UNIVERSITY OF WUPPERTAL
BERGISCHE UNIVERSITÄT WUPPERTAL

EUROPÄISCHE WIRTSCHAFT
UND
INTERNATIONALE MAKROÖKONOMIK

Dora Borbély

EU Export Specialization Patterns in Selected Accession Countries

Diskussionsbeitrag 116
Discussion Paper 116

Europäische Wirtschaft und Internationale Wirtschaftsbeziehungen
European Economy and International Economic Relations

ISSN 1430-5445

Dora Borbély

EU Export Specialization Patterns in Selected Accession Countries

March 2004

Herausgeber/Editor: Prof. Dr. Paul J.J. Welfens, Jean Monnet Chair in European Economic Integration

EUROPÄISCHES INSTITUT FÜR INTERNATIONALE WIRTSCHAFTSBEZIEHUNGEN (EIIW)/
EUROPEAN INSTITUTE FOR INTERNATIONAL ECONOMIC RELATIONS
Bergische Universität Wuppertal, Gaußstr. 20, D-42119 Wuppertal, Germany
Tel.: (0)202 – 439 31 71
Fax: (0)202 – 439 31 77
E-mail: welfens@uni-wuppertal.de
www.euroeiiw.de

JEL classification: F14, O33, O52
Key words: EU-Enlargement, Structural Change, Specialization, Foreign Trade Patterns

Summary: EU eastern enlargement provides major impulses for structural change in industry within the accession countries. This analysis begins with basic theoretical approaches to trade and specialization, including intra-industry trade. The paper then focuses on disaggregated trade in Hungary, the Czech Republic and Poland. The key shifts in sectoral developments and changing RCA indicators in exports are presented as well as other indicators measuring foreign trade performance, specifically the Trade Coverage Index and the Grubel-Lloyd Index for Intra-Industry Trade. Whereas Poland shows clusters of export specialization in sectors of low and medium R&D intensity, the Czech Republic has clusters both in medium and high R&D intensive sectors, while Hungary specializes mostly in high technology products. Furthermore, R&D expenditure ratios are still much lower in eastern European countries than in the current EU member states, such as Germany. The sectoral distribution of R&D expenditures is, however, similar.

Zusammenfassung: Die EU-Osterweiterung entfaltet große Impulse für den industriellen Strukturwandel in den Beitrittsländern. Diese Analyse durchleuchtet zunächst grundlegende theoretische Ansätze zu Außenhandel und Spezialisierung mit Berücksichtigung des intra-industriellen Handels. Anschließend wird der Schwerpunkt auf disaggregierte Außenhandelsströme Ungarns, der Tschechischen Republik und Polens gelegt. Die wesentlichen Veränderungen der sektoralen Entwicklung und der RCA-Indikatoren der Exporte werden dargestellt. Zudem werden andere Messinstrumente verwendet wie z. B. der Trade Coverage Index oder der Grubel-Lloyd Index für intra-industriellen Handel. Während Polen sich überwiegend auf den Export von Gütern mit geringen bis mittleren F&E Intensitäten spezialisiert, liegt die Außenhandelsspezialisierung in der Tschechischen Republik in den Industriesektoren mit mittleren bis höheren Technologieintensitäten und in Ungarn sogar in den Hochtechnologiebereichen. Zudem lässt sich feststellen, dass die F&E Ausgaben in Prozent des Umsatzes in den Beitrittsländern noch viel geringer sind als in der EU-15, wie z.B. in Deutschland, jedoch ähnelt sich die sektorale Verteilung der F&E Ausgaben stark.

Dora Borbély; European Institute for International Economic Relations at the University of Wuppertal; Gauss Str. 20; D-42119 Wuppertal
E-mail: dora.borbely@wiwi.uni-wuppertal.de; Phone: +49-202-439-3173

EIIW Paper No. 116
March 2004

EU Export Specialization Patterns in Selected Accession Countries*

Contents

* This research is part of the project "Changes in Industrial Competitiveness as a Factor of Integration: Identifying Challenges of the Enlarged Single European Market" in the EU 5th Framework Programme (Contract No. HPSE-CT-2002-00148). The author is solely responsible for the contents, which might not represent the opinion of the Community. The Community is not responsible for any use that might be made of data appearing in this publication. For valuable comments the author is grateful to Paul J.J. Welfens.

List of Figures

List of Tables

1. Introduction

In the last few decades, integration of goods, capital and financial markets has proceeded on a global scale. In particular, international trade and foreign investment flows have increased enormously since the second half of the eighties. Globalisation and internationalisation have been driven by lower trade barriers and transportation costs, reduced restrictions on FDI and improvements in communication technologies, facilitating the utilisation of scale economies and a deeper division of labour. These impulses are expected to be part of the driving forces for structural changes in the economy, and for changes in competitiveness. Changes in relative factor prices and technological upgrading will also be crucial.

Western Europe, in particular, faces a much tougher competitive environment, mainly due to the opening-up of Eastern Europe and to some extent to the emergence of Asian competitors. Since the theoretical literature does not present a consistent picture of evidence on the outcome of internalisation and globalisation on specialization patterns, this empirical paper aims to draw first conclusions on structural change in the export industry for three Eastern European countries: Hungary, Poland and the Czech Republic at a disaggregated level.

One may anticipate accelerated structural change in eastern European accession countries in the late 1990s as the impulses from system transformation and from anticipated EU membership have stimulated a dynamic adjustment process, including a shift in specializations in particular countries. These impulses included trade liberalization and rising FDI inflows from EU countries. This process should be accompanied by shifts in revealed comparative advantage. Moreover, it is widely accepted that the regional trade orientation of eastern European countries shifted strongly towards the EU in the 1990s. It is therefore clear that major changes in sectoral specialization in Western Europe will reflect major changes in EU accession countries.

As this analysis looks into Hungary, Poland and the Czech Republic in the 1990s it is clear that different developments in the respective country's sectoral R&D expenditure can affect specialization patterns. In order to ascertain whether specialization has taken place in low, middle or high technology sectors, this paper aims to find a connection between R&D expenditure and three indicators measuring foreign trade performance at a disaggregated sectoral level: Trade Coverage Index, Revealed Comparative Advantage and the Grubel-Lloyd Index for Intra-Industry Trade.

In section 2 the paper looks at the theoretical background of structural change in open economies. The statistical analysis is done in section 3 on the basis of NACE 2-digit (partially NACE 3-digit) level of aggregation. Three indicators mentioned above are being calculated to analyze the performance of three accession countries in their trade with the EU15. Finally section 4 concludes and provides suggestions for further complementary research.

2. Theoretical Background

The "Traditional Trade Theory" emphasizes the role of physical geography and endowments of natural resources when explaining foreign trade structures. According to

Ricardo (1817), locational patterns are driven by relative differences in technology observed as differences in relative production costs termed "comparative advantage". According to the Heckscher-Ohlin model (Heckscher 1949, Ohlin 1933) uneven spatial distribution of production – specialization – emerges, if countries display pronounced differences in factor endowments. The "Traditional Trade Theory" predicts that a general economic opening up induces activities to concentrate in countries with matching comparative advantages. However, these theories do not explain why IIT takes place: A large part of trade comprises the exchange of differentiated goods that fall into the same product category and takes place between industrialised countries with similar factor endowments and production technologies.

"New Trade Theory" models include scale economies, product differentiation (preference variety) and imperfect competition as main ingredients to explain IIT. The major conclusion of the "New Trade Theory" is that the share of IIT in total trade is opposed to the share of inter-industry trade, and is positively related to the similarities of demand and production characteristics (Love of Variety Approach). Demand characteristics and market structure thus play a crucial role in these kinds of models. More modern "New Trade Theory" models distinguish further between horizontal and vertical product differentiation (Greenaway, Hine and Milner 1995). The "New Trade Theory" is, however, no complete theory of economic geography. One question remains unanswered: Why can ex-ante similar countries develop divergent production and trade structures? The "New Economic Geography" helps to understand such real world developments.

The literature of the "New Economic Geography" adds transportation costs and their implications for specialization patterns to "New Trade Theory" models (Krugman and Venables 1995). The "New Economic Geography" focuses particularly on two main agglomeration mechanisms: (1) interregional and inter-sectoral labour mobility (Krugman 1991, Puga 1998) and (2) mobility of firms demanding intermediate products (Venables 1996). These two factors lead to an endogenous differentiation process of initially similar regions. "New Economic Geography" models tend to show that at early stages of integration, concentration forces dominate and due to reduced trade costs industry tends to cluster, but further integration promotes a re-dispersion of industries towards the periphery due to lower factor costs. Furthermore, Venables (1998) points out - investigating the relationship between agglomeration and specialization within the increasing returns to scale activity - that the resulting division between the core region and the periphery is not unique and is not necessary in line with comparative advantages. The more mature the product, the less important are fixed costs of production e.g. R&D expenditure, and the greater is the scale of production (Brülhard 1995). A country that has the most beneficial endowments for fixed costs, e.g. much skilled labour and equipment, will attract production of new goods. Old goods will be produced where factor endowment is favourable with respect to variable costs of production, such as a low share of skilled labour.

To summarize, what does the theory tell us about the EU export specialization patterns of accession countries? "Traditional Trade Theory" predicts that the accession countries will export mainly labour and possibly resource intensive goods, because therein lies their initial comparative advantage. The "New Trade Theory" indicates that the extent of intra-industry trade in accession countries will depend on country characteristics, such as demand characteristics. Thus the share of IIT will be high, if demand characteristics place emphasis on product differentiation indicating a high level of economic integration of the respective country. The "New Economic Geography" shows that for mature products the importance of fixed costs e.g. R&D expenditure is less relevant, so that mature products

tend to be produced and exported by countries richly endowed with skilled workers and physical capital, e.g. the EU15. "Old" products, referring to non-innovative products, will therefore be rather exported by the accession countries. The following empirical analysis aims to test these assumptions by calculating simple indicators to shed some light on the foreign trade specialization patterns of some accession countries as compared to the EU15.

3. Empirical Analysis

In this paper we use three different indicators, the *Trade Coverage Index*, the *Revealed Comparative Advantage Index* and the *Grubel-Lloyd Index of Intra-Industry Trade* to measure foreign trade performance - at a disaggregated level - of three accession countries, Poland, the Czech Republic and Hungary, towards the current EU15 countries. We will, however, first take a look at aggregated exports.

3.1. Aggregated Exports of Three Accession Countries to the EU15

To give an insight into the development of exports, we first take a look at the export flows at an aggregated level[1]. Therefore we use the SITC rev.3. Classification (Table 1).

Throughout the paper, only that part of total exports (imports) of the three accession countries considered is dealt with, which is imported (exported) by the EU15. Since we are interested in structural change especially compared to the structure of the economies in the EU15, these variables seem to be appropriate to explain the main findings. Besides, trade with the EU15 comprises the greatest part of trade activities in these countries. In the year 2001 export ratios of EU exports to total exports amounted for 69.2% in Poland, 68.9% in the Czech Republic, and 74.3 % in Hungary. The ratio of imports stemming from the EU15 was a bit lower with 61.4% in Poland, 61.8% in the Czech Republic, and 57.8% in Hungary.[2]

Table 1: SITC rev. 3. Classification

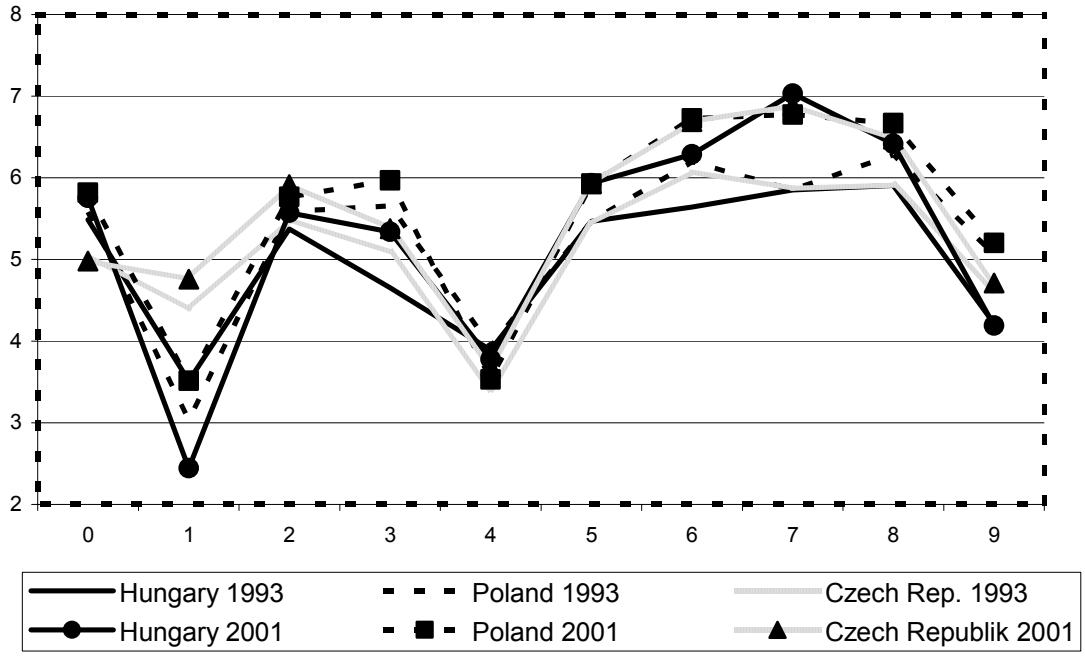
CODE	CONTENT
0	Food and live animals
1	Beverages and Tobacco
2	Crude Materials, Excluding Fuels
3	Mineral Fuels etc.
4	Animal, Vegetable oil and fat
5	Chemicals
6	Basic Manufactures
7	Machines, Transport Equipment
8	Miscellaneous Manufactures Goods
9	Goods not classified by kind

[1] Data comes from the COMEX-Database of the European Commission.
[2] See Borbély and Gern (2003)

Figure 1 shows the logarithm of the exports of Hungary, Poland and the Czech Republic to the EU15 in the years 1993 and 2001, the first and last year of our observation period. The use of logarithms allows us to compare the relative volumes between the countries rather easily.

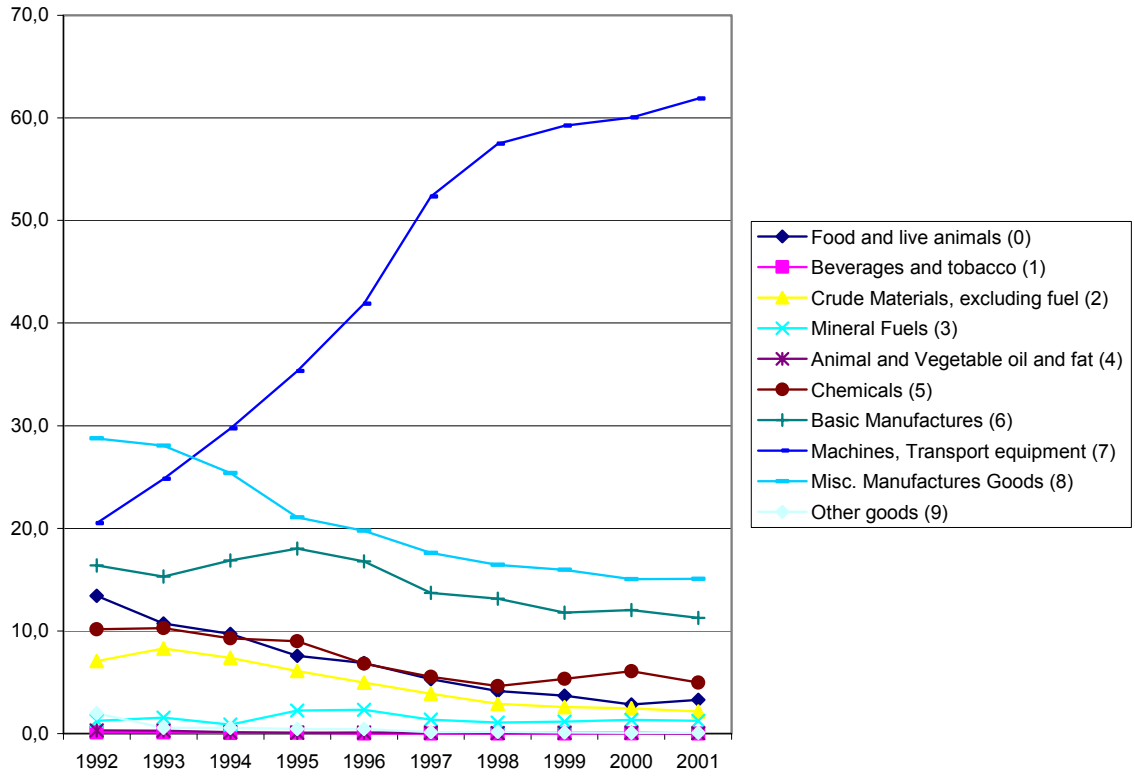
The first striking result is that exports in the categories "beverages and tobacco" (1) and "animal, vegetable oil and fat" (4) are relatively low compared to the categories "basic manufactures" (6), "machines and transport equipment" (7) and "miscellaneous manufactured goods" (8). Manufacturing thus seems to be one of the main export ingredients of the accession countries to the EU15.

