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*Michael Landesmann and  
Robert Stehrer*

**Trade Structures,  
Quality Differentiation  
and Technical Barriers  
in CEE-EU Trade**

Michael Landesmann is Research Director of WIIW and professor of economics at Johannes Kepler University, Linz, Austria. Robert Stehrer is WIIW research economist and lecturer in economics at Johannes Kepler University.

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## **Abstract**

In this paper we attempt to quantify the incidence of different types of technical barriers to trade (TBTs) on trade structures between seven Central and Eastern European countries (Hungary, Poland, Czech Republic, Slovakia, Slovenia, Bulgaria, and Romania) and the European Union at the industrial level. The issue becomes important as CEECs as candidates for EU membership will become subject to the same Single Market arrangements that regulate access of EU members to each other's markets. As compared to the current situation, compliance with EU regulations can be seen as enabling easier access of CEE producers to EU markets in the long run even though they might impose costs of adjustment in the short and medium run. This is the topic analysed in a quantitative manner. We start in this paper by reporting the most important facts on CEE–EU trade structures and their developments. We analyse the export structure of CEECs, the development of market shares and the CEECs' position with respect to export unit values. Second, we try to quantify the coverage of technical barriers to trade in the CEECs' trade structures with the European Union. All this is done at an industrial level based on product level information on TBTs. Finally, we make a tentative attempt to see whether a relationship may be established between the incidence of different types of trade barriers and the market performance of CEE exporters. We look here both at the impact on market share growth and on 'quality upgrading' as proxied by relative export price movements.

**Keywords:** international trade, trade barriers, CEE–EU trade, product differentiation in international trade

**JEL classification:** F02, F13, F14, F15, L15

## **Trade Structures, Quality Differentiation and Technical Barriers in CEE–EU Trade**

### **1 Introduction**

In this paper we attempt to quantify the incidence of different types of technical barriers to trade (TBTs) on trade structures between seven Central and Eastern European countries (Hungary, Poland, Czech Republic, Slovakia, Slovenia, Bulgaria, and Romania) and the European Union at the industrial level. The issue becomes important as CEECs as candidates for EU membership will become subject to the same Single Market arrangements that regulate access of EU members to each other's markets. As compared to the current situation compliance with EU regulations can be seen as enabling easier access of CEE producers to EU markets in the long run even though they might impose costs of adjustment in the short and medium run. This is the topic analysed in this paper in a quantitative manner.

The effects of technical barriers to trade are discussed both in theoretical contributions as well as in a few empirical studies. Recent overviews of this topic can be found e.g. in Swann et al. (1996), where the theoretical approaches are discussed and the effects of standards on UK trade performance are analysed. Three differing perspectives are mentioned: First, if a country has some strength in product standards which promotes the quality of the domestic products, technical standards can promote exports and reduce imports for this country through non-price competitiveness. Second, non-tariff barriers may act as an impediment to imports but can also be a barrier for exports as national product specificities may not be accepted (by consumers) in other countries. Third, in the economic integration literature it is argued that the existence of standards which are accepted across countries promotes intra-industry trade. Analysing British trade data and UK data on standards compared to German standards, it is found that standards increase both exports and imports. The net effects of British standards on the trade balance of the UK turned out to be positive. Further, it was found that a switch from idiosyncratic UK standards to international standards reduces trade which could be the case if the standards reduce variety. Moenius (1999) reports econometric analysis which generally confirms that the bilaterally shared standards are favourable for trade between two partners. He also does not find that the number of country-specific standards for imports is necessarily a barrier to trade.

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In a recent paper Baldwin (2000) argues that technical barriers to trade are important and measures of liberalization may create a two-tier system of market access with advanced economies in the first and developing economies in the second tier. The reason for this is that the EU's Single Market programme reduces trade on a preferential basis (i.e. by mutual recognition principle or arrangements) as developing countries cannot easily join since this approach requires a certain level of trust in a country's governance capacity. This may be especially a problem when liberalization schemes include 'rules of origin'. Further analysis of the effects of TBTs with emphasis on developing countries can be found in Wilson (1999) and Maskus and Wilson (2000). Here it is also argued that more harmonization of standards and certification systems are called for. However, as developing countries have only limited capacities and infrastructure which are necessary to meet the requirements for modern standards and modern testing procedures, it is argued that these countries may be harmed by technical regulations.

The theoretical literature on this issue is quite diverse and discussed in some of the publications mentioned above. Thus we shall not present an overview here.<sup>1</sup>

The arguments are in line with considerations that enterprises in developing countries may have the burden of initial fixed costs to meet the requirements of technical regulations and testing procedures. Firms may not be able to afford these fixed costs: such investments may be unprofitable as the gains in potential market shares are quite small. The initial fixed costs are furthermore most probably higher for new entrants than for incumbents. Thus, while there is some evidence that measures to reduce technical barriers to trade increase intra-EU trade, the effects on the Central and Eastern European countries are far from clear. Of course, FDI, mergers, etc. which promote technology transfer and ease access to investment finance may be helpful to overcome this potential obstacle to trade with the European Union.

The paper goes as follows: We first describe the database used in the following analysis and then report the most important facts on CEE–EU trade structures and their developments. We analyse the export structure of CEECs, the development of market shares and the CEECs' position with respect to export unit values. Second, we try to quantify the coverage of technical barriers to trade in the CEECs' trade structures with the European Union. All this is done at an industrial level based on product level information on TBTs. Finally, we make a tentative attempt to see whether a relationship may be established between the incidence of different types of trade barriers and the market performance of CEE exporters. We look here both at the impact on market share growth and 'quality upgrading' as proxied by relative export price movements.

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<sup>1</sup> A lot of information can be found at the homepage of the World Bank [www.worldbank.org](http://www.worldbank.org).

## 2 Description of data sources

The empirical investigation in this paper comprises data for 15 EU countries and seven Central and Eastern European countries, which are listed in Table 2.1. From these countries we further use aggregates for the EU-12 (EU countries without Sweden, Finland and Austria; this provides a longer time series for EU–CEE trade) and two groups of Central and Eastern European countries: CEE-5, which comprise Poland, Czech Republic, Slovakia, Hungary, and Slovenia, and EE-2, consisting of Romania and Bulgaria.

Table 2.1

<b>List of countries</b>		
<b>Number</b>	<b>Country</b>	<b>Abbreviation</b>
<b>EU countries</b>		
1	France	FRA
2	Belgium and Luxembourg	BEL
3	Netherlands	NLD
4	Germany	GER
5	Italy	ITA
6	United Kingdom	UKD
7	Ireland	IRE
8	Denmark	DEN
9	Greece	GRC
10	Portugal	POR
11	Spain	ESP
30	Sweden	SWE
32	Finland	FIN
38	Austria	AUT
<b>Central and Eastern European countries (CEECs)</b>		
60	Poland	POL
61	Czech Republic	CZK
63	Slovakia	SLK
64	Hungary	HUN
66	Romania	ROM
68	Bulgaria	BUL
91	Slovenia	SLV

As main data source we use the COMEXT trade database provided by Eurostat. This database includes data on exports and imports of the reporting countries (EU-12 or EU-15) to / from all other countries in the world ('partner countries') at the very detailed 8-digit product level (Combined Nomenclature). We use data from 1993 to 1998. Trade between the CEECs and the EU expanded dramatically after the initial steps towards trade liberalization had been taken in 1990/91. Below we may distinguish between the initial phase and the years from 1993 onwards, when the range of products exported from the



CEECs to the EU became much wider than it was in the years 1990/91. The data are reported at current prices (expressed in current EUR units).

