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IMPACTS OF AN EU EASTERN ENLARGEMENT ON AUSTRIA'S MANUFACTURING

EASTERN OPENING STIMULATES THE AUSTRIAN INDUSTRY

Austria's manufacturing benefited most from the fall of communism in eastern Europe, which opened up new markets. If the CEECs join the EU, the continued positive prospects for foreign trade promise even more positive effects on production and employment for the Austrian industry. Even the problems of adjustment in labour- and energy-intensive manufacturing industries will have been overcome by free trade agreements before the accession of the CEE countries.

The positive effects of the pronounced stimulation of foreign trade in Austria after the eastern opening were most noticeable in manufacturing which is responsible for the majority of export activities. The additional exports led to an increase in production and employment. Over the 1989-1996 period Austrian exports of industrial goods to Poland, the Czech Republic, Hungary, and Slovakia (4 CEECs) increased by about ATS 40 billion, corresponding to a net production value of about ATS 14 billion (Table 1). This equals an increase in the net production value in the Austrian industry of an additional 0.6 percent per year (in comparison to a scenario without an eastern opening). These figures result from relating foreign trade figures (SITC) to production figures (two-digit/one-digit level of the Austrian trade classification of 1968) and the multiplication of the increase in export figures in the various sectors with the net rate (net production value/gross production value ratio). Employment figures increased slightly less than production figures (+0.5 percent per year) as the rise in production was partly caused by an increase in productivity. The additional exports to the 4 CEE countries provided work for about 20,000 people in the Austrian industry. This (direct) effect on employment is the result of the sum of ratios between the export-related net production value and the labour productivity throughout the sectors. It does not include the workforce employed in the supply of input that is required by the sectors exporting to the CEECs. If these indirect effects were included also, the benefits for employment would be 1.5 to 2 times higher than for the direct effects.

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Table 1: The stimulation of the Austrian industry through eastern opening

	Net production value		Employment		
	Export effects	Import effects	Export effects	Import effects	Balance
	Million ATS			Persons	
Vienna	+ 3,318	+ 2,348	+ 3,931	+ 2,689	+ 1,242
Lower Austria	+ 2,310	+ 1,304	+ 3,244	+ 1,972	+ 1,273
Burgenland	+ 392	+ 224	+ 693	+ 505	+ 188
Styria	+ 2,244	+ 1,212	+ 3,329	+ 1,879	+ 1,450
Carinthia	+ 371	+ 817	+ 725	+ 1,377	– 651
Upper Austria	+ 2,652	+ 2,066	+ 4,097	+ 2,878	+ 1,219
Salzburg	+ 593	+ 397	+ 895	+ 629	+ 266
Tyrol	+ 1,418	+ 608	+ 1,684	+ 829	+ 855
Vorarlberg	+ 681	+ 560	+ 945	+ 689	+ 256
Austria	+13,980	+ 9,537	+19,544	+13,447	+ 6,097
	Average year-to-year percentage changes 1989-1996				
Vienna	+ 0.8	+ 0.6	+ 0.5	+ 0.4	+ 0.2
Lower Austria	+ 0.6	+ 0.3	+ 0.5	+ 0.3	+ 0.2
Burgenland	+ 1.3	+ 0.8	+ 0.8	+ 0.6	+ 0.2
Styria	+ 0.7	+ 0.4	+ 0.5	+ 0.3	+ 0.2
Carinthia	+ 0.3	+ 0.7	+ 0.3	+ 0.6	– 0.3
Upper Austria	+ 0.5	+ 0.4	+ 0.4	+ 0.3	+ 0.1
Salzburg	+ 0.6	+ 0.4	+ 0.5	+ 0.4	+ 0.1
Tyrol	+ 1.0	+ 0.4	+ 0.7	+ 0.4	+ 0.4
Vorarlberg	+ 0.6	+ 0.5	+ 0.4	+ 0.3	+ 0.1
Austria	+ 0.6	+ 0.4	+ 0.5	+ 0.3	+ 0.2

Source: Austrian Central Statistical Office; own calculations. Impacts of eastern opening from the increase in foreign trade 1989-1996 with the 4 CEECs Poland, Czech Republic, Slovakia, Hungary.

These effects are counteracted by an intensified competition in the import sector. Not only exports to but also imports from the CEE countries increased, partly substituting the Austrian production in manufacturing. It would be unrealistic to assume that the imports from the CEECs had no negative impact on local production, implying that gross export effects would equal net export effects. There is, however, no indication as to the extent of this displacement. Competition arising from imports did not take full effect as sensitive sectors were excluded from free trade under the Europe Agreements of the EU with the CEECs. This action was taken to protect all those sectors in the western European industries in which the CEECs have considerable comparative locational advantages (e.g., chemicals and plastics, textiles, clothing, iron and steel, food). Taking into consideration such displacement effects, the additional foreign trade with the 4 CEECs is estimated to have created (directly) between 6,100 and 19,500 jobs in the Austrian production in manufacturing. This corresponds to an annual rise of between 0.2 percent (complete displacement through imports) and 0.5 percent (no displacement through imports).