Figure 1: Logarithm of Exports to the EU15 in the 9 main SITC rev. 3. categories



Comparing the years 1993 and 2001 seems to show similar results for all three countries. Export volumes to the EU15 were considerably higher in 2001 than in 1993, except for "animal and vegetable oils and fats" (4), where volumes have hardly changed. Contrasting the export flows of the two years does not, however, say anything about the development of exports in the years between, which this paper will now turn to. In order to reveal specialization patterns in the export structure it is important to outline the relative shares of the exports of each category to total (EU15) exports. Figures 2-4 show the respective shares for the three accession countries on a yearly average for the period 1992-2001.

Figure 2: Shares of branches in exports to the EU15 in Hungary



The results are quite clear: In all three countries, exports to the EU15 are dominated by "Machines and Transport Equipment" (7). This holds especially for Hungary, where category 7 makes up more than 60% of total exports to the EU. In Poland and the Czech Republic "Basic Manufactures" (6) and "Miscellaneous Manufactured Goods" (8) also play an important role. In Poland the shares of these three branches are relatively equally distributed with roughly 25-30 % respectively. In the Czech Republic, the importance of categories 6 and 8 has decreased continuously since 1996. In Hungary this has been the case since 1995.

Machines and Manufacturing are the single most important export branches for these countries. All the other branches remained mostly under 10% in the initial period and no longer exceed 5 % in the second half of the 1990s. The outstanding role of manufacturing in the export structure of the accession countries is not surprising. This is in line with the outcome of the "Traditional Trade Theory" and the "New Economic Geography" models, if we assume that many of the manufactured goods are labour intensive in production and do not require high endowments in capital, skilled work, technology, or R&D activities.[3]

[3] If the parent company – e.g. in the computer sector - gives a blueprint of a computer to a foreign subsidiary in eastern Europe, the product can be a medium technology product but it nevertheless can be produced by low skilled workers using a sophisticated electronic assembly line.

Figure 3: Shares of branches in exports to the EU15 in Poland

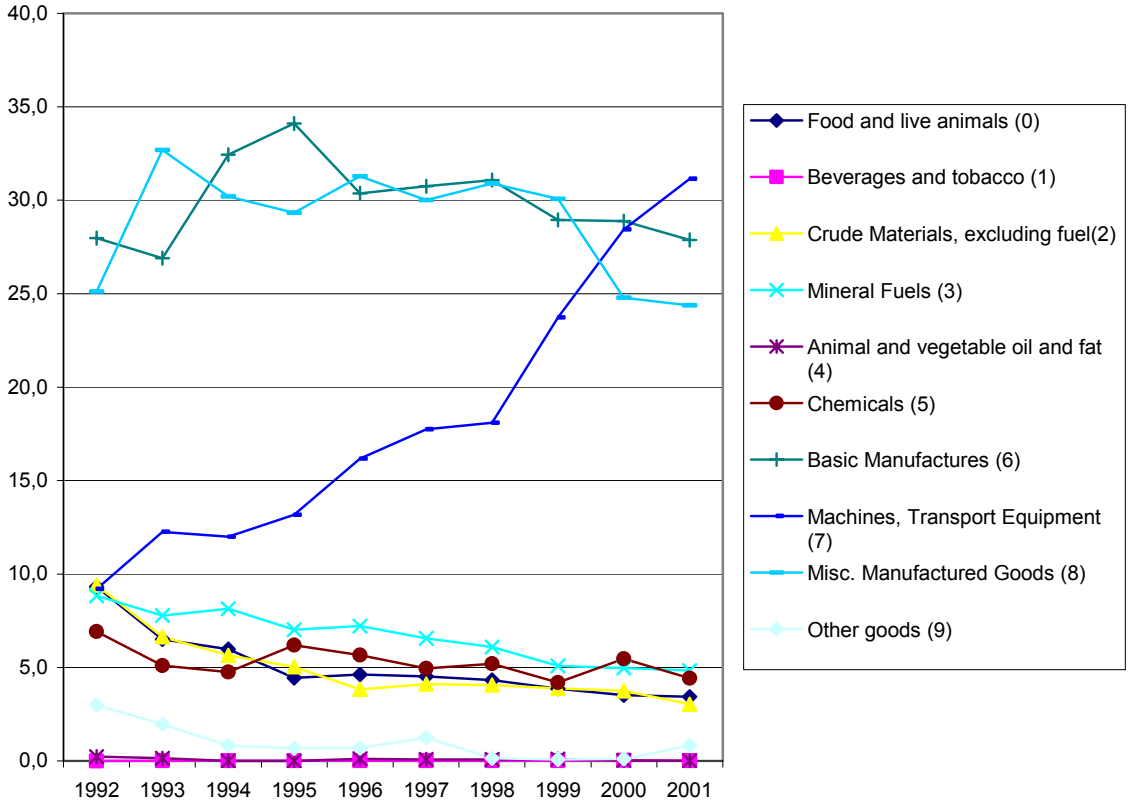
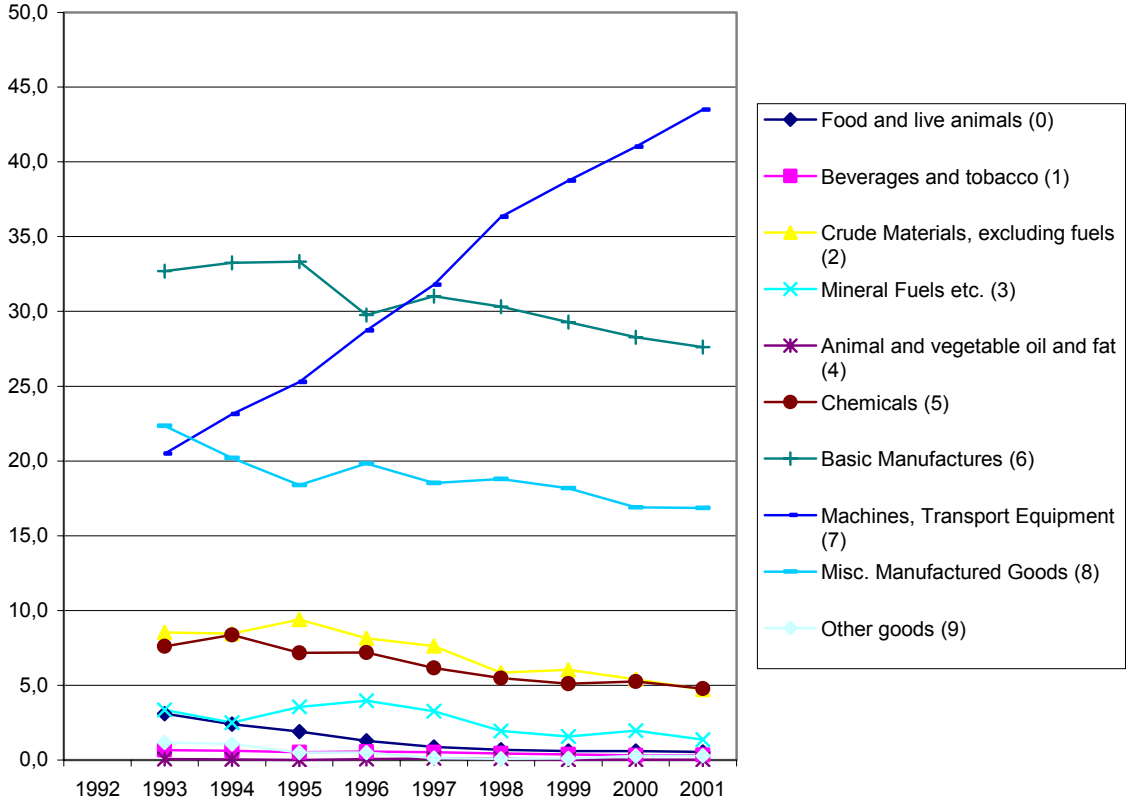


Figure 4: Shares of branches in exports to the EU15 in the Czech Republic



However, within the branch of manufacturing, there are, as a matter of course, great differences in the intensity of inputs required. In the next step, we will focus solely on manufacturing in great detail and attempt to identify specialization or dispersion patterns among the countries. We therefore use foreign trade data on manufacturing at a 3-digit level.[4]

3.2. Analysing R&D Expenditure

Different measures can be applied to categorize product groups according to their technology level. The most commonly used distinction is between low, medium (medium-low and medium-high) and high technology industries. This distinction is, however, not detailed enough for our purposes. In the following we will use R&D expenditure, which is available at a more disaggregated level, as a proxy for technology intensity.

According to the Schumpeterian point of view, technology intensity of goods plays an important role in specialization patterns. Schumpeterian goods – which are defined as technology intensive goods - can be divided into two categories: immobile Schumpeterian goods require high R&D activities and R&D and production must be located together at the same geographical location. On the contrary, for mobile Schumpeterian goods production and R&D activity can be located at different places. In the course of catching up the question arises, in the exportation of what kinds of goods do accession countries gain more comparative advantage and in the exportation of what kind of goods do they lose comparative advantage? According to the "climbing-up-the-ladder-strategy", technological catching-up first takes place in low-tech industries. Under the assumption that these are likely to be more labour-intensive and less capital-intensive industrial sectors, the outcome is consistent with the classical Heckscher-Ohlin model. Countries will specialise in labour-intensive goods, with the result that catching up first takes place in those industries. As a result we should observe that the EU15 specialize more in R&D and human capital- intensive goods exportation, whereas the accession countries specialize in labour-intensive goods exportation. In the course of integration, however, accession countries should experience a rise in exports in the low and middle technology fields and in the later stages of integration also of higher technology products.

Here it is assumed that technology and R&D intensity are positively correlated. The two variables are of course no perfect substitutes, however, for the purpose of this analysis they can be used as alternatives. Other possible measures for technology intensity would be the use of data on capital stock or total factor productivity. However, here we face severe data availability problems for the accession countries.[5]

Figures 5, 6 and 7 show the R&D intensity in different industrial sectors for Poland, the Czech Republic and Hungary. Figure 8 represents the according figures for Germany, as an example of the current EU15 countries.

[4] Data is extracted from the COMEX database of the European Commission. Only trade data between the accession countries and the EU15, and intra-EU trade data are used.

[5] For many accession countries – in particular for Poland -, also FDI and imports of goods can be seen as main sources of technology spill-over. Analysing FDI should be a target for future research. Imports as a source of technology are, however, very hard to measure.

