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# Trade Integration between Eastern and Western Europe: Policies Follow the Market

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## Abstract

*This paper examines to what extent Eastern Europe trade reorientation towards the West has been driven by market forces versus policies for regional integration. Hierarchical cluster analysis based on bilateral trade intensity reveals the convergence of regional trade structures to the pre-World-War II pattern. Estimates of the expected trade pattern of Eastern Europe with a grav - ity model predict continuing rising importance of the EU. Furthermore, the assessment of the welfare implications of preferential access to EU markets shows that beneficial effects of trade expansion are likely to outweigh possible*

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*distortions. Hence integration policies follow the facts created by the market. (JEL Classification: F14, F15)*

## I. The Issue

The transformation of the Central and Eastern European economies has eliminated the preference for intra-COMECON trade and many barriers to trade between Eastern and Western Europe. As a result, Central and Eastern European countries (CEECs) have reoriented their foreign trade towards Western Europe. Simultaneously, the institutional integration between the EU and Eastern Europe may also have driven the process of reorientation. The purpose of this research is to investigate whether this process has been primarily driven by market forces or institutional integration. The focus is on the following countries: Bulgaria, the Czech Republic, Hungary, Poland, Romania and the Slovak Republic.

First, I examine the occurred regional regrouping of countries within Europe by using hierarchical cluster analysis and dendrograms (tree diagrams) to identify functional regions characterised by the intensity of bilateral trade. This statistical approach reveals profound changes in trade orientation of the CEECs from East towards the West since 1989 and allows a comparison with trade orientation before World War II.

Second, an estimate of the “normal” regional pattern of trade of the CEECs is determined with a gravity model that expresses bilateral trade as a function of economic size of the countries (as a proxy of trade promoting factors) and the distance between them (as a proxy of trade restricting factors).

Third, different indices are applied to ascertain whether EU membership of the CEECs would have distortionary trade effects. The analysis reveals that trade integration between Eastern and Western Europe has already

## II. Trade Reorientation of the CEECs Since 1989

### *A. The Geographical Composition of CEEC Trade*

The year 1989 brought the artificial trade isolation of Central and Eastern Europe from Western Europe to an end. Since then, trade barriers have been dismantled (not completely yet) and East-West trade has increased dramatically. There has been a distinct regional shift of the trade of the CEECs to Western Europe as revealed in the trade statistics. This shift is also due to the collapse of trade between the CEECs since the Council for Mutual Economic Assistance (CMEA) disintegrated and the decreasing GNP level during the early period of transformation reduced import demand for goods.

The geographical composition of export flows of the CEECs is listed in Table 1 for three years: 1929 as representative of the pre World War II period, 1984 as representative of the time of the Iron Curtain and 1994 as the most current year with available data.[1] In 1984, the share of the 15 countries of the EU in the total trade of the CEECs was only 18 percent. In the same year the countries of the Eastern bloc were the important purchasers of goods and services of the CEECs, with the Soviet Union as the most important trading partner. This had changed drastically by 1994. The Soviet Union vanished as the main destination of the CEECs products. The succeeding 15 republics have attracted only a fraction of the former trade flows. For each Eastern European country, the other CEECs also lost in importance.

As a point of reference for the present trading pattern, a suitable historical trading pattern can shed light on the extent of the occurred changes. The trading pattern of the CEECs before World War II mirrors cultural affinity with the Western European Countries as all CEECs were characterised by market economies. Only the USSR followed a planned economy

## Table 1

## eographical Composition of Exports, 1929, 1984, 1994 (percentage of total)

| lgaria | | Czech Rep./ Slovak Rep. | | | | Hungary | | | Poland | | | Romania | | | all 6 CEECs[2] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 984 | 1994 | 1929 | 1984 | 1994 | | 1929 | 1984 | 1994 | 1929 | 1984 | 1994 | 1929 | 1984 | 1994 | 1929 | 1984 | 1994 |
| | | | | *Cz*[3] | *SL*[3] | | | | | | | | | | | | |
| **0.9** | **15.9** | **15.9** | **60.0** | **14.5** | **8.4** | **22.7** | **42.6** | **25.5** | **17.7** | **43.3** | **13.8** | **19.3** | **20.9** | **13.4** | **18.3** | **49.5** | **15.3** |
| 0.8 | 11.3 | 1.3 | 43.4 | 6.5 | 7.2 | 0.1 | 30.1 | 15.1 | 2.9 | 29.3 | 9.3 | 0.0 | 13.1 | 6.6 | 0.9 | 37.3 | 9.3 |
| **4.6** | **48.4** | **53.8** | **13.0** | **72.8** | **83.0** | **58.5** | **22.9** | **60.7** | **71.1** | **28.9** | **69.2** | **62.3** | **24.0** | **48.2** | **63.8** | **18.7** | **63.7** |
| 1.4 | 14.0 | 19.3 | 4.9 | 42.6 | 43.5 | 11.7 | 7.5 | 28.0 | 31.2 | 8.9 | 35.7 | 27.6 | 6.0 | 16.0 | 23.9 | 5.7 | 30.0 |
| 0.5 | 4.7 | 1.6 | 0.8 | 3.0 | 4.0 | 1.2 | 1.7 | 3.3 | 2.2 | 2.5 | 4.0 | 4.5 | 2.4 | 5.1 | 2.9 | 1.6 | 4.0 |
| 0.2 | 3.3 | 6.9 | 1.1 | 3.7 | 2.7 | 3.6 | 1.5 | 3.1 | 10.3 | 4.1 | 4.5 | 6.3 | 1.9 | 3.2 | 5.7 | 1.8 | 3.4 |
| 0.7 | 9.9 | 2.7 | 1.0 | 5.8 | 11.7 | 6.9 | 3.3 | 8.1 | 1.4 | 2.4 | 5.0 | 7.7 | 7.4 | 13.0 | 5.8 | 3.0 | 8.9 |
| 0.5 | 7.1 | 0.6 | 0.2 | 0.8 | 0.8 | 1.1 | 0.4 | 0.5 | 0.1 | 0.4 | 0.4 | 3.5 | 1.5 | 2.3 | 2.6 | 0.5 | 2.0 |
| 0.3 | 1.9 | 15.0 | 2.6 | 8.6 | 11.6 | 30.4 | 5.3 | 9.9 | 10.5 | 2.1 | 2.2 | 9.4 | 1.5 | 1.6 | 15.6 | 2.4 | 6.0 |
| **0.3** | **7.3** | **7.2** | **0.4** | **2.9** | **4.5** | **1.1** | **2.7** | **4.0** | **1.1** | **2.2** | **3.4** | **0.2** | **5.6** | **3.1** | **2.3** | **2.2** | **4.2** |
| **4.2** | **28.4** | **23.1** | **26.6** | **9.8** | **4.1** | **17.7** | **31.8** | **9.8** | **10.1** | **25.6** | **13.6** | **18.2** | **49.5** | **35.3** | **15.6** | **29.6** | **16.8** |

;aria, Czech Republic, Slovak Republic, Hungary, Poland, Romania, Ex-Soviet Union and Ex-Yugoslavia.
[reland and Portugal for 1929.
ıge.
)4 excludes Czech-Slovak trade.
1939], IMF, Direction of Trade Statistics (various issues), UN, International Trade Statistics Yearbook (various issues).

graphical proximity. Bilateral trade occurred according to key factors that will become again decisive once the countries have fully established their market economies.[2] However, the time before World War II was not distortion-free and a comparison to the eighties and nineties requires caution. In the twenties and thirties, the Soviet Union still suffered from the effects of the civil war and was isolated from the other countries. The borders of the Soviet Union, Poland and Germany have changed in the wake of World War II. Furthermore, the relative strength of Western countries has changed over the decades, most noticeable for the UK and Japan. Given these qualifications, the year 1929 was selected for a snapshot of trading before the Great Depression of 1933.

Table 1 shows that there is an astonishing correlation in the geographical composition of trade of the CEECs between the year 1929 and 1994. In 1994 as in 1929, the 15 countries of the EU accounted for two thirds of the exports of the six CEECs. The extent of the reorientation to the pre World War II pattern varies for the different Eastern European countries, but the overall conclusion for the CEECs is the same.

### *B. Reshaping of Functional Regions in Europe*

The reorientation of CEEC trade as described in the preceding section has reshaped the regional trading patterns in Europe. In this context, regions are defined to include countries whose trade links to other members of the group are stronger than their links to non-members. In regional science, this is described as the concept of functional regions. In other words, functional regions are characterized by intra-regional interactions that are stronger than inter-regional interactions.[3] Regions matter since

2 Collins and Rodrik [1991] combine trade data from the pre World War II period and

their configuration often determines the political decision making. The relative intensity of bilateral merchandise trade reflects the degree of the mutual dependence of the goods markets and can be used as a criterion for the identification of regions.