The product level information can be aggregated to different classifications at the industrial level (e.g. NACE70 or NACE rev.1). In this paper we aggregate to the NACE70 industry level.<sup>2</sup>

Table 2.2

**Number of commodities in COMEXT database**

Industry	Number of products							Consistent over years			
	1993	1994	1995	1996	1997	1998	1993-95	1996-98	1993-98	in %	in %
22	849	867	872	799	802	802	863	801	573	66.42	71.54
23	86	90	91	89	89	89	89	89	76	85.39	85.39
24	301	312	304	302	302	298	306	301	225	73.61	74.83
25	1259	1295	1333	1347	1451	1396	1296	1398	1011	78.03	72.32
26	73	73	73	74	74	52	73	67	52	71.23	78.00
2	2566	2637	2673	2611	2718	2637	2626	2655	1937	73.76	72.95
31	463	463	455	452	450	448	460	450	391	84.94	86.89
32	928	952	965	960	958	913	948	944	724	76.34	76.72
33	46	47	47	53	53	46	47	51	21	45.00	41.45
34	785	784	828	855	857	819	799	844	513	64.21	60.81
35	124	124	124	124	125	125	124	125	119	95.97	95.45
36	171	175	171	171	171	171	172	171	157	91.10	91.81
37	267	270	274	268	265	258	270	264	216	79.90	81.92
3	2784	2815	2864	2883	2879	2780	2821	2847	2141	75.90	75.19
41	1167	1199	1279	1292	1291	1291	1215	1291	942	77.53	72.95
42	272	289	306	321	323	320	289	321	206	71.28	64.11
43	983	986	997	1004	1004	1000	989	1003	933	94.37	93.05
44	81	81	82	82	82	82	81	82	80	98.36	97.56
45	392	397	394	396	396	396	394	396	376	95.35	94.95
46	200	213	213	243	243	242	209	243	139	66.61	57.28
47	234	245	247	245	245	245	242	245	209	86.36	85.31
48	290	298	297	298	307	304	295	303	257	87.12	84.82
4	3615	3708	3815	3881	3891	3880	3714	3884	3142	84.60	80.90

When aggregating data from the 8-digit CN level to the 2- or 3-digit NACE70 level one has to take into account that some commodities are dismissed from or included into the dataset during the time period considered. Thus, for a first overview we present the number of commodities for the 2-digit NACE70 industries in the period from 1993 to 1998 and the number of commodities which are included consistently from 1993 to 1998. Table 2.2 shows the number of products which are included in the dataset for the various industries

<sup>2</sup> For a list of industries at NACE70 level see table A.1 in the Appendix.

over the years 1993-1998 and the average number of products from 1993 to 1995 and 1996 to 1998. The numbers range from a minimum of 46 products in industry 33 (manufacture of office machinery and data processing machinery) to a maximum of 1451 products in industry 25 (chemical industry). The next column shows the number of products which are consistently included in the database over the years 1993-1998. Here again we have a minimum of 21 products in industry 33 and a maximum of 1011 in the chemical industry. For comparison, we show the percentages of the number of products consistently in the dataset relative to the average of the years 1993-1995 and 1996-1998. On average about 75% are included consistently over the years, although there is a wide range across industries from about 44% (office machinery) to more than 95% (leather and leather goods industry).

### **3 The structure of CEE–EU trade**

For a first overview we present some descriptive statistics of the development of trade structures between the EU and the Central and Eastern European countries over the period 1993-1998. We start, first, with an analysis of the number of traded products, then look, second, at the export structure of Central and Eastern European countries, third, analyse the development of market shares in EU-12 and finally, fourth, describe the pattern of unit value ratios which can be interpreted as quality indicators.

Note that in the following tables the growth rates over the periods 1993-1998 were calculated from regressions using all the yearly data points; averages across years or countries are simple arithmetic means.

#### **3.1 The number of traded products**

The number of products (by industry) included in the COMEXT dataset is only a first point of reference. Table 3.1 presents the range of products which are exported from the CEECs to the EU-12 and the total number of products which are imported by the EU-12. This means that we can compare the number of products imported by EU-12 from the whole world with the number of products imported from the Central and Eastern European countries and its development over time. Table 3.1 presents the number of products (averages over 1993-1995 and 1996-1998) actually traded in each industry and in columns named 'Gr' the per annum growth rates of these numbers.

The number of products actually traded by a particular country (and thus the growth rate) may vary over time because of variations in the total number of products actually included in the dataset for each particular group of industries as presented in Table 2.2. That is why we present in Table 3.2 the numbers for the two groups of CEECs relative to the EU-12.

Table 3.1

## Number of traded products

Industry	EU12			CEE-5			EE-2		
	1993-95	1996-98	Gr	1993-95	1996-98	Gr	1993-95	1996-98	Gr
22	821	759	-1.84	347	326	-1.01	194	204	4.52
23	88	88	0.34	39	35	-3.65	21	21	1.63
24	295	290	-0.47	194	192	-0.75	119	127	2.55
25	1273	1371	2.41	376	381	0.58	201	196	-0.85
26	72	66	-4.66	40	37	-3.01	25	23	-6.19
2	2550	2574	0.50	996	971	-0.55	560	572	1.64
31	450	438	-0.86	279	289	1.31	166	184	3.94
32	902	899	-0.16	492	515	1.32	316	350	3.05
33	47	51	1.38	16	20	8.85	7	8	8.73
34	771	815	1.48	302	321	2.00	167	165	0.22
35	123	124	0.30	75	75	0.30	40	41	2.43
36	165	164	-0.16	60	62	1.70	26	25	-1.42
37	242	232	-1.28	69	73	2.75	27	32	4.52
3	2700	2723	0.15	1293	1356	1.53	747	805	2.45
41	1188	1271	2.32	188	176	-3.06	122	99	-5.42
42	283	315	3.57	66	73	2.38	30	30	-1.01
43	974	987	0.42	434	464	2.50	298	349	6.71
44	79	79	0.00	48	47	-0.14	42	45	1.79
45	384	383	-0.08	263	270	1.18	237	262	3.93
46	206	240	4.38	132	145	2.36	98	114	5.00
47	237	239	0.60	143	146	0.84	52	64	8.06
48	293	301	0.95	183	192	1.32	91	104	6.01
4	3644	3816	1.51	1459	1514	1.21	969	1067	3.90

Two important features of the structure of product differentiation emerge:

- First, trade of the country group EE-2 (Bulgaria and Romania) is less differentiated than trade of the CEE-5 group of countries. For the latter group, the countries export on average 45% to 50% of the number of commodities which are imported to the EU-12 as a whole, whereas the EE-2 countries export only about 25% to 35%. The percentages vary over industries from less than 10% (in industry 41, food, drink, and tobacco) to about 70% (in industry 45, footwear and clothing) which may show implicit barriers to trade.
- Further there is a clear correlation across industries in the ranking of these shares. The coefficient of correlation between CEE-5 and EE-2 is about 0.85 in both periods.

Thus, although there is a significant difference in the level of product coverage between the two groups of countries, the structure is quite similar. But this is not the case for the growth

Table 3.2

**Number of traded products relative to EU-12 (in %)**

Industry	CEE-5			EE-2		
	1993-95	1996-98	Gr	1993-95	1996-98	Gr
22	42.26	42.95	0.84	23.61	26.89	6.48
23	43.96	39.55	-3.98	23.46	24.24	1.29
24	65.67	66.03	-0.28	40.31	43.81	3.04
25	29.54	27.83	-1.79	15.78	14.31	-3.18
26	55.28	56.61	1.73	34.95	34.56	-1.61
2	39.04	37.72	-1.04	21.94	22.21	1.14
31	61.90	65.92	2.18	36.78	42.05	4.83
32	54.57	57.26	1.48	35.03	38.89	3.21
33	33.68	40.11	7.36	14.25	16.17	7.25
34	39.25	39.38	0.52	21.60	20.22	-1.24
35	61.25	60.86	0.00	32.19	33.29	2.13
36	36.49	38.13	1.86	15.43	15.27	-1.27
37	28.30	31.51	4.09	11.07	13.69	5.88
3	47.89	49.80	1.38	27.64	29.57	2.30
41	15.87	13.87	-5.26	10.33	7.80	-7.56
42	23.50	23.26	-1.15	10.60	9.46	-4.43
43	44.58	46.98	2.07	30.62	35.37	6.27
44	60.34	59.66	-0.14	52.74	56.33	1.79
45	68.46	70.51	1.26	61.54	68.44	4.02
46	64.46	60.56	-1.94	47.71	47.57	0.59
47	60.58	61.17	0.23	21.79	26.64	7.41
48	62.61	63.69	0.37	30.86	34.61	5.01
4	40.04	39.68	-0.29	26.58	27.96	2.36

rates of the numbers of products exported, where the coefficient of correlation is about 0.6. Although the EE-2 show higher growth rates on average in all industry groups, the structure is quite different: Whereas the CEE-5 show positive growth rates predominantly in industry group 31-37, the EE-2 also have high growth rates in industry group 41-48 (with the exception of the food and drinks industry).