Figure 5: R&D intensity in Poland, average of 1995-2000, in %

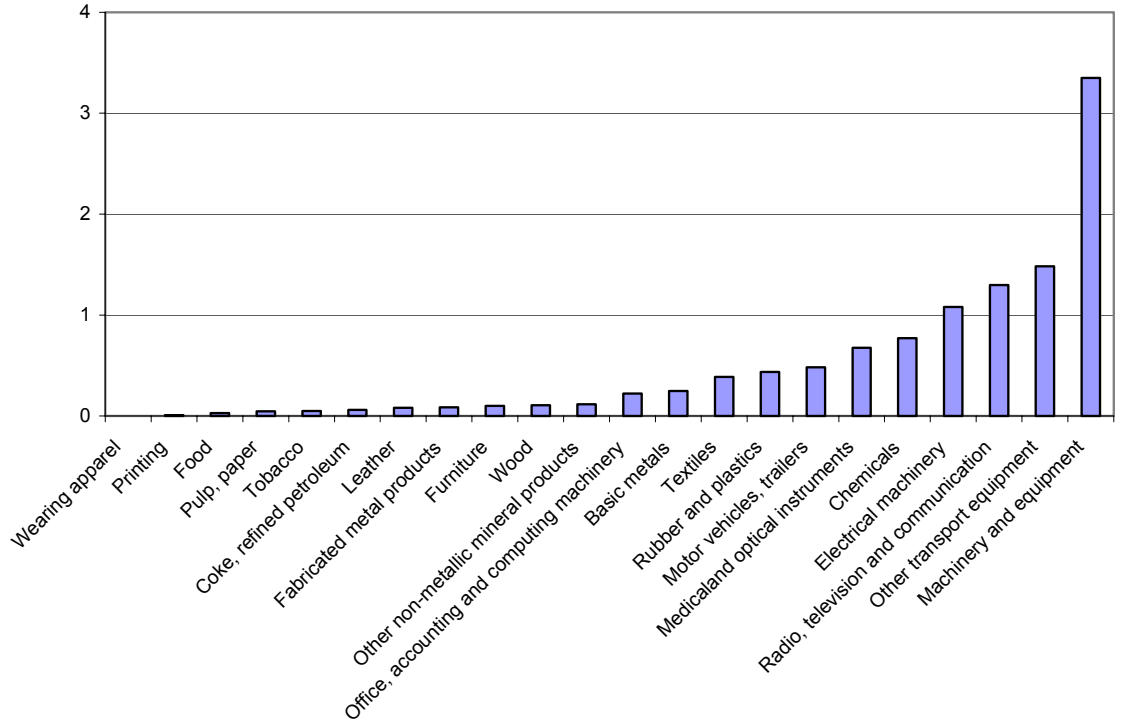


Figure 6: R&D intensity in the Czech Republic, average of 1997-2000, in %

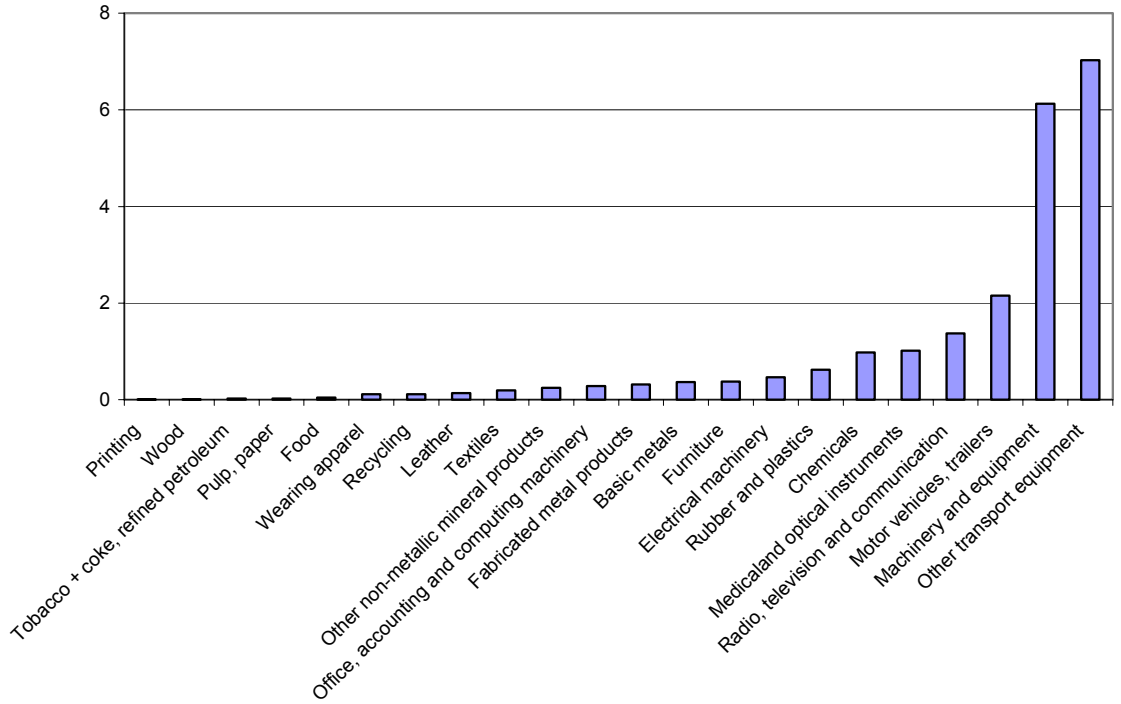


Figure 7: In-firm R&D intensity in Hungary, average of 1998-2001, in %

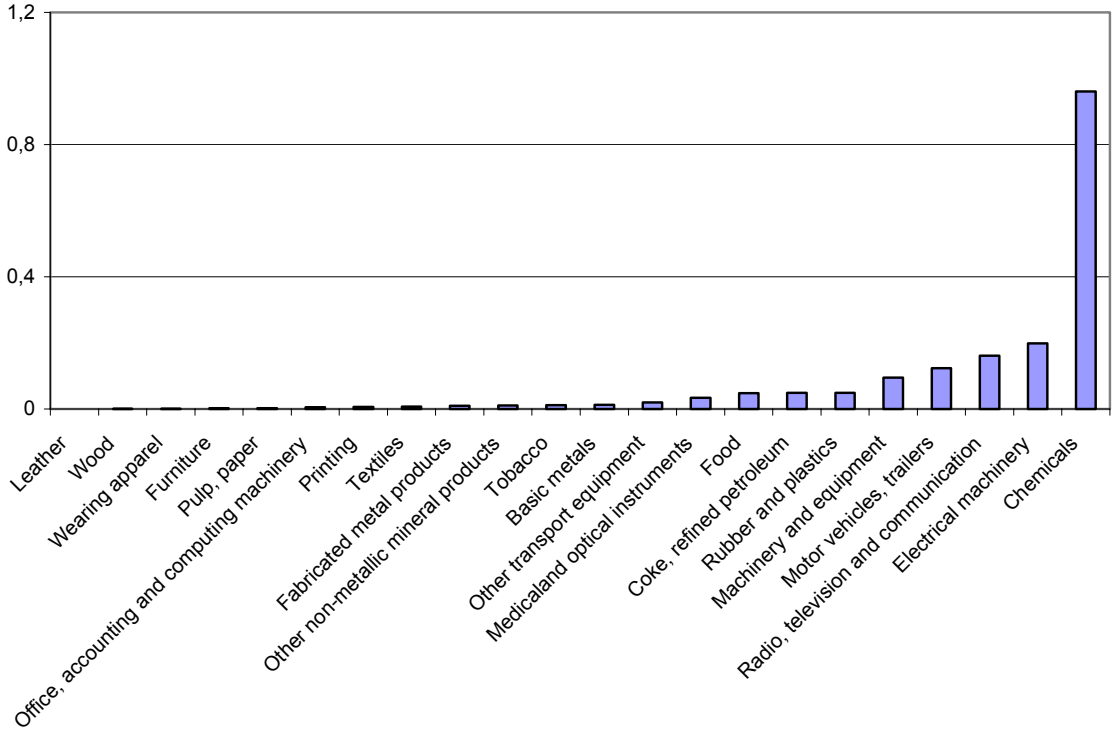
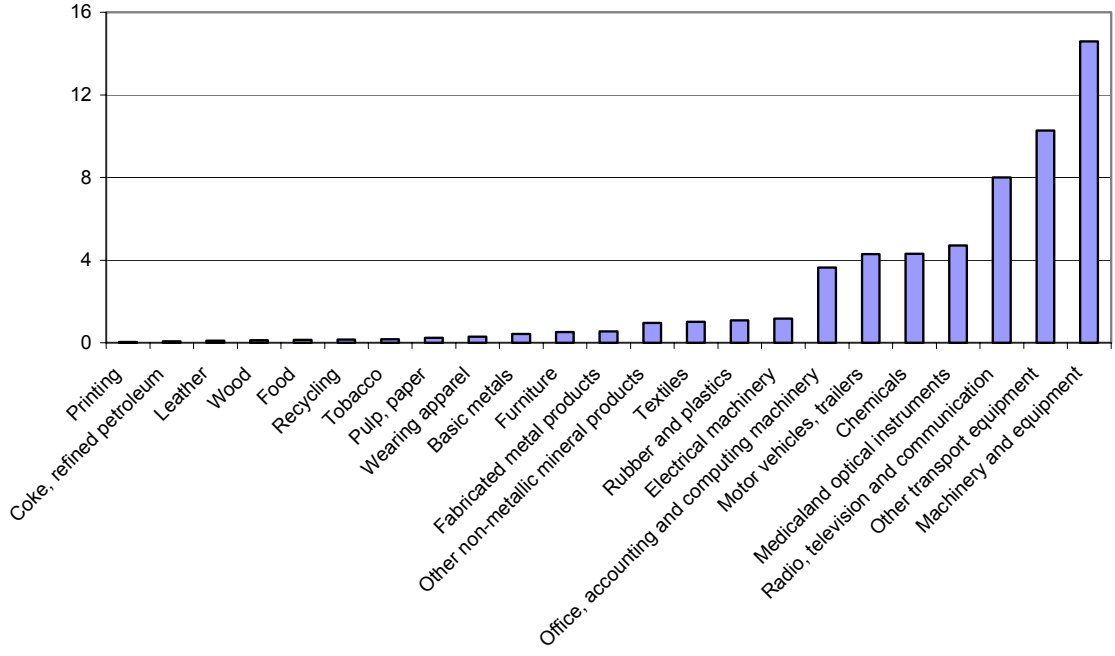


Figure 8: R&D intensity in Germany in the year 2000, in %



The R&D ratio is measured as the relation between sectoral R&D expenditure and sectoral turnover.[6] Note, that the underlying figures are not fully comparable with each other. While R&D expenditure for Poland, the Czech Republic and Germany represent total figures, the Hungarian data contains – due to problems with data availability – only in-firm R&D expenditure. R&D expenditure of Hungarian research institutes or Hungarian universities e.g. are not covered. This probably accounts for Hungary's R&D intensity being considerably lower than in the other two accession countries.

In the accession countries there is hardly any R&D expenditure in most industrial sectors. In Poland and Hungary there is merely one sector each, namely machinery and equipment in Poland, and chemicals in Hungary, and in the Czech Republic two sectors, namely machinery and equipment and other transport equipment, which have significantly higher R&D expenditure ratios. As already mentioned above, the Hungarian figure is not comparable to the other countries, therefore we have to interpret it carefully. The highest in-firm R&D ratio in Hungary does not exceed 1%, while in most sectors it lies beyond 0.2 % of turnover, which is rather negligible. However, it is noteworthy that chemicals are at the top of the R&D list in Hungary. Although R&D expenditure represents total figures in the Czech Republic and Poland, only a few sectors far exceed the 1% R&D ratio. In contrast, in Germany, in almost half of the sectors, the R&D ratio exceeds 1%. The absolute ratio is also far higher in Western Europe: while Germany invests more than 14% of turnover in R&D in the highest R&D intensive sector, investment is only 7% in the Czech Republic and not even 3,5% in Poland. However, the distribution of R&D expenditure across the sectors is similar if one compares accession countries and Germany. In all of the countries some of the most R&D intensive sectors are radio, television and communication and machinery and other transport equipment.

Next we aim to establish whether manufacturing foreign trade patterns, especially exports, in accession countries at a disaggregated level are connected to technology intensity in the respective manufacturing sector. To corroborate this hypothesis we will order the results of all calculated indicators of NACE 2-digit-level classified products according to the national R&D intensity. We will calculate some indicators also for the NACE 3-digit level; these figures can be found in the annexes of the paper.

3.3. Analysing Specialization Patterns in Manufacturing Exports

Data on exports and imports to the EU15 in the manufacturing sector are available for all three accession countries at a 3-digit-level.[7] Data is classified by NACE rev.1.1. The list of variables can be found in Annex 1. We will now apply three different measures of trade performance to shed some light on the specialization patterns of manufacturing foreign trade, especially exports, in Hungary, Poland and the Czech Republic. We will calculate firstly the Trade Coverage Index, secondly the Revealed Comparative Advantage Index by Balassa and thirdly the Grubel-Llyod-Index of Intra-Industry Trade.

[6] Data on turnover for Germany and on R&D expenditure in Hungary is taken from Eurostat. Turnover in the accession countries has kindly been provided by the National Statistical Offices. R&D expenditure in Germany, Poland and the Czech Republic are taken from the OECD's Anbert database.

[7] Most of the data has been kindly provided by the National Statistical Offices of Hungary, Poland and the Czech Republic. Otherwise it is taken from the COMEX database.

3.3.1. Trade Coverage Index

The Trade Coverage Index (TCI) reveals the ratio of exports (X) to imports (M).

$$TCI_i^t = \frac{X_i^t}{M_i^t}$$

i can stand for e.g. total manufacturing or for a certain product group.

For a first insight, we calculate the Trade Coverage Index for total manufacturing in different years. Table 3 shows the results.

Table 2: TCI for total manufacturing

TCI	1997	1998	1999	2000	2001	2002
Poland	0.57	0.59	0.63	0.74	0.80	
Czech Republic	0.78	0.91	1.00	0.99	1.01	1.07
Hungary			1.42	1.50	1.58	

Poland's foreign trade structure concerning total manufacturing differs from the other two accession countries. While Poland imports more than it exports in manufacturing, although this trend has been decreasing throughout the second half of the 1990s, the Czech Republic and Hungary export more than they import, with the result that their TCI exceeds 1 most of the time. However, all three countries have rising TCI values in common.

It is of utmost importance to analyse whether the countries import and export rather low or high quality products. According to the "New Economic Geography" models, the accession countries would, in the initial stages of integration, rather specialize in low R&D intensity product groups, later on also in higher technology products. Figures 9, 10 and 11 display the development of the sectoral TCIs, ordered according to the country's own R&D intensity.

In the case of Poland, product categories 18, 36 and 20 dominate the figure. The TCIs for wearing apparel (18) and manufacture of wood and its products (20) amount for values around four – however decreasing from eight or ten - in the respective time horizon, for furniture it accounts for a TCI value of three. That means that Poland exports roughly four times more wearing apparel and wood and three times more furniture to the EU15 than it imports from it. The rest of the figure underlines the trend that has already been shown by total manufacturing: the foreign trade position of Poland in manufacturing is not bright, but shows slight changes for the better. TCIs are slowly increasing in many product groups, however in the majority of manufacturing product groups Poland's imports relatively more than it exports. Except for the three categories mentioned above, TCIs do not significantly differ according to R&D intensity. To sum up, it can be stated that TCIs in the low and middle technology sectors are higher than in the high technology sectors in the Polish economy.

Figure 9: Trade Coverage Index in Poland, according to R&D intensity, 1995-2001

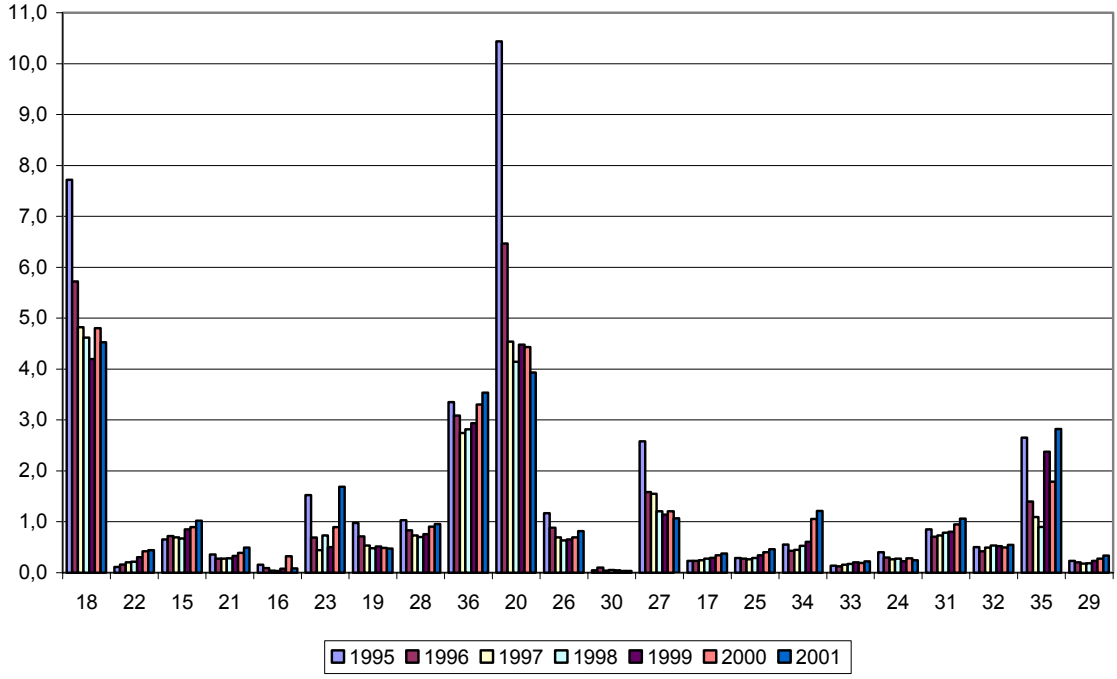
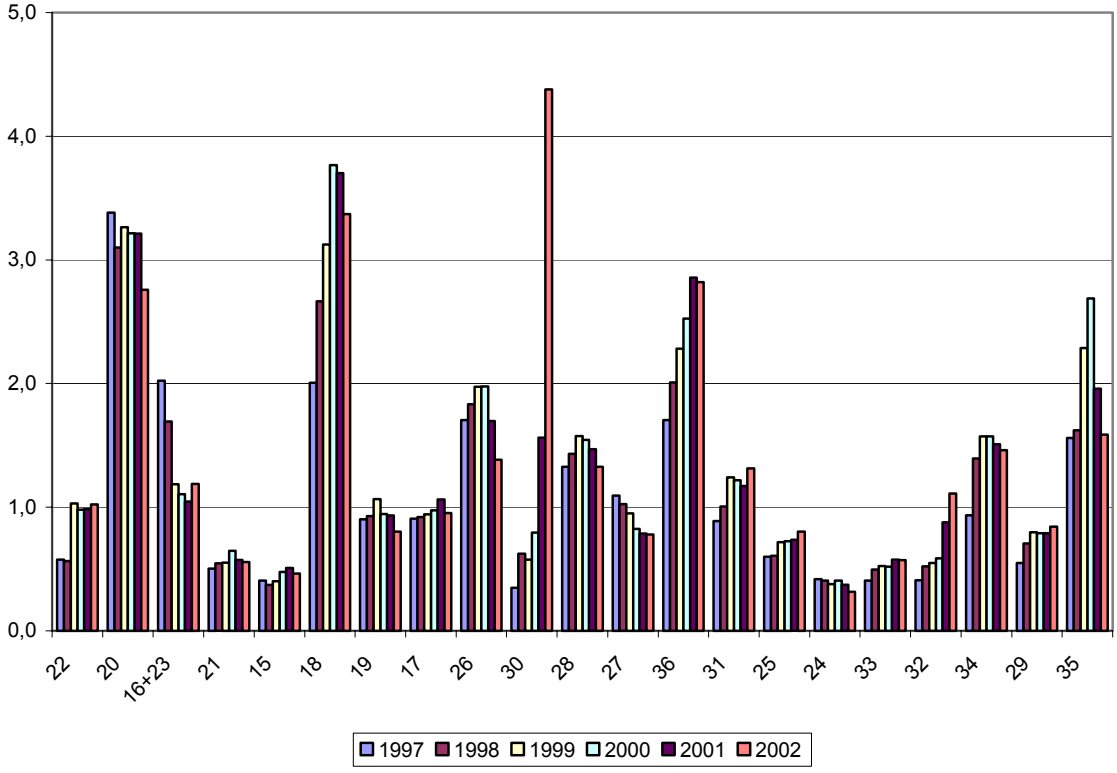


Figure 10: Trade Coverage Index in the Czech Republic, according to R&D intensity, 1997-2002



The situation is a little different in the Czech Republic: the respective TCIs are presented in figure 10. As indicated by the TCIs for total manufacturing, sectoral TCIs are also often larger than one, meaning exports exceeding imports in the respective manufacturing sector. We can find sectors with exports being up to two or three times higher than imports in basically all technology levels: low R&D intensity (wood and cork products (20), wearing apparel (18)), middle R&D intensity (office machinery and computers (30) and furniture (36)) and high R&D intensity (other transport equipment (35)). There has been an extraordinary increase in TCI in the manufacture of office machinery and computers (30). This is a rather strong indicator for the Czech Republic's foreign trade specialization in middle and higher technology products.

