sup> The CMEA internal settlement mechanism based on “transferable ruble” was formally abandoned on January 1, 1991. Six months later the organization itself was dissolved.

<sup>6</sup> Data on foreign trade for the 1980s are not reliable. They are also highly sensitive to the choice of exchange rate for transferable ruble used in intra-CMEA payments. Figure 1 is based on Hungarian official data: the transferable ruble exchange rate of the Hungarian Forint was regarded as most “realistic,” although it still probably largely overstates the “weight” of the CMEA in its trade. They show that around 1988-89 the value of foreign trade turnover with developed countries caught up with that with CMEA countries. Notwithstanding differences, both official as well as revalued trade figures suggest a long-term trend of declining shares of the CMEA. According to an estimate, between 1970 and 1990 this share fell from 62 percent to 31 percent (Pohl and Sorsa 1992). The demise of German Democratic Republic exacerbates the decline of the former CMEA in Hungarian trade in 1991.

Despite this long term of declining trade with the former CMEA, the challenge of re-adjustment of trade patterns in the early 1990s was formidable. Consider that the previous two decades had witnessed declining competitiveness of Hungarian exports in Western markets and that many Hungarian firms operated in ‘soft’ CMEA markets devoid of competition and dominated by products of shoddy quality. Furthermore, although the price of oil supplied by the former Soviet Union--based on a moving five-year average--was close to the world price, Hungarian products exported would purchase more oil there than elsewhere. Thus, in addition, the shift to convertible currencies in CMEA trade, combined with a rapidly falling import demand in the FSU, amounted to a significant deterioration in Hungary’s terms of trade mainly with the FSU.

Hungary has successfully coped with these challenges. The volume of total exports fell by 5 percent in 1991; was flat in 1992; took a dive of 13 percent in 1993; and increased by 17 percent in 1994. By around 1994-95 the volume of total exports exceeded the 1989 level, and the share of developed countries in Hungary’s exports has moved to around 70 percent in line with what one might expect given Hungary’s proximity to EU markets. The changes on the import side were even more pronounced. As a result, the process of geographic reorientation to market-driven patterns of foreign trade was quickly completed.

### **3. TWO PHASES OF INDUSTRIAL RESTRUCTURING AS REVEALED IN EXPORT PERFORMANCE**

The path of industrial restructuring in transition economies--as observed from the point of view of export performance--has had unique features. Two different phases in developments in Hungarian exports to the EU can be distinguished: the 1989-92 phase and 1993-97 phase. During the first stages of the transition, most exports came from firms with already established links abroad and/or through redirection of exports from former CMEA markets. Subsequently, sustainability of foreign trade and economic growth depended on facilitating the entry of “second generation” firms, i.e., those which were either newly established or successfully restructured. The restructuring was FDI-led. Thanks to the supply of high quality services and favorable investment climate, the shift to a “second generation” firms, mostly foreign-owned, was already well-advanced in Hungary before 1995, albeit the revival of a stalled privatization in the second half of 1995 has clearly accelerated it.

During the first phase the value of EU-destined exports increased by 84 percent between 1989 and 1992. During the second phase, which has been witnessing a much faster expansion, the value of exports increased by 132 percent. The engine of growth was restructured industrial with

participation of foreign control. 1993 was a breaking point, marking the beginning of the second phase in transition.

The expansion lost steam in 1993 when the value of EU-oriented exports fell by 12 percent (see Table 4).<sup>7</sup> This was not because of the falling import demand in the EU, as the share of Hungary in EU external imports also fell from 1.09 percent in 1992 to 1.03 percent in 1993, or by almost 6 percent. Agriculture contributed to it. The fall in the value of agricultural products, which accounted for almost one-fourth of total EU-destined exports, fell by 24 percent. This decrease accounted for 48 percent of the difference between the value of exports to the EU in 1992 and 1993.

**Table 1: Two phases of Hungarian export expansion (annual changes in percent)**

Annual growth rates:	1990	1991	1992	1992, 1989=100	1993	1994	1995	1996	1997	1997. 1993= 100
Hungarian exports to EU*/	30.5	20.0	12.7	184	-11.7	25.8	37.4	12.6	19.2	232
In terms of share in EU imports **/	10.3	15.7	9.4	140	-5.5	14.1	17.0	9.5	13.2	165
Total exports **/	-0.2	6.2	5.2	111	-16.8	20.2	20.3	2.2	21.2	179

**Sources:** \*/ derived from data reported by EU to UN COMTRADE database; \*\*/ derived from *Statistical Yearbook of External Trade*, Hungarian Central Statistical Office, Budapest 1997.

However, the contraction was short-lived. The value of EU-oriented exports soared in 1994 by 26 percent, and was higher than in 1992 by 11 percent. The growth accelerated in 1995 with exports increasing to 37 percent. The average growth rate over 1994-97 was about 24 percent per year. The value of exports to EU countries increased by 132 percent, i.e., by almost 55 percentage points more than during the first phase (Table 1).

Expansion in commercial ties with the EU has had a discernible impact on the composition of exports. Indeed, even a cursory examination of data in Table 2 suggests very substantial changes. First, the expansion of exports in both 1990-92 and 1994-97 periods has been driven by manufactures: their value increased between 1989 and 1997 around almost six-times with the increases of 218 percent during the first phase and 277 percent during the second phase. The share of manufactures in Hungarian EU-oriented exports increased from 55 percent to 68 percent over 1989-92 and from 71 to 88 percent during the second phase. While transport equipment (albeit from a very low base) and metal manufactures drove the expansion during the first phase, non-electric machinery and electrical machinery together with transport equipment were most rapidly growing exports during the second phase.

<sup>7</sup> This analysis is based on mirror statistics, i.e., data on Hungarian exports and imports as reported by its EU trading partners.

**Table 2: Composition of Exports to the EU over 1989-97 and Percent Change in Phases 1 (1989-92) and 2 (1993-97), in million of US dollars and percent**