### 3.2 Export structure

Let us start by introducing some notation used in this paper. The basic dataset of this research are the imports and exports of a particular country  $r$  to a country  $s$  at the most disaggregated 8-digit product level. The values in EUR and the quantities (measured in tons) of exports from country  $s$  to country  $r$  of a particular commodity  $i$  at time  $t$  are denoted respectively by

$$v_{i,t}^{x,rs} \quad \text{and} \quad q_{i,t}^{x,rs}$$

Similarly, the values of imports and the quantities of imports (measured in tons) of country  $r$  from country  $s$  are denoted as

$$V_{i,t}^{m,rs} \quad \text{and} \quad q_{i,t}^{m,rs}$$

We first compare the shares of EU-12 imports from the two groups of CEECs (CEE-5 and EE-2) with the shares of EU-12 total imports (including intra and extra EU-trade) in the particular industries. The import shares are calculated as

$$s_j^{m,c} = \frac{\sum_{i \in I(j)} V_{i,t}^{m,c}}{\sum_i V_{i,t}^{m,c'}}$$

where  $s_j^{m,c}$  denotes the share of imports of the EU-12 from country  $c$  in industry  $j$ . Note that the data by industry are compiled from detailed product statistics, where  $i \in I(j)$  are the range of products  $i$  belonging to industry  $j$ . Further we calculated the EU-12 structure of total imports, i.e.

$$s_j^{m,EU-12} = \frac{\sum_{c'} \sum_{i \in I(j)} V_{i,t}^{m,c'}}{\sum_{c'} \sum_i V_{i,t}^{m,c'}}$$

where  $c'$  refers to all trading partners of the EU-12 (thus including intra- and extra-EU trade). These shares are presented in Table 3.3.<sup>3</sup> The table presents the structure of EU-12 imports including intra- and extra-EU trade and compares this with the structure of imports from CEE-5 and EE-2 for the periods 1993-1995 and 1996-1998. Further the growth rates (Gr) are reported. We look at similarities between the EU-12 import structure and the export structure of the two country groups by calculating the coefficient of correlation between the three country groups for both periods. The coefficient of correlation between EU-12 and CEE-5 has risen from 0.573 to 0.729 and between EU-12 and EE-2 has fallen from 0.192 to 0.145. This means that whereas the CEE-5 group of countries has become more similar in terms of their export structures to the average EU-12 import structure, the second group of countries, EE-2, has become more dissimilar. This is confirmed by the coefficient of correlation between CEE-5 and EE-2, which declined from 0.758 to 0.386.

But these numbers mask country differences. Thus Table 3.4 shows the coefficients of correlation between the EU-12 import structure and the export structure of the particular countries.

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<sup>3</sup> Please note that in this table the shares do not sum up to unity as not all industries are included in the table.

Table 3.3

## Trade structures – shares and growth

Industry	EU-12			CEE-5			EE-2		
	1993-95	1996-98	Gr	1993-95	1996-98	Gr	1993-95	1996-98	Gr
22	5.90	5.57	-0.27	9.80	7.96	-4.46	16.94	18.06	10.05
23	0.38	0.38	-0.81	0.47	0.24	-16.81	0.33	0.42	-13.15
24	1.48	1.33	-3.52	4.22	3.05	-9.73	2.92	2.37	-6.51
25	10.97	10.81	-0.39	6.65	5.21	-6.58	8.64	8.44	-3.24
26	0.50	0.43	-6.36	0.88	0.59	-10.02	0.53	0.47	-6.34
2	19.24	18.53	-2.27	22.02	17.04	-6.83	29.36	29.76	3.30
31	2.60	2.70	0.94	6.60	7.22	1.23	1.89	2.14	4.30
32	6.97	7.05	-0.32	6.03	6.92	3.28	3.71	4.77	6.50
33	4.66	5.03	1.59	0.46	1.73	31.41	0.12	0.04	-17.00
34	10.27	10.56	0.40	9.93	13.51	12.30	3.76	3.36	-3.51
35	9.12	10.20	3.31	8.42	16.44	27.91	0.55	0.81	11.77
36	3.54	3.34	-2.23	1.57	1.01	-8.83	1.34	0.71	-19.31
37	2.13	2.09	-1.39	0.68	0.86	11.07	0.22	0.26	5.30
3	39.30	40.97	0.33	33.68	47.68	12.42	11.59	12.09	0.11
41	4.97	4.35	-4.62	3.63	2.50	-11.43	3.63	2.31	-17.64
42	2.37	2.18	-3.12	0.65	0.55	-2.77	0.48	0.42	-8.91
43	3.86	3.56	-3.11	4.92	4.04	-6.58	6.96	8.10	3.68
44	0.56	0.54	-1.77	0.98	0.68	-13.06	1.21	0.99	-6.01
45	3.60	3.35	-2.99	12.81	9.62	-10.37	26.77	30.38	3.10
46	2.00	1.79	-3.68	7.00	5.86	-7.58	7.46	5.89	-4.16
47	3.42	3.07	-2.61	3.09	2.39	-4.66	0.83	0.67	-3.26
48	2.95	2.89	-0.78	2.96	3.10	1.16	1.25	1.12	-4.19
4	23.73	21.73	-2.84	36.04	28.75	-8.02	48.59	49.88	-0.21

Table 3.4

## Correlation of trade structures

Country	1993-95	1996-98
Czech Republic	0.605	0.712
Hungary	0.704	0.799
Poland	0.293	0.447
Slovakia	0.413	0.684
Slovenia	0.519	0.628
Bulgaria	0.355	0.260
Romania	0.060	0.051

Hungary and the Czech Republic are the best performers, followed by Slovenia and Slovakia. Poland has the lowest coefficient of correlation within the CEE-5 with 0.293 (even lower than Bulgaria), but this has risen remarkably to 0.447. Further one can see that Romania has a coefficient of only 0.06 which has further declined. Similarly in Bulgaria the

coefficient is lower in the second period; it fell from 0.355 to 0.260. Again we look at differences relative to the EU-12 at the industrial level, which are described in Table 3.5.

Table 3.5

**Export structure of CEECs relative to EU-12 import structure**

Industry	CEE-5			EE-2		
	1993-95	1996-98	Gr	1993-95	1996-98	Gr
22	1.66	1.43	-4.20	2.81	3.24	10.34
23	1.24	0.62	-16.13	0.87	1.11	-12.44
24	2.84	2.27	-6.43	1.97	1.78	-3.10
25	0.61	0.48	-6.22	0.79	0.78	-2.86
26	1.75	1.30	-3.90	1.06	1.11	0.02
2	1.15	0.92	-6.14	1.51	1.61	4.07
31	2.54	2.67	0.29	0.73	0.79	3.33
32	0.86	0.98	3.61	0.53	0.68	6.85
33	0.10	0.35	29.36	0.03	0.01	-18.29
34	0.96	1.28	11.85	0.37	0.32	-3.89
35	0.92	1.61	23.81	0.06	0.08	8.19
36	0.44	0.30	-6.76	0.36	0.21	-17.47
37	0.32	0.41	12.63	0.10	0.13	6.78
3	0.86	1.17	11.50	0.29	0.30	-0.70
41	0.73	0.57	-7.13	0.73	0.53	-13.65
42	0.27	0.25	0.37	0.20	0.19	-5.97
43	1.27	1.14	-3.58	1.80	2.29	7.00
44	1.75	1.26	-11.50	2.16	1.84	-4.32
45	3.55	2.87	-7.60	7.44	9.09	6.28
46	3.50	3.28	-4.05	3.72	3.30	-0.49
47	0.90	0.78	-2.11	0.24	0.22	-0.67
48	1.00	1.07	1.95	0.42	0.39	-3.44
4	1.52	1.32	-5.12	2.04	2.30	2.94

This table gives the ratio of the trade structure of the two groups of countries relative to the EU-12 structure, i.e.  $s_j^{m,c} / s_j^m$  where  $s_j^{m,c}$  denote the shares of imports of the EU-12 from country  $c$  and  $s_j^m$  denote the shares of industries in total EU-12 imports. Thus, in this table a number larger than 1 indicates that the share of exports of country  $c$  in industry  $j$  to the EU-12 is larger than the share of industry  $j$  in total imports of the EU-12. To get a picture of actual developments by industry we constructed Table 3.6. In this table we differentiated the industries by two criteria: the first was whether the initial relative export share (average 1993-1995) was smaller or larger than 1 and the second criterion was whether the average growth rate over the whole period was smaller or larger than 0. This was done for both groups of countries. The results are given in Table 3.6 where we also marked industries (boldface) which are in the same quadrant for both groups of CEECs. We can see the

following: the two groups start with a 'relative over- or under-representation' of similar types of industries. The industries which are more strongly represented in the CEE-5 and the EE-2 in the initial period are resource-based industries such as metals, minerals, timber and wood-based industries, manufacture of metal articles (for CEE-5 only), man-made fibres (in EE-2 only) and the more labour-intensive industries textiles, leather goods and footwear and clothing. The industries which were under-represented are all engineering industries (32-37) and chemicals (25, plus man-made fibres in the case of CEE-5) and, interestingly, food, drinks and tobacco (41, 42) and the paper products, printing and publishing industries (47).