A suitable measure for trade intensity is the share of country $i$'s exports destined to country $j$, $X_{ij}/X_i$, with $X_{ij}$ as country $i$'s exports to country $j$ and $X_i$ as country $i$'s total exports.[4] The trading relationship between two countries is characterised by two values: $(X_{ij}/X_i)$ and $(X_{ji}/X_j)$, of which the minimum is chosen to represent the relationship. A high value means that bilateral trade influences the allocation of resources in both economies. A large economy might dominate a region and all surrounding smaller economies will have high bilateral trade shares $(X_{ij}/X_i)$ concerning the exports to the large country whereas the trade from the large country's point of view, $(X_{ji}/X_j)$ will be small. Choosing the lower of both measure ensures that the two countries are interdependent at least up to the point represented by this value Amelung [1992] .[5]

A hierarchical cluster analysis can be used to identify regions based on the intensity of bilateral trade links. The first step of hierarchical cluster analysis is the calculation of the "similarity matrix" which gives the values of $(X_{ij}/X_i)$ and $(X_{ji}/X_j)$, labeled $a_{ij}$ and $a_{ji}$; for each pair of countries.

The second step links the countries into "clusters" or "strong components" through a single-linkage algorithm.[6] The procedure starts by linking

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to measure bilateral and multilateral integration are discussed in Haass and Peschel [1982].

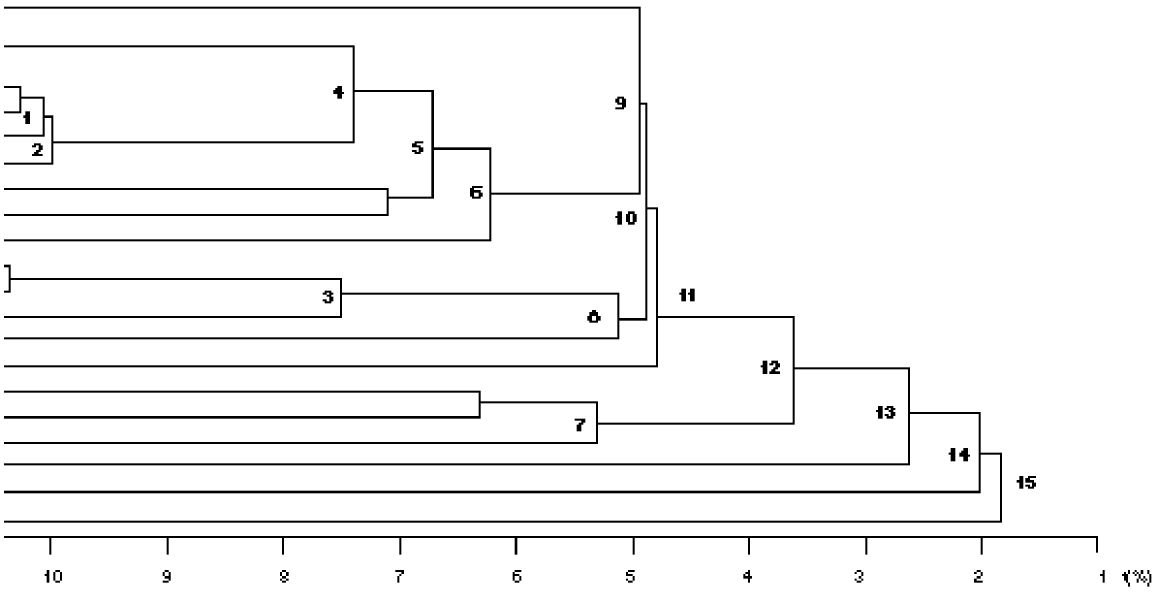
4. For this part of the analysis one could also employ import shares or trade shares instead of export shares. However, the alternative index in the appendix is derived on the basis of export shares. To facilitate comparison between the different indices, I also selected export shares for the analysis in this section.

the countries with the largest $a_{ij}$ or $a_{ji}$ value. A threshold $t$ for min($a_{ij}$, $a_{ji}$) is progressively reduced and a link between countries is inserted when both values $a_{ij}$ and $a_{ji}$ are larger than $t$. With decreasing $t$, a cluster of countries will be linked to single countries or other clusters until all countries are united into one cluster. It is important to note that the similarity of groups is determined only by their closest members.

The results of the hierarchical cluster analysis of bilateral trade flows for 1929, 1984 and 1994 are described by Dendrograms (tree diagrams) (Figures 1 to 3). At the x-axis, the magnitude of the threshold value t is depicted. Additionally, the pairs of countries that lead to links between existing clusters are listed below the dendrograms. In 1984, three functional regions could be identified within Europe: First, five members of the Council of Mutual Economic Assistance (East Germany, USSR, Czechoslovakia, Bulgaria, Poland and Hungary),[7] second, the four Scandinavian countries (Sweden, Norway, Finland and the EC-member Denmark), third, the core members of the EC (Benelux, the UK, Italy, France and West Germany). Japan, the USA and Canada are linked to the functional bloc of the Western European countries before a link is established between Western and Northern Europe or between Western and Eastern Europe. The USA and Canada are very closely linked and can serve as a point of reference for functional regions in Europe.

The shape of the dendrogram from 1994 shows the effects of the breakdown of trade between the Eastern European countries. The functional region of Eastern Europe – clearly apparent in the dendrogram from 1984 – has disintegrated. While the Czech and the Slovak Republic are of course closely linked, these two countries, Poland and Hungary join the extended functional bloc of Western European countries at a low level of economic integration. Russia is first linked to Finland rather than to another CEEC.

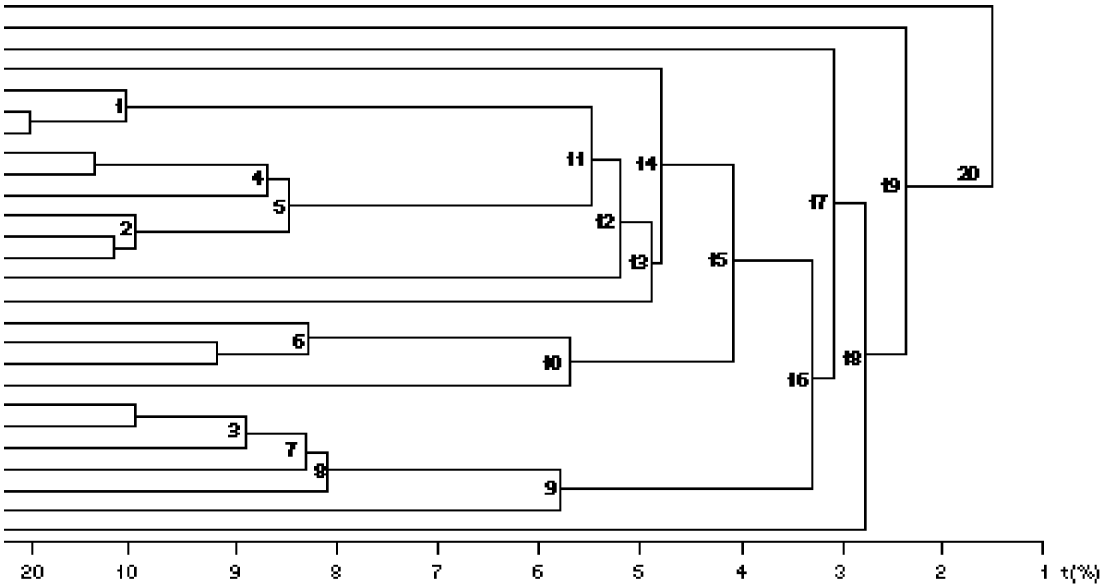
## Figure 1: Dendrogram of Functional Regions 1929




owing countries are united as strong components:

um – Netherlands
any – Netherlands
a – Hungary
any – USA
e – Switzerland
6. United Kingdom – USA
7. Norway – Sweden
8. Austria – Romania
9. Japan – USA
10. Czechoslovakia – Germany
11. Austria – Poland
12. Denmark – Germany
13. Germany – USSR
14. Finland – Sweden
15. Bulgaria – Germany

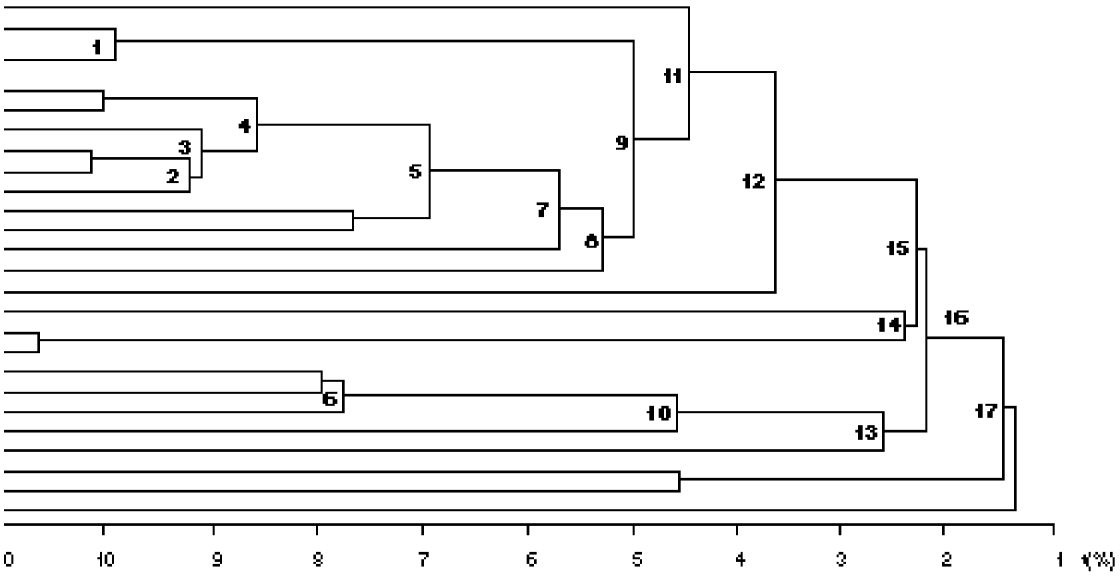
## Figure 2: Dendrogram of Functional Regions 1984




e following countries are united as strong components:

Japan – USA
France – Italy
Czechoslovakia – USSR
Netherlands – United Kingdom
W. Germany – Netherlands
Bulgaria – Sweden
Bulgaria – USSR
8. Poland – USSR
9. Hungary – USSR
10. Finland – Sweden
11. United Kingdom – USA
12. W. Germany – Switzerland
13. Austria – W. Germany
14. Ireland – United Kingdom
15. Sweden – United Kingdom
16. Finland – USSR
17. France – Spain
18. Poland – Romania
19. Portugal – Spain
20. Greece – Italy

## Figure 3: Dendrogram of Functional Regions 1994




llowing countries are united as strong components:

an – USA
nce – United Kingdom
nce – Italy
gium-Lux. – France
nce – Spain
nmark – Sweden

7. Austria – Germany
8. Germany – Switzerland
9. United Kingdom – USA
10. Finland – Sweden
11. Ireland – United Kingdom
12. Austria – Hungary

13. Finland – CIS
14. Czech Rep. – Poland
15. Austria – Czech Rep.
16. Sweden – United Kingdom
17. Greece – Italy
18. Bulgaria – Romania

Portugal, Austria, Switzerland, USA, Canada, Japan and Ireland before any of the Eastern European or Scandinavian countries. Sweden, Norway, Finland and Denmark constitute a distinct Scandinavian functional region and are linked to the Western Europe bloc only after the Eastern European countries.

The situation in 1929 broadly resembles that of 1994. A core region consists of France, Belgium-Luxembourg, the Netherlands and Germany, and a larger region includes this core region, Switzerland, Italy, the UK, the USA, Canada and Japan. Austria, Czechoslovakia, Hungary and Romania are linked to this functional region before the Scandinavian countries. In 1929, the Scandinavian functional region included Denmark, Sweden and Norway, but not Finland. Thus, the dendrograms reveal a convergence of the pattern of functional regions within today's Europe to the one which held for Europe before World War II. The dendrogram of 1984 differs through the pronounced existence of a functional region of the Eastern European countries from the dendrograms of 1929 and 1994. Hierarchical cluster analysis therefore exposes the renaissance of the old functional regions within Europe.

## III. Expected Long-Term Pattern of Trade of the CEECs

The trading pattern of the pre-World War II period provides a useful point of reference for intra-European trade under market economy conditions, but given substantial differences in political mapping between the two periods such comparison should not be overinterpreted. A gravity model – based on current economic data – can better approximate the expected or "normal" pattern of trade of the CEECs once the adjustment problems of the transformation period have been overcome.

between them. Gravity models were developed in the early 1960s as a framework for the empirical analysis of trade phenomena Tinbergen [1962]; Pöyhönen [1963]; Linnemann [1966] . Although the theoretical foundation of the gravity model were sometimes called into question, its robustness and high explanation power in empirical applications are undisputed c.f. Deardorff [1984] . Recently, Deardorff [1995] showed that even a simple gravity equation can be derived from standard trade theories. Gravity models have been widely used to test a host of hypotheses and have not lost their attraction over the decades.[8] The gravity model explains bilateral trade as a function of the "size" of the two countries and "distance". "Size" is reflected in the national product and GNP per capita of both the supplier country and of the destination country and captures supply potential and absorptive capacity. "Distance" captures all factors that restrict (or stimulate) trade by increasing (or reducing) transaction costs of trade between the two countries. Trading restricting factors include transport costs and protectionist measures; trade stimulating factors include regional preference zones, a common border, a common language, cultural similarities and historical links.

Our estimates of the potential trade of the CEECs are based on recent work by Schumacher [1995]. Schumacher's coefficient estimates are derived from bilateral trade data among 22 OECD countries and between the 22 OECD countries and 48 additional partner countries.[9] The coefficient estimates are then combined with the explanatory variables of the CEECs to derive the expected "normal" trade flows between the CEECs and all

8. c.f. Langhammer [1989]; Havrylyshyn and Pritchett [1991]; Gros and Dautrebande [1992], Winters and Wang [1994], Frankel [1993] and Frankel, Stein and Wei [1995].
9. The coefficients of the equation are derived with the OLS estimation procedure. To obtain consistent estimates, observations with zero values are replaced by very small

partner countries. Besides GNP and geographical distance, Schumacher's full model includes various regression variables like a shared language, colonial ties, membership of a preference zone and a common border. Schumacher concludes, however, that these variables provide little additional explanatory power.[10] His preferred regression includes only national product, per capita income and geographical distance.

For the exports of OECD countries, the following equation is derived:

$$\ln X_{ij} = -13.07 + 0.92 \ln Y_i + 0.38 \ln \frac{Y_i}{P_i} + 0.79 \ln Y_j + 0.17 \ln \frac{Y_j}{P_j} - 0.89 \ln D_{ij}$$

For the imports of OECD countries, the corresponding equation is:

$$\ln X_{ij} = -13.14 + 1.00 \ln Y_i + 0.18 \ln \frac{Y_i}{P_i} + 1.20 \ln Y_j - 0.24 \ln \frac{Y_j}{P_j} - 0.90 \ln D_{ij}$$

with:

- $X_{ij}$ Exports from country $i$ to country $j$
- $Y_i$ GNP of supplier country $i$
- $P_i$ Population of supplier country $i$
- $Y_j$ GNP of destination country $j$
- $P_j$ Population of destination country $j$
- $D_{ij}$ Distance in miles between the economic centre of country $i$ and $j$

All estimated coefficients except for $Y_j/P_j$ in the import equation are sig-

10. An extended discussion concerning the significance of various additional variables and non-linearity in the distance variable for the gravity equation can be found in the work by Schumacher [1995, 1996] and in an analysis by Frankel [1993].
11. For the export equation, $R^2$ is 0.82 instead of 0.84 for the equation with all variables; for the import equation, $R^2$ is 0.49 instead of $R^2 = 0.50$ for the equation with all variables. The regression equation is also applied to individual countries to reflect better

nificant at the 99 per cent level.[11] They confirm the analogy to the gravitational law of physics: Exports or imports between two countries are larger, the higher their national products and the smaller the distance between them. A higher level of per capita income results also in higher bilateral trade flows.[12] The negative coefficient on $Y_j/P_j$ in the import equation may reflect collinearity between total and per capita income (the coefficient on total GNP is greater than unity).

Table 2 reports the resulting estimates of the expected long-term trade pattern of the CEECs. It is important to note that Schumacher's coefficient estimates were derived through a regression analysis of the trade of the OECD countries with other OECD and developing countries. In using these estimates, it is assumed that the trading relationships of the CEECs are determined by the same factors of the OECD countries. Employing these coefficient estimates, long-term equilibrium exports and imports of each CEEC in trade with 84 partner countries are estimated.[13] Table 2 and Appen-

12. Per capita income can be interpreted as an indirect representation of the level of human capital and therefore of factor endowment c.f. Schumacher [1995] .

13. The 84 countries consist of the 70 countries used by Schumacher for his regression estimates, the CEECs, the Baltic Republics, the Russian Federation, Belarus, Ukraine, Kazakstan and Slovenia. The regression was estimated with data on GNP per capita and population for the years 1988 to 1990 taken from the World Bank's Development reports. To capture the actual weight of the countries' GNP, the latest World Bank's GNP figures of the year 1994 from the World Bank Atlas 1996 were adjusted to the price level of 1990 and employed for the estimation of the trading pattern of the CEECs. The inflation adjustment is necessary to maintain the relative weight of GNP and distance on bilateral trade flows. Bikker [1987] stated that a gravity model will exhibit money illusion unless predictions are made at the same prices as used in the estimations. The estimated volumes of trade are subsequently "inflated" from the price level of 1990 to the level of 1994 to facilitate the comparison to the