PRODUCT GROUP	1989	1990	1991	1992	1993	1994	1995	1996	1997	Phase 1 (change in %)	Phase 2 (change in %)
All food products (0+1+22+4)	955	1,067	1,302	1,246	959	1,080	1,167	1,203	1,067	30.4	11.3
Agricultural materials (2-22-27-28)	194	227	268	267	190	217	248	229	283	37.3	49.1
Textile fibres (26)	22	28	33	24	10	19	18	19	28	10.3	169.2
Ores, Minerals and Metals (27+28+68)	232	301	232	272	220	356	535	381	426	16.9	93.4
Energy (3)	231	244	297	243	217	219	258	341	93	5.5	-57.3
All Manufactured Goods (5 to 8 – 68)	2,033	2,944	3,625	4,423	4,111	5,303	7,638	8,947	11,386	117.6	177.0
Chemical elements (51)	203	231	223	243	209	249	322	319	323	19.6	54.4
Leather and goods (61)	61	93	113	130	122	141	153	165	168	114.5	37.3
Wood manufactures (63)	43	75	82	81	62	81	124	122	132	87.3	111.9
Textile yarn and fabric (65)	112	164	159	160	138	169	220	218	207	42.6	49.9
Iron and Steel (67)	198	251	177	192	116	244	333	288	242	-3.1	108.9
Metal manufactures (69)	83	139	191	242	208	228	323	355	383	192.2	84.4
Non-electric machinery (71)	185	303	399	433	444	711	1,506	1,910	3,325	133.7	648.4
Electrical machinery (72)	206	329	461	567	595	945	1,384	1,883	2,377	175.1	299.3
Transport equipment (73)	36	55	108	172	149	230	533	629	765	372.8	412.2
Furniture (82)	67	89	126	154	128	149	216	268	193	130.8	50.9
clothing (84)	365	537	696	899	868	919	960	1,106	1,083	146.0	24.8
footwear (85)	54	85	116	155	133	138	161	187	212	186.4	59.7
Scientific instruments (86)	16	19	28	41	41	53	87	100	128	166.5	209.9
All goods (0 to 9)	3,705	4,834	5,799	6,537	5,773	7,260	9,974	11,231	13,398	76.5	132.1
(in terms of percent)											
PRODUCT GROUP	1989	1990	1991	1992	1993	1994	1995	1996	1997	Phase 1 (change in %)	Phase 2 (change in %)
All food products (0+1+22+4)	25.8	22.1	22.4	19.1	16.6	14.9	11.7	10.7	8.0	-26.1	-52.1
Agricultural materials (2-22-27-28)	5.2	4.7	4.6	4.1	3.3	3.0	2.5	2.0	2.1	-22.2	-35.8
Textile fibres (26)	0.6	0.6	0.6	0.4	0.2	0.3	0.2	0.2	0.2	-37.5	16.0
Ores, Minerals and Metals (27+28+68)	6.3	6.2	4.0	4.2	3.8	4.9	5.4	3.4	3.2	-33.8	-16.6
Energy (3)	6.2	5.0	5.1	3.7	3.8	3.0	2.6	3.0	0.7	-40.2	-81.6
All Manufactured Goods (5 to 8 – 68)	54.9	60.9	62.5	67.7	71.2	73.0	76.6	79.7	85.0	23.3	19.3
Chemical elements (51)	5.5	4.8	3.8	3.7	3.6	3.4	3.2	2.8	2.4	-32.2	-33.5
Leather and goods (61)	1.6	1.9	2.0	2.0	2.1	1.9	1.5	1.5	1.3	21.5	-40.8
Wood manufactures (63)	1.2	1.6	1.4	1.2	1.1	1.1	1.2	1.1	1.0	6.1	-8.7
Textile yarn and fabric (65)	3.0	3.4	2.7	2.4	2.4	2.3	2.2	1.9	1.5	-19.2	-35.4
Iron and Steel (67)	5.3	5.2	3.1	2.9	2.0	3.4	3.3	2.6	1.8	-45.1	-10.0
Metal manufactures (69)	2.2	2.9	3.3	3.7	3.6	3.1	3.2	3.2	2.9	65.6	-20.5
Non-electric machinery (71)	5.0	6.3	6.9	6.6	7.7	9.8	15.1	17.0	24.8	32.4	222.5
Electrical machinery (72)	5.6	6.8	8.0	8.7	10.3	13.0	13.9	16.8	17.7	55.9	72.0
Transport equipment (73)	1.0	1.1	1.9	2.6	2.6	3.2	5.3	5.6	5.7	167.9	120.7
Furniture (82)	1.8	1.8	2.2	2.4	2.2	2.1	2.2	2.4	1.4	30.8	-35.0
Clothing (84)	9.9	11.1	12.0	13.7	15.0	12.7	9.6	9.9	8.1	39.4	-46.2
Footwear (85)	1.5	1.8	2.0	2.4	2.3	1.9	1.6	1.7	1.6	62.3	-31.2
Scientific instruments (86)	0.4	0.4	0.5	0.6	0.7	0.7	0.9	0.9	1.0	51.0	33.5
All goods (0 to 9)	100	100	100	100	100	100	100	100	100	0.0	0.0

Source: Own calculations base on EU statistics as reported to the UN COMTRADE database.

Second, contrary to widespread perception there was no collapse of agricultural exports. The bad weather in 1992 and 1993 appears to be responsible for their contraction in terms of value in 1992 and 1993. Although the share of agricultural products (foods and agricultural materials) in Hungarian exports to the EU fell from 31 percent in 1989 to 13 percent in 1996 and 10 percent in 1997, three elements should be taken into account. First, EU external imports of agricultural products were stagnant during this period. Their value in 1997 was 26 percent larger than in 1989, while that of total imports was 78 percent higher. Second, the share of Hungarian exports in EU external imports of these products fell by 0.11 percentage points from 1.64 to 1.53 in 1997.<sup>8</sup> Had Hungary maintained its 1989 share in EU imports, the value of its exports would have been larger by US \$102 million—hardly a noticeable amount in exports of US \$13.4 billion. Last but not least, Hungarian exporters of some specialized agricultural products already held a large share (70 percent or more) of EU imports in 1989. Yet, they have been quite successful in retaining and expanding shares in other markets.<sup>9</sup>

Expansion in Hungarian EU-oriented exports during the second phase coincided with the end of what Janos Kornai dubbed a ‘transformational recession’. 1994—the second year into the phase 2—witnessed the first positive growth rate of real GDP since 1989.<sup>10</sup> An increasing domestic consumption in 1994-97 has not brought the growth of export to a halt—if anything, the recovery was export-led.

Hungary’s export performance during the second phase offers evidence as to an impressive progress in industrial restructuring. Consider the following. First, during the first phase the increase came from redirecting exports from the former CMEA, mainly the FSU (former Soviet Union). The FSU accounted in the late 1980s for around 40 percent of Hungarian total exports of machinery and transport equipment whereas the EU for 10 percent.<sup>11</sup> The proportion was reversed already in 1991 with the share of the EU in Hungarian exports of these products increasing to 35 percent, and that of the FSU falling to 19 percent. The contraction of 20 percent in the value of machinery exports between 1988 and 1991 does not explain the change, as

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<sup>8</sup> The share changed over time. It increased to 2.1 percent in 1991, fell to 1.51 in 1995, and increased to 1.58 in 1996. Had Hungary maintained its 1989 share in 1997, its agricultural exports would have been larger by US \$102 million.

<sup>9</sup> Despite the contraction in the value of EU external imports of many agricultural products, Hungarian suppliers have been quite successful in retaining, and expanding their market shares in some areas. The number of food products with a Hungarian share above 70 percent in EU external imports rose from one in 1989 (sausages - SITC. 0134) and 1993 to six in 1997. These included sausages (0134), pig meat (0113), swine (0013), sheep, lambs and goats (0012), unmilled rye (0451), and fat of pig and poultry (0913).

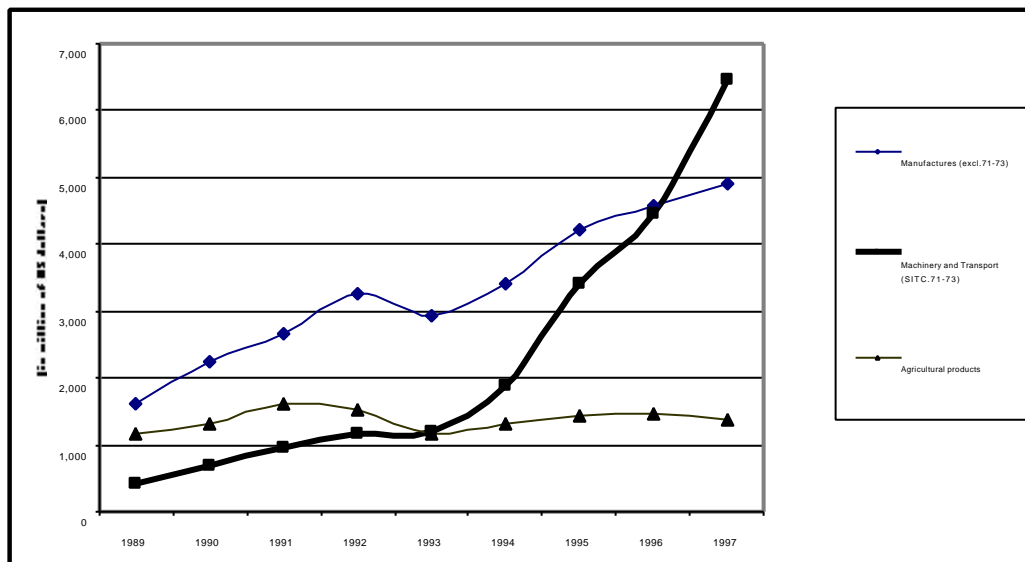
<sup>10</sup> The GDP, after four years of contraction increase by 2.9 percent in 1994, 1.5 percent in 1995, 1 percent in 1996, and 4.2 percent in 1997 (official data quoted in Hamar 1998)

<sup>11</sup> Calculations based on data reported by Hungary to the UN COMTRADE database.

the value of EU-destined exports more than doubled over this period. In 1992 the share of the FSU fell further to 16 percent, while the value of total machinery exports was flat. Clearly not all exports could be redirected, but some of them could be marketed in EU markets.