Table 3.6

Growth Rate	CEE-5		EE-2	
	Relative Share		Relative Share	
	< 1	> 1	< 1	> 1
	<b>25</b>	22,23,24,26	23,25	<b>24</b>
< 0	<b>36</b>		33,34,36	
	<b>41,47</b>	43,44,45,46	<b>41,42,47,48</b>	<b>44,46</b>
				22,26
> 0	<b>32,33,34,35,37</b>	31	<b>31,32,35,37</b>	
	42	48		43,45

If one looks at the growth rates there is however quite a difference between the CEE-5 and EE-2 group of countries: For the CEE-5, all engineering industries (except for other transport equipment) have growth rates in export shares above the overall EU import patterns while for the EE-2 this is not the case for industries 33 (data processing) and 34 (electrical engineering).

In fact the growth rates in shares for the industries 33, 34, 35, 37 are extremely high for the CEE-5 in absolute terms. The EE-2 on the other hand have above-average growth in export shares in textiles (43) and clothing and footwear industries (45) which is not the case for the CEE-5. Hence, Table 3.6 reiterates the point that the pattern of change in export structure is quite differentiated between the CEE-5 and the EE-2.

### 3.3 Market shares in EU-12

A second issue is the market shares of CEECs in total EU-12 imports (which of course is another way of representing differential growth in exports relative to total EU-12 imports). For this we calculated the market shares as



$$m_{j,t}^{m,c} = \frac{\sum_{i \in I(j)} v_{i,t}^{m,c}}{\sum_{c'} \sum_{i \in I(j)} v_{i,t}^{m,c'}}$$

where  $c'$  refers to all trading partners of the EU-12 and  $c$  to the particular country whose market shares are calculated. Table 3.7 shows the evolution of the market shares of CEECs in EU-12 markets. First, as one would expect, the market shares are in general much higher for the CEE-5 than for the EE-2 countries. Second, the growth rates are in most cases positive and quite high for some industries. Negative growth rates can only be observed in industry 23 (extraction of minerals ...) for both groups of countries. Further, the CEE-5 group shows a negative growth rate only in industry 44 (leather and leather goods industry except footwear and clothing); the EE-2 group has negative growth rates of market shares in industries 33 (office machinery), 36 (manufacture of other means of transport), and 41 (food, drink, and tobacco). Further there are particular differences of the growth rates by industry. The CEE-5 shows very high (and higher than EE-2) growth

Table 3.7

**Market shares in total EU-12 imports (in %)**

Industry	CEE-5			EE-2		
	1993-95	1996-98	Gr	1993-95	1996-98	Gr
22	0.65	0.67	4.16	0.42	0.56	20.54
23	0.55	0.35	-9.05	0.10	0.14	-4.94
24	1.11	1.17	1.56	0.31	0.34	5.72
25	0.24	0.25	1.91	0.11	0.12	6.10
26	0.43	0.48	4.39	0.16	0.19	8.92
2	0.45	0.45	1.99	0.22	0.27	13.65
31	1.06	1.38	8.87	0.12	0.16	12.75
32	0.35	0.50	12.84	0.08	0.13	16.82
33	0.04	0.21	42.66	0.00	0.00	-10.00
34	0.38	0.65	22.12	0.06	0.07	5.17
35	0.36	0.74	36.09	0.01	0.02	18.31
36	0.17	0.15	1.91	0.05	0.05	-9.48
37	2.11	4.08	25.04	0.02	0.02	16.68
3	0.27	0.41	18.31	0.04	0.06	8.59
41	0.36	0.36	0.97	0.09	0.08	-5.78
42	0.12	0.13	9.34	0.02	0.02	2.70
43	0.50	0.56	5.00	0.27	0.43	16.88
44	0.67	0.57	-3.57	0.27	0.30	4.70
45	1.47	1.44	0.67	1.24	1.94	16.12
46	1.58	1.81	4.47	0.65	0.74	8.56
47	0.29	0.34	6.39	0.03	0.03	8.61
48	0.38	0.54	10.98	0.06	0.07	5.62
4	0.63	0.68	3.31	0.32	0.47	12.47

rates of market shares in industries 32, 33, 34, 35, and 37 (which are mainly higher-tech sectors), whereas the EE-2 have higher growth rates in sectors 22-26 (resource-based industries), 43 (textiles), and 45 (footwear and clothing).

The two groups of countries have become more dissimilar between the two periods. Again we calculated the coefficient of correlation between CEE-5 and EE-2 for both periods. This coefficient is 0.528 in the first and has dropped to 0.211 in the second period.

### 3.4 Unit values and unit value ratios

Next we present the evolution of the unit values of total EU imports from all trading partners (from inside and outside the EU). For calculating these unit values at the aggregate NACE70 2-digit level we calculated in a first step the unit values at the 8-digit level as

$$u_{i,t}^{m,c} = \frac{v_{i,t}^{m,c}}{q_{i,t}^{m,c}} \quad (3.1)$$

where  $q_{i,t}^{m,c}$  is a volume indicator of products exported by country  $c$  to the EU-12; we used weight (kilograms) as volume indicator.  $u_{i,t}^{m,c}$  denotes the unit value of EU-12 imports from country  $c$  in year  $t$  of commodity  $i$ . In a second step we calculated the weighted averages of these unit values for each industry:

$$u_{j,t}^{m,c} = \sum_{i \in I(j)} u_i^{m,c} c_{i,t}^{m,c} \quad (3.2)$$

where  $I(j)$  denotes the set of commodities  $i$  belonging to NACE70 industry  $j$ , and

$$c_{i,t}^{m,c} = \frac{v_{i,t}^{m,c}}{\sum_{i \in I(j)} v_{i,t}^{m,c}} \quad (3.3)$$

denotes the share of exports of commodity  $i$  in total exports of industry  $j$  by country  $c$ . As there could be some mistakes in the raw data at this highly disaggregated level, we corrected for outliers in this aggregation procedure in the following manner: First, we calculated the weighted mean of unit values across products (equation 3.2), second, we calculated the standard deviation within each industry group  $j$  and country  $c$  and then, third, dropped each observation at the 8-digit level if the unit value exceeded the (weighted) mean plus three times the standard deviation. We then calculated the weighted mean for the remaining observations by equation (3.2). Table 3.8 reports the unit values. The unit value by industry  $j$  depends thus on the levels of the unit values of the products belonging

to that industry at the 8-digit level (i.e.  $u_{i,t}^{m,c}$ ) and the shares of the particular commodities in the value of exports of that industry.<sup>4</sup>