## Table 2

## "Normal" Geographical Composition of Trade-Exports

| ulgaria | | Czech Rep./ Slovak Rep. | | | | Hungary | | Poland | | Romania | | all 6 CEECs[1] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | expected | Cz | | SL | | 1994 | expected | 1994 | expected | 1994 | expected | 1994 | expected |
| | | 1994[2] | expected | 1994[2] | expected | | | | | | | | |
| | **8.6** | **14.5** | **5.5** | **8.4** | **7.8** | **25.5** | **8.2** | **13.8** | **8.2** | **13.4** | **8.9** | **15.3** | **7.9** |
| | 3.9 | 6.5 | 2.3 | 7.2 | 2.5 | 15.1 | 3.4 | 9.3 | 5.2 | 6.6 | 4.8 | 9.3 | 3.7 |
| | **66.3** | **72.8** | **77.2** | **83.0** | **75.4** | **60.7** | **71.5** | **69.2** | **69.0** | **48.2** | **64.3** | **63.7** | **70.6** |
| | 16.0 | 42.6 | 30.3 | 43.5 | 18.9 | 28.0 | 19.8 | 35.7 | 19.9 | 16.0 | 15.8 | 30.0 | 20.1 |
| | 8.8 | 3.0 | 9.6 | 4.0 | 8.0 | 3.3 | 8.9 | 4.0 | 9.2 | 5.1 | 8.7 | 4.0 | 8.9 |
| | 6.4 | 3.7 | 6.8 | 2.7 | 5.6 | 3.1 | 6.4 | 4.5 | 7.0 | 3.2 | 6.4 | 3.4 | 6.4 |
| | 12.9 | 5.8 | 7.7 | 11.7 | 9.0 | 8.1 | 10.2 | 5.0 | 8.0 | 13.0 | 11.1 | 8.9 | 9.8 |
| | 2.1 | 0.8 | 0.5 | 0.8 | 0.6 | 0.5 | 0.8 | 0.4 | 0.7 | 2.3 | 1.9 | 2.0 | 1.1 |
| | 4.0 | 8.6 | 6.1 | 11.6 | 19.5 | 9.9 | 9.2 | 2.2 | 4.5 | 1.6 | 3.8 | 6.0 | 7.8 |
| | **7.4** | **2.9** | **4.9** | **4.5** | **4.8** | **4.0** | **6.0** | **3.4** | **6.9** | **3.1** | **7.9** | **4.2** | **6.3** |
| | **6.5** | **2.2** | **3.8** | **0.5** | **3.9** | **1.9** | **5.0** | **3.6** | **5.8** | **5.7** | **7.2** | **3.2** | **5.4** |
| | **11.2** | **7.0** | **8.6** | **3.2** | **8.1** | **8.3** | **9.3** | **10.8** | **10.1** | **28.5** | **11.7** | **13.6** | **9.8** |

aria, Czech Republic, Slovak Republic, Hungary, Poland, Romania, Ex-Soviet Union and Ex-Yugoslavia. Asia: Japan, , India, Sri Lanka, Thailand, Malaysia, Singapore, Indonesia, Philippines, Korea, Hong Kong.
ge.
or 1994 excludes Czech-Slovak trade.
ary Fund [1995], own calculations.

dix Table 2 list total exports and imports for each CEEC and the shares of the main trading partner.

The analysis indicates that we should expect a continuing shift of the CEECs' trade orientation towards the EU. As the summary columns for the 6 CEECs reveal, the expected EU share is on average almost 71 per cent of the total CEEC exports and 72 per cent of total imports (Appendix Table 2). In 1994, the actual share was almost 64 per cent of the exports and 60 per cent of the imports. The expected percentage share of Eastern Europe (consisting of the CEECs, the successor states of the Soviet Union and Slovenia) is less than 8 per cent for CEEC exports and less than 5 per cent for imports. In 1994, the actual shares were around 15 per cent for the exports and almost 23 per cent of the imports.[14]

However, some qualifications are necessary. The gravity model predicts an average share of less than 3 per cent of total CEECs' imports for the successor states of the Soviet Union. Considering the present volume of energy imports from the Russian Federation, this value is probably too low. The omission of an important variable (natural resource endowment) inevitably restricts the predictive power of the gravity model.

Another qualification concerns the relative GNP level among the countries. The estimates for the potential volume of trade are biased downwards due to the presently depressed levels of the GNP of the CEECs during the transformation period. Schumacher [1995] accounts for the high skill level of CEEC population by increasing their GNP threefold, based on a regression of per capita income on human capital in market economies. The adjustment of per capita GNP to reflect expected income convergence especially affects the relative importance of trade among the CEECs. I use three different scenarios to gauge the trade impact of the CEECs' expected catching up in per capita income.

cent compared to 8 per cent under the assumption of current GNP levels. The 15 countries of the EU attract 64 per cent rather than 69 per cent of CEEC exports. In Scenario II the GNP of the Eastern European countries is tripled whereas the GNP of all other countries is kept constant. In the final Scenario III, the GNP of the Eastern European countries is tripled, the GNP of the developing countries is doubled, and the GNP of the developed countries remains constant. Scenario III models the hypothesis of the global convergence. Scenarios II and III lead to very similar shares of different regions in CEEC exports: Eastern Europe accounts for roughly 19 per cent, and the EU for 57 per cent (Scenario III) to 60 per cent (Scenario II).

These experiments with different relative GNPs indicate that the EU will also maintain its predominant position in trade of the CEECs in the case of a "rapid catching up" of the CEECs and of the developing countries. A trebling of the GNP requires a growth rate of 6 per cent for almost 20 years. If EU countries continue to grow at a moderate rate of 2 per cent, say, then even higher growth rates are required for the CEECs to close the income gap. However, until now the leading transformation countries did not show signs of settling on growth paths with sustained growth rates of around 8 per cent. Therefore, scenario I seems to represent in a realistic way the expected normal trading pattern of the CEECs after a catching up period. Collins and Rodrik [1991] also introduce a catch up scenario in their analysis based on pre World War II trade data and comparator countries by assuming full convergence i.e. that the CEECs reach the average EU level of per capita income. This scenario would require growth rates above 8 per cent for 20 years and is regarded as an optimistic extreme by the authors.

Other recent studies also use gravity models to estimate the potential volume and pattern of trade between Eastern and Western Europe Havrylyshyn and Pritchett [1991]; Gros and Dautrebande [1992]; Winters and

share of Germany in CEECs exports in 1994 was substantially larger than predicted by the gravity model. It has been suggested that special cultural and historical links between the CEECs and Germany might have led to lower transaction and information costs for partners of these countries.

Herrmann et al. [1982] analyse the different types of communication costs and the effects on international trade. Following the approach of Herrmann et al., the special German position may be explained by comparatively low communication costs. Communication costs in this context consist of the costs related to all the activities required to send and receive information needed about products, companies and markets in order to sell goods. A company that wants to export its product to a foreign market needs information about the characteristics and preferences of the target group as well as about the level competition and supply structure in the country. This set of information has to include knowledge about commercial customs, cultural norms and personal value systems. A high level of cultural affinity between the home country of the exporter and the target country will lead to lower communication costs.

It is difficult to identify communication costs that are substantially lower in trade between the CEEC and Germany than in trade between the CEECs and other West European countries. One possible candidate would be language barriers. German was the only “Western” language that could be learned and practised freely in Eastern Europe before 1989 because the German Democratic Republic was a socialist country. However, no evidence is detected in a recent survey of Hungarian exporters of manufactures Szalavetz and Lücke [1997] . Similarly, special links between East German and CEEC enterprises had been severed by 1991 and cannot have contributed to the prominent role of trade with Germany in recent years.

At least in part, the prominent position of Germany may be explained by

## IV. Trade Effects of EU Membership for the CEECs

The preceding sections have demonstrated that the reorientation of CEEC trade towards Western Europe is largely due to the elimination of politically motivated barriers to East-West trade and of the preference for trade among CMEA member countries under the central planning system. This suggests that CEEC trade reorientation is essentially market-driven and represents a return to normalcy.

However, from a very early stage, market-driven trade reorientation has been complemented by trade policy measures that promoted regional integration between the European Union and the CEECs. The Europe Agreements between the EU and the CEECs have provided a framework for a progressive liberalisation of industrial imports from the CEECs with the long-term option of EU membership. The integration of the CEECs into a regional trading bloc of the size of the EU may well influence their trade flows both with EU members and non-members. The standard theory of economic integration analyse the effects of increased trade on the goods and factor markets and states that trade can act as a substitute for factor mobility leading to a convergence of factor prices between countries c.f. Hine [1994] . The factor price equalisation theorem rests, however, on highly restrictive assumptions like common technology and perfect competition in perfect markets. The focus of the following analysis will be based on trade flows between countries. Customs union theory assesses the world welfare effects of a regional bloc in terms of trade creation (through efficiency gains inside the bloc) and trade diversion (efficiency loss through displacing efficient external suppliers). Besides the static effects of economic integration that are analysed with the standard customs union theory, dynamic effects may represent additional gains for the member countries. Dynamic effects

to be low compared with trade creation. A very rough, but simple and widely used rule of thumb relates to the share of intraregional trade in the bloc's total trade prior to integration. Following Krugman [1991a, 1991b] a group of countries with a large share of intra-bloc trade (often referred to as a share of at least 50 per cent) is called a "natural" free trade area. The six CEECs trade on average around 60 per cent of their exports and imports with the EU. From the perspective of the CEECs, these countries are part of the natural grouping with the EU. However, this rough rule of thumb is fairly vague and cannot be used from the perspective of the EU, since the CEEC share of EU trade is less than five per cent.

### *A. Complementarity of Trade Structure*

The expectations of the CEECs about the benefits of joining the EU rest on the hope for increased export and employment opportunities through secure unrestricted access to a large market.[15] These hopes can only be fulfilled if the CEECs offer a competitive supply in goods facing an income-elastic demand in the EU. Furthermore, commodity complementarity between CEEC and EU supply would ensure that both groups gain from the regional arrangement and that protectionist vested interests can be contained. Therefore, a measure of trade complementarity can provide some indication about the odds of successful integration.