As no regional export statistics were available, the effects of eastern opening on the whole of Austria were applied to the industries in the Länder by means of an allocation formula. It was assumed that the higher the number of industrial sectors with high export dynamics in a Land (structural factor) was, the more this Land participated in foreign trade with the CEECs. In addition, the development of the net production value during the 1990s was included under the assumption that a dynamic sector would be more successful on the eastern markets than a sector with decreasing production in a particular Land (growth factor). Both these factors were mapped in two matrices, one for the sectors and one for the Länder. The multiplication of the corresponding elements in these matrices produced the allocative matrix which served for the allocation of the Austrian industrial sectors' net production value (based on exports to the CEECs) to the various Länder[1]. Import and employment figures are broken down per region in the same way.

The economic and political transformations in the CEECs are of less concern to western Austria than to its eastern and southern regions. In the west the export sector benefits from the additional opportunities mainly indirectly through its close ties with the German markets that also profit from the situation. It is above all the east that received a clear impulse for more internationalisation.

The economic and political transformations in the CEECs are of more concern to the east and south of Austria than to its western region. Eastern Austria (including Styria) benefited from a sectoral structure in which the technological sector, essential for exports to the CEECs (electrical industry, vehicle industry, mechanical engineering, chemical industry), was more important than in the west (with the exception of the Tyrol). The industries in Vienna and those in the Burgenland (important suppliers of components for Vienna) were offered opportunities for more internationalisation. Businesses in the western Länder that concentrate on EU markets were less active in exports to the CEECs. They did, however, benefit indirectly from increased exports to the German markets that were also stimulated by the eastern opening. Hardly any advantages were noticeable for the industries in Carinthia. Structural problems there slowed down export dynamics, and the pressure from competition in the import sector was very high. Under the extreme assumption of a complete import substitution, employment figures in the industries in Carinthia would even have dropped following the eastern opening (–0.3 percent per year).

[1] $v = p\,S * G$, v . . . vector (1, r) of the Länder's export-induced net production value, p . . . vector (1, k) of the Austrian industrial sectors' export-induced net production value, S . . . matrix (k, r) of the structural proportion throughout the sectors and the Länder, G . . . matrix (k, r) of the rate of change in net production values; * . . . Hadamard product (multiplication of the corresponding elements).

FREE TRADE LEADS TO NEW DIVISION OF LABOUR BEFORE THE EU ACCESSION OF THE CEECS

In the years prior to the EU accession of the CEE countries the liberalisation of sensitive sectors in trade between the EU and the CEECs will speed up changes in the sectoral structure of the Austrian industry. The comparative locational disadvantages will put particular competition pressure on the labour- and energy-intensive manufacturing sectors. In light of the emerging division of labour in central Europe the industries in eastern and southern Austria have a greater need for adjustment.

Perspectives for the future, drawn from the past development of division of labour between the EU and the CEECs, are restricted by the fact that "sensitive sectors" were excluded from the free trade agreements. Hence, no conclusions are possible as to the actual comparative locational advantages of Austria and the CEECs. For imports into the EU this special arrangement expired in 1998, and for imports into the CEECs it will expire in the year 2000. Thus, competition in the import sector will increase before the EU accession of the CEECs following a new division of labour in central Europe. The comparative locational advantages of the CEECs will probably lead to relocations of production facilities (mainly in the labour- and energy-intensive sectors) to the disadvantage of Austrian locations. Together with the catching-up process in the CEECs, exports in the human-capital intensive sectors will continue to grow.

The pressure of competition in labour-intensive sectors is due to the high wage differential. Nominal wages in Austria (at uniform exchange rates) are up to 10 times higher than those in a neighbouring CEEC (Table 2). The differences in the unit labour costs, relevant for foreign investments, are slightly smaller. Compared to the Austrian level the disparities range from a quarter (Slovakia) to two thirds (Slovenia). Unit labour costs in the Czech Republic (29.7 percent) and in Hungary (33.3 percent) are similar to those in Slovakia.

The following identification of potentially jeopardised labour-intensive industrial sectors is based on the criteria of wage rate (remuneration per employee) and unit labour costs (remuneration in percent of the net production value). Austrian sectors that are potentially jeopardised are those where labour cost is of high importance to the total costs, i.e., its share is at least 5 percentage points higher than the average in Austrian industries, and where the wage rate is low (more than 10 percent below the national average). Keeping in mind that, due to a regional division of labour, high-quality and labour-intensive components for a sector are manufactured at different locations, the labour intensity of a sector can vary from Land to Land. Thus, the sectors particularly affected by the transformation of the CEECs were defined based on characteristics specific to the various Länder. For the unit labour costs in a Land the same criterion is applied as to the whole of Austria. For the wage rate, however, a relative characteristic attributed to the sectoral average is applied: the wage rate in a sector particularly affected by eastern opening lies at least 10 percent below the Austrian sectoral average (relative wage rate lower than 90; Table 3).