Table 3.8

**Unit values – levels and growth rates**

Industry	EU-12			CEE-5			EE-2		
	1993-95	1996-98	Gr	1993-95	1996-98	Gr	1993-95	1996-98	Gr
22	27.05	59.51	18.33	1.09	1.30	8.03	0.96	0.81	-2.83
23	0.10	0.10	1.30	0.15	0.16	5.14	0.14	0.15	-0.54
24	2.61	2.83	1.40	1.36	1.99	12.41	1.05	1.09	0.12
25	22.65	27.09	5.04	3.53	3.72	2.21	2.10	1.82	-4.91
26	3.77	4.87	10.56	2.46	3.09	8.85	2.03	2.23	4.68
31	6.29	5.99	-1.04	2.47	3.51	12.66	1.31	1.44	1.36
32	16.13	20.56	2.21	5.68	7.13	7.05	4.72	5.28	3.12
33	92.17	98.36	1.52	25.40	59.25	22.32	105.39	97.83	2.00
34	141.58	160.92	8.89	15.54	19.34	9.58	9.31	11.56	10.44
35	8.08	8.43	1.45	6.65	7.67	5.64	4.54	12.36	32.11
36	438.75	473.22	2.37	42.34	31.74	4.58	310.37	167.35	-45.22
37	134.93	147.96	2.41	32.94	33.72	3.10	73.59	50.40	-4.17
41	2.17	2.19	0.34	2.13	2.08	-0.39	3.70	3.52	2.94
42	4.34	4.20	-0.98	1.70	1.38	-2.21	2.94	13.47	42.73
43	13.99	14.50	1.05	14.60	14.93	-0.05	10.49	11.85	2.98
44	14.41	14.43	-1.46	12.10	16.29	10.63	6.67	11.10	19.83
45	22.83	22.28	-1.26	29.48	31.18	1.92	18.41	19.53	1.72
46	1.93	1.92	-0.49	1.46	1.55	1.91	1.13	1.09	-1.76
47	1.76	1.79	0.26	1.08	1.27	5.83	0.66	0.98	14.21
48	4.22	4.31	0.42	2.75	3.29	5.68	2.19	2.35	3.37

Further we calculated unit value ratios (of export unit values of country  $c$  relative to total EU-12 import unit values) in the following manner:

$$r_{j,t}^{m,c} = \sum_{i \in I(j)} \frac{u_{i,t}^{m,c}}{u_{i,t}} c_{i,t}^{m,c} \quad \text{with} \quad c_{i,t}^{m,c} = \frac{\sum_{i \in I(j)} v_{i,t}^{m,c}}{\sum_i v_{i,t}^{m,c}} \quad (3.4)$$

<sup>4</sup> This measure was used by Burgstaller and Landesmann (1999) for a limited set of industries but a wider range of countries. Further it was used by Stehrer and Landesmann (1999) in an econometric investigation.

Here again we used a procedure to detect and delete outliers as we dropped each observation for which the unit value ratio was greater than five.<sup>5</sup> The results are reported in Table 3.9.

Table 3.9

Industry	Unit value ratios					
	CEE-5			EE-2		
	1993-95	1996-98	Gr	1993-95	1996-98	Gr
22	0.88	0.92	1.78	0.91	0.90	-0.58
23	1.16	1.11	-1.71	0.84	1.29	8.39
24	0.90	0.99	3.68	0.68	0.73	2.32
25	0.95	0.94	-0.17	0.89	0.92	1.47
26	0.82	0.89	4.20	0.67	0.81	6.56
31	0.80	0.94	4.35	0.58	0.61	2.59
32	0.58	0.70	6.45	0.47	0.57	4.20
33	0.53	0.91	14.48	1.08	1.49	5.74
34	0.83	0.93	5.23	0.67	0.73	5.42
35	0.90	0.96	2.38	0.46	0.90	19.35
36	0.83	0.85	0.87	0.78	0.72	-2.56
37	0.79	0.80	2.39	0.58	0.91	13.99
41	0.97	0.99	0.85	0.91	1.05	4.38
42	0.99	1.21	4.97	1.11	0.82	-7.63
43	1.00	0.97	-1.21	0.74	0.69	-2.34
44	1.23	1.30	3.02	0.87	0.92	3.05
45	1.17	1.24	2.80	0.80	0.86	2.14
46	0.76	0.82	2.38	0.57	0.67	5.88
47	0.77	0.84	4.22	0.80	0.84	2.16
48	0.73	0.82	3.90	0.62	0.68	4.05

These figures can be interpreted as quality indicators. In general the unit value ratios are below 1, which means that the quality of exports to EU-12 is lower than the average quality of imports of the EU-12. But there are some exceptions to this: First, in industry 23 (extraction of minerals ...) both groups of countries have a value larger than one, which may be explained by the special nature of this industry. Further in industry 33 (office machinery and data processing) the EE-2 countries show rather high relative unit value

<sup>5</sup> We also tried another outlier procedure similarly to the one described above: We calculated the weighted averages of the unit value ratios by equation (3.4), then calculated the standard deviation for each country and industry group and dropped each observation where the unit value ratio was higher than the (weighted) mean plus three times the standard deviation. For the remaining sample the unit value ratios were again calculated by equation (3.4) However, by this procedure the calculation of the average unit value of the industry could be distorted by data mistakes for individual commodities. This would lead to the elimination of the 'wrong products' as the calculated average gets distorted through the data mistakes. Hence, as for some industries (especially those where the number of exported products is quite small) this procedure of outlier detection was not satisfactory, we only report the results of the alternate outlier procedure.

ratios (larger than 1). This may be explained by the small number of products exported to the EU-12 – only 7 products in the first and 8 products in the second period. In this case the calculated numbers become more sensitive to outliers (which are not detected) or to the performance of a particular industry at a more disaggregated level. Further there are some quite high levels in industries 43-45 (textiles, leather, and footwear) which may be explained by effects of outward processing.

Although there are thus some qualifications necessary in interpreting the data, one can conclude that the unit value ratios are, first, in general relatively higher for the CEE-5 than for the EE-2, and, second, that the unit value ratios are lower in the engineering industries (31-37) as opposed to the resource-based industries (21-26) and lower-tech industries (41-48). Further the growth rates of the unit value ratios are in most cases positive with only a few exceptions. This means that there is a catching-up process taking place with respect to the average export quality in most industries.

#### **4 Technical barriers to trade and directives**

##### **4.1 Measures for the removal of technical barriers to trade**

Before analysing the effects of technical barriers to trade we give a brief overview of the role of EU directives in the removal of such barriers or at least in the removal of the discriminatory character of such barriers.

We have to note at the beginning that by now trade in goods (except for agricultural products) between the EU and the Central and Eastern European countries is almost free of tariff and quite a few of the non-tariff barriers (such as quotas, and there has also been a strong reduction in anti-dumping cases). There remain, however, so-called technical barriers to trade (TBTs). These consist of national (or EU) standards regarding technical regulations of products for reasons of health, safety and consumer protection. As these standards may differ across countries they act as barriers to trade. For example, it is costly for firms to meet different regulations in various countries as economies of scale cannot be fully exploited, it could be laborious and costly to get the product approvals in a foreign country, etc.

For the European Union it is estimated that less than one quarter of intra-EU imports are in sectors where technical regulations are not important although there may be quite large differences across countries (for details see Brenton et al., 2000).

One of the aims of the Community is to reduce these technical barriers to trade within the European Union. For this the European community has developed a set of instruments to reduce these barriers. The most important are:

- Mutual recognition principle (MRP) and mutual recognition arrangements (MRA)
- Old approach (OA)
- New approach (NA)

The latter two are referred to as the harmonization approach. We shall shortly discuss these procedures in the following.

#### **4.1.1 Mutual recognition principle**

This principle<sup>6</sup> means that products which are produced or marketed in one of the member states should have access to all other member states as well. Each member state thus has to accept products which are legally produced and marketed in other member states. This principle applies mainly for new or very specialized products which are not covered by minimal or optional harmonization measures. It works either through a formal agreement or where mutually recognized standards have been developed (e.g. the CENELEC cable standards, ECISS steel standard, etc.). It is estimated that the mutual recognition principle affects about 25% of intra-EU trade.

#### **4.1.2 The harmonization approach**

Under this heading one summarizes the 'old approach' (OA) and the 'new approach' (NA).<sup>7</sup> Both aim at reaching a set of legally binding requirements for all member states.

The 'old approach' (OA) means quite extensive product-by-product or even component-by-component regulations and legislation. It is mainly applied to products such as chemicals, motor vehicles, pharmaceuticals and foodstuffs, for which regulations must be quite detailed to protect against safety risks, support health standards, etc. mainly in sectors such as motor vehicles, foodstuffs, pharmaceuticals, and the chemical sector. Estimates show that about one third of the value of intra-EU trade is subject to this measure.

On the other hand, the 'new approach' (NA), which was adopted in 1985, means that member states may reach a set of legally binding requirements. This type thus indicates only essential (minimum) requirements and thus means greater freedom for manufacturers. To date 22 directives have been adopted (see <http://www.newapproach.org/directiveList.asp>). About 17% of intra-EU trade are subject to this approach.