There was a dramatic change in the composition of exports. Note that while the value of manufacture exports almost tripled between 1993 and 1997, the share of machinery (SITC. 71 and 72) and transport equipment (73) rose from 21 percent to 48 percent over the same period. The value of these exports rose from US \$1.2 billion in 1993 to US \$6.5 billion in 1997, while the value of other manufactures increased from US \$1.9 billion to US \$4.9 billion. It appears that this increase has come from activity of ‘second generation’ firms, i.e., either restructured or established after the collapse of central planning.

**Figure 2: The value of EU-destined exports of manufactures (excluding SITC.71-73), transport and machinery (SITC.71-73) and agricultural products over 1989-97, in million of US dollars**



Source: Derived from data reported by EU to UN COMTRADE database.

The unique feature of restructuring of the Hungarian industry was that it has been FDI-led. It was already well advanced by the mid-1990s. Hungary was the first among transition economies to experience FDI-led industrial restructuring. Over 1990-94, during the early stages of transition, Hungary attracted US \$6.7 billion in FDI.<sup>12</sup> These inflows amounted on average to around 5 percent of GDP per year. By 1994 there were more than 4,000 firms either wholly or partly (with more than 10 percent foreign-held equity) foreign-owned. They were an important factor in integration and globalization promoting economic growth through the transfer of

<sup>12</sup> This amounted to 36 percent of total FDI flows to former Centrally Planned Economies in that time.

managerial skills, technology, and incorporating manufacturing activities into global networks of production and distribution. An early opening to capital flows has clearly paid off. The capacity of domestic firms, foreign or locally owned, to compete in international markets has improved: in spite of the appreciation of Forint throughout 1997, exports continued to grow faster than imports.

But the effects of microeconomic liberalization and opening up to foreign capital on competitiveness usually take time. Considering that by 1994 four years had elapsed with annual inflows of FDI in the range of 5 percent of the GDP (accounting for around 20-25 percent of domestic investment outlays), one might expect improvements in quality, efficiency and productivity to take firm hold. Hunya (1997) notes that the trend of deteriorating trade balance had been bound to change in 1994-95, because several large manufacturing firms finished their investment (and stopped importing capital equipment) and turned to exports. And indeed this is exactly what has happened.

In large part thanks to foreign investments, which appear to have compensated for the decline in domestic savings, there was no contraction in aggregate investment activity in Hungary. The share of gross investment in GDP, after taking a dive in 1992 to 16 percent, had been on the increase each year. The share amounted to 20 percent in 1993, 22 percent in 1994, 24 percent in 1995 and 25 percent in 1995-96 and 27 percent in 1998. Investment has contributed to modernization of the supply base and to exports and GDP growth.

Opening up 'strategic' services to foreign capital and competition, which began with the sale of a 30 percent share of the Hungarian Telecom for US\$ 875 in 1993 had a significant long-term impact on both foreign trade as well as inflows of FDI into other sectors of the economy. High quality and availability of services not only attracts foreign investors but also facilitates foreign exchanges by reducing transaction costs.

Rapidly growing export earnings and inflows of foreign capital have allowed an increase in imports providing higher quality products, both for consumption and investment. In a nutshell, a virtuous circle has been set in motion, which has clearly occurred. The changes in the composition of Hungarian exports were much more extensive than in other economies in transition, which indicates a very advanced process of economic restructuring. It seems that without this FDI-created supply base, there would be no such an impressive increase in Hungarian exports combined with the shift towards more sophisticated manufactures.

#### **4. CHANGE IN EXPORT BASKETS AND COMPETITIVENESS IN EU MARKETS: EMERGING PATTERNS OF SPECIALIZATION**

The opening of the economy, combined with the observed acceleration in globalization of production triggered by reductions in the cost of transportation, and especially information,

usually leads to more specialization and improved competitiveness. Thanks to changes in institutional environment and opening to foreign investment, the capacity of Hungarian firms to compete internationally has significantly improved. This section begins with the discussion of changes in shares of Hungarian exports in EU-external imports, i.e., excluding trade among EU members. The analysis of specialization patterns as captured in indices of revealed comparative advantage follows.

#### **4.1. Share in EU-external imports**

Since the outset of transition Hungarian suppliers have consistently outperformed suppliers from other countries: the share of products made in Hungary in EU outside imports (i.e., excluding trade among EU members) increased each year--except in 1993--between 1989 and 1997 (Table 3). The time profile of shares in EU imports, that is, years when they reached maximum levels (these are identified in bold italic in Table 3), carries no surprises. With the progress in transition in terms of industrial restructuring, elimination of energy subsidies, and growing wages, one would expect declining performance in energy intensive and labor intensive products. This seems to have occurred. Leaving aside product categories with shares below the share of Hungarian exports in EU-external imports in 1992 (1.09%), during the first phase exports of metal manufactures, leather and leather products and footwear expanded most rapidly.<sup>13</sup> Excluding product categories with shares below the share of Hungarian exports in EU-external imports in 1997 (1.71%), machinery and transport equipment (SITC. 7) were most successful in increasing their presence in EU markets during the second phase. But “traditional” exports of furniture, footwear, metal manufactures and iron and steel still account for the largest shares in respective EU imports.

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<sup>13</sup> Chemical elements peaked in 1990. For some product categories the shares peaked in 1991. These include food products, agricultural materials, textile fibers and politically sensitive iron and steel. Others had maximum share in 1992. These include, leather goods (which captured 5 percent of EU imports) and footwear (with an almost 3 percent share). The latter had two maximum values in 1992 and 1997. For other product groups, the shares in EU were the highest in 1997.

**Table 3: The share of Hungarian exports in EU-external imports, 1989-97 (in percent)**

PRODUCT GROUP	1989	1990	1991	1992	1993	1994	1995	1996	1997	Percent	Percent
										change,	change,
										1992 vs.	1997 vs.
										1989	1993
All food products (0+1+22+4)	2.00	1.99	<b>2.35</b>	2.16	1.82	1.78	1.74	1.77	1.63	8	-10
Agricultural materials (2-22-27-28)	0.88	1.01	<b>1.34</b>	1.31	1.14	1.02	0.92	1.02	1.24	49	9
Textile fibres (26)	0.38	0.51	<b>0.66</b>	0.52	0.30	0.39	0.34	0.39	0.55	37	83
Ores, Minerals and Metals (27+28+68)	0.77	1.01	0.87	1.04	0.94	1.26	<b>1.46</b>	1.19	1.23	35	31
Energy (3)	0.33	0.25	0.30	0.26	0.26	0.28	0.31	<b>0.34</b>	0.09	-21	-65
All Manufactured Goods (5 to 8 – 68)	0.70	0.85	0.98	1.13	1.09	1.27	1.54	1.76	<b>2.13</b>	61	95
Chemical elements (51)	1.48	1.63	1.48	1.53	1.47	1.43	<b>1.48</b>	1.50	1.42	3	-3
Leather and goods (61)	2.35	2.85	4.03	<b>4.58</b>	4.40	3.64	3.54	3.72	3.75	95	-15
Wood manufactures (63)	1.74	2.30	2.38	2.02	1.63	1.83	2.33	2.47	<b>2.59</b>	16	59
Textile yarn and fabric (65)	0.98	1.17	1.11	1.10	1.03	1.10	1.27	<b>1.31</b>	1.17	12	14
Iron and Steel (67)	2.54	3.11	2.49	2.54	1.93	2.93	2.49	<b>2.65</b>	2.16	0	12
metal manufactures (69)	1.34	1.87	2.30	2.67	2.37	2.27	2.55	2.83	<b>2.88</b>	99	22
Non-electric machinery (71)	0.31	0.43	0.55	0.56	0.59	0.85	1.47	1.76	<b>2.81</b>	81	376
Electrical machinery (72)	0.48	0.65	0.84	1.01	1.03	1.38	1.61	2.12	<b>2.60</b>	110	152
Transport equipment (73)	0.10	0.12	0.21	0.34	0.34	0.53	1.15	1.32	<b>1.59</b>	240	368
Furniture (82)	2.64	2.89	3.54	<b>3.70</b>	2.94	2.99	3.43	3.89	2.61	40	-11
Clothing (84)	1.72	1.91	2.04	2.41	2.33	2.36	2.25	<b>2.44</b>	2.31	40	-1
Footwear (85)	1.79	2.21	2.29	2.95	2.52	2.49	2.75	2.88	<b>2.95</b>	65	17
Scientific instruments (86)	0.09	0.09	0.13	0.18	0.19	0.23	0.34	0.38	<b>0.47</b>	100	147
All goods (0 to 9)	0.78	0.86	1.00	1.09	1.03	1.18	1.38	1.51	<b>1.71</b>	40	66