Figure 11: Trade Coverage Index in Hungary, according to R&D intensity, 1999-2001

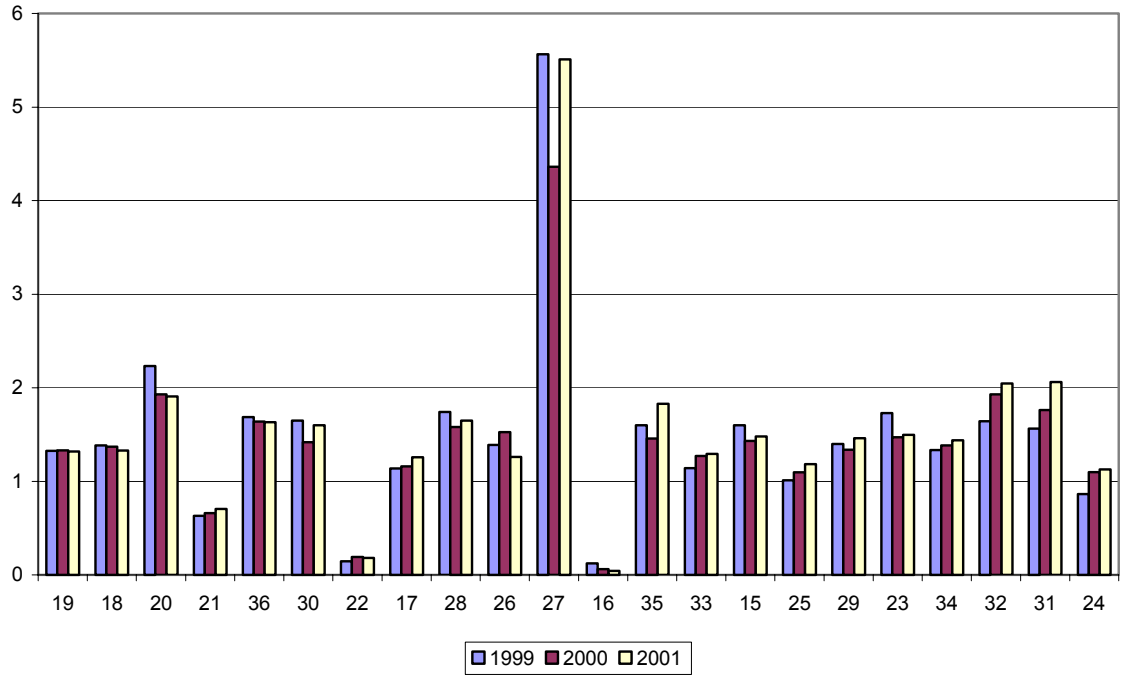


Figure 11 shows the sectoral TCIs for Hungary, and clearly reflects the total manufacturing TCIs. Except for pulp and paper (21), publishing and printing (22) and tobacco (16) all TCIs exceed unity. Especially in the manufacture of basic metals (27), Hungary clearly exports more to the EU15 than it imports from it. Otherwise TCIs are relatively evenly distributed, and volatility is rather low. The very short time horizon of only 3 three years plays, of course, a role in the low volatility. Despite the short time horizon, the trend of rising TCIs seems to be most pronounced in the middle (35, 33, 25) and especially in high technology sectors (32, 31, 24). Obviously, exports to the EU15 play a major role in the Hungarian economy, at least in comparison to Poland and the Czech Republic.

To conclude, the Polish economy imports more from the EU15 than it exports to the EU15 in most of the manufacturing product groups. TCIs exceed one mainly in certain low and middle technology product groups. Positive net exports to the EU15 play a more important role in the Czech Republic, where large TCIs can be found in all technology sectors. A high rise in net exports has in particular taken place in the manufacturing of

office machinery and computers. With three exceptions, Hungary experiences positive net exports to the EU15 in all product groups. Sectoral TCIs seem to be the most evenly distributed in Hungary.

In the next stage we will focus more on exports and analyse in which product groups the accession countries have a relative comparative advantage or disadvantage as compared to the current EU member states.

3.3.2. RCA-Balassa

The specialization indicator used here is a modification of the classical Revealed Comparative Advantage (RCA) index, invented by Balassa (1965). The modification reveals the relative comparative advantage of an industry within a country by comparing the share of that particular industry in the country's total exports to the share of that industry in total world exports at a certain point in time.[8] Since we are interested in the question, whether an accession country has a comparative advantage as compared to the EU15[9], we take the respective accession countries' exports to the EU15 instead of total exports, and intra-EU15 exports instead of worldwide exports. RCA-Balassa for country i at time t is as follows:

$$RCA_i^t = \frac{\left(\frac{x_i}{\sum_k x_{ik}} \right)}{\left(\frac{x_j}{\sum_k x_{jk}} \right)}$$

Where k stands for commodities in total, j stands for the EU15 and i for an accession country. RCA-Balassa has a minimum value of 0 and a maximum value of infinity. If $RCA_i > 1$, the accession country i has a comparative advantage in that commodity as compared to the EU15. If $RCA_i < 1$, there is a comparative disadvantage of the accession country i. X can stand for different variables, mostly used for exports, patents or value added. In this analysis it stands for exports.

Annex 2 displays the RCA-Balassa values for the NACE classification at the 3-digit level for Poland, annex 3 for the Czech Republic and annex 4 for Hungary. In all three countries there are several branches with RCA values close or equal to zero. In Poland, these comprise for instance exports of grain mill products (156), tobacco (160), or ceramic products (263). The Czech Republic has a very strong comparative disadvantage in the exportation of for instance fish (152), grain mill products (156), or animal feeds (157) and Hungary for instance publishing (221), nuclear fuel (233), or paints (243). On the contrary, very strong comparative advantages exist in Poland concerning the export of wood and its products (205) and coke oven products (231); in the Czech Republic of wooden containers (204) and also coke oven products (231) and in Hungary of textile articles (174), leather clothes (181) and electrical equipment (316). To enable us to characterise the export structure more distinctly, the analysis will now turn to a NACE 2-digit-level consideration. Unfortunately, R&D expenditure data was not available at the 3-digit-level.

[8] Whereas the classical RCA-Balassa reveals a country's sectoral export-import relation divided by the export-import relation of its total economy.

[9] Greece is missing in the database due to data availability problems, so it is actually EU14, which we consider.

Subsequently we wish to establish whether, in the course of integration, high R&D intensity (standing for technology intensity) leads to a higher RCA-Balassa value. Do accession countries still have a stronger comparative advantage in sectors with lower technology intensity than in sectors with higher intensity? To put it differently: Do accession countries still have a comparative disadvantage in sectors with high technology intensity? For the initial periods of transition we would expect a clear negative relationship between the two variables: higher technology intensity accompanied by lower RCA-Balassa value for accession countries. However, in the course of European integration we would expect the R&D expenditures to rise in accession countries and also the share of products with higher R&D intensities to rise. This could lead to a rise in the number of sectors with an RCA-Balassa value >1, meaning that accession countries may gain comparative advantages compared to EU15 in more and more product categories; alternatively, RCAs in certain sectors could rise over time so that the sector is likely to gain importance in economic terms. On the other hand, this would mean, that in other product categories they might lose comparative advantage. If specialization takes place, we should see clear upwards and downwards movements in the RCA-Balassa values. Furthermore, in the course of European integration, we should gradually see a positive relationship between R&D expenditure and RCA-Balassa values in accession countries.

In order to get an idea of the technology intensity of export products, figures 12, 13 and 14 show the RCAs of exports of each product group at NACE 2-digit-level listed according to the national R&D intensity for Poland, the Czech Republic and Hungary. Intensity is increasing as moving from the left to the right of the figure (according to figures 5, 6 and 7), and RCA is again calculated as compared to the EU15 countries. To demonstrate the economic importance of the product groups, the percentage of the respective group's exports to total manufacturing exports is also shown in the figure. It is represented by the line, which belongs to the right scale in the figure.

Figure 12: Poland, RCA of exports according to R&D intensity

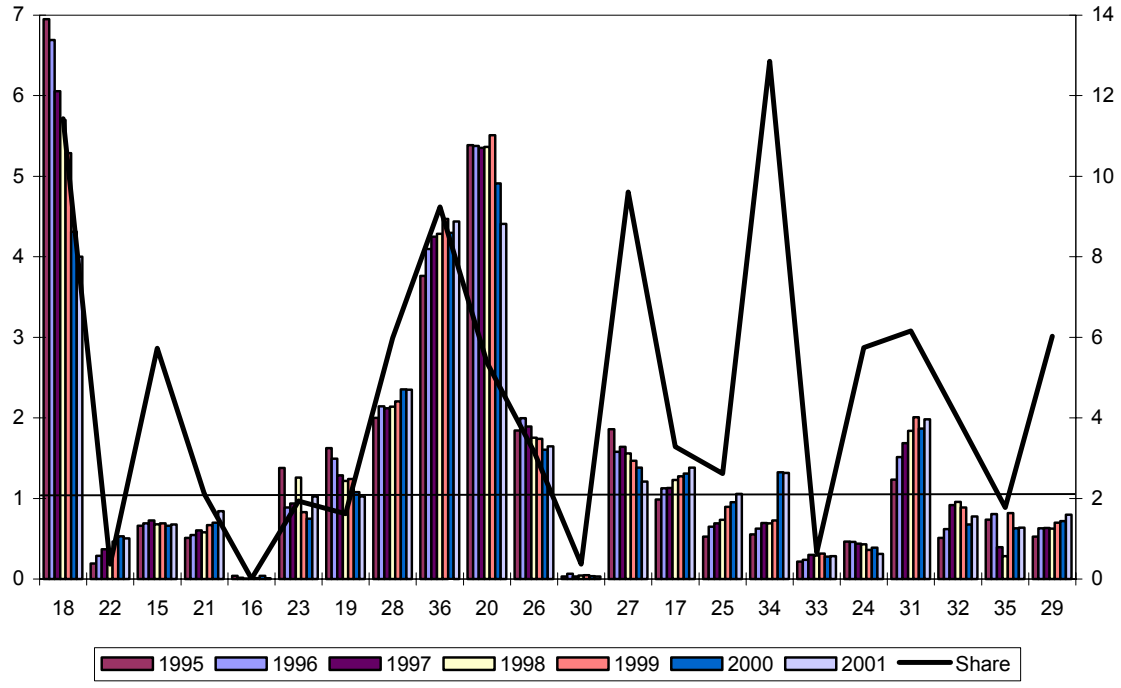
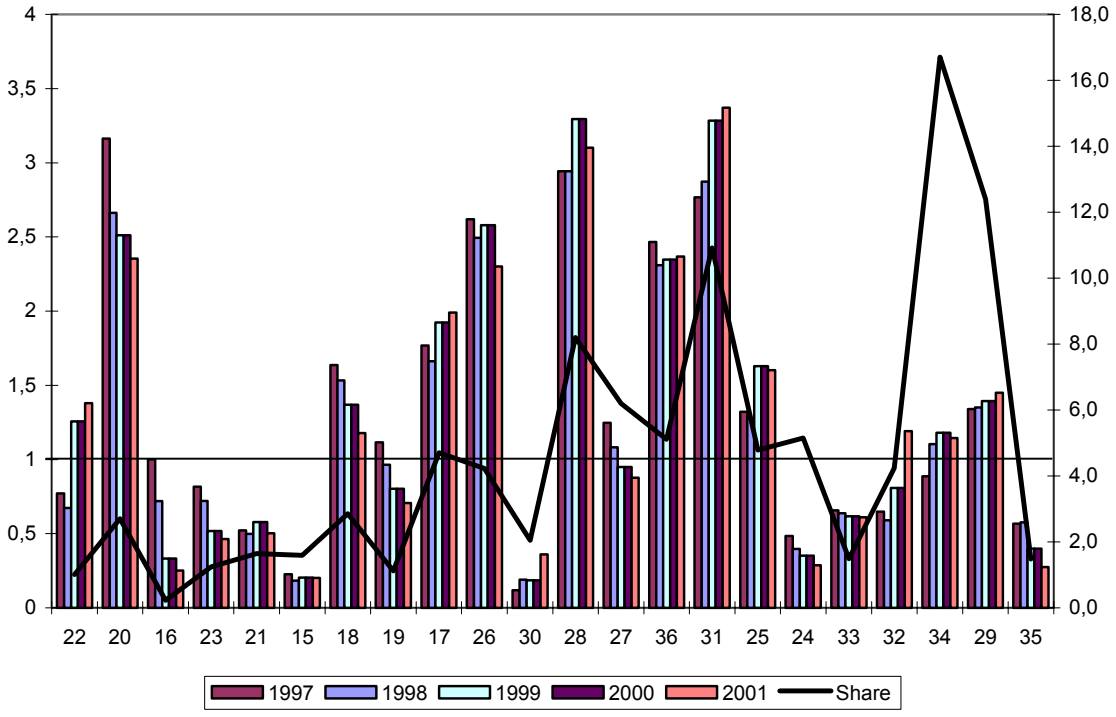


Figure 12 shows an interesting picture for Poland. Less than half of the product groups show a comparative advantage of Poland as compared to the EU15. These are mainly found in rather high labour intensive and low or middle R&D and technology intensive sectors. RCAs are by far the highest for wearing apparel (18) – the lowest technology intensive sector – as well as for furniture (36) and wood or wooden products (20). However, Poland has improved its comparative position towards the EU15 in many product groups. Some of those belong not only to lower, but also to middle or even higher technology intensive groups. According to this development, it does not seem unlikely that Poland could gain a comparative advantage in some more middle and higher technology product group in the next years. Moreover, it is losing comparative relatively significantly in some low technology product groups, in particular in wearing apparel (18), in which it had performed much better in the middle of the 1990s.

The share of exports within total manufacturing exports is highest in Poland in wearing apparel (18) and motor vehicles (34) with approximately 12% each, followed by furniture (36) and basic metals (27) with around 10% respectively. These four sectors account for almost half of total manufacturing exports. Interestingly, these four sectors comprise both low and middle technology intensities. The export volumes seem rather evenly distributed along the technology ladder.

The picture presented for the Czech Republic is slightly different. First of all, the absolute number of product groups with a comparative advantage is higher than in Poland. Furthermore, the Czech Republic has an increasing comparative advantage in the middle and higher technology intensive sectors, while the export position in the low technology fields seems to have deteriorated since 1997. With the exception of wood or wood products (20) and printing and publishing (20), all product groups, which reveal a comparative advantage in exports compared to the EU15 lie in middle and higher technology sectors.

Figure 13: Czech Republic, RCA of exports according to R&D intensity

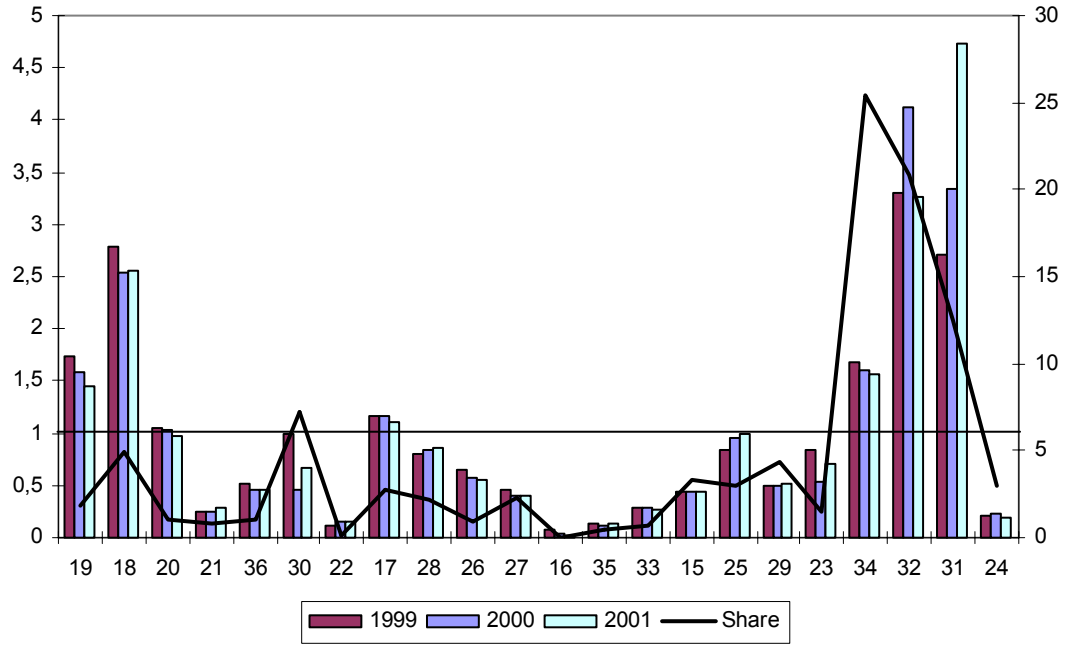


To underline the meaning of middle and high technology sectors in the Czech Republic, the line indicating the share of the products groups' exports in total manufacturing exports seems to have an upward slope as moving from lower to higher technology sectors. Thus export shares are highest in high and lowest in low technology industries.