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<sup>6</sup> For details about this approach see [http://europa.eu.int/comm/internal\\_market/en/goods/mutrec.htm](http://europa.eu.int/comm/internal_market/en/goods/mutrec.htm).

<sup>7</sup> Details may be found under several addresses, e.g. <http://www.newapproach.org> and <http://europa.eu.int/comm/enterprise/atex/direct/newapproach.htm> for the 'new approach', and <http://europa.eu.int/comm/enterprise/atex/direct/oldapproach.htm> for the 'old approach', respectively.

## 4.2 The effects of technical barriers to trade for CEE–EU trade

For a detailed overview of the importance of technical barriers to trade (TBTs) for accession countries see Brenton et al. (2000). In this section we derive some measures for the effects of the removal of TBTs through the application of directives at the industrial level. For this we use two different types of information: The first one is a translation of EU product related directives into the relevant tariff codes (i.e. at the detailed 8-digit CN product level). The second dataset gives information on the sectoral incidence of technical barriers and the particular approaches which have been adopted by the EU for the removal of these barriers to trade. These two sets of data are described in Brenton et al. (2000).<sup>8</sup>

Data on the existence of EU directives are thus available at the detailed product level. We denote the existence of a directive for a particular product  $i$  by  $d_i = 1$ . As described in Brenton et al. (2000) the removal of a technical trade barrier can in this case either be through a 'new approach' directive (NA) or an 'old approach' directive (OA).

In general the existence of an EU directive is seen as a *removal* of a technical barrier to trade as countries can no longer apply country-specific technical barriers which in general are greater barriers to sales of a particular good from another country. But, on the other hand, for Central and Eastern European countries this could also mean that a potential exporter has to manage to improve the product (or at least change its specification) to be able to meet the technical requirements. This view is in line with the discussion of the existing literature in Swann et al. (1996) where it is concluded that different theories lead to rather different predictions about the role of standards and their effects on trade.

## 4.3 The coverage by number of products

For a first overview we look at the number of goods which are affected by a directive either of the 'new approach' (NA) or the 'old approach' (OA). The number of products which are affected by one or more directives are reported in Table 4.10. In the dataset there are 10971 commodities included in total (for the year 1997). 732 are affected by one directive, 63 by two and only three commodities by three directives of the 'new approach'. The 'old approach' covers 2611 commodities with one and 26 with two directives. Thus in terms of the number of products which are affected in total only 7.27% of the products are affected by the NA directives and 24.04% are affected by OA directives.

But the industries are affected quite differently by the directives. To see these differences across industries we report the percentage of the 'old approach' and 'new approach'

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<sup>8</sup> The authors would like to thank Paul Brenton and Marc Vancauteren for providing us with these datasets.

Table 4.10

**Number of products affected by a directive**

d	New approach		Old approach	
	Number	in %	Number	in %
0	10173	92.73	8334	75.96
1	732	6.67	2611	23.8
2	63	0.57	26	0.24
3	3	0.03	0	0
<b>Total</b>	<b>10971</b>	<b>100</b>	<b>10971</b>	<b>100</b>

Table 4.11

**Number of products affected by directives**

Industry	Number	Average 1993-98				Consistent sample				
		NA	in %	OA	in %	Number	NA	in %	OA	in %
22	691	1	0.14	44	6.41	563	1	0.18	39	6.93
23	84			2	2.37	75			2	2.67
24	270	19	6.97	9	3.14	222	18	8.11	7	3.15
25	1230	11	0.93	837	68.06	1000	11	1.10	680	68.00
26	69	1	1.45	0	0.73	50	1	2.00	0	0.00
31	423	32	7.69	4	0.95	388	30	7.73	4	1.03
32	879	282	32.12	78	8.82	722	219	30.33	68	9.42
33	37	14	36.61			21	9	42.86		
34	703	253	36.03	18	2.56	511	207	40.51	14	2.74
35	121			121	100.00	118			118	100.00
36	164	11	6.71	41	24.80	154	11	7.14	34	22.08
37	246	42	17.14	2	0.81	215	37	17.21	2	0.93
41	1146			806	70.33	934			667	71.41
42	277			131	47.38	200			107	53.50
43	962	2	0.21			922	2	0.22		
44	79					78				
45	384					370				
46	192	3	1.30	2	1.04	136	2	1.47	2	1.47
47	234	4	1.71			206	3	1.46		
48	284	18	6.33	26	9.26	255	18	7.06	25	9.80

products by industry (i.e. the number of products affected by a directive relative to the total number of products in this particular industry). This exercise was done, first, for the products which are in the dataset for TBT and also in the trade dataset for the years 1993-1998. We only report the average over the years. Second we also calculated the shares for the products which are consistently in the trade dataset from 1993 to 1998.<sup>9</sup> In

<sup>9</sup> Here we do not take into account that some of the directives have not been effective in the years before 1997, the year for which we have data on TBTs.



the case where there is more than one directive for a particular product, this was still counted only once. As one can see, 'new approach' directives affect mainly three sectors: mechanical engineering (32), manufacture of office machinery (33), and electrical engineering (34) where more than 30% are affected. Further, in sector 37 (instrument engineering) 17% of the products are affected. In the other sectors the coverage is less than 10%.

The coverage by 'old approach' directives is quite different. Here 100% of sector 35 (manufacture of motor vehicles ...) are covered, 68% of chemical products, and 71% of food and food products. In the other sectors the coverage is less than 10%. Thus one can see that the industries are affected quite differently by the application of NA or OA directives, respectively.

#### 4.4 The extent of coverages of exports

##### 4.4.1 Old and new approach directives

We can now take a closer look at the relationship between trade structures and their development over time between the CEECs and the EU-12 as discussed in section 3 and the applications of directives. To quantify the coverage of different directives we calculated two measures:

$$n(\mathbf{d})_{j,t}^{m,c} = \sum_{i \in I(j)} \mathbf{d}_{i,97}^{m,c} \quad (4.5)$$

which gives the number of products in an industry  $j$  for which a directive exists and which are actually exported to EU-12. The second measure is

$$s(\mathbf{d})_{j,t}^{m,c} = \frac{\sum_{i \in I(j)} \mathbf{d}_{i,97}^{m,c} v_{i,t}^{m,c}}{\sum_{i \in I(j)} v_{i,t}^{m,c}} \quad (4.6)$$

which gives the value share of goods in industry  $j$  exported by country  $c$  which are affected by a directive (NA or OA) in total industry  $j$  exports to EU-12.

Tables 4.12 and 4.13 report the results of these calculations for the 'old approach' and 'new approach' directives, respectively.

A comparison of the measure  $s(\mathbf{d})$  across the EU-12, the CEE-5 and the EE-2 shows the following pattern:

1. The representation of products covered by the 'old approach' in CEE-5 and EE-2 are in a number of industries higher than the representation of these products in total EU imports. This is particularly the case for industries 34 (electrical engineering), 25 (chemicals, for EE-2 only), 36 (other means of transport, for CEE-5 only) while for 41 (food) the CEE-5 have a smaller coverage of OA barriers.
2. As regards the much weaker barriers of the 'new approach', which are quite strongly represented in the engineering industries, we can see that in general the extent of product coverage by NA barriers is lower in CEE-5 and EE-2 as compared to total EU-12 imports. This is also the case for industry 48 (rubber and plastics).

#### **4.4.2 The mutual recognition principle**

As mentioned above, we calculated a similar measure of coverage at the industrial level for the mutual recognition principle (MRA and MRP) for which data are available only at a more aggregated sectoral level (for details see Brenton et al., 2000). We aggregated the data which are available at the 3-digit NACE70 industry level to calculate the share of affected subbranches within the 2-digit branch. The results are reported in Table 4.14. As regards the impact of mutual recognition (MR) trade barriers, which are generally considered to be the most restrictive TBTs, we see that the shares of the 3-digit branches to which the MR principle applies are particularly high in industries 25, 26, 33, 34, 36, 43, 45, and 48. Overall, the coverage of MR technical barriers would be somewhat lower for the CEE-5 and EE-2 than they are for total EU-12 imports. However, in general the CEE-5 are close to or approaching the levels of representation of these MR sub-branches typical for total EU-12 imports.