**Source:** Derived from the UN COMTRADE database as reported by the EU.

Hungary seems to have moved beyond the stage of a marginal supplier of manufactures, highly vulnerable to vicissitudes in the business cycle that it used to be in the 1980s. The number of markets in terms of four-digit SITC product categories where Hungarian exporters have a share larger than 20 percent of external supplies of the EU fell from 12 in 1989 to 8 in 1993 and 1996, and increased to 13 in 1997. But the number of markets dominated by suppliers from Hungary, that is, with shares exceeding 70 percent of EU outside imports, increased from one in 1989 and 1993 to six in 1996, and fell to four in 1997. The number of product categories with a share between 10 and 20 percent increased from 15 to 17 and 23 over the same period. Between 1993 and 1996 the share of shipments in Hungarian exports to EU markets with a share below 5 percent in EU outside imports has fallen from 65 to 59 percent (Table 4). This suggests a significant increase in the weight of Hungarian products accounting for more than 5 percent in EU respective imports: their share rose from 35 percent in 1989 to 41 percent in 1997.

Although most engineering products, which have been successful in EU markets outperforming other suppliers, were already manufactured in 1989, the expansion did not consist

merely in shipping more of the products already produced. Examples abound. Compare the four-digit (SITC.7) items, which accounted for more than 10 percent of EU imports in 1989 with those in 1997. In 1989 there were only two SITC.7 items that met the 10-percent criterion: skin leather working machinery (7172) and electric bulbs (7292). The share of leather machinery fell to 2 percent in 1996, and rebounded in 1997, while the share of electric bulbs in EU imports grew to 21 percent. The share of buses (7322) was 9.8 percent in 1989, and declined slightly to 7 percent in 1997. Three other four-digit items SITC.7 with a share in EU external imports exceeding 10 percent were also exported in 1989 but in tiny amounts. The share of piston engines (7115) in EU-external imports was 0.1 percent in 1989 and 27 percent in 1997; that of insulated wire cable was 1 percent and 15 percent respectively; and that of trailers (7333) increased from 3.5 percent to 18 percent. Although there were both losers and winners, the winners far outnumbered the losers.

**Table 4: Significance of Hungarian exports to the EU in 1989, 1993, 1996 and 1997**

	1989	1993	1997
Number of product categories with a share in EU imports exceeding 10% (4 digit SITC. Rev. 1)	27	25	29
Value of exports (million of US\$)	654	845	4,418
Share in total EU-destined exports (in percent)	17.65	14.64	33.0
<b>Memorandum:</b> share of exports of products with a share in EU imports below 5% in Hungarian EU-oriented exports (in percent)	65	68	56

**Source:** derived from SITC. Rev. 1. four-digit data as reported by the EU to the UN COMTRADE Database.

Despite the contraction in the value of EU external imports of many agricultural products, Hungarian suppliers have been successful in retaining, and expanding their market shares in some areas. The number of food products with a Hungarian share above 70 percent in EU external imports rose from one in 1989 (sausages - SITC. 0134) and 1993 to six in 1996<sup>14</sup>, and fell to two in 1997. The loss of some EU markets (above a 10 percent benchmark) to other external suppliers occurred between 1989 and 1993, and was limited to four product groups. The four product groups, whose share in EU external imports dropped below 10 percent between 1989 and 1997 were live poultry (0014), eggs (0250), prepared breakfast food (0481), and malt (0482).

These products did not completely disappear from EU imports from Hungary. Although the share of live poultry reached its maximum level of 19 percent in 1990, it was 9 percent in 1996 and increased to 15 percent in 1997. The share of prepared breakfast food fell from 10 percent in 1989 to 1 percent over 1992-94, and jumped back to 4 percent over 1995-97. But two other product groups recorded much larger losses: the share of eggs fell steadily from 13 percent in 1989 to 4 percent in 1996; and the share of malt had a share of 11 percent in 1989 and 1.5

<sup>14</sup> These included sausages (0134), pig meat (0113), swine (0013), sheep, lambs and goats (0012), unmilled rye (0451), and fat of pig and poultry (0913).

percent in 1996. The remaining twelve SITC four-digit food products had a share of EU imports exceeding 10 percent in both 1993 and 1996.

#### **4.2. Change in Revealed Comparative Advantage**

Changes in shares of various products in EU imports provide insights into competitive position of Hungarian firm's vis-à-vis other suppliers. But in order to assess emerging patterns of specialization of the Hungarian economy as demonstrated in EU markets, it is useful to look in the changes in "revealed comparative advantage," assessed not against world trade but that of the EU. Since the EU takes around 70 percent of all Hungarian exports, this provides a good measure of developments in overall comparative advantage of Hungarian products. The value of revealed comparative advantage index (RCA) for a product above unity suggests a country's revealed specialization in producing this product.<sup>15</sup>

In terms of broad products groups, as used in Tables 2 and 3, the estimates of RCA confirm a shift in Hungary's status in EU markets from that of a mainly agricultural exporter to that specialized in industrial products (see Table 5). From 1989 on RCA indices for agricultural products were declining, while that for manufactures was increasing. The end of the phase 1 coincided with the value of Hungary's RCA for manufactures exceeding one. Simultaneously within the manufactures there was a considerable change occurring already during the first phase. Among products with comparative advantage there was an increase in specialization in leather goods (61), footwear (89) and metal manufactures (69). However, not a single broad group of manufactured products acquired comparative advantage between 1989 and 1992.

During the second phase RCA fell below unity for several broad groups including chemical elements, textile yarn and fabric. Some product categories have gained comparative advantage. These included such engineering products as non-electric machinery and electric machinery. The remaining product groups have maintained it. As for products of the agricultural sector, Hungary has moved overall to comparative disadvantage vis-à-vis other suppliers in EU markets. Although one may attribute this outcome to Common Agricultural Policy of the EU, the rapid expansion in exports of manufactures has been also responsible for it.

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<sup>15</sup> A country's "revealed" comparative advantage in a product "j" is defined as the ratio of the share of "j" in the country's exports to the share of the product "j" in world trade (see Balassa 1965). A value for this index below unity indicates a comparative disadvantage. If the index takes a value greater than unity, the country is considered to have a "revealed" comparative advantage in the product.