Hungarian manufacturing's export position is shown in figure 14. There are two low technology sectors, namely leather (19) and wearing apparel (18) with a strong comparative advantage, and three high technology sectors: motor vehicles (34), radio, television and communication equipment (32) and electrical machinery and apparatus (31). Since RCA's in the high technology sectors exceed RCAs in the low technology sectors by far, Hungary's relative export advantage seems to mainly lie in high technology product groups. Since the time horizon of three years is again very short, one should be cautious with formulating statements on the development; however, comparative advantages in the high R&D intensive sectors seem rather to be increasing – or at least they are steadily high over time – while some RCAs in the low technology sectors are decreasing.

The distribution of the product groups' shares undermines the statement of specialization in high technology exports. Clearly the export of R&D intensive products dominates the picture. More than half of manufacturing exports belong to high technology sectors.

Figure 14: Hungary, RCA of exports according to in-firm R&D intensity



To sum up, there are dynamic patterns of specialization in accession countries: while Poland specializes mainly in rather low or middle R&D intensive sectors, the Czech Republic gains comparative advantages in the middle and higher R&D intensive sectors and Hungary has a strong tendency to specialize in very high - and in some very low - technology sectors. From a theoretical perspective one may expect that certain fields of low, medium or high technology intensities will be reinforced over time as a result of

reinforcement of specialization; in such a dynamic view it is not so much important that modified RCA exceeds unity but that the RCA indicator is rising. Indeed, the empirical findings suggest that especially the Czech Republic and Hungary - with rising RCAs in many sectors - have a broader field of competence and might find it easier than Poland to upgrade the overall economy in technological terms over time.

After having analysed, which product linkages exist in the trade between the EU15 and the accession countries, we will now focus on the total extent of economic integration between eastern and western European countries.

3.3.3. The Grubel-Lloyd Index of Intra-Industry Trade

According to the "New Trade Theory", intra-industry trade is determined by country characteristics such as demand differences. The size of intra-industry trade indicates the extent of the economic integration of a country, also influencing the relative per capita income. Taking into consideration that a large part of foreign trade takes place within the same industries, we will now turn to analysing the ratio of intra-industry trade in accession countries. Again, we will only use that part of foreign trade of the accession countries, which is associated with the EU15. Thus, the index directly measures the extent of economic integration with the current EU. The Grubel-Lloyd Index (GLI) of Intra-Industry Trade (IIT) is calculated as follows:

$$GLI_i = \frac{\left[(X_i + M_i) - |X_i - M_i|\right]}{(X_i + M_i)} * 100$$

X stands for exports to the EU15, *M* for imports from the EU15. The index takes values between 0 and 100. The higher the value, the greater the extent of intra-industry trade the greater the degree of economic integration.

Figures 15, 16 and 17 display the yearly GLI for Poland, the Czech Republic and Hungary, ordered in accordance with national R&D intensities.

Some of Poland's manufacturing branches are highly integrated with the EU15 (GLI above 90), some are hardly at all (GLI below 20 or even 10). High integration can be found at any technological level: low, middle and high. There does not seem to be a correlation between integration and R&D intensity. This finding is in line with the existing empirical literature, which has not been very successful in relating IIT to cross-country differences in endowments and other country characteristics. Generally speaking, Poland's integration with the EU seems to have risen in the second half of the 1990s, although in some product groups there has been a significant decline, e.g. tanning and dressing of leather (19). This might, however, indicate that there is still much potential for gains in foreign trade in these sectors of the Polish economy.

Figure 15: Grubel-Lloyd Index of IIT in Poland, 1995-2001

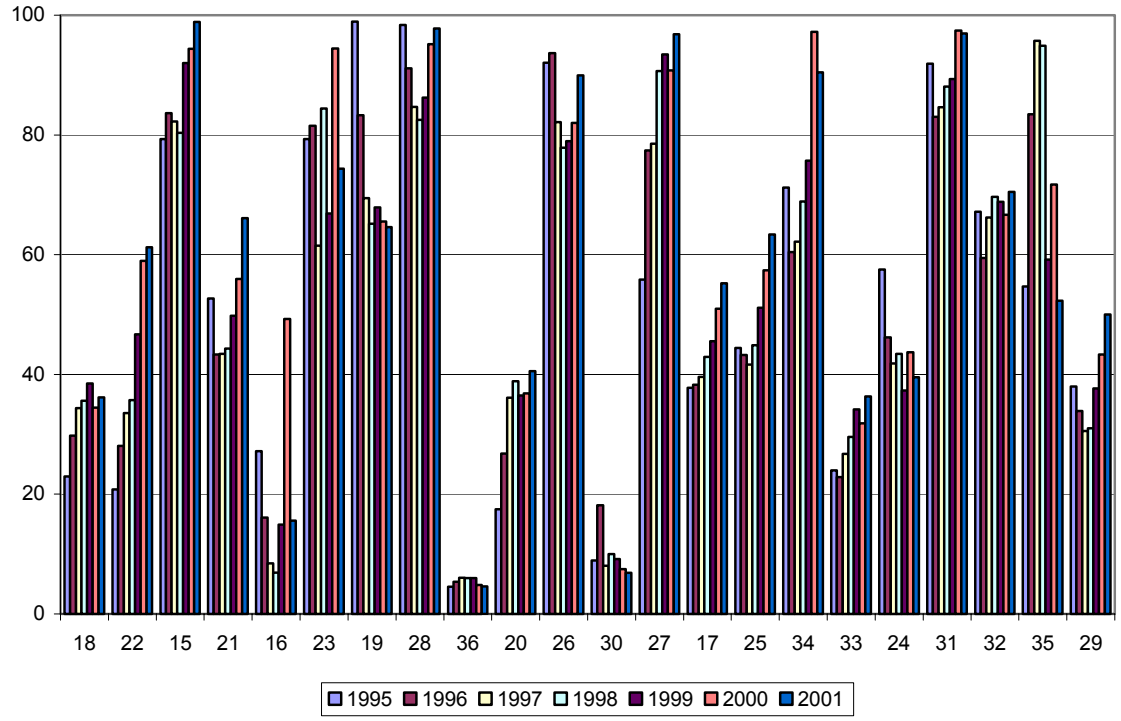
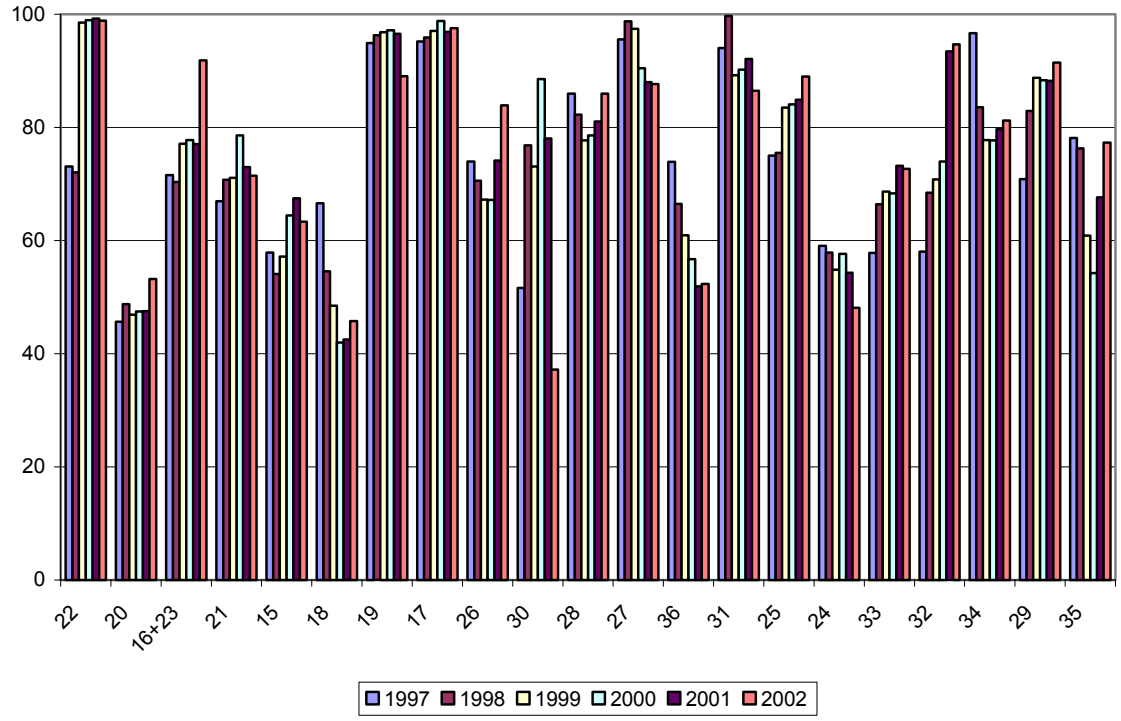
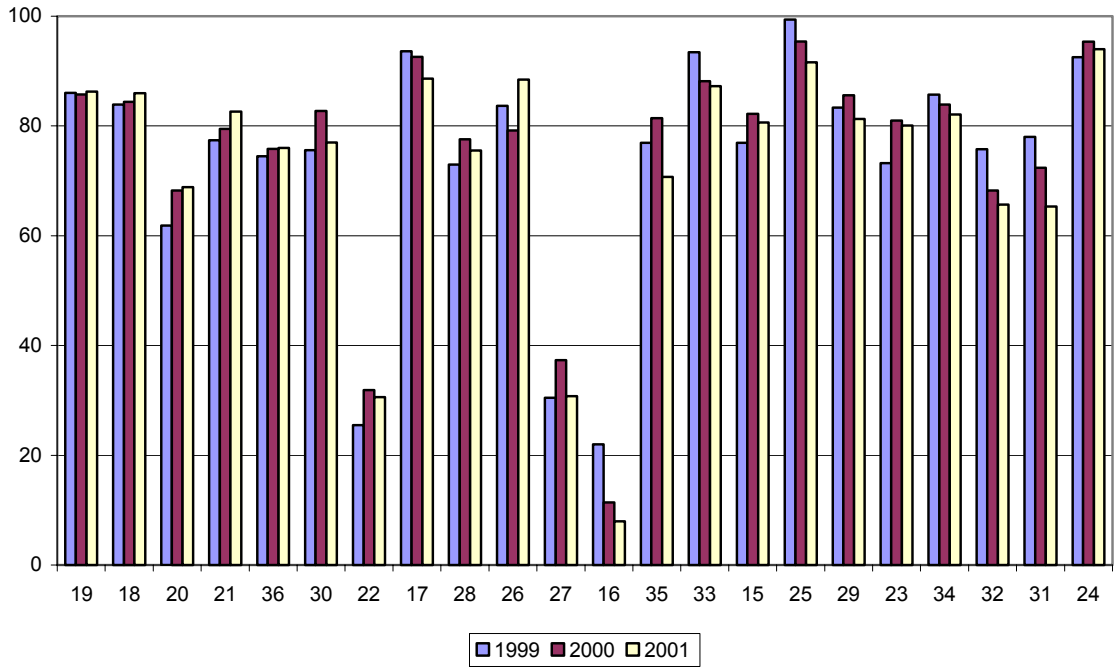


Figure 16: Grubel-Lloyd Index of IIT in the Czech Republic, 1997-2002



Unsurprisingly, economic integration as measured by the GLI is in general higher in the Czech Republic than in Poland. There are hardly any product categories that are integrated less than 50% with the EU15 and certain categories even reach an integration level of almost 100%. Similarly to Poland, high integration can be found in all technology product groups. At the same time integration in middle and high technology sectors tends to be of higher intensity than integration in low technology product groups. This is clearly in line with the findings of the RCAs.

Figure 17: Grubel-Lloyd Index of IITin Hungary, 1999-2001



In the case of Hungary, the share of IIT in total EU-trade is highest in high technology sectors, reaching almost 100% in rubber and plastic products (25) and chemicals (24). But it is also quite high in some middle and lower R&D intensive sectors such as leather (18), wearing apparel (18) and textiles (17). The lowest GLs are found in middle technology product groups, e.g. tobacco products (16).

In terms of absolute distribution of GLs between the product groups, the picture for 2001 is quite similar for the Czech Republic and Hungary, and differs from the picture presented for Poland. GLs reach more than 80% in twelve and ten product groups in the Czech Republic and Hungary, respectively, whereas in only six groups in Poland. Moreover, GLs account for less than 40% in merely one product group in the Czech Republic and three in Hungary, while this is the case for six product groups in Poland. Thus in the Czech Republic and Hungary approximately half of the product groups show a rather high economic integration with the EU15, approximately 10% show low economic integration and the remaining approximately 40% of the product groups can be found in between. For Poland this distinction makes up to about 25% for high integration, 25% for low integration and 50% of the product groups are placed in between.

To sum up, the Czech Republic and Hungary are extensively integrated with the EU15. However, for some product groups there is still much potential for increasing economic integration, especially in Hungary and in Poland.

4. Conclusion and Future Research

Based on theoretical considerations this paper empirically analysed the foreign trade structure of three accession countries towards the current EU15 countries, placing an emphasis on the development of export specialization. The outcome of the "Traditional Trade Theory", that accession countries will rather specialize in labour intensive production can, at least for two of the three countries, be rejected. We found that Poland exports rather low and some medium technology (or labour intensive) products, the Czech Republic, on the contrary, shows clear specialization patterns in the field of medium and even high technology, while Hungary mainly specialized in the export of high technology – and also of some very low technology – products in the 1990s. The share of intra-industry trade, as explained by the "New Trade Theory" mainly by differences in demand characteristics, is very high in some product groups in all three countries. However, there are – especially in Hungary and in Poland - also some branches of manufacturing where integration with the current EU-market has not yet proceeded this far. Hungary's and the Czech Republic's specialization in higher technology production questions the assumption of the "New Economic Geography" that mature products - with higher R&D expenditure - will be provided by economies richly endowed with skilled labour and physical capital and less mature products by countries endowed with much unskilled labour. Alternatively it raises the question as to whether the distinction between the EU15, as countries endowed with skilled labour and much capital and the accession countries, as countries endowed with unskilled labour, can still be regarded as an appropriate characterization.

Technology intensity was proxied in this paper by R&D ratios, which were measured as sectoral R&D expenditure as a percentage of sectoral turnover. R&D ratios, as an indicator for technology intensity, are still much lower in the three accession countries considered, than in current EU member states, e.g. Germany. However, we found that the sectoral distribution of R&D expenditure is rather similar.

As regards future research there is a broad range of further interesting issues to deal with. Firstly, the analysis should be expanded to include other accession countries, and in particular certain selected current EU countries (e.g. Portugal or Greece), to be able to compare the developments of structural change - especially foreign trade specialisation - in the course of different enlargement and integration processes within Europe. A comparative analysis of country results should uncover differences and similarities of specialization patterns between selected new and current EU15 members.

Secondly, it would be interesting to examine export and import unit values, in order to reveal specialization patterns. The basic assumption for catching-up should be tested, namely that with rising per capita income there will be high export shares of product groups with a high unit export value. Additionally, the use of alternative variables (e.g. capital stock or total factor productivity) is needed to give better insight into specialisation patterns of accession countries in terms of technology intensity in the Schumpeterian sense. Future research should also include analysis of patents at a disaggregated level to

implicate propositions on innovation and structural change. In addition, the impact of FDI flows on RCA dynamics should be analyzed.

Last but not least, it is necessary to use more advanced econometric methods for the analysis. The use of indicators for trade performance is just one of a variety of possible methods for measuring structural change. In future research, convergence indicators – e.g. β-convergence and δ-convergence – should be calculated, as well as other econometric methods (e.g. unit root tests). Finally policy implications should be incorporated, using also the experiences from previous examples of economic integration with the EU.