Table 4.12

**Number and value shares of traded products affected by 'old approach' directives**

Industry	EU-12			CEE-5			EE-2		
	1993-95	1996-98	Gr	1993-95	1996-98	Gr	1993-95	1996-98	Gr
<b>Number of products</b>									
22	39	38	-0.22	5	5	3.33	2	3	10.95
23	2	2	0.00	0	0	0.00	0	0	0.00
24	7	7	0.00	5	5	3.71	2	2	2.98
25	677	678	0.00	168	162	-0.78	105	97	-2.40
26									
31	4	4	0.00	3	4	2.05	2	2	2.58
32	68	68	0.04	45	47	0.59	33	37	3.20
33									
34	14	14	0.00	8	9	3.86	6	5	-1.49
35	118	118	0.12	73	73	0.28	39	40	1.81
36	34	34	0.00	20	20	-0.63	6	5	-2.67
37	2	2	0.00	1	1	0.64	1	1	0.00
41	655	659	0.18	81	73	-3.35	49	39	-4.75
42	107	107	0.00	31	32	0.53	10	9	-3.47
43									
44									
45									
46	2	2	0.00	2	2	-1.89	1	1	3.06
47									
48	25	25	0.00	21	20	-1.61	13	11	-4.27
<b>Shares in values</b>									
22	1.78	2.05	4.93	0.21	0.22	-9.31	0.37	0.08	-8.75
23	1.36	0.46	-30.25	0.85	0.04	0.00	0	0	0.00
24	7.39	8.93	6.25	1.65	5.2	34.53	0.24	0.18	-5.71
25	54.87	57.19	1.45	59.6	57.02	-1.40	79.4	72.65	-3.23
26									
31	1.67	2.2	9.70	0.97	1.25	5.49	1.16	1.52	21.34
32	18.64	19.76	2.07	18.84	19.1	2.60	18.24	19.42	6.54
33									
34	6.51	7.36	4.20	19.01	24.19	8.62	23.02	21.53	-16.26
35	100	100	0.00	100	100	0.00	100	100	0.00
36	10.14	10.86	2.60	19.77	24.09	13.71	3.35	6.67	49.40
37	2.38	2.49	1.35	2.81	4.11	17.86	0.26	0.1	0.00
41	59.28	61.03	1.10	46.53	48.77	2.91	62.87	56.45	-4.38
42	62.44	62.53	0.24	66.51	53.58	-6.57	51.05	48.8	-6.37
43									
44									
45									
46	6.07	6.13	-0.04	5.98	6.62	1.73	4.65	4.33	-6.82
47									
48	21.69	21.27	-0.77	40.04	36.17	-2.84	38.07	26.22	-15.48

Table 4.13

**Number and value shares of traded products affected by 'new approach' directives**

Industry	EU-12			CEE-5			EE-2		
	1993-95	1996-98	Gr	1993-95	1996-98	Gr	1993-95	1996-98	Gr
<b>Number of products</b>									
22	1	1	0.00	1	1	0.00	1	1	0.00
23									
24	18	18	0.00	14	14	-0.34	9	9	1.78
25	11	11	0.00	6	7	1.10	4	4	-3.48
26	1	1	0.00	0	0	0.00	0	0	0.00
31	30	30	0.00	22	23	2.04	14	15	2.86
32	219	219	0.04	117	129	3.84	70	86	7.30
33	9	9	0.00	2	2	7.25	1	1	0.00
34	206	206	0.04	108	117	2.89	59	58	-0.43
35									
36	11	11	0.00	7	7	2.21	2	3	3.32
37	37	37	0.00	11	12	3.32	2	4	9.01
41									
42									
43	2	2	0.00	1	1	-1.49	1	1	0.00
44									
45									
46	2	2	0.00	2	2	2.08	2	2	2.18
47	3	3	0.00	2	1	-0.84	0	1	0.00
48	18	18	0.00	12	12	-1.32	5	6	9.32
<b>Shares in values</b>									
22	0.15	0.15	-1.64	0.1	0.24	10.49	0.03	0	-22.74
23									
24	7.97	7.6	-1.66	10.71	9.48	2.01	2.14	3.67	34.83
25	1.43	1.44	-0.14	1.44	1.51	0.35	0.98	1.06	4.72
26	0.09	0.09	-0.05	0.46	0.45	-0.25	0	0	0.00
31	14.32	13.41	-2.33	9.46	9.65	-1.08	10.89	8.56	-7.17
32	22.05	21.05	-1.59	14.06	14.15	-0.79	19.74	18.15	-4.33
33	46.47	57.97	7.97	25.56	15.29	-7.97	34.1	44.32	0.00
34	46.84	46.2	-0.27	41.7	38.21	-3.90	32.53	28.31	-5.77
35									
36	3.01	3.2	1.38	5.01	6.72	3.12	1.25	2.07	6.41
37	34.23	33.97	-0.34	15.74	24.43	16.69	10.58	14.43	12.28
41									
42									
43	0.1	0.11	2.68	0.48	0.35	-9.67	0.18	0.01	0.00
44									
45									
46	2.08	1.86	-3.13	7.82	6.53	-3.79	0.77	1.48	19.28
47	0.73	0.75	1.10	0.33	0.16	-18.55	0	0.01	0.00
48	7.3	7.2	-0.30	3.68	4.53	7.20	1.16	1.56	17.83

Table 4.13

**Value shares of traded products affected by Mutual Recognition**

Industry	EU-12			CEE-5			EE-2		
	1993-95	1996-98	Gr	1993-95	1996-98	Gr	1993-95	1996-98	Gr
<b>Mutual recognition principle</b>									
22	31.51	30.93	0.26	36.82	33.19	-0.32	41.81	51.96	15.86
23	53.23	46.93	-3.86	69.65	73.35	2.86	87.42	62.19	-9.01
24									
25	68.49	66.77	-0.80	67.29	67.70	0.27	51.76	50.38	0.94
26	100.00	100.00	0.00	100.00	100.00	0.00	100.00	100.00	0.00
31									
32									
33									
34	10.16	9.98	-0.67	6.49	7.41	-2.78	16.62	9.91	-12.39
35									
36	92.67	92.99	0.32	71.41	83.92	9.76	64.26	51.57	-5.87
37									
41	12.20	13.09	1.86	11.91	12.42	9.81	7.27	10.62	-14.67
42	22.97	22.40	-1.24	27.04	21.90	-1.60	7.03	5.32	3.95
43	90.45	91.12	0.25	98.04	97.76	-0.09	98.37	99.16	0.30
44									
45	73.46	72.50	-0.30	80.04	78.45	0.19	74.44	73.01	-0.38
46	33.08	33.99	0.02	41.34	40.03	-2.32	59.20	50.58	-6.69
47									
48	67.40	66.51	-0.42	47.25	47.59	0.35	36.02	42.89	4.22
<b>Mutual recognition arrangements</b>									
22									
23									
24									
25	28.19	30.79	2.70	11.96	11.76	-0.47	10.11	7.48	-9.14
26									
31									
32									
33									
34	70.80	72.23	0.61	63.38	62.42	-0.74	48.98	51.72	3.29
35									
36									
37									
41									
42									
43	9.55	8.88	-2.51	1.96	2.24	4.55	1.63	0.84	-19.92
44									
45									
46									
47									
48									

## 5 Technical barriers, development of trade patterns, and quality upgrading

In the next two tables we give an overview of both the coverage rates of products within industries which are affected by directives of the OA and NA type and of the subbranches affected by MR barriers as well as information concerning market shares, market share developments, unit value ratios and growth in UVRs. The point of putting TBTs and performance indicators together is to make a first tentative attempt to see whether a relationship could be established between the different types of technical barriers to trade and market performance. Tables 5.15 and 5.16 summarize the results of the previous chapters for the group of CEE-5 and EE-2, respectively. One can observe the following patterns:

1. As regards coverage by TBTs of the 'old approach', we already mentioned that the coverage in CEE-5 and EE-2 of products affected by these trade barriers is somewhat higher than in total EU imports. But as regards CEE-5 we can see that market share growth and the growth in unit value ratios (i.e. relative export prices), which can reflect the attempt to produce products which satisfy EU technical standards, is rather high in the engineering industries (except for other means of transport) and also in drinks (42) and in rubber and plastics (48). In EE-2 on the other hand there is relatively high market share growth in chemicals (25) and some of the engineering industries (32, 35, 37) but at lower rates than in CEE-5 and also not across all engineering branches.
2. As regards coverage by TBTs of the 'new approach', we have also mentioned above that in general CEE-5 and EE-2 have a lower coverage of products affected by these weaker types of trade barriers which are concentrated in the engineering branches and hence the same differentiation in terms of market performance between CEE-5 and EE-2 applies.
3. The problematic mutual recognition trade barriers are concentrated in industries 25, 26, 33, 34, 36 43, 45, and 48. As was mentioned above, in general the coverage of subbranches which are affected by MR TBTs is somewhat lower in CEE-5 and EE-2 than in total EU imports. This is particularly true for the chemicals industry (especially for EE-2), electrical engineering (34) and other means of transport (36) (again particularly for EE-2) as well as textiles (43) and rubber and plastics (48). As regards market performance in these industries there is market share growth in chemicals and man-made fibres in EE-2, in office machinery and computing (33) and in electrical engineering (34) in CEE-5 but not in EE-2, while the EE-2 have high growth in textiles (43) and footwear and clothing (45) as was discussed earlier.