**Table 5: Values of RCA indices for selected product categories, 1989-97**

PRODUCT GROUP	1989	1990	1991	1992	1993	1994	1995	1996	1997	Percent change, phase 1	Percent change, phase 2
All food products (0+1+22+4)	2.56	2.31	2.35	1.98	1.77	1.51	1.26	1.17	0.95	-23	-46
Agricultural materials (2-22-27-28)	1.12	1.16	1.35	1.20	1.10	0.87	0.67	0.67	0.73	7	-34
Textile fibres (26)	0.48	0.59	0.66	0.48	0.29	0.33	0.25	0.26	0.32	-1	10
Ores, Minerals and Metals (27+28+68)	0.98	1.17	0.87	0.95	0.91	1.07	1.06	0.79	0.72	-4	-21
Energy (3)	0.39	0.29	0.30	0.24	0.26	0.24	0.22	0.23	0.06	-38	-78
All Manufactured Goods (5 to 8 – 68)	0.90	0.98	0.98	1.04	1.05	1.08	1.12	1.16	1.25	16	18
Chemical elements (51)	1.90	1.89	1.48	1.40	1.42	1.22	1.07	0.99	0.83	-26	-42
Leather and goods (61)	3.00	3.30	4.03	4.19	4.26	3.09	2.57	2.47	2.19	40	-49
Wood manufactures (63)	2.23	2.67	2.39	1.85	1.58	1.55	1.69	1.63	1.51	-17	-4
Textile yarn and fabric (65)	1.25	1.36	1.11	1.01	0.99	0.93	0.92	0.87	0.69	-20	-31
Iron and Steel (67)	3.25	3.60	2.49	2.32	1.87	2.49	1.81	1.75	1.26	-28	-32
Metal manufactures (69)	1.71	2.16	2.30	2.44	2.30	1.93	1.85	1.87	1.68	43	-27
Non-electric machinery (71)	0.40	0.50	0.55	0.51	0.58	0.72	1.07	1.17	1.64	30	185
Electrical machinery (72)	0.62	0.75	0.84	0.92	1.00	1.18	1.17	1.41	1.52	49	52
Transport equipment (73)	0.13	0.14	0.21	0.31	0.33	0.45	0.83	0.88	0.93	147	179
Furniture (82)	3.37	3.35	3.55	3.39	2.85	2.54	2.49	2.58	1.53	1	-46
Clothing (84)	2.20	2.21	2.04	2.21	2.26	2.01	1.63	1.62	1.35	0	-40
Footwear (85)	2.29	2.56	2.29	2.70	2.44	2.11	2.00	1.91	1.73	18	-29
Scientific instruments (86)	0.11	0.11	0.13	0.16	0.18	0.20	0.24	0.25	0.27	46	49
All goods (0 to 9)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	0

**Source:** Derived from the UN COMTRADE database as reported by the EU.

A less aggregate picture emerging from the estimates of values of RCA for 804 four-digit SITC (Rev.1) items sheds some new light on emerging patterns of specialization (Table 6). While one should not attribute significance to comparisons in RCA values, as these are also driven by the share of these products in total EU external imports, an important point is to assess how different (or not) the list of top performers has become. The data compiled there suggest at a first glance modest change in Hungary's EU-oriented export basket. Food products still remain a main Hungarian specialization. Food products continue to have a strong comparative advantage in EU markets: among top products with the largest values of RCA indices there were seven food products in 1989, 1992 and 1997.<sup>16</sup> However, the RCA profile has become less concentrated—the RCA values for top performers significantly declined between 1989 and 1997. Furthermore, the expansion in exports of transportation and capital equipment products has resulted in their

<sup>16</sup> To be precise, in 1989 there was one item (2411 fuel wood and waste) falling into agricultural materials.

increased comparative advantage. Note that while in 1989 or 1992 there was not a single product of transport equipment and machinery (SITC. 7) among top ten, in 1997 piston engines (7115), electric bulbs (7292) and non-motor vehicles (7333) entered the top ten performers.

**Table 6: Top ten performers in terms of values of RCA indices, 1989, 1992 and 1997**

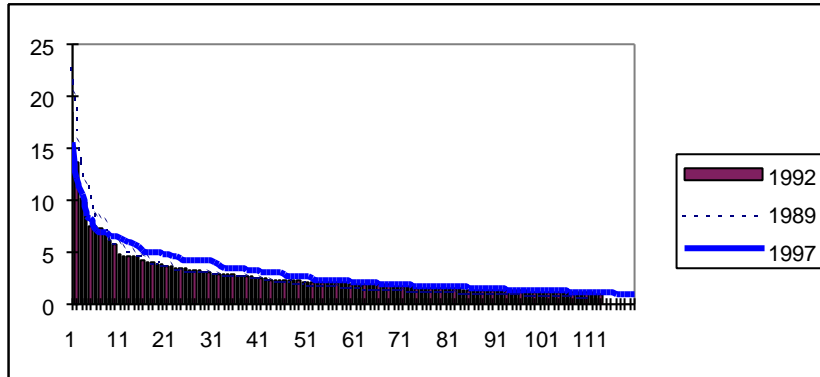
Commodity	1989	Commodity	1992	Commodity	1997
0118 meat fresh, chilled, frozen	89.7	0118 meat fresh, chilled, frozen	50.7	0134 sausages incl. tinned	49.3
0012 sheep, lambs, goats	66.7	0012 sheep, lambs, goats	33.5	0913 pig, poultry fat rendered	47.8
2411 fuel wood and waste	50.8	2411 fuel wood and waste	25.0	0012 sheep, lambs, goats	38.6
0616 natural honey	37.5	0751 pepper and pimiento	21.1	0113 pig meat fresh, chilled, frozen	37.0
0913 pig, poultry fat rendered	30.9	0134 sausages incl. tinned	19.8	0812 bran, pollard, sharps, etc	23.9
0114 poultry fresh, chilled, frozen	30.4	2923 vegetable plaiting materials	19.8	0121 pig meat dried, salted, smoked	23.6
2923 vegetable plaiting materials	24.0	6123 prepared parts of footwear	18.5	4216 sunflower seed oil	23.6
0134 sausages incl. tinned	22.9	0114 poultry fresh chilled, frozen	15.9	0013 swine	23.2
6643 drawn, blown glass unworked	22.9	3326 mineral jelly, wax	14.2	0451 rye unmilled	18.5
6321 boxes, cases, crates	20.3	6578 mats, screens, etc plaited	13.7	0114 poultry fresh chilled, frozen	17.8
3326 mineral jelly, wax	19.5	0913 pig, poultry fat rendered	12.7	7115 piston engines non-air	15.5
0751 pepper and pimiento	18.2	0551 vegetables dried excluding legumes	11.2	7292 electric lamps, bulbs	12.1
4216 sunflower seed oil	16.9	0616 natural honey	10.7	0118 meat nes fresh, chilled, frozen	11.9
0459 other cereals unmilled	15.6	6643 drawn, blown glass unworked	10.2	7333 vehicles nes non-motor trailers	10.6
0536 fruit temporarily preserved	14.9	0536 fruit temporarily preserved	10.1	0014 live poultry	8.7

**Source:** Derived from the UN COMTRADE database as reported by the EU.

On the other hand, the number of SITC four-digit items with RCA exceeding unity was falling steadily from 208 in 1989, 195 in 1992, and 164 in 1995 to 153 in 1996. This clearly indicates compression in the export offer.

Thus, it would be tempting to draw the conclusion that there was no significant expansion in new specialization in the Hungarian economy. However, this conclusion is not warranted. This outcome seems to result from lumping all products together. An examination of manufactures alone, which is a better proxy for changes in industrial specialization, does not support this conclusion for at least three reasons. First, the distribution of RCA indices for manufactures has become less skewed and the number of manufactures with the value of RCA index above unity grew from 111 in 1989 to 113 in 1992 and 120 in 1993 (Figure 3).<sup>17</sup>

<sup>17</sup> Numerous empirical studies show that as a country develops the distribution of RCA becomes less skewed and the number of manufactures with RCA above unity increases (Yeats 1989).

**Figure 3: Profiles of RCA indices of manufactures in 1989, 1992 and 1997**

Source: Own calculations from EU data as reported to the UN COMTRADE database.

Second, there has significant reshuffling within the top ten (Table 7). There were seven newcomers among top ten products in 1997 in comparison to 1989 and eight in comparison to 1992. Capital equipment and transportation products have gained significant comparative advantage in EU markets. They replaced footwear, glass and paper products at the top four positions.