Table 2: Relative wage level in 1996

	Nominal wages[1]	Unit labour costs[2]
	Austria = 1	
Poland	0.122	0.405
Slovakia	0.100	0.241
Slovenia	0.359	0.671
Czech Republic	0.134	0.297
Hungary	0.116	0.333

Source: Austrian Central Statistical Office, Vienna Institute for Comparative Economic Studies, own calculations. – [1] At uniform exchange rates. – [2] Wages/labour productivity ratio.

The price advantages the CEECs have in energy-intensive sectors result from the partly distorted input prices in the COMECON system. Since the eastern opening, increased competition has been due to lower environmental standards. The elimination of distorted competition resulting from differences in prices and standards will, in turn, lead to the disappearance of locational advantages in most of the CEECs in the primary industry in the course of liberalisation, whereas the comparative labour-cost advantages will disappear more slowly.

In contrast to the labour-intensive sectors, production in the energy-intensive sectors is barely organised in an interregional division of labour. These sectors, mostly producing with capital intensive technologies, tend to concentrate their locations close to raw material deposits or at transport axes in consideration of their returns to scale. The regional differences between these sectors are not so much found in the factor endowment as in their lines of production. Hence, a uniform criterion for definition was set for Austria and the Länder: an industrial sector is classified as energy-intensive if its energy costs account for more than 8 percent of the net production value (Table 4).

Soon after the onset of reforms in the East the development of Austrian exports to the CEECs showed that the lo-

Table 3: Importance of labour-intensive sectors

Employees 1994, Austrian trade classification 1968

		Vienna	Lower Austria	Burgenland	Styria	Carinthia	Upper Austria	Salzburg	Tyrol	Vorarlberg	Austria
		As a percentage of total industrial employment									
33	Manufacture of textiles and textile articles	1.5	6.1	4.8	2.4	0.7	2.8	2.9	7.5	31.2	5.0
34	Manufacture of clothing and bedding	2.2	3.1	16.3	1.9	1.5	2.4	1.9	2.7	4.5	2.8
35	Manufacture and repair of shoes	0.1	0.3	–	.	9.0	1.1	.	.	–	1.0
36	Production and processing of leather	.	.	.	1.1	2.0	0.1	.	.	–	0.4
38	Processing of wood	1.4	6.3	5.2	4.2	3.8	5.8	5.8	1.5	2.0	4.2
39	Manufacture of musical instruments	.	1.0	–	–	.	1.2	4.8	.	.	1.1
53	Manufacture of metal products	2.5	5.3	1.5	6.0	3.6	4.2	6.6	4.9	10.8	4.9
41	Manufacture and processing of paper	2.3	4.1	.	7.8	2.8	3.5	6.6	.	2.5	4.0
44	Manufacture of rubber products	1.1	6.5	1.5	1.7	2.0	3.8	0.7	3.1	1.6	3.0
46	Processing of petroleum, etc.	2.3	2.2	.	0.1	.	0.2	.	.	–	1.0
48	Manufacture and processing of glass	0.5	1.6	.	1.4	0.4	1.2	.	.	.	1.7
51	Manufacture of steel and non-ferrous metals	0.9	8.7	.	12.5	.	11.6	3.8	8.0	2.1	7.3
52	Processing of metal, etc.	1.3	3.3	8.5	6.8	3.8	5.3	4.3	1.2	4.6	4.1
54/55	Manufacture of machinery	9.1	12.5	2.5	10.4	9.6	17.4	12.6	10.2	10.4	12.1
56/57	Manufacture of electrical installations	37.0	6.9	29.7	14.9	18.3	6.1	9.5	8.6	8.8	14.7
58	Manufacture of transport equipment	12.0	4.0	.	9.7	3.7	8.7	8.6	4.2	1.6	7.4
59	Manufacture of precision and medical-optical instruments	1.1	.	–	0.2	.	1.6	2.0	.	.	0.9
	Labour-intensive sectors total	2.0	38.0	32.0	26.5	31.4	26.5	34.4	19.2	14.8	19.4
21 to 59	Industry	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Austrian Central Statistical Office, own calculations. Shaded fields . . . jeopardised sectors.

cational advantages of the EU countries are mainly found in the human-capital intensive sectors. In order to delimit the potential advantages based on factor endowment, the industrial sectors were defined as human-capital intensive. The four sectors of the technological industry (chemicals, mechanical engineering, vehicles, electrical industry) in a Land are considered human-capital intensive, even if the wage rate is not below average (wage rate in a sector in a Land no more than 5 percent below the appropriate Austrian average; Table 5). The wage rate can be regarded as a proxy variable for the human-capital endowment since better qualified workers usually earn higher wages than unskilled workers.