Michaely [1996] proposes the index

$$C_{jk} = 1 - (\Sigma \left| m_{ik} - x_{ij} \right|) / 2$$

with $x_{ij}$ as the share of good $i$ in total exports of country $j$
and $m_{ik}$ as the share of good $i$ in total imports of country $k$.

The index is zero when goods exported by country $j$ are not imported by

on the assumption that existing trade barriers do not heavily distort the structure of trade between the countries. Otherwise the index cannot yield a reasonable indication of the likelihood of successful integration. A further caveat is necessary for the case of a small country with a limited range of traded goods. If this country can sell all its exports under more favourable terms to a large partner country, a regional free trade agreement might be successful even though the structure of the exports of the small country does not fit well the structure of the imports of the larger country.

The index has been calculated for Bulgaria, the Czech Republic, Hungary, Poland and the Slovak Republic in relation to the EU for 1990 through 1994.[16] For each bilateral relationship, two index values have been computed: one for the complementarity of the exports of each CEEC with EU imports (Table 3) and the other for the complementarity of the imports of each CEEC with EU exports (Table 4). The index values for CEEC exports and EU imports remain relatively stable over the years except for Bulgaria with a slightly decreasing value. The index values for CEEC imports and the EU exports increase gradually over the years (from an already high level). With progressing transformation, the CEECs increasingly demands sophisticated capital goods as exported by the EU.

It is interesting to compare the Eastern integration into the EU with other regional integration schemes. Michaely [1996] calculated the index for several proposed agreements like the extension of NAFTA to the rest of Latin America (the so called American Free Trade Area – AFTA) and Asia Pacific Economic Co-operation (APEC) as well as for existing successful and unsuccessful arrangements at the time when they were formed. The index values in Table 5 show a marked difference between successful and unsuccessful trading agreements. The six founding members of the EEC had an average trade complementarity index of 0.53, and the free trade area between Cana-

Table 3

Trade Complementarity Index: Exports of the CEECs, Imports of the EU

| | 1990 | 1991 | 1992 | 1993 | 1994 | 1990-1994 average |
|---|---|---|---|---|---|---|
| Bulgaria | 0.49 | 0.44 | 0.45 | 0.43 | 0.42 | 0.45 |
| Hungary | 0.56 | 0.54 | 0.55 | 0.55 | 0.54 | 0.55 |
| Poland | 0.49 | 0.45 | 0.46 | 0.47 | 0.48 | 0.47 |
| Czechoslovakia | 0.53 | 0.56 | 0.58 | | | 0.56 |
| Czech Rep. | | | | 0.57 | 0.60 | 0.59 |
| Slovak Rep. | | | | 0.47 | 0.46 | 0.46 |
| CEEC average | 0.52 | 0.50 | 0.51 | 0.50 | 0.50 | 0.50 |

Source: Own calculations.

Table 4

Trade Complementarity Index: Imports of the CEECs, Exports of the EU

| | 1990 | 1991 | 1992 | 1993 | 1994 | 1990-1994 average |
|---|---|---|---|---|---|---|
| Bulgaria | 0.66 | 0.65 | 0.68 | 0.68 | 0.69 | 0.67 |
| Hungary | 0.72 | 0.75 | 0.77 | 0.79 | 0.77 | 0.76 |
| Poland | 0.68 | 0.71 | 0.73 | 0.74 | 0.75 | 0.77 |
| Czechoslovakia | 0.62 | 0.68 | 0.72 | | | 0.68 |
| Czech Rep. | | | | 0.73 | 0.77 | 0.75 |
| Slovak Rep. | | | | 0.72 | 0.73 | 0.72 |
| CEEC average | 0.67 | 0.70 | 0.72 | 0.73 | 0.74 | 0.71 |

Source: Own calculations.

Table 5

Trade Complementarity Indices for Selected Trade Arrangements

| Trading arrangement | Index | Trading arrangement | Index |
|---|---|---|---|
| *Successful arrangements* | | *Recent arrangements* | |
| EEC (6) | 0.53 | NAFTA | 0.56 |

da and the USA an value even of 0.64.[17] By contrast, unsuccessful arrangements had much lower values, such as for LAFTA (0.22) and the Andean pact (Bolivia, Colombia, Ecuador, Peru and Venezuela) 0.07.

The corresponding average value for the Eastern enlargement of the EU is the order of 0.61 (as the average of 0.51 for the trade complementarity of CEECs exports and EU imports and of 0.71 for the trade complementarity of EU exports and CEECs imports).

Thus, the complementarity of the commodity composition of CEECs and EU trade is broadly comparable to the original EEC of 6 and the Canada-US free trade area. However, there is the possibility of indices to be biased upwards due to data problems since the trade statistics from important partner countries (like the republics of the former USSR) are not included in the used COMTRADE database. On the other hand, unrestricted access to the large EU market will allow the CEECs to market their limited range of export products under more favourable conditions than today. On balance, therefore, the accession of the CEECs to the EU will provide opportunities for trade expansion and will benefit both the CEECs and the EU.

### *B. Is CEEC-EU Integration Harmful for Third Countries?*

The commodity composition of trade prior to integration has also been used to define a “natural” regional grouping differently as Krugman does Kreinin and Plummer [1994] . If the composition of trade remains largely unchanged after integrating, the new economic bloc is a “natural” one. The composition of trade is expected to remain unchanged if the ranking of a country’s industries by revealed comparative advantage (RCA) in trade with members of the proposed economic bloc (which would tend to increase because of its preferential status) does not differ substantially from the

This analysis is applied here from the perspective of the CEECs.[18] RCA indices are calculated for 260 commodity groups at the three-digit level of the Standard International Trade Classification (SITC).[19] For each CEEC, commodity groups are ranked, first by their RCA values in trade with all partners, and second by their RCA values with respect to the regional bloc that would include the CEECs and the EU. It is assumed that the ranking of the industries by their export performance indicates their ranking by the country's comparative advantage. If the RCA ranking in regional trade differs substantially from that in total trade, bloc formation is expected to lead to trade diversion.

Revealed comparative advantage is defined as:

$$RCA_1 = \frac{\frac{X_{ij}}{X_j}}{\frac{X_{iw}}{X_w}} = \frac{\frac{\text{exports of commodity } i \text{ by country } j}{\text{total exports by country } j}}{\frac{\text{world exports of commodity } i}{\text{total world exports}}}$$

with respect to all trading partners, and as

$$RCA_2 = \frac{\frac{X_{ij-to(EU+CEECs)}}{X_{j-to(EU+CEECs)}}}{\frac{X_{i(EU+CEECs)-to(EU+CEECs)}}{X_{(EU+CEECs)-to(EU+CEECs)}}}$$

$$= \frac{\frac{\text{exports of commodity } i \text{ by country } j \text{ into (EU + CEECs)}}{\text{total exports by country } j \text{ into (EU + CEECs)}}}{\frac{\text{into (EU + CEECs) exports of commodity } i \text{ into (EU + CEECs)}}{\text{total (EU + CEECs) exports into (EU + CEECs)}}}$$

18. This approach could be also applied for the existing EU countries to analyse the

with respect to the proposed regional grouping, consisting of the EU and the CEEC.

An RCA1 of unity implies that the share of a commodity in a country's total exports equals the share of the commodity in total world exports. An RCA1 above 1 states that the commodity has a higher proportion in a country's export than in its world exports and suggests that the country has a comparative advantage in this product. In the following, the proposed regional bloc consisting of the present 15 EU countries and the CEECs is termed "EUplus". An RCA2 above unity implies that this commodity accounts for a larger share in the country's exports to EUplus than in the exports to all the member countries of EUplus together.

The similarity between the commodity rankings in terms of RCA1 and RCA2 is measured by the Spearman rank correlation coefficient (Table 6). The coefficients have been calculated for the years 1990 to 1994, with only modest fluctuations in the results. All CEECs have correlation coefficients above 0.65 and Bulgaria, Poland and the Slovak Republic even above 0.75, well in excess of the critical value of 0.5 suggested by Kreinin and Plummer. Hence, commodity composition of intraregional trade, which would be privileged, does not differ substantially from that of total trade. Therefore, regional integration benefiting intra-group trade is unlikely to lead to substantial distortions. In this sense, Bulgaria, the Czech Republic, Hungary,

Table 6
Spearman Rank Correlations Coefficients for the CEECs Between RCAs Relative to Total World and Relative to an Extended EU

| | Bulgaria | Czechoslovakia | Hungary | Poland |
|---|---|---|---|---|
| 1990 | 0.80 | 0.78 | 0.78 | 0.77 |

Poland and the Slovak Republic and the present 15 countries of the EU constitute a natural grouping.

## V. Conclusions

As a consequence of their economic transformation, the CEECs have substantially redirected their foreign trade from Central and Western Europe towards Western Europe and specially the EU. Judging by the intensity of their bilateral trade flows, Hungary, Poland, the Czech Republic and the Slovak Republic are already part of the economic region of Western Europe. Estimates of the expected "normal" trade patterns of the CEECs under market economy conditions suggest that the EU may become even more important, especially to Bulgaria and Romania whose reforms lag behind the other four CEECs.[20]

Policies for integration between the EU and the CEECs have started with the Europe agreements providing a framework for stepwise liberalisation and are ultimately directed towards EU membership. The presented analysis has found that third countries' trade has little to fear from full EU liberalisation of CEECs-EU trade. Trade diversion effects are likely to be low compared to trade creation benefits leading to growth and therefore also to increased trade potential for third countries.