Hence, at first glance, one can conclude from the analysis that TBTs do not prevent fast growth of exports in areas where comparative advantages (which are different between the CEE-5 and EE-2) do exist. However, a fuller analysis would require formulating a counterfactual to examine how trade growth, trade specialization, and product quality upgrading would have proceeded with a different (or changing) structure of technical barriers to trade.

Table 5.15

**Summary table for CEE-5**

Industry	Coverage ratios of NA, OA and MR								Trade performance				
	(4.12)		(4.13)		(4.14)		(4.14)		(3.7)		(3.9)		(3.2)
	Old approach	New approach	MRP		MRA		Market shares		UVR		Number		
Share	Gr	Share	Gr	Share	Gr	Share	Gr	Share	Gr	Ratio	Gr		
22	0.22	-9.31	0.24	10.49	33.19	-0.32			0.67	4.16	0.92	1.78	42.95
23	0.04	0.00			73.35	2.86			0.35	-9.05	1.11	-1.71	39.55
24	5.20	34.53	9.48	2.01					1.17	1.56	0.99	3.68	66.03
25	57.02	-1.40	1.51	0.35	67.70	0.27	11.76	-0.47	0.25	1.91	0.94	-0.17	27.83
26			0.45	-0.25	100.00	0.00			0.48	4.39	0.89	4.20	56.61
31	1.25	5.49	9.65	-1.08					1.38	8.87	0.94	4.35	65.92
32	19.10	2.60	14.15	-0.79					0.50	12.84	0.70	6.45	57.26
33			15.29	-7.97					0.21	42.67	0.91	14.48	40.11
34	24.19	8.62	38.21	-3.90	7.41	-2.78	62.42	-0.74	0.65	22.12	0.93	5.23	39.38
35	100.00	0.00							0.74	36.09	0.96	2.38	60.86
36	24.09	13.71	6.72	3.12	83.92	9.76			0.15	1.91	0.85	0.87	38.13
37	4.11	17.86	24.43	16.69					0.20	23.02	0.80	2.39	31.51
41	48.77	2.91			12.42	9.81			0.36	0.97	0.99	0.85	13.87
42	53.58	-6.57			21.90	-1.60			0.13	9.34	1.21	4.97	23.26
43			0.35	-9.67	97.76	-0.09	2.24	4.55	0.56	5.00	0.97	-1.21	46.98
44									0.57	-3.57	1.30	3.02	59.66
45					78.45	0.19			1.44	0.67	1.24	2.80	70.51
46	6.62	1.73	6.53	-3.79	40.03	-2.32			1.81	4.47	0.82	2.38	60.56
47			0.16	-18.55					0.34	6.39	0.84	4.22	61.17
48	36.17	-2.84	4.53	7.20	47.59	0.35			0.54	10.98	0.82	3.90	63.69

This would require much more variation in the TBTs across different producers and over time than is available in our dataset. The conclusion we can draw from the analysis above however is that there are distinct and changing patterns of trade specialization across CEE producers and that fast export growth (and quality upgrading) is often taking place in areas which are covered by rather stringent TBTs (under existing EU rules). As this is already the case in the pre-accession period in which the Single Market rules do not yet apply to the candidate countries, one can conjecture that the full incorporation of the new members into the existing EU trading structures (which include the EU instruments with regard to TBTs) should further facilitate the developments already taking place.

Table 5.15

## Summary table for EE-2

Industry	Coverage ratios of NA, OA and MR								Trade performance				
	(4.12)		(4.13)		(4.14)		(4.14)		(3.7)		(3.9)		(3.2)
	Old approach	New approach	MRP		MRA		Market shares		UVR	Number			
Share	Gr	Share	Gr	Share	Gr	Share	Gr	Share	Gr	Ratio	Gr		
22	0.08	-8.75	0.00	-22.74	51.96	15.86			0.56	20.54	0.90	-0.58	26.89
23	0.00	0.00			62.19	-9.01			0.14	-4.94	1.29	8.39	24.24
24	0.18	-5.71	3.67	34.83					0.34	5.72	0.73	2.32	43.81
25	72.65	-3.23	1.06	4.72	50.38	0.94	7.48	-9.14	0.12	6.10	0.92	1.47	14.31
26			0.00	0.00	100.00	0.00			0.19	8.92	0.81	6.56	34.56
31	1.52	21.34	8.56	-7.17					0.16	12.75	0.61	2.59	42.05
32	19.42	6.54	18.15	-4.33					0.13	16.82	0.57	4.20	38.89
33			44.32	0.00					0.00	-10.00	1.49	5.74	16.17
34	21.53	-16.26	28.31	-5.77	9.91	-12.39	51.72	3.29	0.07	5.17	0.73	5.42	20.22
35	100.00	0.00							0.02	18.31	0.90	19.35	33.29
36	6.67	49.40	2.07	6.41	51.57	-5.87			0.05	-9.48	0.72	-2.56	15.27
37	0.10	0.00	14.43	12.28					0.02	16.68	0.91	13.99	13.69
41	56.45	-4.38			10.62	-14.67			0.08	-5.78	1.05	4.38	7.80
42	48.80	-6.37			5.32	3.95			0.02	2.70	0.82	-7.63	9.46
43			0.01	0.00	99.16	0.30	0.84	-19.92	0.43	16.88	0.69	-2.34	35.37
44									0.30	4.70	0.92	3.05	56.33
45					73.01	-0.38			1.94	16.12	0.86	2.14	68.44
46	4.33	-6.82	1.48	19.28	50.58	-6.69			0.74	8.56	0.67	5.88	47.57
47			0.01	0.00					0.03	8.61	0.84	2.16	26.64
48	26.22	-15.48	1.56	17.83	42.89	4.22			0.07	5.62	0.68	4.05	34.61



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## Appendix: List of industries

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Table A.1

### NACE70, 2-digit industries

<b>Code</b>	<b>Description</b>
1	Agriculture and hunting
2	Forestry
3	Fishing
11	Extraction and briquetting of solid fuels
12	Coke ovens
13	Extraction of petroleum and natural gas
14	Mineral oil refining
15	Nuclear fuels industry
16	Production and distribution of electricity, gas, steam and hot water
17	Water supply: collection, purification and distribution of water
21	Extraction and preparation of metalliferous ores
22	Production and preliminary processing of metals
23	Extraction of minerals other than metalliferous and energy-producing minerals; peat extraction
24	Manufacture of non-metallic mineral products
25	Chemical industry
26	Man-made fibres industry
31	Manufacture of metal articles (except for mechanical, electrical and instrument engineering and vehicles)
32	Mechanical engineering
33	Manufacture of office machinery and data processing machinery
34	Electrical engineering
35	Manufacture of motor vehicles and of motor vehicle parts and accessories
36	Manufacture of other means of transport
37	Instrument engineering
41	Food, drink and tobacco industry
42	Food, drink and tobacco industry
43	Textile industry
44	Leather and leather goods industry (except footwear and clothing)
45	Footwear and clothing industry
46	Timber and wooden furniture industries
47	Manufacture of paper and paper products; printing and publishing
48	Processing of rubber and plastics
49	Other manufacturing industries
62	Dealing in scrap and waste materials
97	Recreational services and other cultural services

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