The classification of sectors based on the regional factor endowment shows that in the Austrian industry the ratio of possible opportunities and displacement from the CEECs is almost balanced. The number of jeopardised sectors is slightly higher: 47 percent of the Austrian industrial workers are employed in labour- or energy-intensive sectors and 41 percent in human-capital intensive sectors. For most of the Länder this balance of potential based on regional factor endowment is negative, except for Vienna, where the human-capital intensive sectors are much more important (about two thirds of the industrial workers), and Vorarlberg. In the industry in Vorarlberg the clothing sector is traditionally very important but its businesses are much

Table 4: Importance of energy-intensive sectors

Employees 1994, Austrian trade classification 1968

		Vienna	Lower Austria	Burgenland	Styria	Carinthia	Upper Austria	Salzburg	Tyrol	Vorarlberg	Austria
		As a percentage of total industrial employment									
21	Mining of coal	–	.	–	.	–	0.2	–	–	–	0.1
22	Mining of metal ores	–	–	–	.	–	–	.	–	–	.
23	Petroleum and natural gas	–	2.2	–	–	–	.	–	–	–	0.4
24	Mining of salt	–	–	–	.	–	0.3	.	–	–	0.1
26	Mining of graphite, etc.	–	.	–	0.4	–	.	.	.	–	0.1
27	Quarrying	0.1	0.6	1.0	0.5	0.8	0.2	.	0.4	.	0.3
37	Processing of wood, etc.	0.1	2.8	2.7	3.3	7.4	1.8	6.4	5.5	1.3	2.7
41	Manufacture and processing of paper	2.3	4.1	.	7.8	2.8	3.5	6.6	.	2.5	4.0
45	Manufacture of chemicals and related products	8.3	6.9	4.6	2.3	9.0	9.1	5.7	11.0	1.6	6.9
46	Processing of petroleum, etc.	2.3	2.2	.	0.1	.	0.2	.	.	–	1.0
47	Manufacture of stone products	2.0	4.7	3.1	4.7	9.6	4.8	2.8	9.5	1.3	4.5
51	Manufacture of steel and non-ferrous metals	0.9	8.7	.	12.5	.	11.6	3.8	8.0	2.1	7.3
	Energy-intensive sectors total	–	32.2	11.4	30.2	29.5	31.6	25.8	24.5	7.4	27.4
21 to 59	Industry	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Austrian Central Statistical Office, own calculations. Shaded fields . . . jeopardised sectors.

Table 5: Importance of human-capital intensive sectors

Employees 1994, Austrian trade classification 1968

		Vienna	Lower Austria	Burgenland	Styria	Carinthia	Upper Austria	Salzburg	Tyrol	Vorarlberg	Austria
		As a percentage of total industrial employment									
45	Manufacture of chemicals and related products	8.3	6.9	4.6	2.3	9.0	9.1	5.7	11.0	1.6	6.9
54/55	Manufacture of machinery	9.1	12.5	2.5	10.4	9.6	17.4	12.6	10.2	10.4	12.1
56/57	Manufacture of electrical installations	37.0	6.9	29.7	14.9	18.3	6.1	9.5	8.6	8.8	14.7
58	Manufacture of transport equipment	12.0	4.0	.	9.7	3.7	8.7	8.6	4.2	1.6	7.4
	Human-capital intensive sectors total	66.4	19.4	–	20.1	18.3	35.2	12.6	15.3	20.8	41.1
	Balance of advantages and disadvantages[1]	64.4	–50.9	–43.4	–36.6	–42.6	–22.9	–47.6	–28.4	– 1.4	– 5.7
21 to 59	Industry	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Austrian Central Statistical Office, own calculations. Shaded fields . . . jeopardised sectors. – [1] Human-capital intensive sectors minus labour-intensive sectors minus energy-intensive sectors.

more active in high-quality market niches than in labour-intensive segments. In Carinthia, the Burgenland, in Salzburg and Lower Austria, however, the surplus of labour-intensive and the shortage of human-capital intensive sectors clearly lies above the Austrian average.

If the possible advantages and disadvantages are defined through a regional structure, the balance of potential, however, is clearly positive. The jeopardised sectors are mainly found in single regions of relatively small importance (low employment) whereas the more promising sectors are concentrated in regions of great importance to the production in manufacturing of a Land. The regional structure of the Länder is represented by various types of "industrial regions" (*Palme,* 1989). The intensification of the regional division of labour in central Europe, concomitant of the liberalisation of trade in sensitive sectors, will mainly compromise the "old industrial areas", the "resource-oriented low-density regions" and the "regions". The most positive effects can be expected for the Vienna agglomeration, the "high-density central regions" and the "labour-intensive low-density regions". If the first group of these industrial regions were regarded as "jeopardised" by the competition on the import sector and the second one as "privileged", more than three quarters of the Austrian industrial workers would be employed in regions where potential opportunities would prevail. The difference in industrial employment between regions with potential of advantages and disadvantages is 58 percentage points (Table 6)[2].