The high share of intra-regional trade in total trade, the complementarity of trade structures in terms of CEEC exports (imports) with the EU imports (exports) and the conformity between the RCA structure of trade with the EU on the one hand and the world on the other suggest the existence of a "natural" trading partnership including the EU and the CEECs. In this sense, integration policies follow the facts created by the market. Although the factual economic integration is less impressive for Bulgaria and Romania, the

## Appendix

The results of the analysis presented in Section II.B. on the Reshaping of Functional Regions in Europe depend on the index applied to derive the similarity matrix and on the algorithm used to link the countries in the cluster analysis. This Appendix discusses alternatives to the approaches employed in the main body of this paper.

### *A. An Alternative Trade Index*

The so called "actual trade intensity index" was developed by Kojima [1964]. The index is defined as the share of country $i$'s exports destined to country $j$ relative to the share of country $j$'s imports in total world imports net of country's $i$ imports. The actual trade intensity index is expressed as:

$$I_{ij} = (X_{ij}/X_i)/[M_j/(M_w - M_i)]$$

with $X_{ij}$ as country $i$'s exports to country $j$, $X_i$ as country $i$'s total exports and $M_i$, $M_j$, $M_w$ as the imports of countries $i$ and $j$ and of the world. Kojima's index has the advantage of correcting for the size of country $j$. A certain ratio of $X_{ij}$ to $X_i$ renders a higher index value, the smaller the share of country $j$ in world import.

However, this approach distorts the extent of economic integration through trade intensity. For example, Kojima's index would indicate that Germany and Liechtenstein are highly integrated. While it is true that the performance of the German economy determines the economic well-being of Liechtenstein, the reverse is not true. Both economies are not integrated to the extent that the factor allocation in one country affects the factor allocation of the other one and vice versa. The interlinkage through factor allocation is an important criterion for economic integration, though it leads to

index, new similarity matrices have been calculated from the trade matrices for the years 1984 and 1994. The resulting dendrogram of functional regions for 1984 (Appendix Figure 1) displays the Eastern Bloc and the Scandinavian bloc clearly. However, no functional regions seem to exist that includes mainly countries of the European Community. There are pairs of Western European countries like Ireland and the UK, Greece and Italy, Portugal and Spain. The difference between the two indices is most clearly disclosed in the performance of the country pair USA-Canada. The dendrogram based on the values $(X_{ij}/X_i)$ and $(X_{ji}/X_j)$ of 1984 shows the USA and Canada linked as a functional region at a very early stage of the cluster analysis. By contrast, Kojima's actual trade intensity index leads to a country pair USA – Canada at a later stage, indicating a comparatively weaker functional region. The actual trade intensity index adjusts for the size of the trading partner, but introduces a bias against large countries: Once a country's share in world trade is large, it cannot achieve such a high $I_{ij}$ value in trade with another country like a country could with a small share in world trade.

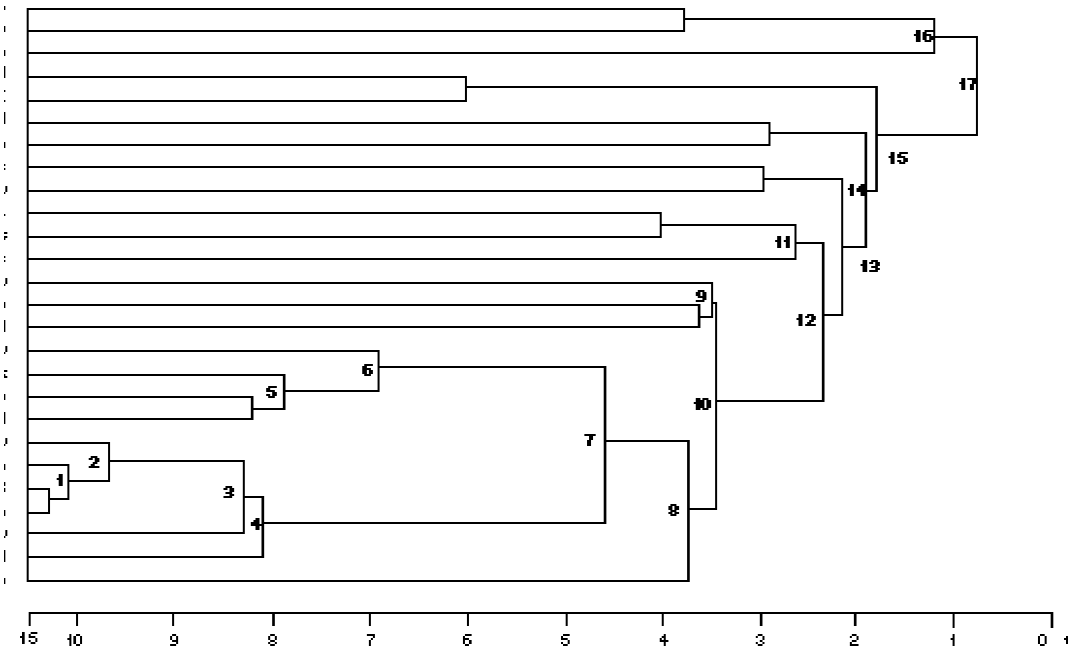
The comparison of the dendrograms based on the actual trade intensity index of 1984 and 1994 (Appendix Figure 2) is also characterised by the bias against large countries. The countries of the EU with their large share in world trade join functional regions relatively late compared to the smaller economies of the CEECs.

The dendrogram for 1994 still identifies a Scandinavian region, but the Eastern European region has disintegrated. While these results are broadly in accordance with those in the main body of the test, with the Kojima index, there is no clearly defined West European region any longer.

### *B. An Alternative Hierarchical Clustering Technique*

## Appendix Figure 1

## ndrogram of Functional Regions 1984 – Actual Trade Intensity Index

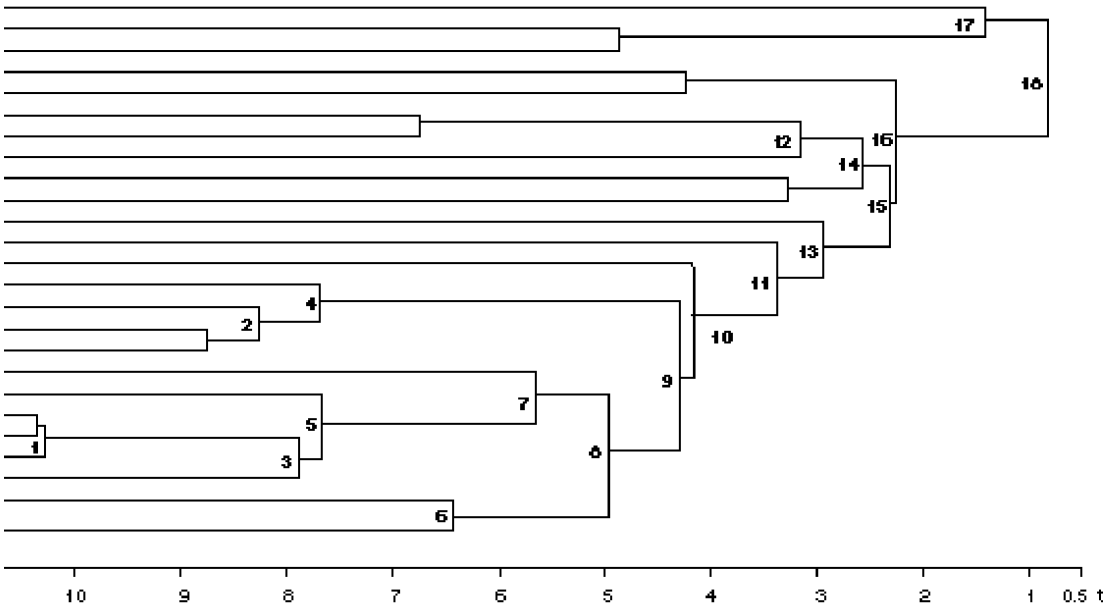



The following countries are united as strong

1. Czechoslovakia – USSR
2. EastGermany – USSR
3. Hungary – USSR
4. Poland – USSR
5. Denmark – Sweden
6. Norway – Sweden
7. Finland – USSR
8. Poland – Romania
9. Austria – West Germany
10. Austria – Hungary
11. Belgium – Lux. – France
12. WestGermany – Netherlands
13. France – Italy
14. France – Spain
15. Sweden – United Kingdom
16. Japan – USA
17. United Kingdom – USA

## Appendix Figure 2

## ndrogram of Functional Regions 1994 – Actual Trade Intensity Index




ng countries are united as strong components:

– Romania
– Sweden
– Romania
– Sweden
Hungary
ep. – Poland

7. Bulgaria – CIS
8. Austria – Czech Rep.
9. Finland – CIS
10. Austria – Germany
11. Greece – Italy
12. France – Spain

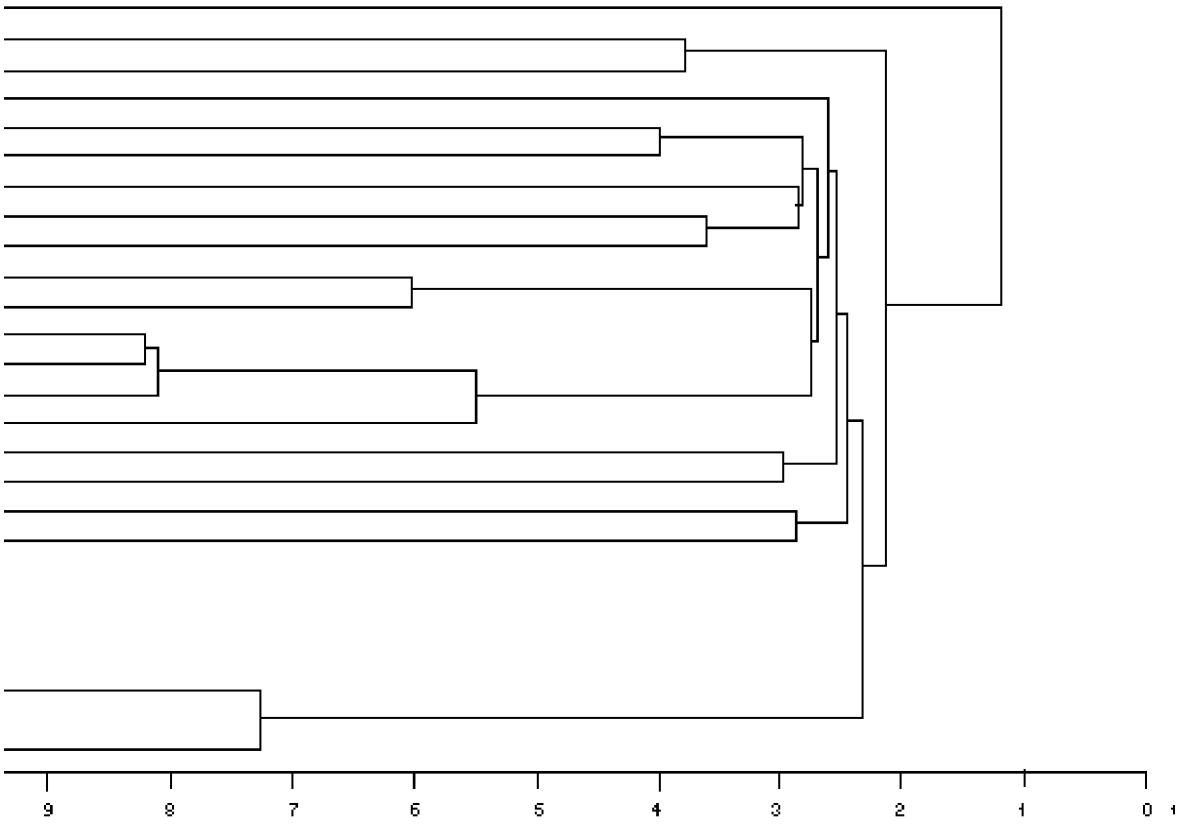
13. Austria – Switzerland
14. Belgium – Lux – France
15. France – Italy
16. Norway – United Kingdom
17. Japan – USA
18. United Kingdom – USA

method lies in the possibility that the value representing the similarity at which clusters are combined can actually increase from one step to the next. Since clusters merged at later stages are more dissimilar than those merged at early stages, this is an undesirable property.

For the derivation of each country's share of the exports of a newly created cluster, the intra-bloc trade is subtracted from the sum of the exports of the countries. This centroid method has been employed for the trade data for 1984 and 1994 in combination with the values ($X_{ij}/X_i$) and ($X_{ji}/X_j$) and with Kojima's actual trade intensity index. If no correction is made for the size of clusters, the centroid method leads quickly to very large entities that draw in country by country. Therefore, the centroid approach requires an adjustment like that suggested by Kojima. The resulting dendrograms are reported in the following Appendix figures. Corresponding to the specified disadvantage of the centroid method, the threshold values for connecting clusters did not continuously decrease, but increase for some steps. For the purpose of graphical representation, a lower threshold value than in the previous step was substituted in these cases. For 1984 as well as 1994, the dendrograms demonstrate the existence of an "Eastern Bloc". However, the bloc had changed some of its members and the intensity of intra-bloc trade had declined by 1994. The Czech and Slovak Republics are integrated into the functional regions of Western Europe in 1994. This exercise shows that the selection of the cluster algorithm have an impact upon the analysis, but that the conclusions from the hierarchical cluster analysis in the main part of this paper are largely unaffected.