Annex 1

NACE rev. 1.1. Classification (in parts)

D		Manufacturing
15		Manufacture of food products and beverages
	151	Production, processing and preserving of meat and meat products
	152	Processing and preserving of fish and fish products
	153	Processing and preserving of fruit and vegetables
	154	Manufacture of vegetable and animal oils and fats
	155	Manufacture of dairy products
	156	Manufacture of grain mill products, starches and starch products
	157	Manufacture of prepared animal feeds
	158	Manufacture of other food products
	159	Manufacture of beverages
16		Manufacture of tobacco products
	160	Manufacture of tobacco products
17		Manufacture of textiles
	171	Preparation of spinning of textile fibres
	172	Textile weaving
	173	Finishing of textiles
	174	Manufacture of made-up textile articles, except apparel
	175	Manufacture of carpets and rugs
	176	Manufacture of knitted and crocheted fabrics
	177	Manufacture of knitted and crocheted articles
18		Manufacture of wearing apparel; dressing and dyeing of fur
	181	Manufacture of leather clothes
	182	Manufacture of other wearing apparel and accessories
	183	Dressing and dyeing of fur; manufacture of articles of fur
19		Tanning and dressing of leather, manufacture of luggage, handbags, saddlery, harness and footwear
	191	Tanning and dressing of leather
	192	Manufacture of luggage, handbags and the like, saddlery and harness
	193	Manufacture of footwear
20		Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
	201	Sawmilling and planing of wood, impregnation of wood
	202	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle, board, fibre board and other panels and boards
	203	Manufacture of builders carpentry and joinery
	204	Manufacture of wooden containers
	205	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials
21		Manufacture of pulp, paper and paper products
	211	Manufacture of pulp, paper and paperboard
	212	Manufacture of articles of paper and paperboard
22		Publishing, printing and reproduction of recorded media
	221	Publishing
	222	Printing and service activities related to printing

	223	Reproduction of recorded media
23		Manufacture of coke, refined petroleum products and nuclear fuel
	231	Manufacture of coke oven products
	232	Manufacture of refined petroleum products
	233	Processing of nuclear fuel
24		Manufacture of chemicals and chemical products
	241	Manufacture of basic chemicals
	242	Manufacture of pesticides and other agro-chemical products
	243	Manufacture of paints, varnishes and similar coatings, printing ink and mastics
	244	Manufacture of pharmaceuticals, medicinal chemicals and botanical products
	245	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations
	246	Manufacture of other chemical products
	247	Manufacture of man-made fibres
25		Manufacture of rubber and plastic products
	251	Manufacture of rubber products
	252	Manufacture of plastic products
26		Manufacture of other non-metallic mineral products
	261	Manufacture of glass and glass products
	262	Manufacture of non-refractory ceramic goods other than for construction purposes; manufacture of refractory ceramic products
	263	Manufacture of ceramic tiles and flags
	264	Manufacture of bricks, tiles and construction products, in baked clay
	265	Manufacture of cement, lime and plaster
	266	Manufacture of articles of concrete, plaster and cement
	267	Cutting, shaping and finishing of ornamental and building stone
	268	Manufacture of other non-metallic mineral products
27		Manufacture of basic metals
	271	Manufacture of basic iron and steel and of ferro-alloys
	272	Manufacture of tubes
	273	Other first processing of iron and steel
	274	Manufacture of basic precious and non-ferrous metals
	275	Casting of metals
28		Manufacture of fabricated metal products, except machinery and equipment
	281	Manufacture of structural metal products
	282	Manufacture of tanks, reservoirs and containers of metal; manufacture of central heating radiators and boilers
	283	Manufacture of steam generators, except central heating hot water boilers
	284	Forging, pressing, stamping and roll forming of metal; powder metallurgy
	285	Treatment and coating of metals; general mechanical engineering
	286	Manufacture of cutlery, tools and general hardware
	287	Manufacture of other fabricated metal products
29		Manufacture of machinery and equipment n.e.c.
	291	Manufacture of machinery for the production and use of mechanical power, Except aircraft, vehicle and cycle engines
	292	Manufacture of other general purpose machinery
	293	Manufacture of agriculture and forestry machinery
	294	Manufacture of machinetools

	295	Manufacture of other special purpose machinery
	296	Manufacture of weapons and ammunition
	297	Manufacture of domestic appliances n.e.c.
30		Manufacture of office machinery and computers
	300	Manufacture of office machinery and computers
31		Manufacture of electrical machinery and apparatus n.e.c.
	311	Manufacture of electric motors, generators and transformers
	312	Manufacture of electricity distribution and control apparatus
	313	Manufacture of insulated wire and cable
	314	Manufacture of accumulators, primary cells and primary batteries
	315	Manufacture of lighting equipment and electric lamps
	316	Manufacture of electrical equipment n.e.c.
32		Manufacture of radio, television and communication equipment and apparatus
	321	Manufacture of electronic valves and tubes and other electronic components
	322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy
	323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods
33		Manufacture of medical, precision and optical instruments, watches and clocks
	331	Manufacture of medical and surgical equipment and orthopaedic appliances
	332	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment
	333	Manufacture of industrial process control equipment
	334	Manufacture of optical instruments and photographic equipment
	335	Manufacture of watches and clocks
34		Manufacture of motor vehicles, trailers and semi-trailers
	341	Manufacture of motor vehicles
	342	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers
	343	Manufactures of parts and accessories for motor vehicles and their engines
35		Manufacture of other transport equipment
	351	Building and repairing of ships and boats
	352	Manufacture of railway and tramway locomotives and rolling stock
	353	Manufacture of aircraft and spacecraft
	354	Manufacture of motorcycles and bicycles
	355	Manufacture of other transport equipment n.e.c.
36		Manufacture of furniture, manufacturing n.e.c.
	361	Manufacture of furniture
	362	Manufacture of jewellery and related articles
	363	Manufacture of musical instruments
	364	Manufacture of sports goods
	365	Manufacture of games and toys
	366	Miscellaneous manufacturing n.e.c.
37		Recycling
	371	Recycling of metal waste and scrap
	372	Recycling of non-metal waste and scrap

Annex 2

RCA-Balassa in Poland's exports as compared to EU15, 1995-2001 (NACE rev.1.1, 3-digit-level)

Nace	1995	1996	1997	1998	1999	2000	2001
151	0,70	0,78	0,73	0,78	0,79	0,74	0,76
152	2,19	1,69	1,52	1,74	1,96	1,60	1,42
153	3,05	3,04	3,53	3,20	2,99	2,94	2,96
154	0,35	0,40	0,44	0,27	0,41	0,28	0,33
155	0,21	0,30	0,33	0,19	0,20	0,13	0,27
156	**0,03**	**0,01**	**0,01**	**0,02**	**0,05**	**0,03**	**0,04**
157	0,03	0,07	0,12	0,19	0,27	0,20	0,56
158	0,26	0,35	0,40	0,32	0,29	0,36	0,35
159	0,05	0,06	0,07	0,07	0,07	0,10	0,06
160	**0,04**	**0,01**	**0,00**	**0,00**	**0,01**	**0,04**	**0,01**
171	0,73	0,64	0,79	1,09	1,10	1,21	1,41
172	0,35	0,41	0,43	0,39	0,31	0,33	0,31
174	5,91	6,62	6,20	6,59	6,40	6,42	6,70
175	0,26	0,32	0,44	0,52	0,63	0,70	0,74
176	0,40	0,38	0,31	0,39	0,42	0,49	0,44
177	1,44	1,63	1,56	1,51	1,56	1,41	1,47
181	2,63	2,05	2,10	2,23	2,43	2,02	2,12
182	7,07	6,81	6,15	5,78	5,33	4,33	3,99
183	3,92	4,68	4,28	4,24	4,87	5,58	7,10
191	2,06	1,59	1,78	1,66	1,72	1,77	1,90
192	1,75	1,65	1,08	1,11	0,95	0,74	0,65
193	1,43	1,44	1,15	1,08	1,15	0,92	0,80
201	3,52	2,96	2,92	2,87	2,75	2,49	1,97
202	2,76	2,42	2,40	3,12	3,41	2,85	2,40
203	6,27	6,78	7,22	6,61	6,92	6,10	6,01
204	**27,65**	**20,97**	**16,58**	**15,04**	**14,10**	**11,47**	**9,66**
205	**13,01**	**15,60**	**16,93**	**15,12**	**15,67**	**14,23**	**13,27**
211	0,42	0,46	0,53	0,53	0,63	0,69	0,69
212	0,81	0,78	0,83	0,73	0,77	0,73	1,27
221	0,14	0,19	0,21	0,28	0,32	0,36	0,38
222	0,29	0,49	0,69	0,52	0,75	0,88	0,75
231	**57,09**	**39,89**	**55,48**	**50,98**	**42,91**	**35,93**	**36,64**
232	0,37	0,28	0,28	0,30	0,28	0,35	0,51
233	0,02	0,02	0,02	0,01	0,01	0,02	0,02
241	0,78	0,78	0,73	0,73	0,58	0,63	0,50
242	0,08	0,06	0,07	0,07	0,09	0,07	0,03
243	0,02	0,03	0,03	0,04	0,05	0,07	0,07
244	0,06	0,08	0,06	0,05	0,04	0,03	0,03
245	0,14	0,18	0,17	0,22	0,29	0,40	0,41
246	0,11	0,13	0,12	0,09	0,11	0,08	0,07
247	0,51	0,43	0,78	0,88	1,02	1,08	1,02
251	0,84	0,99	1,03	1,15	1,32	1,52	1,75
252	0,37	0,47	0,51	0,52	0,68	0,68	0,73
261	1,26	1,37	1,46	1,61	1,73	1,70	1,71
262	1,77	2,50	2,40	2,48	2,75	2,75	2,88
263	**0,01**	**0,01**	**0,01**	**0,01**	**0,02**	**0,02**	**0,02**

Nace	1995	1996	1997	1998	1999	2000	2001
264	1,77	2,40	3,20	3,03	2,47	1,95	1,82
265	14,06	12,15	9,59	6,83	4,61	2,39	2,38
266	2,48	2,82	2,83	1,83	2,04	2,23	2,35
267	1,62	1,97	2,03	1,79	1,77	1,39	1,24
268	0,32	0,58	0,66	0,90	0,95	0,93	1,12
271	1,32	0,99	1,14	1,18	1,03	1,13	1,02
272	1,26	1,21	1,14	1,14	1,12	1,12	1,20
273	1,05	1,19	1,22	1,11	1,00	0,81	0,79
274	2,85	2,43	2,39	2,21	2,12	1,82	1,50
281	5,20	6,13	5,66	4,92	4,69	5,35	5,86
282	0,87	0,94	1,10	1,22	1,55	1,86	2,06
283	3,33	3,44	4,93	5,35	7,10	16,87	5,27
286	0,47	0,49	0,50	0,52	0,62	0,69	0,81
287	2,24	2,28	2,37	2,55	2,56	2,51	2,48
291	0,59	0,72	0,60	0,65	0,69	0,86	0,93
292	0,39	0,50	0,56	0,51	0,61	0,59	0,62
293	0,97	1,03	1,05	0,93	0,92	0,87	0,86
294	0,42	0,50	0,53	0,53	0,58	0,61	0,70
295	0,51	0,61	0,66	0,63	0,70	0,65	0,72
296	0,26	0,28	0,16	0,11	0,17	0,09	0,10
297	0,56	0,62	0,67	0,73	0,88	0,87	1,14
300	0,03	0,07	0,03	0,04	0,04	0,03	0,03
311	0,81	1,27	1,64	1,65	1,66	1,42	1,39
312	0,69	0,81	1,19	1,03	1,13	1,14	1,21
313	3,49	3,26	2,53	3,15	3,18	3,05	3,40
314	0,16	0,86	1,99	2,51	2,33	2,46	2,40
315	2,57	2,91	3,10	3,22	3,26	2,84	2,79
316	0,91	1,32	1,23	1,59	2,15	2,04	2,42
321	0,52	0,65	0,64	0,64	0,61	0,34	0,27
322	0,13	0,16	0,29	0,16	0,15	0,16	0,13
323	0,73	0,93	1,83	2,29	2,37	2,17	2,63
331	0,18	0,16	0,20	0,25	0,32	0,32	0,33
332	0,29	0,32	0,36	0,31	0,34	0,30	0,32
334	0,07	0,07	0,07	0,06	0,06	0,05	0,05
335	0,21	0,87	1,85	1,76	1,42	0,63	0,66
341	0,58	0,66	0,69	0,66	0,65	1,42	1,34
342	1,93	2,23	2,11	2,09	2,19	1,95	1,91
343	0,36	0,42	0,59	0,65	0,82	0,97	1,21
351	12,28	17,20	4,66	2,60	14,08	6,14	7,11
352	0,80	0,86	0,80	0,88	2,02	3,14	3,46
353	0,04	0,05	0,05	0,05	0,05	0,05	0,12
354	0,84	0,90	0,90	0,86	1,06	1,00	0,97
355	4,52	5,32	6,36	4,61	5,37	5,06	5,26
361	6,72	7,25	7,64	7,47	7,87	7,80	8,10
362	0,26	0,29	0,33	0,34	0,25	0,20	0,19
363	1,33	1,37	1,43	1,14	0,90	0,63	0,58
364	0,72	0,75	0,83	0,76	0,69	0,59	0,56
365	0,57	0,55	0,54	0,59	0,59	0,47	0,48
366	1,21	1,42	1,44	1,56	1,63	1,63	1,69

Annex 3

RCA-Balassa in the Czech Republic's exports as compared to EU15, 1995-2001 (NACE rev.1.1, 3-digit-level)

NACE	1997	1998	1999	2000	2001
151	0,20	0,16	0,17	0,17	0,18
152	**0,00**	**0,00**	**0,00**	**0,01**	**0,01**
153	0,17	0,11	0,13	0,13	0,12
154	0,46	0,28	0,22	0,28	0,23
155	0,26	0,25	0,16	0,21	0,20
156	**0,05**	**0,02**	**0,05**	**0,04**	**0,05**
157	**0,02**	**0,02**	**0,02**	**0,02**	**0,02**
158	0,18	0,17	0,16	0,22	0,26
159	0,45	0,34	0,32	0,42	0,37
160	1,00	0,72	0,40	0,33	0,25
171	1,64	1,52	1,75	2,43	2,63
172	2,24	2,12	2,07	2,26	2,36
174	5,07	4,63	4,78	4,79	4,92
175	0,85	0,87	1,01	1,27	1,34
176	1,11	1,10	1,09	1,05	0,93
177	0,98	0,77	0,79	0,74	0,66
181	1,47	1,18	0,98	0,83	0,61
182	1,64	1,54	1,45	1,37	1,18
183	1,64	1,28	1,48	1,96	1,65
191	0,47	0,29	0,24	0,18	0,14
192	2,04	1,80	1,53	1,43	1,31
193	1,18	1,05	1,04	0,88	0,78
201	3,59	2,97	3,11	2,79	2,43
202	1,76	1,47	1,33	1,22	1,10
203	3,48	3,21	3,45	3,15	4,02
204	**10,95**	**8,13**	**7,81**	**7,06**	**5,83**
205	1,90	1,76	1,93	2,06	1,75
211	0,54	0,51	0,47	0,59	0,49
212	0,48	0,47	0,49	0,54	0,53
221	0,33	0,34	0,38	0,37	0,49
222	1,69	1,31	3,01	3,10	3,16
231	**24,81**	**15,29**	**17,38**	**9,94**	**8,65**
232	0,45	0,45	0,51	0,41	0,36
233	1,41	0,27	0,29	0,33	0,08
241	0,80	0,64	0,52	0,55	0,45
242	0,22	0,15	0,11	0,16	0,14
243	0,26	0,26	0,29	0,27	0,28
244	0,18	0,13	0,11	0,11	0,09
245	0,09	0,19	0,21	0,24	0,16
246	0,14	0,13	0,12	0,10	0,13
247	0,39	0,45	0,54	0,64	0,63
251	1,55	1,82	2,16	2,45	2,38
252	1,20	0,99	1,14	1,23	1,22
261	3,13	3,17	3,17	3,20	2,83
262	3,20	3,37	3,39	3,74	3,59
263	1,18	0,98	1,01	1,04	0,96