**Table 7: Ten manufactures with highest values of RCA indices, 1989, 1992 and 1997**

Commodity	1989 Commodity	1992 Commodity	1997		
6643 drawn, blown glass unworked	22.87	6123 prepared parts of footwear	18.52	7115 piston engines non-air	15.53
6321 boxes, cases, crates	20.25	6578 mats, screens, etc., plaited	13.67	7292 electric lamps, bulbs	12.05
6123 prepared parts of footwear	13.80	6643 drawn, blown glass unworked	10.15	7333 vehicles nes non-motor, trailers	10.58
6578 mats, screens, etc., plaited	11.95	6321 boxes, cases, crates	9.84	7231 insulated wire, cable	8.53
6735 iron, steel small sections, etc.	11.44	7292 electric lamps, bulbs	7.53	6912 structures, parts, aluminum	8.34
6577 tapestries	9.72	8412 textile clothing accessories non-knit	7.49	7241 television receivers	7.18
8945 amusements, etc., for fairs	8.79	6971 domestic stoves, ovens, etc.	7.35	6321 boxes, cases, crates	7.01
7292 electric lamps, bulbs	8.57	7231 insulated wire, cable	6.66	8911 sound recorders, phonograms ,parts	6.97
6562 made-up canvas goods	8.35	6644 glass surface-ground etc.	6.13	8945 amusements, etc., for fairs	6.62
7316 freight cars not powered	6.33	6561 bags, sacks of textiles	5.70	6638 asbestos, friction prods	6.53

Source: Derived from the UN COMTRADE database as reported by the EU.

Third, comparisons of the composition of manufacture exports to the EU seem to suggest rather a significant change especially between 1992 and 1997. Correlation coefficient between the 1989 composition of manufacture exports and that in 1992 was 92 percent, whereas that between 1992 and 1997 was 50 percent. It seems that the export push has come from products, which—although mostly produced in the 1980s—were completely redesigned and their technologies overhauled. Although except for piston engines (7115) and electronic sound recorders (8911) all

other top performers had comparative advantage in EU markets already in 1989, 40 percent (or 48 SITC four digit manufactures) of manufactures acquired comparative advantage between 1989 and 1997. Values of RCA for 30 product categories moved above unity over 1992-97.

Expansion in their exports and presence in these markets suggests mostly restructuring of already industrial capacities that already existed before the collapse of central planning. Considering that around 40 percent of FDI was related to privatization of formerly state-owned enterprises, this result should come as no surprise.

### 5. FACTOR INTENSITIES OF EU-ORIENTED EXPORTS

According to the Heckscher-Ohlin Theorem, commodity trade patterns reflect differences in comparative advantage as determined by different factor endowments among countries. A country tends to export those goods, which use factors in relative abundance--an outcome of a competitive market mechanism efficiently allocating resources. Exploring a full causal chain linking factor endowments, comparative advantage and trade patterns are not relevant for this discussion. The question germane here concerns broad changes in relative factor intensities as revealed in their exports to the EU.

To test the Heckscher-Ohlin Theorem, Krause (1988:91-95) breaks commodity groups as classified in the SITC into four groups reflecting their distinct relative factor intensities. These groups are natural resource-intensive products; unskilled labor-intensive products; technology-intensive products; and, human capital-intensive products.<sup>18</sup> The first two groups represent lines of production characterized by low value added, high natural resource-intensity and simple technologies. For countries at the lower end of the industrial scale such products account for a dominant share of exports.<sup>19</sup> While the line dividing the technology- and capital-intensive groups is fuzzy, they both contain products requiring more sophisticated inputs than found in the first two groups.

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<sup>18</sup> The first group consists of food, beverages, crude materials, mineral fuels, animal and vegetable oils, leather, plywood, mineral manufactures, diamonds and non-ferrous metals. The second group, representing commodities with the lowest value added per worker, includes textiles, garments, furniture, glass, etc. The third group of technology-intensive products are goods with the highest ratios of R&D (Research and Development) expenditures to value added, whereas the human-capital-intensive group contains goods with the lowest ratios of R&D expenditures to value added. The third group includes chemicals (plastics, fertilizers, etc.), some capital equipment, telecommunications equipment, medical, scientific, and measuring equipment, and photographic supplies. The fourth group includes such goods as paints, rubber, paper, TV and radio sets, etc.

<sup>19</sup> For an extensive discussion of links between level of development and factor content of exports, see Balassa (1978) and Yeats (1989).

The results obtained hinge critically on the quality of a classification used to examine export baskets over time by factor mix. The choice is always controversial.<sup>20</sup> There are woeful difficulties to define and measure factor intensity, and trade theorists have long wrestled with it. Special problems emerge when a classification aims to capture “quality” of factors involved (Winters 1997). Some definitions of the groups of goods by factor intensity are overlapping and non-exhaustive. Definitions used here do not suffer from these shortcomings—all industries are taken into account, an industry appears only in one classification and the classification distinguishes among four types of factors.<sup>21</sup> Since some industries are intensive in terms of more than one factor, the results may be distorted. But even assuming that the initial classification captures adequately factor proportions at a given point of time, with the passage of time it may provide a distorted picture. Some industries may become more capital-intensive or less active in technological terms. In all, however, comparisons with other classifications as well as calculations of respective baskets do not seem to challenge-- in terms of overall changes and tendencies--the major results discussed in this paper.<sup>22</sup>

**Table 8: The Composition of Hungarian Exports to the EU According to Factor Intensities, 1989-97**

Relative Factor Intensity Groups	1989	1990	1991	1992	1993	1994	1995	1996	1997	A*/	B**/
Natural Resource Intensive	46.2	41.5	39.3	34.1	30.8	28.9	25.1	21.9	16.5	-26	-46
Unskilled Labor Intensive	18.8	21.1	22.6	24.8	26.5	23.0	19.2	19.3	17.1	32	-36
Technology Intensive	19.3	21.1	22.5	23.0	25.3	28.9	34.6	36.9	44.1	19	74
Human Capital Intensive	12.9	14.2	13.3	15.7	15.1	17.0	19.1	20.1	22.2	22	47

\* / Percent change during the first phase, i.e., between 1989 and 1992

\*\* / Percent change during the second phase, i.e., between 1993 and 1997.

Note: the product shares do not sum to 100 because some SITC. four digit categories (all SITC. 9) cannot be classified in terms of factor intensities.

Source: Derived from the UN COMTRADE database as reported by the EU.

Considering the endowment of Hungary in factors of production—temperate climate, available land for agricultural production and highly educated labor force—one would expect significant shares of skilled labor intensive and natural resource intensive products. The 1989-export basket confirms this expectation only in relation to natural resource intensive products, which accounted for almost half of Hungarian EU-oriented exports (Table 8). But it defied the prediction as far as skilled labor intensive products are concerned. The share of human capital

<sup>20</sup> Considering that there seems to be no consensus even as to where the line should be drawn distinguishing between a commodity and a manufactured product, one would expect that classifications of products in terms of factor intensities would be wobbly. The variety of definition used by international organizations testifies to difficulties involved. For their overview see Appendix table B1 in GEP:1992.

<sup>21</sup> Excluding SITC. 9 categories used to account for special transactions, which cannot be expressed in terms of factor intensities.

<sup>22</sup> Calculations were performed using the definition of high tech products developed in Braga and Yeats (1993) and of labor intensive products (GEP 1992).

intensive products of 19 percent was substantially lower than that of unskilled labor intensive products.

Furthermore, during the first phase of expansion in EU-destined exports unskilled labor intensive recorded the largest increase (see column A, Table 7). With the share of natural resource intensive falling, it thus appears that the export expansion was initially driven mainly by unskilled labor-intensive manufactures.

Taking the share of these products as a measuring rod, one may distinguish between two phases of the adjustment to international markets in terms of factor intensities. These phases overlap with the earlier identified phases of Hungary's exports to the EU. The cutting year is 1993, when the beginning of a second phase also coincided with the peak share of unskilled labor intensive products. This share had been steadily increasing from 19 percent in 1989 to 27 percent in 1993. It fell to 17 percent in 1997, that is, slightly below its pre-transition level in 1989.

The second phase witnessed an alignment of Hungarian exports in terms of factors' intensities in line with what appears to be Hungary's endowment in factors of production. Technology and human capital intensive products have expanded with their aggregate share rising from 32 percent in 1989 to 39 percent in 1992 and 66 percent in 1997. The major change has clearly occurred during the second phase.

Two developments would seem to defy predictions derived from endowments of Hungary in factors of production. First is the explosive growth of technology capital intensive products, whose share had the largest increase between 1992 and 1997. After all these are also capital intensive products and capital would seem to be in scarcity relative to labor. The key to this puzzling development is massive inflows of FDI, whose share in total investment outlays increased from around one-third in 1991 to two-thirds in 1996 (Hamar 1998).