The assertion that prior to the EU accession of the CEECs the western region has less need for restructuring its industry than the rest of Austria is not only supported by a close look at the sectoral structure, but even more so by the analysis of the regional structure. From this point of view the industry in Salzburg, which has only a small number of peripheral regions, seems hardly jeopardised at all. The relatively high number of jobs in labour- and energy-intensive sectors is concentrated in the central area of Salzburg. Lower Austria is another Land where the regional structure is considerably more adaptable than the sectoral structure. The regional structures of Vienna and Vorarlberg seem to be largely untouched by the structural changes following the inter-industrial division of labour. Tyrol and Upper Austria also have a favourable regional structure with highly efficient high-density central regions. Styria and the Burgenland, however, seem to be more susceptible to intensified competition pressure due to their relatively unbalanced regional structure. Burgenland is dominated by peripheral regions with businesses of only little management competence, a situation that complicates an independent upgrading process. Styria is also dominated by peripheral regions (though not as much as the Burgenland), but those located close to motorways benefit more and more from the suburbanisation development of the Styrian capital of Graz. A number of structural problems could arise in the old industrial area of the Mur-Mürzfurche region where the primary industry that is concentrated there comes under considerable competition pressure. In Carinthia, both the sectoral and the regional structures are unfavourable. The balance of potential of the regional structure, however, is positive as the central high-density region of Carinthia is relatively important, even though it does not have high-quality industrial sites, apart from the Villach area (*Palme,* 1992).

These simulations refer to potential developments and thus represent the maximum possible dangers of displacement and opportunities for growth. Estimates based on the multilateral foreign trade flows are more realistic as the balance of trade is also an indicator of competitiveness. Highly competitive businesses can succeed in jeopardised

[2] Naturally, the dimension of this balance is distorted as the regions are not usually monostructural. Privileged businesses can also be found in jeopardised areas and in turn businesses jeopardised by displacement can be located in privileged areas. However, due to the differences in location, privileged sectors in privileged regions are faced with different competitive conditions than those in jeopardised regions. The electrical or clothing industries in Vienna or Vorarlberg, for example, are faced with different competition than those in the Waldviertel region.

sectors, whereas less competitive businesses may fail in privileged sectors. On the basis of the future development of foreign trade with the CEECs the Austrian manufacturing sector is not as concerned. Assuming that the trade structure in the CEECs will not adjust to that of the EU, 17.6 percent of the jobs in the Austrian industry will be newly created by exports (directly) to the 5 CEECs Slovakia, the Czech Republic, Poland, Hungary, and Slovenia until the year 2004, whereas 11.6 percent are jeopardised by their import competition.

EU EASTERN ENLARGEMENT CREATES STRONGER DYNAMICS IN THE LÄNDER WITH HIGH DENSITY

Under realistic assumptions the effects on production and employment of an EU eastern enlargement will exceed those of the eastern opening. It is mainly the intra-industrial trade that will increase through vertical division of labour and horizontal product differentiation. The high-density regions around the major cities and in the central areas of the Länder will profit from the use of increasing returns to scale. The Länder of Vienna, Lower Austria, Upper Austria, Styria, the Tyrol, and Vorarlberg have good export opportunities, whereas the smaller and partly less developed Länder of Burgenland, Carinthia, and Salzburg will have to expect weaker impulses.

The actual EU accession of the CEECs will no longer lead to a heavy adjustment shock in the Austrian industry as the structural changes are already happening in the wake of the implementation of the free trade zone between the EU and the CEECs, as laid down in the Association Agreements. The competition among the large EU countries who want to profit from the effects of integration of the CEECs could outweigh the price competition of imports from the CEECs for shares of the domestic or outside markets. In this contest for specialisation the highly competitive groups in Germany and Italy will be the main opponents for Austrian businesses.

The EU eastern enlargement will particularly intensify the intra-industrial division of labour, which in turn will lead to higher concentration in the Austrian industry. The focus will change towards a vertical division of labour within the network of component suppliers. At the same time there are signs that the horizontal product differentiation (specialisation on varieties of products) will become more important if the CEECs will continue their positive economic development and if their foreign trade structure will adjust to the EU average[3].

If the trade structure of the 4 CEECs (Poland, the Czech Republic, Hungary, Slovenia; for Slovakia the scenario predicts an adjustment until the year 2010) will meet the EU average to its full extent by the year 2004 (a relatively early date for accession), the direct effects on production of Austrian exports to the CEECs (2004 ATS +71.2 billion) could be 132 percent higher than in a scenario based on an unchanged foreign trade structure and an export development limited to the growth of the GDP (2004 ATS +30.6 billion). It is, however, more realistic not to limit the adjustment phase to the pre-accession period but to grant a longer period of time. If the adjustment would continue for 6 more years after the accession (until the year 2010), the direct export-related effects on production in the year 2004 would be slightly lower, but would still be 113 percent higher than those based solely on the growth of GDP. For the foreign trade dynamics it is not so important how fast the structure of foreign trade adjusts to that of the EU but that it adjusts at all.