NACE	1997	1998	1999	2000	2001
264	2,36	2,96	2,55	2,58	2,46
265	5,16	3,79	3,66	3,17	1,91
266	3,66	2,96	2,84	2,95	2,55
267	1,13	0,98	1,00	0,89	0,77
268	0,92	0,79	1,00	1,09	1,11
271	1,28	1,00	0,97	0,92	0,94
272	1,68	1,78	1,54	1,64	1,44
273	1,81	1,89	1,88	1,62	1,38
274	0,99	0,81	0,82	0,71	0,60
281	**6,51**	**5,65**	**5,48**	**6,07**	**5,42**
282	2,55	2,66	2,59	2,85	2,82
283	2,34	1,57	3,02	3,55	1,72
286	1,44	1,35	1,40	1,66	1,84
287	3,08	3,34	3,44	3,70	3,42
291	1,09	1,21	1,22	1,30	1,57
292	1,47	1,38	1,35	1,40	1,40
293	1,38	1,21	0,84	0,78	0,83
294	2,36	2,21	2,37	2,08	2,14
295	1,50	1,56	1,59	1,78	1,71
296	2,45	2,14	3,65	3,43	2,37
297	0,53	0,51	0,45	0,44	0,51
300	0,12	0,19	0,15	0,19	0,36
311	3,01	2,92	3,04	3,25	3,04
312	3,14	3,11	3,01	3,20	2,84
313	2,74	3,25	4,11	4,07	4,19
314	6,41	4,76	6,94	7,51	9,95
315	0,85	0,87	0,74	0,80	0,84
316	2,13	2,87	3,01	3,18	3,52
321	1,13	1,13	1,13	1,18	1,08
322	0,06	0,05	0,05	0,19	0,75
323	0,54	0,55	0,74	1,29	2,08
331	0,35	0,32	0,35	0,33	0,34
332	0,62	0,64	0,57	0,61	0,64
334	1,22	1,25	1,14	1,23	1,13
335	1,57	1,06	0,64	0,53	0,33
341	0,78	1,00	0,92	0,93	0,85
342	1,91	1,67	1,50	1,46	1,25
343	1,08	1,33	1,63	1,87	2,03
351	1,14	0,84	0,70	0,22	0,34
352	5,47	6,68	7,28	6,12	3,28
353	0,09	0,14	0,14	0,06	0,04
354	1,48	1,15	0,90	0,94	0,75
355	1,18	1,71	1,97	2,31	2,23
361	3,13	2,96	3,26	3,29	3,41
362	0,18	0,17	0,16	0,10	0,09
363	7,63	6,95	6,15	5,82	5,03
364	3,99	2,98	2,32	2,17	2,11
365	0,98	0,97	0,97	1,04	1,16
366	2,57	2,40	2,17	2,16	1,94

Annex 4

RCA-Balassa in Hungary's exports as compared to EU15, 1998-2001 (NACE rev.1.1, 3-digit-level)

NACE	1999	2000	2001
151	1,4	1,3	1,3
152	**0,0**	**0,0**	**0,0**
153	1,0	0,9	0,8
154	0,2	0,3	0,1
155	0,1	0,1	0,2
156	0,1	0,1	0,3
157	0,5	0,6	0,9
158	0,1	0,1	0,1
159	0,1	0,2	0,2
160	0,1	0,0	0,0
171	0,9	1,2	1,4
172	0,5	0,4	0,4
174	**6,6**	**6,5**	**5,3**
175	0,6	0,6	0,7
176	0,5	0,5	0,5
177	0,7	0,6	0,6
181	**6,4**	**5,4**	**5,2**
182	2,8	2,5	2,5
183	0,3	0,4	0,3
191	0,4	0,4	0,3
192	2,7	2,3	2,0
193	2,0	1,8	1,7
201	0,6	0,6	0,6
202	0,6	0,5	0,5
203	2,8	2,8	2,7
204	1,9	2,0	1,8
205	1,1	0,9	0,8
211	0,2	0,2	0,3
212	0,5	0,4	0,3
221	**0,0**	**0,0**	**0,0**
222	0,3	0,4	0,4
231	0,0	0,0	0,0
232	0,9	0,6	0,8
233	**0,0**	**0,0**	**0,0**
241	0,3	0,3	0,3
242	0,1	0,2	0,3
243	**0,0**	**0,0**	**0,0**
244	0,2	0,2	0,2
245	0,1	0,1	0,2
246	**0,0**	**0,0**	**0,0**
247	0,2	0,2	0,2
251	0,9	1,0	1,1
252	0,8	0,9	1,0
261	0,5	0,4	0,4
262	2,0	1,7	1,5
263	0,1	0,1	0,1

NACE	1999	2000	2001
264	0,5	0,6	0,7
265	0,2	0,2	0,2
266	0,3	0,3	0,3
267	**0,0**	**0,0**	**0,0**
268	0,9	0,9	0,8
271	0,4	0,1	0,1
272	0,1	0,1	0,0
273	0,1	0,1	0,1
274	0,7	0,8	0,8
281	2,5	2,9	3,2
282	2,0	1,4	1,5
283	1,9	3,0	1,2
286	0,3	0,4	0,4
287	0,4	0,5	0,5
291	0,3	0,2	0,3
292	0,4	0,4	0,4
293	1,1	1,3	1,6
294	0,2	0,2	0,3
295	0,3	0,3	0,3
296	0,2	0,3	0,2
297	1,4	1,4	1,3
300	1,0	0,5	0,7
311	0,9	0,9	0,9
312	1,2	1,3	1,5
313	3,7	3,9	3,4
314	0,0	0,2	1,2
315	5,2	5,7	5,9
316	**5,1**	**7,4**	**13,3**
321	4,3	6,0	2,5
322	0,1	0,3	0,5
323	**6,7**	**7,7**	**9,1**
331	0,2	0,2	0,2
332	0,3	0,3	0,3
334	0,4	0,4	0,4
335	**0,0**	**0,0**	**0,0**
341	1,9	1,7	1,6
342	0,8	0,7	0,9
343	1,2	1,3	1,4
351	0,1	0,1	0,1
352	2,2	2,5	2,5
353	0,0	0,0	0,0
354	0,1	0,1	0,1
355	0,5	0,5	0,6
361	0,7	0,6	0,7
362	0,1	0,1	0,0
363	**0,0**	**0,0**	**0,0**
364	0,5	0,4	0,4
365	0,3	0,2	0,2
366	0,6	0,5	0,5

Literature

AIGINGER, K., "Do Industrial Structures Converge? A survey on the empirical literature on specialisation and concentration of industries", WIFO Working Paper, (116), 1999.

BORBÉLY, D., and K.J. GERN, "Die EU-Osterweiterung – Makroökonomische Aspekte aus Sicht der Beitrittsländer", Die Weltwirtschaft 4, 2003.

BRÜLHART, M., "Scale Economies, Intra-Industry Trade and Industry Location in the New Trade Theory", Trinity Economic Paper Series, Technical Paper No. 95/4, 1995.

GREENAWAY, D., HINE, R. C., MILNER, CH., "Vertical and horizontal intra-industry trade: a cross industry analysis for the United Kingdom", The Economic Journal, 1995, 105 (November), pp: 1505-1518.

HECKSCHER, E., "The Effect of Foreign trade on Distribution of Income." Ekonomisk Tidskrift, pp.497-512, 1919; reprinted in H.S. Ellis and L.A. Metzler (eds.), A. E. A. Readings in the Theory of International Trade, Philadelphia: Blakiston, pp: 272-300. 1949.

KRUGMAN, P., "Increasing Returns and Economic Geography", Journal of Political Economy, 1991, (99), pp: 483-499.

KRUGMAN, P. and VENABLES, A.J., "Globalization and the Inequality of Nations", Quarterly Journal of Economics, 1995, 60(4), pp: 857-880.

OHLIN, B., Interregional and International Trade. Campbridge, MA: Harvard University Press, 1933.

PUGA, D., "Urbanisation patterns: Europe versus Less Developed Countries", Journal of Regional Science, 1998, (38), pp: 231-252.

RICARDO, D., On the Principles of Political Economy and Taxation, London, 1817.

VENABLES, A.J.,"Equilibrium locations of vertically linked industries", International Economic Review, 1996, Vol. 37, No. 2.

VENABLES, A. J., "The international division of industries: clustering and comparative advantage in a multi-industry model", CEPR Discussion Paper, 1998, (1961).

WOLFMAYR-SCHNITZER, Y., "Economic Integration, Specialisation and the Location of Industries. A Survey of the Theoretical Literature", WIFO Working Paper No. 120, 1999.

EIIW Discussion Papers

ISSN 1430-5445:
Standing orders (usually 13 issues or more p.a.): academic rate 95 Euro p.a.
normal rate 250 Euro p.a.
Single orders: academic rate10 Euro per copy; normal rate 20 Euro per copy.

Die Zusammenfassungen der Beiträge finden Sie im Internet unter:
The abstracts of the publications can be found in the internet under:

http://www.euroeiiw.de

No. 1 **Welfens, P.J.J.:** Telecommunications in Systemic Transformation, January 1995.

No. 2 **Welfens, P.J.J.; Graack, C.:** Telecommunications in Western Europe: Liberalization, Technological Dynamics and Regulatory Developments, January 1995.

No. 3 **Welfens, P.J.J.:** Achieving Competition in Europe's Telecommunications Sector, February 1995.

No. 4 **Addison, J.T.:** The Dunlop Report: European Links and Other Odd Connections, May 1995.

No. 5 **Addison, J.T.; Blackburn, McKinley L.:** A Puzzling Aspect of the Effect of Advance Notice on Unemployment, May 1995.

No. 6 **Welfens, P.J.J.; Graack, C.:** Deregulierungspolitik und Wettbewerb in Netzindustrien: Bedeutung und Optionen für osteuropäische Transformationsländer, May 1995.

No. 7 **Addison, J.T. Chilton, J.B.:** Models of Union Behavior, June 1995.

No. 8 **Graack, C.:** EU-Telecom Markets and International Network Alliances: Developments, Strategies and Policy Implications, August 1995.

No. 9 **Welfens, P.J.J.:** Koordinationserfordernisse der EU-Infrastrukturpolitik, November 1995.

No. 10 **Hillebrand, R.:** Umweltpolitik in föderalen Systemen - eine kritische Analyse der EU-Umweltpolitik, December 1995.

No. 11 **Addison, J.T.; Schnabel, C.; Wagner J.:** On the Determinants of "Mandatory" Works Councils in Germany, December 1995.

No. 12 **Welfens, P.J.J.:** Towards Full Employment and Growth in the European Union, December 1995.

No. 13 **Welfens, P.J.J.:** Wirtschaftspolitische Kompetenzverteilung in der Europäischen Union, December 1995.

No. 14 **Welfens, P.J.J.:** Privatization, Efficiency and Equity, January 1996.

No. 15 **Hartwig, K.-H.; Welfens P.J.J.:** EU and Eastern Europe: Western European Integration and Eastern European Transformation, May 1996.

No. 16 **Welfens, P.J.J.:** Konsequenzen einer Osterweiterung für die EU und deren Reformbedarf, May 1996.

No. 17 **Graack, C.:** Structure of the Telecoms Sector and Degree of Internationalization in Europe and Russia, July 1996.

No. 18 **Bogai, D.:** Werkstatt der Deutschen Einheit? Wirtschaft und Arbeitsmarkt in der Region Berlin-Brandenburg, October 1996.

No. 19 **Graack, C.:** Internationale Aspekte der Telekommunikationswirtschaft: Liberalisierung, internationale Tarifmechanismen und Wohlfahrtseffekte, October 1996.

No. 20 **Jungmittag, A.; Welfens P.J.J.:** Telekommunikation, Innovation und die langfristige Produktionsfunktion: Theoretische Aspekte und eine Kointegrationsanalyse für die Bundesrepublik Deutschland, October 1996.

No. 21 **Welfens, P.J.J.; Guth M.:** EU-Strukturpolitik in Deutschland: Entwicklung, Effizienzüberlegungen und Reformoptionen, October 1996.

No. 22 **Welfens, P.J.J.; Graack C.:** Telekommunikationsmärkte in Europa: Marktzutrittshemmnisse und Privatisierungsprobleme aus Sicht der Neuen Politischen Ökonomie, October 1996.

No. 23 **Welfens, P.J.J.:** Die Position Deutschlands im veränderten Europa: Wirtschaftliche und reformpolitische Perspektiven, November 1996.

No. 24 **Hartmann, P.:** Foreign Exchange Vehicles Before and After EMU: From Dollar/Mark to Dollar/Euro?, November 1996.

No. 25 **Jungmittag, A.; Welfens P.J.J.:** The Political Economy of EMU and Stabilization Policy, May 1997.

No. 26 **Hölzler, H.:** Privatisierung und Einführung von Wettbewerb in Rußland, January 1996.

No. 27 **Welfens, P.J.J.:** Small and Medium-sized Companies in Economic Growth: Theory and Policy Implications in Germany, May 1997.

No. 28 **Bogai, D.:** Europäische Arbeitsmarktpolitik und nationale beschäftigungspolitische Initiativen, May 1997.

No. 29 **Welfens, P.J.J.:** Research & Development Policy and Employment, June 1997.

No. 30 **Sinclair, A.:** Liberalising the Electricity Supply Industry in Western and Eastern Europe: Lessons for Russia, July 1997.

No. 31 **Graack, C.:** Infrastructure Investments and Regulation in Telecommunications, July 1997.

No. 32 **Welfens, P.J.J.; Schwarz A.:** Die Rolle des Staates in der Sozialen Marktwirtschaft bei Globalisierung der Wirtschaftsbeziehungen, August 1997.

No. 33 **Welfens, P.J.J.; Wiegert R.:** Transformation Policies, Regulation of Telecommunications and Foreign Direct Investment in Transforming Economies, July 1997.

No. 34 **Welfens, P.J.J.:** Internationalization of Telecoms, Deregulation, Foreign Investment and Pricing: Analysis and Conclusions for Transforming Economies, July 1997.

No. 35 **Schwarz, A.:** Subventionspolitik in den mittel- und osteuropäischen Transformationsländern: Gegenwärtige Strukturen, Probleme und Transparenzdefizite, September 1997.

No. 36 **Welfens, P.J.J.; Hillebrand R.:** Globalisierung der Wirtschaft: Wirtschaftspolitische Konsequenzen des internationalen Standortwettbewerbs, September 1997.

No. 37 **Stiller, H.:** Material Intensity of Transportation and Implications for Sustainable Mobility in Europe, September 1997.

No. 38 **Gerstberger, T.; Graack C.:** Competition and Deregulation in the Japanese Telecommunications Network Industry, September 1997.

No. 39 **Welfens, P.J.J.:** Wirtschaftspolitische Flankierungserfordernisse des Euro-Starts, November 1997.

No. 40 **Aslund, A.:** The Political Economy of Systemic Transformation and Institution-Bulding, November 1997.

No. 41 **Guth, M.:** Regionale Beschäftigungspakte im Rahmen der EU-STrukturpolitik: Hintergrund und Einordnung, November 1997.

No. 42 **Jungmittag, A.; Welfens P.J.J.:** Politische Ökonomie der Europäischen Währungsunion und Stabilitätspolitik, January 1998.

No. 43 **Welfens, P.J.J.:** Labor Costs, Unemployment and Innovation, February 1998.

No. 44 **Addison, J.T.; Audretsch, D.B.; Gries, T.; Grupp H.; Welfens, P.J.J.:** Economic Globalization, Innovation and Growth, April 1998.

No. 45 **Welfens, P.J.J.:** Euro, Währungsunion und EU-Binnenmarkt, April 1998.

No. 46 **Addison, J.T., Schnabel, C.; Wagner J.:** Works Councils in Germany: Their Effects on Firm Performance, March 1998.

No. 47 **Addison, J.T.; Portugal, P.:** Short- and Long-Term Unemployment, March 1998.

No. 48 **Welfens, P.J.J.:** Trade and Optimum Import Tariffs: A Note in the Context of Foreign Direct Investment, June 1998.

No. 49 **Bohn, F.:** Monetary Union and the Interest-Exchange Trade-off, July 1998.

No. 50 **Welfens, P.J.J.:** Exchange Rate Policy for the Euro: Theory, Strategic Issues and Policy Options, July 1998.

No. 51 **Addison, J.T.; Portugal P.:** Job Search Methods and Outcomes, July 1998.

No. 52 **Jungmittag, A.; Welfens P.J.J.:** Telecommunication, Innovation and the Long-Term Production Function: Theoretical Analysis and a Cointegration Analysis for West Germany 1960-1990, August 1998.

No. 53 **Welfens, P.J.J.:** Eastern EU Enlargement: Problems, Conflicts and Policy Options, September 1998.

No. 54 **Welfens, P.J.J.:** Die russische Transformationskrise: Monetäre und reale Aspekte sowie Politikoptionen, November 1998.

No. 55 **Graack, C.; Welfens, P.J.J.:** Internationaler Technologiewettlauf, Arbeitsmarktdynamik und Unternehmensgründungsdynamik bei Standortkonkurrenz, September 1998.