Second one would expect that some firms, faced with the contraction in domestic and former CMEA import demand, would be initially successful in redirecting their sales of engineering products to EU markets. But this expansion would quickly lose steam. This never appeared to be the case of Hungary. The share of technology intensive products has been steadily expanding increasing from 19 percent in 1989 to 44 percent in 1997. It is interesting to note that this share in Polish EU-oriented exports (considerably smaller) contracted over 1992-95, and was flat in Slovenian exports (Kaminski 1998, and WB 1998). Clearly, success in attracting high quality flows of foreign investment has largely contributed to this outcome.

Leaving aside the profile of labor intensive products and technology intensive products, the developments in Hungary's exports have confirmed the existence of severe distortions inherited from the past. Despite low wages, labor intensive products accounted for barely 32

percent in 1989. Low value added natural resource intensive products and unskilled labor intensive products accounted for two-thirds of EU-directed exports in 1989. This share started to decline precipitously around 1993-94. Over 1990-92 the driving force of this change was the relative decline in exports of agricultural products, accounting for almost 70 percent of resource-intensive products. High value added technology intensive and human capital-intensive product command the 1997-export basket. The dramatic acceleration over 1994-97 of exports of engineering products, machinery and capital equipment has been responsible for this change.

Indeed, calculations of Hungary's RCA indices in EU markets give further credence to these observations. While technology intensive products and human capital intensive products were initially at a comparative disadvantage in trade of these products, they have subsequently seen their fortunes reversed. The RCA index of skilled labor products exceeded unity first in 1990 and between 1992 and 1997 increased from 1.06 to 1.46. Their share in EU imports more than tripled over this time, increasing to 2.2 percent. Technology intensive products have recorded even more impressive gains, albeit from a lower base. The value of RCA index rose by 89 percent from 0.61 to 1.16 over and their share of EU external imports also quadrupled. Exporters of these products have outperformed other suppliers of human capital intensive goods and technology products.

**Table 9: RCA and Shares in EU Imports of Major Product Groups in Terms of their Factor Intensities, 1989-95**

<i>A. Revealed Comparative Advantage Indices</i>										
Relative Factor Intensity Groups	1989	1990	1991	1992	1993	1994	1995	1996	1997	1997, 1993=100
Natural Resource Intensive	1.15	1.05	1.08	0.97	0.90	0.85	0.76	0.66	0.50	43
Unskilled Labor Intensive	1.61	1.71	1.67	1.73	1.77	1.61	1.41	1.40	1.08	67
Technology Intensive	0.61	0.67	0.68	0.70	0.75	0.82	0.95	1.00	1.16	189
Human Capital Intensive	0.92	1.01	0.93	1.06	1.03	1.20	1.34	1.46	1.52	165
<i>B. Share in EU Imports, in percent</i>										
Natural Resource Intensive	0.90	0.91	1.08	1.06	0.93	1.01	1.04	1.00	0.90	100
Unskilled Labor Intensive	1.26	1.47	1.67	1.89	1.82	1.89	1.95	2.12	1.93	153
Technology Intensive	0.48	0.58	0.68	0.76	0.77	0.97	1.31	1.51	2.07	433
Human Capital Intensive	0.72	0.87	0.93	1.16	1.07	1.42	1.85	2.21	2.73	378

**Source:** Derived from the UN COMTRADE database as reported by the EU.

On the other hand, exporters of natural resource intensive products have lost comparative advantage in these markets, while that of unskilled labor intensive products has been on the decline. Yet, their share in EU external imports fell for the first time in 1997. In comparison to 1989-90 the share of Hungary in EU imports of natural resource intensive products has remained stable at 0.9-1.0 percent (Table 9). The RCA indices of unskilled labor were increasing over 1989-93 and subsequently were falling. Hungary's share, however, in EU imports of these

products had been growing until 1996. Unskilled labor had the highest share in EU imports until 1996. Human capital intensive products have topped the list of best performers.

Thus, as measured by the share in EU imports, Hungary remains most competitive in human capital intensive products and technology intensive products. These products also have comparative advantage in EU markets.

## **6. THE LEVEL OF PROCESSING**

Hungary's export offer has moved towards capital and technology intensive products, but has it become "higher value-added" in terms of processing of commodities? To address this question, we use a classification developed by the World Bank for analyzing different levels of processing commodities.<sup>23</sup> The classification identifies 48 commodities exported in various forms of processing by developed and developing countries alike. The World Bank's commodity processing classification scheme distinguishes at a minimum between two stages, i.e., a primary and processed stage product (for instance, the primary stage of vegetable chain consists of fresh vegetables whereas the processed stage includes preserved vegetables) or three stages. An extra stage includes an intermediate processing (the so-called semi-fabricated stage). For instance, the primary stage of the wheat chain consists of unmilled wheat (041), a semi-fabricated stage includes wheat mill or flour (046) and bread or biscuit (04841) are the final stage item).

The share of 48 commodity-processing chains in Hungarian exports to the EU has been on the decline. It fell from 35 percent in 1989 to 15 percent in 1997 (Table 10). In terms of value these exports increased over this period by around 60 percent. Meat and poultry has remained the most important commodity chain. But its share in both total EU-destined exports and commodity exports has declined—from 13 and 37 percent respectively in 1989 to 4 percent and 25 percent in 1997. Its value was stagnant at around US\$ 500 million. Leather-based followed by wood-based and bauxite-based commodity chains registered the largest increases in exports. The value of leather-based products increased more than three-fold between 1989 and 1997 with its share in commodity exports growing from 7 percent to 14 percent, that of wood-based products increased from 8 percent to 14 percent, and that of bauxite-based from 9 percent to 14 percent. These four commodity chains accounted for almost three-fourths of Hungarian commodity exports to the EU in 1997.

It is perhaps worth noting that difficulties in accessing highly protected EU markets for agricultural products may account for Hungarian performance in commodity chains exports. The share of commodity chains in Hungarian exports, excluding those to the EU, increased from 21 to

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<sup>23</sup> For a discussion and presentation of the commodity processing classification, see Yeats (1991).

28 percent between 1992 and 1997.<sup>24</sup> Even more significantly, the share of chains based on such commodities such as meat and poultry, fruit and vegetable-- together accounting for around one third of commodity chains exports-- significantly increased. Otherwise the developments in non-EU oriented exports have followed similar patterns. Like in EU-oriented exports there was also a significant shift towards higher stages of processing with the share of primaries falling from 33 to 18 percent, intermediate stage products from 27 to 26 percent, and that of final stage products increasing from 40 to 55 percent.

**Table 10: Changes in Hungary's exports to the EU in individual commodity chains, 1989-97**

	1989	1997	Average 1989-92	Average, 1994-97	Change in percent, 1997 vs.1989	Change in percent, 1994-97 vs. 1989-92
Share of primary stage products	19.8	18.3	19.0	17.4	-7.8	-8.6
Share of intermediate products	37.3	26.0	33.0	27.4	-30.3	-17.1
Share of final stage products	42.9	55.7	48.0	55.3	+29.8	15.2
Share of commodity chains in total exports to EU	35.2	15.1	31.4	17.6	-56.8	-43.9
<b>Memorandum:</b> share in EU imports						
Primary stage products	0.28	0.32	0.31	0.31	14.3	0.0
Intermediate stage products	2.35	2.27	2.62	2.41	-3.4	-8.0
Final stage products	1.62	2.16	2.03	2.18	33.3	7.4

**Source:** Derived from the UN COMTRADE database as reported by the EU.

The changes in the level of processing suggest significant progress in industrial restructuring, as demonstrated by the Hungarian export basket visibly moving towards “higher value-added” in terms of processing. An increased portion is processed domestically.<sup>25</sup> The share of primary stage and intermediate products in total 48 commodities chains has been declining since 1989 while that of final stage products has significantly increased (Table 10). This shift towards final stage products has been also reflected in shares in EU external imports. Taking the averages for 1989-92 and 1994-97, final stage products comprised the only group that increased its presence in EU markets. In fact, the share of final stage products in EU imports increased spectacularly by more than 30 percent between 1989 and 1997.