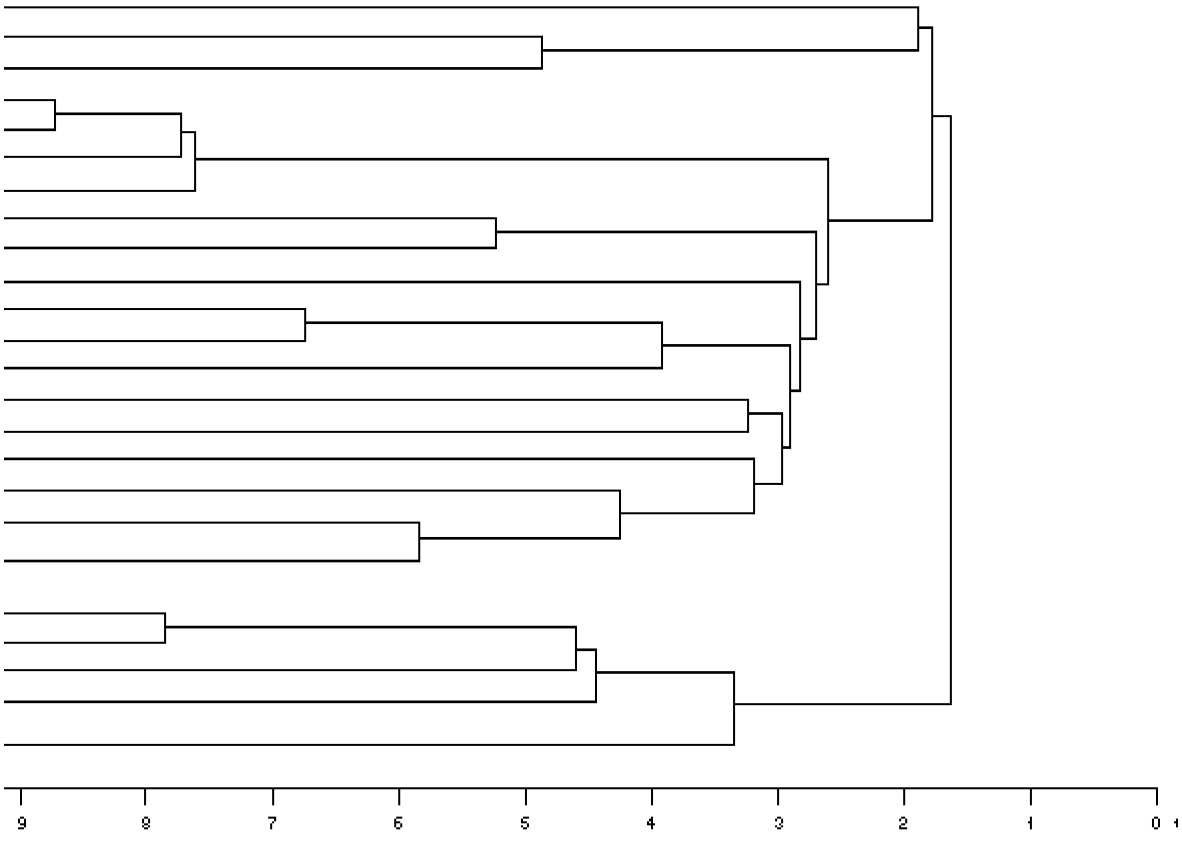
## Appendix Figure 3

### ı of Functional Regions 1984 – Centroid Method – Actual Trade Intensity Index



## Appendix Figure 4

### ı of Functional Regions 1994 – Centroid Method – Actual Trade Intensity Index



## Appendix Table 1

## eographical Composition of Imports, 1929, 1984, 1994 (percentage of total)

| lgaria | | Czech Rep./ Slovak Rep. | | | | Hungary | | | Poland | | | Romania | | | all 6 CEECs[2] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 984 | 1994 | 1929 | 1984 | 1994 | | 1929 | 1984 | 1994 | 1929 | 1984 | 1994 | 1929 | 1984 | 1994 | 1929 | 1984 | 1994 |
| | | | | *Cz*[3] | *SL*[3] | | | | | | | | | | | | |
| **9.9** | **29.8** | **15.0** | **64.5** | **17.4** | **22.9** | **35.5** | **41.9** | **29.9** | **10.6** | **48.1** | **13.9** | **23.9** | **24.0** | **23.0** | **20.9** | **51.7** | **22.8** |
| 8.5 | 24.7 | 1.3 | 46.8 | 12.0 | 21.0 | 0.2 | 29.2 | 23.1 | 1.3 | 34.0 | 9.8 | 0.2 | 14.5 | 17.7 | 0.7 | 38.6 | 18.0 |
| **1.7** | **45.3** | **50.0** | **11.4** | **73.7** | **72.1** | **47.8** | **26.8** | **56.4** | **61.8** | **22.2** | **65.3** | **62.7** | **9.5** | **47.4** | **57.5** | **16.3** | **60.0** |
| 4.7 | 14.2 | 25.0 | 4.2 | 40.4 | 35.8 | 20.0 | 10.7 | 23.6 | 27.3 | 7.4 | 27.5 | 24.1 | 3.0 | 17.7 | 23.7 | 6.0 | 26.5 |
| 1.0 | 3.0 | 3.8 | 0.8 | 4.9 | 3.6 | 2.3 | 1.7 | 3.1 | 6.9 | 1.9 | 4.5 | 5.5 | 1.2 | 5.0 | 5.3 | 1.3 | 4.0 |
| 0.7 | 2.8 | 4.1 | 1.2 | 4.2 | 2.0 | 2.8 | 1.8 | 2.4 | 8.5 | 3.6 | 5.3 | 7.3 | 1.5 | 3.1 | 6.3 | 1.8 | 3.3 |
| 1.4 | 6.7 | 2.3 | 0.7 | 6.2 | 10.8 | 4.4 | 2.4 | 7.0 | 2.7 | 1.8 | 8.4 | 6.9 | 1.0 | 11.7 | 5.4 | 1.5 | 8.5 |
| 0.4 | 8.6 | 0.9 | 0.2 | 0.2 | 0.6 | 0.7 | 0.4 | 0.2 | 0.1 | 0.2 | 0.3 | 0.8 | 0.4 | 1.2 | 0.7 | 0.3 | 1.9 |
| 1.1 | 2.5 | 7.8 | 2.0 | 8.5 | 11.2 | 13.2 | 5.1 | 10.5 | 5.8 | 2.4 | 2.6 | 12.5 | 0.7 | 2.7 | 9.4 | 2.3 | 6.3 |
| **0.4** | **2.4** | **5.5** | **0.3** | **2.1** | **1.2** | **4.6** | **2.5** | **1.8** | **12.3** | **1.6** | **3.9** | **6.1** | **2.6** | **6.4** | **6.4** | **1.5** | **3.0** |
| **8.0** | **22.5** | **29.5** | **23.8** | **6.8** | **3.8** | **12.1** | **28.8** | **11.9** | **15.3** | **28.1** | **16.9** | **7.3** | **63.9** | **23.2** | **15.2** | **30.5** | **14.2** |

;aria, Czech Republic, Slovak Republic, Hungary, Poland, Romania, Ex-Soviet Union and Ex-Yugoslavia.
[reland and Portugal for 1929.
ıge.
)4 excludes Czech-Slovak trade.
1939], IMF, Direction of Trade Statistics (various issues), UN, International Trade Statistics Yearbook (various issues).

## Appendix Table 2
## "Normal" Geographical Composition of Trade-Imports

| ulgaria | | Czech Rep./ Slovak Rep. | | | | Hungary | | Poland | | Romania | | all 6 CEECs[1] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | expected | Cz | | SL | | 1994 | expected | 1994 | expected | 1994 | expected | 1994 | expected |
| | | 1994[2] | expected | 1994[2] | expected | | | | | | | | |
| | **5.2** | **17.4** | **3.2** | **22.9** | **4.8** | **29.9** | **4.9** | **13.9** | **5.0** | **23.0** | **5.5** | **22.8** | **4.8** |
| | 2.8 | 12.0 | 1.6 | 21.0 | 1.8 | 23.1 | 2.4 | 9.8 | 3.5 | 17.7 | 3.4 | 18.0 | 2.6 |
| | **67.7** | **73.7** | **79.1** | **72.1** | **76.7** | **56.4** | **73.1** | **65.3** | **70.1** | **47.4** | **65.4** | **60.0** | **72.0** |
| | 19.7 | 40.4 | 36.3 | 35.8 | 24.1 | 23.6 | 24.6 | 27.5 | 24.4 | 17.7 | 19.5 | 26.5 | 24.8 |
| | 9.8 | 4.9 | 10.5 | 3.6 | 9.2 | 3.1 | 10.1 | 4.5 | 10.3 | 5.0 | 9.7 | 4.0 | 10.0 |
| | 6.7 | 4.2 | 7.0 | 2.0 | 6.2 | 2.4 | 6.9 | 5.3 | 7.5 | 3.1 | 6.8 | 3.3 | 6.8 |
| | 13.9 | 6.2 | 8.0 | 10.8 | 10.0 | 7.0 | 11.1 | 8.4 | 8.5 | 11.7 | 12.0 | 8.5 | 10.6 |
| | 1.3 | 0.2 | 0.3 | 0.6 | 0.4 | 0.2 | 0.5 | 0.3 | 0.4 | 1.2 | 1.2 | 1.9 | 0.7 |
| | 3.0 | 8.5 | 4.5 | 11.2 | 15.5 | 10.5 | 7.0 | 2.6 | 3.4 | 2.7 | 2.9 | 6.3 | 6.0 |
| | **11.4** | **2.1** | **7.3** | **1.2** | **7.7** | **1.8** | **9.3** | **3.9** | **10.6** | **6.4** | **12.2** | **3.0** | **9.7** |
| | **8.5** | **1.8** | **4.8** | **0.5** | **5.3** | **3.6** | **6.5** | **5.7** | **7.6** | **2.6** | **9.3** | **2.7** | **7.0** |
| | **7.2** | **5.0** | **5.6** | **3.1** | **5.5** | **7.0** | **6.2** | **12.0** | **6.7** | **20.7** | **7.6** | **11.4** | **6.5** |

aria, Czech Republic, Slovak Republic, Hungary, Poland, Romania, Ex-Soviet Union and Ex-Yugoslavia.
Bangladesh, India, Sri Lanka, Thailand, Malaysia, Singapore, Indonesia, Philippines, Korea, Hong Kong.
ge.
or 1994 excludes Czech-Slovak trade.
ary Fund [1995], own calculations.

## Appendix Table 3
## Simulation of Different GNP Scenarios – Exports

| All CEECs<br>Partner countries | 1994 | Expected<br>Conventional | Expected<br>Scenario I | Expected<br>Scenario II | Expected<br>Scenario III |
|---|---|---|---|---|---|
| Eastern Europe | 15.3 | 7.9 | 14.2 | 19.6 | 18.7 |
| Ex Soviet Union | 9.3 | 3.7 | 6.7 | 9.2 | 8.7 |
| EU (15) | 63.7 | 68.6 | 63.8 | 59.8 | 56.9 |
| Germany | 30.0 | 20.1 | 18.8 | 17.6 | 16.8 |
| France | 4.0 | 8.9 | 8.3 | 7.7 | 7.4 |
| United Kingdom | 3.4 | 6.4 | 6.0 | 5.6 | 5.3 |
| Italy | 8.9 | 9.8 | 9.1 | 8.5 | 8.1 |
| Greece | 2.0 | 1.1 | 1.0 | 1.0 | 0.9 |
| Austria | 6.0 | 7.8 | 7.3 | 6.8 | 6.5 |
| US | 4.2 | 6.3 | 5.9 | 5.5 | 5.2 |
| Asia | 3.2 | 5.4 | 5.0 | 4.7 | 5.1 |
| Other | 13.6 | 11.9 | 11.1 | 10.4 | 14.1 |

Notes: • Eastern Europe: Bulgaria, Czech Republic, Slovak Republic, Hungary, Poland, Romania, Ex-Soviet Union and Ex-Yugoslavia; • Asia: Japan, Pakistan, Bangladesh, India, Sri Lanka, Thailand, Malaysia, Singapore, Indonesia, Philippines, Korea, Hong Kong; • Conventional: See Table 2; • Scenario I: GNP of the Eastern European Countries is doubled; • Scenario II: GNP of the Eastern European countries is tripled; • Scenario III: GNP of the Eastern European countries is tripled and GNP of the developing countries is doubled.
Sources: International Monetary Fund [1995]; own calculations.

## Appendix Table 4
## Simulation of Different GNP Scenarios – Imports

| All CEECs<br>Partner countries | 1994 | Expected<br>Conventional | Expected<br>Scenario I | Expected<br>Scenario II | Expected<br>Scenario III |
|---|---|---|---|---|---|
| Eastern Europe | 22.8 | 4.8 | 10.2 | 15.5 | 14.8 |
| Ex Soviet Union | 18.0 | 2.6 | 5.5 | 8.4 | 8.0 |
| EU (15) | 60.0 | 70.0 | 66.1 | 62.2 | 59.5 |
| Germany | 26.5 | 24.8 | 23.4 | 22.1 | 21.1 |
| France | 4.0 | 10.0 | 9.4 | 8.8 | 8.4 |
| United Kingdom | 3.3 | 6.8 | 6.5 | 6.1 | 5.8 |
| Italy | 8.5 | 10.6 | 10.0 | 9.4 | 8.9 |
| Greece | 1.9 | 0.7 | 0.7 | 0.6 | 0.6 |
| Austria | 6.2 | 6.0 | 5.7 | 5.4 | 5.2 |

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