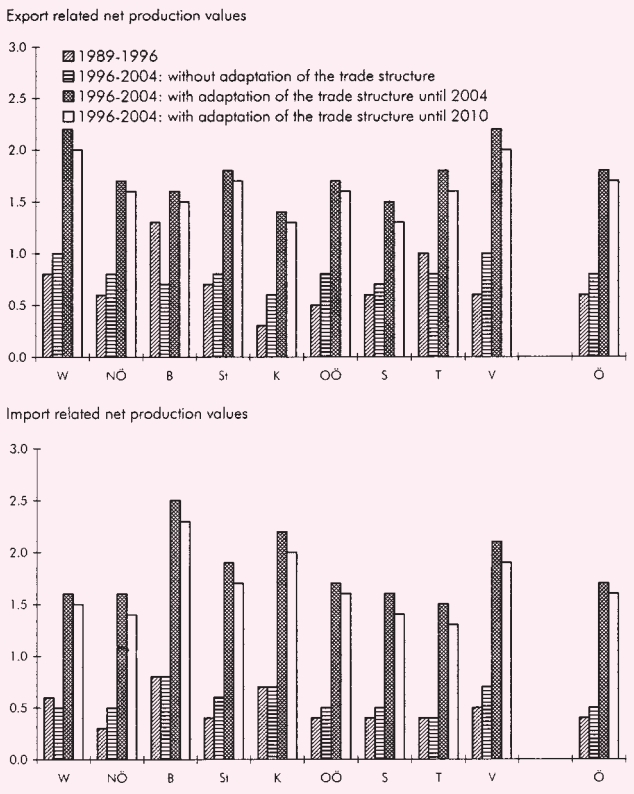
However, the catching-up process and the intensification of the intra-industrial trade will also enhance imports from the CEECs. If the trade structure in these countries adjusts to the EU average, Austrian imports from the region will increase noticeably faster than without an adjustment. In a scenario where Austrian production would be completely displaced by imports, the net effects of Austrian production in manufacturing in case of adjustment of the trade structure would be about half those that would occur without adjustment (2004 ATS +11.3 billion). For the accession scenario the assumption of a complete substitution of local Austrian production by imports would be very unrealistic, as the displacement in intra-industrial trade is considerably lower than that in inter-industrial trade because of the complementarity of products. A simulation of complete complementarity between Austrian production and imports from the CEECs (the gross export effects equal the net export effects) and a structural adjustment of foreign trade in the CEECs until the year 2010 would result in a net production value of Austrian production in manufacturing (direct) between 1994 and 2004 that would grow by 1.7 percent p.a. more than without eastern enlargement (without structural adjustment +0.8 percent; Figure 1).

These production dynamics are considerably higher than in the first few years after the eastern opening. Under the realistic scenario of a partial displacement through im-

[3] See Egger, P., "The Potential for Trade between Austria and five CEE Countries. Results of a panel based econometric gravity model", in this issue.

Figure 1: Impacts of eastern integration on the Austrian Länder: net production value

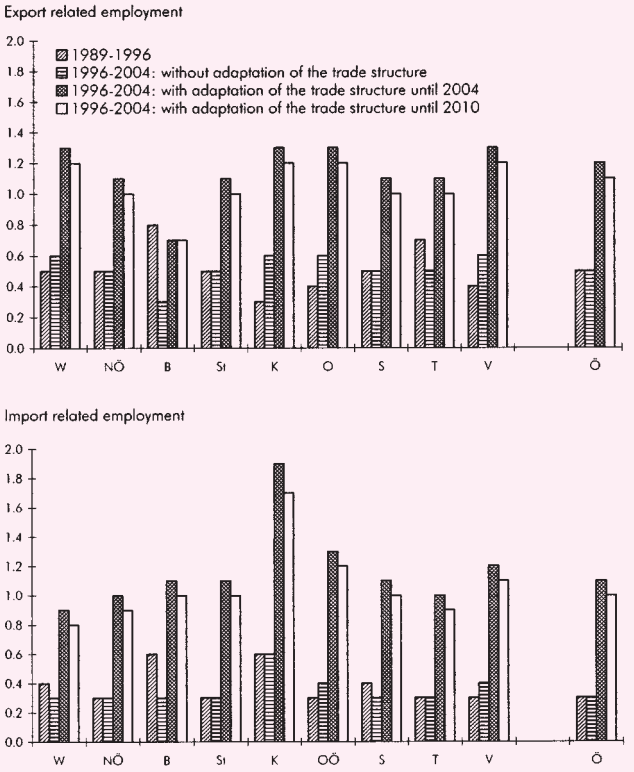
Average year-to-year percentage changes



Source: Austrian Central Statistical Office, own calculations. Changes in the net production value following the increase in foreign trade with the 5 CEECs (Poland, Czech Republic, Slovakia, Hungary, Slovenia). W . . . Vienna, NÖ . . . Lower Austria, B . . . Burgenland, St . . . Styria, K . . . Carinthia, OÖ . . . Upper Austria, S . . . Salzburg, T . . . Tyrol, V . . . Vorarlberg, Ö . . . Austria.