## 7. “ENVIRONMENTALLY DIRTY” PRODUCTS IN EXPORTS TO THE EU

Environmentally dirty industries tend to concentrate in countries where environmental control measures are less stringently applied. Since these affect costs, as more demanding

<sup>24</sup> This is according to trade data as reported by Hungary to the UN system. For years prior to 1992, Hungary did not report data in 4-digit SITC breakdown. Therefore, it is not possible to assess developments for the whole 1989-96 period.

measures impose higher costs of compliance, countries with more lax environmental regulations tend to specialize in “dirty” industries. Less developed countries have less demanding compliance rules. Therefore, one would expect them to have revealed comparative advantage in markets for dirty products. Indeed, some empirical studies confirm the shift in specialization in these products away from highly developed to developing countries (Low and Yeats 1992). There is nothing inherently bad about it as less developed countries may have higher pollution assimilative capacities and less-environment biased social preferences.

The identification of environmentally dirty industries has been derived from Low and Yeats (1992). They define dirty industries as those incurring the highest level of pollution abatement and control expenditures in the United States, i.e., equal or higher than one percent of the value of their sales in 1988. The weighted average of expenditure/output ratio for all US industry was 0.54 percent with cement having the highest ratio of over 3 percent.<sup>26</sup> Using this classification one hundred eighty eight four-digit SITC industries were selected. They include all four-digit SITC products in ferrous metals (SITC 67), nonferrous metals (SITC 68) metal manufactures (SITC 69), pulp and paper products (SITC 251), refined petroleum products (SITC 332), organic chemicals (SITC 512), inorganic chemicals (SITC 513 and SITC 514), mineral tars and petroleum chemicals (SITC 521), manufactured fertilizers (SITC 561), agricultural chemicals (SITC 599), wood products (SITC 631 and 632), paper and paper articles (SITC 641 and 642), cement and other building products (SITC 661).

Contrary to what one might expect, the share of environmentally dirty products in Hungary’s EU exports has not increased following the collapse of central planning.<sup>27</sup> To the contrary, the share has begun declining rather precipitously beginning in 1991: it dropped from 25 percent in 1990 to 21 percent in 1991 and 12 percent in 1997 (Table 11). Although Hungarian share in EU-outside imports kept growing until 1996, the RCA index has been contracting since 1990 falling below unity in 1997 (Table 11).

Exports of pollution-intensive products remain highly concentrated with the top ten four-digit SITC industries accounting for more than 50 percent of ‘dirty’ exports. The most important item has been aluminum—aluminum alloys, worked and unwrought (SITC. 6842 and 6841 correspondingly) have contributed on average more than 10 percent to dirty exports to the EU over 1992-97. With the value of exports of US\$ 287 million, this share was 17 percent in 1997 up

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<sup>25</sup> As long as costs are internationally competitive there is nothing wrong in exporting primary commodities; nonetheless, the movement up the processing is a clear sign of a more sophisticated and mature industrial structure.

<sup>26</sup> For a detailed discussion see a footnote #6 in Low and Yeats (1992:91).

<sup>27</sup> Interestingly, the share of these products increased in Polish exports to the EU (Kaminski 1998).

form 14 percent in 1996. Another important contributor continues to be steel (SITC. 67). Its share remained remarkably stable at around 12 percent of dirty exports between 1989 and 1997.

**Table 11: Selected Features of Hungary's 'Dirty' Exports to the EU, 1989-97**

	1989	1990	1991	1992	1993	1994	1995	1996	1997
<b>Exports (in million of US dollars)</b>	954	1,224	1,208	1,251	1,025	1,355	1,829	1,738	1,658
<b>Share in exports to EU (in percent)</b>	25.7	25.3	20.8	19.1	17.8	18.7	18.3	15.5	12.4
<b>Share in EU "dirty" imports (in percent)</b>	1.33	1.54	1.54	1.60	1.47	1.69	1.72	1.77	1.63
<b>RCA</b>	1.70	1.78	1.55	1.46	1.43	1.44	1.24	1.17	0.96

**Source:** Derived from the UN COMTRADE database as reported by the EU.

The mere existence of dirty industries does not automatically amount to a dirty environment. Intervening factors include environmental policy and the technologies used. While an assessment whether clean or dirty technologies prevail is not possible, it appears that since 1990 there have been significant improvements in environmental quality, and a clear shift away from "dirty" industries. The fact that the weight of dirty industries seems to have declined suggests that Hungary may face lower cost of adjustment to EU environmental standards than countries where this share has not declined (e.g., Poland and Slovenia).

## 8. SUMMARY OF MAJOR FINDINGS

The changes in the composition of Hungarian EU-oriented exports indicate a very advanced process of economic restructuring. It appears that marketing more of the same products has not driven export growth. Export offer has become more diversified. The share of high value-added products has been on the increase, while that of unskilled labor intensive products has been on the decline. So has—contrary to what one might anticipate—the share of environmentally dirty products.

The major conclusion of this analysis is that Hungary's economy is well prepared to cope with competitive pressures of a Single Market. The following findings offer empirical support to this conclusion: First, the process of industrial restructuring has produced internationally competitive industrial capacities. Since the outset of transition in 1989 Hungary's foreign trade developments have gone through two distinct phases. The first phase was characterized by an initial explosion and dramatic reorientation of trade—driven mainly by double-shocks of the collapse of the Soviet Union and the CMEA and a shift towards market-based regime in foreign trade—towards Western markets over 1990-92 with exports growing at 20 percent per year. The second phase—driven by restructured and rapidly changing export offer—began with a surge in exports in 1994, and it seems to continue until now (mid-1998). A dramatic shift from an export basket dominated by resource intensive, low value added products to that driven by manufactures

suggests that some exporters specializing in CMEA markets were successful in marketing their products in EU markets.

Second, rapid, recently accelerating, growth of exports of engineering products suggests an advanced integration of Hungarian firms into EU-wide (if not worldwide) distribution and production networks. The Hungarian export basket has undergone dramatic change (probably the most profound among first wave EU candidates). The share of machinery and transport equipment rose gradually from 12 percent in 1989 to more than 50 percent of EU-oriented exports in 1997. Hungarian firms ceased to be swing suppliers vulnerable to even slight drops in import demand. In a number of products they account for more than 10 percent of external imports by EU countries. Furthermore, new specialization lines include parts and components (e.g., piston engines, which became a major export item), which belong to rapidly growing intra- rather than inter-industry trade. This augurs well for a smooth adjustment to requirements of a Single Market.

Third, the shift from natural resource and unskilled labor intensive products to technology and human capital intensive products in EU-oriented exports suggests the potential for integration at a higher end of a value-added spectrum. The composition of Hungarian exports to EU in terms of factor intensities has undergone dramatic change. Although unskilled labor intensive products still account for almost one-fifth of Hungarian EU-oriented exports, the share of skilled labor (human capital) intensive increased sizably from 15 percent in 1993 to 22 percent in 1996. Together with technology intensive products these account for two-thirds of Hungarian exports. Thus, Hungarian export offer embodies higher quality inputs. Furthermore, it also contains commodities at higher stages of processing. Given Hungary's relatively modest endowment in nonrenewable natural resources and limited access to EU markets for agricultural products, the fall in the share of commodities in Hungarian EU-oriented exports comes as no surprise. There was, however, a marked shift to final stage products within this group. Its share increased from 43 percent to 58 percent over 1989-96.

Fourth, meeting EU environmental standards may have lesser impact on international competitiveness of Hungarian firms than on firms from other Central European countries. Although the Hungarian share of environmentally "dirty" products in EU imports has been on the increase, these products have not been trendsetters of Hungarian exports. Their growth was slower than that of total EU-directed exports: the share of these products has fallen from 26 percent in 1989 to 16 percent in 1996. Thus, more stringent EU environmental regulations will affect a relatively low, and already falling, share of Hungarian exports.

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