No. 56 **Welfens, P.J.J.:** Liberalisierung der Energiewirtschaft in Deutschland und EU-Partnerländern, Januar 1999

No. 57 **Welfens, P.J.J.:** The RussianTransformation Crisis: Origins, Analysis and NewPolicy Requirements, January 1999

No. 58 **Komulainen , Tuomas:** Currency Crisis Theories – Some Explanations for the Russian Case, May 1999

No. 59 **Welfens, P.J.J.:** Internet Market Dynamics in Germany: From a small Market towards a Strategic Sector of the Economy, May 1999

No. 60 **Wiegert, R.:** Der russische Bankensektor im Prozeß der Systemtransformation, Juni 1999

No. 61 **Vogelsang, M.:** How to rescue Japan: Proposal of a staggered VAT reform. Draft, May 1999

No. 62 **Welfens, P.J.J.:** The Start of the Euro, International Relations and Inflation, April 1999

No. 63 **Sutela, P.:** Overcoming the Russian Transformation Crisis: Selected Issues and Policy Options, June 1999

No. 64 **Bohn, F.:** The Italian Case: A Parable for the Eastern Enlargement of the EMU, July 1999

No. 65 **Meyer, B.; Welfens, P.J.J.:** Innovation – Augmented Ecological Tax Reform: Theory, Model Simulation and New Policy Implications, September 1999

No. 66 **Gavrilenkov, E.:** Crisis in Russia: Selected Problems of the Macroeconomic Performance, September 1999

No. 67 **Steinsdorff, S. v.:** Wie demokratisch ist Rußland? Dezember 1999

No. 68 **Pelzel, R.:** Internationalisierung der Telekommunikation, eine Vergleichsanalyse für USA, Großbritannien und Deutschland, Dezember 1999

No. 69 **Serebryakov, G.:** Structural Change and Econometric Prospective, January 2000

No. 70 **Bohn, F.:** Political Instability, Inflation, and International Loans, February 2000

No. 71 **Welfens, P.J.J.:** The EU and Russia: Strategic Aspects of Transformation and Integration, April 2000

No. 72 **Jungmittag, A.:** Techno-Globalismus: Mythos oder Realität?, Juli 2000

No. 73 **von Westernhagen, N.:** The Role of FDI in the Transition Process of Selected CIS and Eastern European Countries, September 2000

No. 74 **Welfens, P.J.J.; Hollants, J.; Kauffmann, A.:** Mittelständische Unternehmen und das Internet: Perspektiven in Deutschland, Oktober 2000

No. 75 **Jungmittag, A.; Welfens, P.J.J.:** Auswirkungen einer Internet Flatrate auf Wachstum und Beschäftigung in Deutschland, März 2000

No. 76 **Addison, J.T.:** Is Community Social Policy Beneficial, Irrelevant, or Harmful to the Labor Market Performance of the European Union?, September 2000

No. 77 **Welfens, P.J.J.:** Modern Exchange Rate Theory and Schumpetrian Economic Analysis: New Approach and Application to the Euro, June 2000

No. 78 **Guth, M.:** From technology policy for regions to regional technology policy towards a new policy strategy in the EU, December 2000

No. 79 **Welfens, P.J.J.; Kauffmann, A.; Vogelsang, M.:** Evaluationsbericht: Das Internet strategisch richtig nutzen, Februar 2001

No. 80 **Welfens, P.J.J.:** Transatlantische Wachstumsunterschiede, Euro-Schwäche und Finanzpolitik, Mai 2001

No. 81 **Jungmittag, A.; Welfens,P.J.J.:** Effects of an Internet Flat Rate on Growth and Employment in Germany, February 2001

No. 82 **Welfens, P.J.J.:** Transatlantic Growth Differentials, ICT Dynamics, Fiscal Policy and the Fall of the Euro, July 2001

No. 83 **Wiegert, R.:** Financial Sector and Human Capital in a Long-Term Growth Perspective: The Case of Russia, July 2001

No. 84 **Addison J.T.:** Principles of Market-Oriented Labor Market Policies; July 2001

No. 85 **Jungmittag, A.; Welfens, P.J.J.:** Europäische Telekomliberalisierung und Außenhandel: Theorie, Gravitationsansatz und Implikationen, Juni 2001

No. 86 **Ponder, J.K.:** Telekommunikationssektor in Polen: Entwicklungen, Investitionsperspektiven und Regulierung, Oktober 2001

No. 87 **Jungmittag, A.; Welfens P.J.J.:** Liberalization of EU Telecommunications and Trade: Theory, Gravity Equation Analysis and Policy Implications, October 2001

No. 88 **Bohn, F.:** Powerful Groups and Corruption, December 2000

No. 89 **Welfens, P.J.J.:** Aggregation in a Two-Sector Growth Model: A Modified Solow Approach with Cobb-Douglas Production Functions, September 2001

No. 90 **Welfens, P.J.J.:** Stabilization and Growth: A New Model, October 2001

No. 91 **Addison, J.T.:** Principles of Market-Oriented Labor Market Policies, March 2002

No. 92 **Jungmittag, A.:** Innovationsdynamik in der EU: Konvergenz oder Divergenz?, Eine Zeitreihen-Querschnittsanalyse, Februar 2002

No. 93 **Welfens, P.J.J.; Wiegert, R.:** Reform des Bankensektors und Stabilität in Rußland, November 2001

No. 94 **Welfens, P.J.J.:** Mittelfristige Herausforderungen für Euroland: Stabilität, EU-Osterweiterung, Wachstum; November 2001

No. 95 **Welfens, P.J.J.:** Constitutional Issues and the Quality of Political Competition: Analysis and Implications for a Future EU Constitution, April 2002

No. 96 **Jungmittag, A:** Innovation Dynamics in the EU: Convergence or Divergence?, A Cross-Country Panel Data Analysis, June 2002

No. 97 **Welfens, P.J.J.:** I&K-Technologie, Produktivität und Wachstum: Transatlantische Ananlyseperspektiven und wirtschaftspolitische Optionen, Juli 2002

No. 98 **Jungmittag, A.; Welfens, P.J.J.:** Telecommunication, Internet, Innovation and Growth in Europe and the US, August 2002

No. 99 **Welfens, P.J.J.:** Finanzpolitik zwischen Wachstumsschwäche und Maastrichter Vertrag / Stabilitätspakt: Ausgabenschwerpunkte neu setzen und kluge Steuerreform, September 2002

No. 100 **Gavrilenkov, E**: Macroeconomic Situation in Russia - Growth, Investment and Capital Flows, October 2002

No. 101 **Agata, K.**: Internet, Economic Growth and Globalization, November 2002

No. 102 **Blind, K.; Jungmittag, A.**: Ausländische Direktinvestitionen, Importe und Innovationen im Dienstleistungsgewerbe, February 2003

No. 103 **Welfens, P.J.J.; Kirn, T.:** Mittelstandsentwicklung, BASEL-II-Kreditmarktprobleme und Kapitalmarktperspektiven, Juli 2003

No. 104 **Standke, K.-H.**: The Impact of International Organisations on National Science and Technology Policy and on Good Governance, March 2003

No. 105 **Welfens, P.J.J.:** Exchange Rate Dynamics and Structural Adjustment in Europe, May 2003

No. 106 **Welfens, P.J.J.; Jungmittag, A.; Kauffmann, A.; Schumann, Ch.:** EU Eastern Enlargement and Structural Change: Specialization Patterns in Accession Countries and Economic Dynamics in the Single Market, May 2003

No. 107 **Welfens, P.J.J.:** Überwindung der Wirtschaftskrise in der Eurozone: Stabilitäts-, Wachstums- und Strukturpolitik, September 2003

No. 108 **Welfens, P.J.J.:** Risk Pricing, Investment and Prudential Supervision: A Critical Evaluation of Basel II Rules, September 2003

No. 109 **Welfens, P.J.J.; Ponder, J.K.:** Digital EU Eastern Enlargement, October 2003

No. 110 **Addison, J.T.; Teixeira, P.:** What Have We Learned About The Employment Effects of Severance Pay? Further Iterations of Lazear et al., October 2003

No. 111 **Gavrilenkov, E.:** Diversification of the Russian Economy and Growth, October 2003

No. 112 **Wiegert, R.:** Russia's Banking System, the Central Bank and the Exchange Rate Regime, November 2003

No. 113 **Shi, S.:** China's Accession to WTO and its Impacts on Foreign Direct Investment, November 2003

No. 114 **Welfens, P.J.J.:** The End of the Stability Pact: Arguments for a New Treaty, December 2003

No. 115 **Addison, J.T.; Teixeira, P.:** The effect of worker representation on employment behaviour in Germany: another case of -2.5%, January 2004

No. 116 **Borbèly, D.:** EU Export Specialization Patterns in Selected Accession Countries, March 2004

EIIW Economic Policy Analysis

ISSN 1434-2510

No. 1 **Welfens, P.J.J.:** Globalisierung der Wirtschaft und Krise des Sozialstaats: Ist die Wirtschaftswissenschaft am Ende?, April 1997

No. 2 **Welfens, P.J.J.:** Nach der D-Mark kommt die E-Mark: Auf dem Weg zur EU-Währungsunion, Juli 1997

No. 3 **Welfens, P.J.J.:** Beschäftigungsförderliche Steuerreform in Deutschland zum Euro-Start: Für eine wachstumsorientierte Doppelsteuerreform, Oktober 1998

Fordern Sie den EIIW Newsletter an: www.euroeiiw.de

Please subscribe to EIIW Newsletter: www.euroeiiw.de

Weitere Beiträge von Interesse:
Titels of related interest:

GAVRILENKOV, E.; WELFENS, P.J.J.; WIEGERT, R. (2004): Economic Opening Up and Growth in Russia, Heidelberg and New York: Springer.

MC MORROW, K.; RÖGER, W. (2003), The Economic and Financial Market Consequences of Global Aging, Heidelberg and New York: Springer.

WIEGERT, R. (2003), Transformation, Wachstum und Wettbewerb in Rußland, Heidelberg und New York: Springer.

PETZOLD, L. (2003), Infrastrukturreform in Transformationsländern, Lohmar: EUL-Verlag.

LANE, T., ODING, N., WELFENS, P.J.J. (2003), Real and Financial Economic Dynamics in Russia and Eastern Europe, Heidelberg and New York: Springer.

BARFIELD, C.E., HEIDUK, G., WELFENS, P.J.J. (2003), Internet, Economic Growth and Globalization, Perspectives on the New Economy in Europe, Japan and the USA, Heidelberg and New York: Springer.

GRIES, T., JUNGMITTAG, A., WELFENS, P.J.J. (2003), Neue Wachstums- und Innovationspolitik in Deutschland und Europa, Heidelberg und New York: Springer.

ADDISON, J.T., WELFENS, P.J.J. (2003), Labor Markets and Social Security, Heidelberg and New York: Springer.

WELFENS, P.J.J., WIEGERT, R. (2002), Transformationskrise und neue Wirtschaftsreformen in Russland, Heidelberg und New York: Springer.

WESTERNHAGEN, N. VON (2002), Systemic Transformation, Trade and Economic Growth, Heidelberg and New York: Springer.

AUDRETSCH, D.B., WELFENS, P.J.J. (2002), The New Economy and Economic Growth in Europe and the US, Heidelberg and New York: Springer.

WELFENS, P.J.J. (2002), Interneteconomics.net, Heidelberg and New York: Springer.

BUNTE, H.-J., WELFENS, P.J.J. (2002), Wettbewerbsdynamik und Marktabgrenzungen auf Telekommunikationsmärkten, Heidelberg und New York: Springer.

JUNGMITTAG, A., WELFENS, P.J.J. (2002) Internet, Telekomliberalisierung und Wirtschaftswachstum, Heidelberg und New York: Springer.

SCHWARZ, A. (2001), Subventionen in Mittel- und Osteuropa, Lohmar: EUL-Verlag.

PELZEL, R.F. (2001), Deregulierte Telekommunikationsmärkte, Heidelberg und New York: Springer.

WELFENS, P.J.J. (2001), Stabilizing and Integrating the Balkans, Heidelberg and New York: Springer.

WELFENS, P.J.J. (2001), Internationalization of the Economy and Environmental Policy Options, Heidelberg and New York: Springer.

WELFENS, P.J.J. (2001), European Monetary Union and Exchange Rate Dynamics, Heidelberg and New York: Springer.

GAVRILENKOV, E., WELFENS, P.J.J. (2000), Restructuring , Stabilizing and Modernizing the New Russia, Heidelberg and New York: Springer.

TILLY, R., WELFENS, P.J.J. (2000), Economic Globalization, International Organizations and Crisis Management, Heidelberg and New York: Springer.

JUNGMITTAG, A., REGER, G., REISS, T. (Eds., 2000), Changing Innovation in the Pharmaceutical Industry. Globalization and New Ways of Drug Development, Heidelberg and New York: Springer.

GRAACK, C., WELFENS, P.J.J. (1999), Technologieorientierte Unternehmensgründungen und Mittelstandspolitik in Europa, Heidelberg und New York: Springer.

GRAACK, C., GRINBERG, R., WELFENS, P.J.J., YARROW, G. (Eds., 1999), Towards Competition in Network Industries – Telecommunications, Energy and Transportation in Europe and Russia, Heidelberg and New York: Springer.

ADDISON, J.T., AUDRETSCH, D.B., GRIES, T., GRUPP, H., WELFENS, P.J.J. (1999), Globalization, Economic Growth and Innovation Dynamics, Heidelberg and New York: Springer.

WELFENS, P.J.J. (1999), EU Eastern Enlargement and the Russian Transformation Crisis, Heidelberg and New York: Springer.

WELFENS, P.J.J. (1999), Globalization of the Economy, Unemployment and Innovation, Heidelberg and New York: Springer.

TILLY, R., WELFENS, P.J.J. (1999), Economic Globalization, International Organizations and Crisis Management, Heidelberg and New York: Springer.

WELFENS, P.J.J. et al. (eds., 1998), Competition in Network Industries: Telecommunications, Energy and Transportation in Europe and Russia, Heidelberg and New York: Springer.

PALKINAS, P.; EICHHORN, B., WELFENS, P.J.J. (eds., 1998), Europäische Währungsunion: Argumente und Fakten zur Euro-Debatte, Frankfurt/Main.

GLOEDE, K., STROHE, H.B. WAGNER, D., WELFENS, P.J.J. (eds., 1998), Systemtransformation in Deutschland und Rußland: Erfahrungen, ökonomische Perspektiven und politische Optionen, Heidelberg und New York: Springer.

AUDETSCH, D.B., ADDISON, J.T. GRUPP, H., WELFENS, P.J.J. (1998), Technological Competition, Employment and Innovation Policy in OECD Countries, Heidelberg and New York: Springer.

ADDISON, J.T., WELFENS, P.J.J. (eds., 1998), European Labor Markets and Social Security, Heidelberg and New York: Springer.

GRAACK, C. (1997), Telekommunikationswirtschaft in der Europäischen Union: Innovationsdynamik, Regulierungspolitik und Internationalisierungsprozesse, Heidelberg: Physica (award-winning book).

WELFENS, P.J.J., WOLF, H. (ed., 1997), Banking, International Capital Flows and Growth in Europe, Heidelberg and New York: Springer.

BÖRSCH-SUPAN, A., VON HAGEN, J., WELFENS, P.J.J. (eds., 1996,1997), Springers Handbuch der Volkswirtschaftslehre, Band 1 und 2, Heidelberg und New York: Springer.

WELFENS, P.J.J., YARROW, G. (eds., 1996), Telecommunications and Energy in Systemic Transformation, Heidelberg and New York: Springer.

GRAACK, C., WELFENS, P.J.J. (1996), Telekommunikationswirtschaft: Deregulierung, Privatisierung und Internationalisierung, Heidelberg und New York: Springer: (award-winning book).

WELFENS, P.J.J. (ed., 1996), European Monetary Integration, 3rd edition, Heidelberg and New York: Springer.

WELFENS, P.J.J. (ed., 1996), Economic Aspects of German Unification, 2. rev. and enlarged edition, Heidelberg and New York: Springer.

TILLY, R., WELFENS, P.J.J. (eds., 1995), European Economic Integration as a Challenge to Industry and Government, Heidelberg and New York: Springer.

WELFENS, P.J.J. (1995), Grundlagen der Wirtschaftspolitik, Heidelberg und New York: Springer.

JASINSKI, P., WELFENS, P.J.J. (1994), Privatization and Foreign Direct Investment in Transforming Economies, Aldershot: Dartmouth/Gower.

WELFENS, P.J.J. (1992), Market-oriented Systemic Transformation in Eastern Europe. Problems, Theoretical Issues and Policy Options, Heidelberg and New York: Springer.

KLEIN, M., WELFENS, P.J.J. (eds., 1992), Multinationals in the New Europe and Global Trade, Heidelberg and New York: Springer.

WELFENS, P.J.J. (1990), Internationalisierung von Wirtschaft und Wirtschafspolitik, Heidelberg und New York: Springer.

BALCEROWICZ, L., WELFENS, P.J.J. (1988), Innovationsdynamik im Systemvergleich. Theorie und Praxis unternehmerischer, gesamtwirtschaftlicher und politischer Neuerung, Heidelberg: Physica.