Figure 2: Impacts of eastern integration on the Austrian Länder: employment

Average year-to-year percentage changes



Source: Austrian Central Statistical Office, own calculations. Changes in employment following the increase in foreign trade with the 5 CEECs (Poland, Czech Republic, Slovakia, Hungary, Slovenia). W . . . Vienna, NÖ . . . Lower Austria, B . . . Burgenland, St . . . Styria, K . . . Carinthia, OÖ . . . Upper Austria, S . . . Salzburg, T . . . Tyrol, V . . . Vorarlberg, Ö . . . Austria.

ports (no total substitution), Austrian production in manufacturing will be stimulated more by the EU accession of the CEECs than it was by the eastern opening. The same applies to the effect on employment (Figure 2). The (additional) increase in employment figures in the Austrian industry resulting from the EU accession of the CEECs would lie between 25,000 (without structural adjustment) in case of a complete complementarity of imports from the CEECs and 53,000 (structural adjustment until the year 2010), compared to between 3,500 and 9,000 in case of complete substitutionality.

The concentration tendencies in the Austrian industry, triggered by an EU accession of the CEECs, will have positive regional effects on the high-density regions, while the low-density regions and the peripheral regions will need intensive upgrading to ensure long-term competitiveness. The concentration on the agglomeration areas, however, is not as strong as it was on the occasion of the Austrian EU accession. Austria's EU accession created much more need for the modernisation of the manufacturing sector and for more intensive R&D than can be expected from the EU accession of the CEECs (*Keuschnigg – Kohler*, 1997). If competition depends on innovation, large cities benefit from the prompt availability of highly qualified human capital and from the diversity of producer services. In the context of the EU accession of the CEECs, increasing returns to scale will be more important than the product diversification through innovation, a situation in which the high-density central regions of the Länder and the suburban areas around the large cities will be at a clear advantage.

This regional impact pattern discriminates against smaller Länder that do not have distinct central areas (Table 6). However, due to more foreign trade, the increase in production value is considerably less dispersed over the Länder in any accession scenario (the range is about half the size) than after the eastern opening (Figure 1). Within the Länder the regional differences in competitiveness in the

Table 6: Regional structure of the Länder: types of industrial regions

Industrial workers 1994

	Vienna	Lower Austria	Burgenland	Styria	Carinthia	Upper Austria	Salzburg	Tyrol	Vorarlberg	Austria
	As a percentage of total industrial employment									
Agglomeration	100.0	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.7
High-density central regions	0.0	46.6	16.7	33.7	30.9	77.3	76.1	88.9	100.0	49.3
With scale effects	0.0	24.8	0.0	10.6	0.0	51.2	21.1	75.7	17.2	25.0
With scope effects	0.0	21.8	16.7	23.1	30.9	26.1	55.0	13.2	82.8	24.3
Old industrial areas	0.0	9.5	0.0	28.5	0.0	0.0	0.0	0.0	0.0	6.3
Low-density regions	0.0	24.8	23.8	20.1	54.8	17.8	21.5	1.2	0.0	16.7
Resource-oriented	0.0	11.7	6.8	3.9	23.4	7.5	0.0	0.0	0.0	6.0
Labour-intensive	0.0	13.2	17.0	16.2	31.4	10.2	21.5	1.2	0.0	10.7
Peripheral regions	0.0	11.5	59.5	17.7	14.3	4.9	2.4	9.9	0.0	8.9
Balance of advantages and disadvantages[1]	100.0	34.6	–32.6	– 0.2	24.6	75.1	95.2	80.2	100.0	57.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Austrian Central Statistical Office, own calculations. – [1] Human-capital intensive sectors minus labour-intensive sectors minus energy-intensive sectors.

intra-industrial trade partly compensate each other. In view of the fact that the opportunities offered by foreign trade with the CEECs depend on competitiveness, the export potentials were allocated to the various Länder based on their labour productivity (as an indicator for competitiveness) and their sectoral structure (eleven sectors)[4]. Assuming that Länder with above average labour productivity (1994) in the manufacturing sector are at an advantage in the export to the CEECs, the Tyrol, Vienna and Lower Austria benefit from this situation, while in Carinthia and in the Burgenland the industry is either less competitive or less efficient in production. For the conversion of the production effects into employment effects it was assumed that the gain in productivity experienced in the first half of the 1990s would continue unchanged over the scenario period. In this simulation the employment effects in Vienna, and also in the Burgenland where the industry is currently undergoing a catching-up process, are weaker than could be expected by the development of production figures whereas the effects on employment in Carinthia, Upper Austria and in Salzburg are more pronounced (Figure 2).

In every export scenario the figures are different but the regional impacts largely remain constant. The effects of EU eastern enlargement on the manufacturing sector in the Austrian Länder were estimated under the assumption that the trade structure in the 5 CEECs would adjust to the EU average until the year 2010. This promises the largest expansion of industrial production resulting from an EU accession of the neighbour CEE countries for the Länder of Vorarlberg, the Tyrol, Vienna, Lower Austria, Upper Austria, and Styria over the 1996 to 2004 period. The increase in net production value is expected to lie about 1.6 to 2.0 percentage points p.a. above that in a scenario without an EU eastern enlargement. These Länder are at an advantage because the productivity of their industries is generally above average, and their regional structures are dominated by high-density central regions oriented towards increasing returns to scale. This is particularly true for Tyrol and Upper Austria. In Lower Austria and in Tyrol only a relatively small part of the increase in production would be achieved through a rise in employment. The additional increase in employment figures for the industries in Lower Austria, Styria and the Tyrol is estimated to lie 0.2 percentage points p.a. below that assumed for the industries in Upper Austria, Vienna and Vorarlberg (+1.2 percent each). In Vorarlberg this increase in employment is mainly due to the importance of its labour-intensive clothing sector. Carinthia, Salzburg and the Burgenland will see the lowest exploitation of potential trade opportunities with the CEECs. Burgenland and Carinthia are less-developed Länder with no important high-density central regions, and Salzburg's industry has suffered problems of competitiveness over the past few years. However, the shortfall to be expected for these Länder is moderate: following the eastern enlargement of the EU the increase in industrial production can be expected to lie between 0.2 and 0.4 percentage points below the Austrian average.

[4] The following matrix was applied: $w = f\,S * E$, w . . . vector (1, r) of the predicted export-induced net production value of the Länder, f . . . vector (1, k) of the predicted export-induced net production value of the Austrian industrial sectors, S . . . matrix (k, r) of the structural proportions across the sectors and Länder, E . . . matrix (k, r) of the standardised productivity under the assumption that productivity will grow until the year 2004 at the same rate as between 1989-1994; * . . . Hadamard product (multiplication of the corresponding elements).

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Impacts of an EU Enlargement on Austria's Manufacturing

Eastern Opening Stimulates the Austrian Industry – Summary

The still favourable foreign trade perspectives in case of EU enlargement are expected to cause positive production and employment effects for Austria's industry. Certain adjustment problems in poorly competitive industries will have been overcome before the accession of CEE countries.

The upheavals in eastern Europe have opened up new markets, thus favouring the manufacturing sector in particular. Industry covers a major portion of the greatly risen exports to Central and Eastern European countries. Due to growing exports to 4 CEECs (Poland, Czech Republic, Slovakia, Hungary), Austria's industry raised its net production value by around ATS 14 billion, or 0.6 percentage points annually, between 1989 and 1996, more than it would have been able to do without these newly opened eastern markets. It is assumed that approximately 20,000 production workers have worked on these additional exports to the 4 CEECs. This estimate does not include the indirect effects of inputs required by export firms. On the other hand, import growth has resulted in a number of domestic production workers being crowded out. There are no reliable estimates as to the extent of displacement. And import competition has not been fully effective as a number of "sensitive industries" (e.g., chemicals and plastics, textiles, clothing, iron and steel, food) have been excluded from free trade between EU and CEE countries in a transitional period in an attempt to protect western European industry. Taking into account such displacement effects, we may assume that Austria's manufacturing jobs have grown by an additional 0.2 to 0.5 percentage point p.a. owing to additional foreign trade. The politico-economic transformation of Central and Eastern European countries has affected more the east and south of Austria than its western Länder. The latter exploit additional export opportunities more indirectly through their close interlinkage with the – also profiting – German economy, whereas the east has received major incentives for enhanced internationalisation.

In the years till EU membership of the CEE countries, the liberalisation of the sensitive sectors of trade between the EU and the CEECs will accelerate sectoral change within Austrian industry. The respective special regulation has expired in 1998 for imports to the EU and is still applicable till 2000 for imports to the CEECs. This signifies that in the years to come import competition will increase on the road to specialisation in central Europe. The CEECs' accession as such will no longer trigger any serious adjustment shock for Austria's industry. Due to their comparative location disadvantages, the labour and energy intensive production sectors will come under enhanced displacement pressure. The respective jeopardised industries are more prevalent in the east and south of Austria than in the west.

Based on realistic assumptions regarding the future trade volume, the production and employment effects of EU enlargement will outdo the ones experienced in the wake of eastern opening. Without import competition, industrial jobs would move up by 25,000 to 53,000 by 2004 because of export growth to the 5 CEECs (Poland, Czech Republic, Slovakia, Slovenia, Hungary). There won't be very great displacement pressure on domestic production as it will mostly be trade with varieties of products (intra-industrial trade) that will expand. Its focus will result from the vertical work sharing within subcontracting networks. In addition, there will be a tendency towards growing specialisation in finished products if CEE countries continue to catch up economically and have their foreign trade structure approximate the EU average. Industries around major cities and in the highly centralised areas of the Länder are well-positioned to exploit increasing returns to scale. The extent to which the Länder are differently affected by these developments will become smaller the greater the integration of CEECs. Industry in the less developed Länder of Carinthia and Burgenland, as well as in Salzburg, has to reckon with somewhat reduced export stimuli.

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