

# OECD PROCEEDINGS

## *The Competitiveness of Transition Economies*

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## 3.4 UNIT VALUES TO SIGNAL THE QUALITY POSITION OF CEECS

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In this chapter we use four indicators on the qualitative competitiveness of the economies in transition. We start by calculating unit values, then we develop a country specific segmentation of markets into price and quality sensitive markets leading to four segments for each country according to the concept of revealed price elasticity (REVELAST 1, Aiginger, 1995A, 1995B, 1995C, 1996). Thirdly we apply an industry specific classification according to revealed price elasticity concept (REVELAST 2), and finally an industry specific market classification according to heterogeneity and fragmentation of markets (Oliveira Martins, 1995, 1996 - OMSEG - Oliveira Martins Segmentation Scheme). Three of our four indicators make use of the unit value concept, as does the segmentation into horizontal and vertical product differentiation as presented in chapter 3.2 (Wolfmayr) and 3.3 (Landesmann - Burgstaller).

### 3.4.1 The unit value of exports and imports - the concept

#### *Definition*

The unit value of exports is defined as nominal sales divided into some quantity measure, usually the kilogram. This indicator is also available for imports, in some cases also for domestic production. Most importantly, it is available for a very large number of countries on data banks provided by the United Nations or the OECD, and it is available at practically all levels of disaggregation: we can calculate unit values for total exports (SITC 0 - 9), for manufacturing exports (SITC 5 - 8), and for more than one thousand products on the 6-digit industry level<sup>1</sup>. If not specified, we will refer to manufacturing exports in the following.

#### *Relation to conventional economic concepts*

The measure "unit value" can, on the one hand be compared to the concepts of productivity and quality, and on the other hand, to the concept of price and costs, depending on specific circumstances and qualifications.

Let us first investigate the relation of the unit value to the concept of partial productivity. We assume a Cobb Douglas production function  $Q = A * L^{\alpha} * K^{\beta} * M$ , where Q, L, K, M are quantities of output, labour, capital and material input. Now we add an output price P and distinguish two types of material,  $M_e$  and  $M_w$ , - material used (embodied) in the final product, and material not embodied ("waste"). The unit value is defined as  $UV = P * Q / M_e$ , id est nominal output per material "embodied" in the final product. This appears to be very similar to partial productivity, whereby the numerator is expressed in nominal terms, and the denominator contains the material input, instead of labour or

capital. It is not total material, since there is waste, and some material is expended in the production process (oil, chemicals). But the essence remains; the unit value is output per units of input (material measured in kilograms). The indicator is, however, much more "quality oriented" than a conventional productivity indicator, because the numerator incorporates all of the quality elements, such as the higher consumer evaluation, premiums for higher sophistication, for speciality production, for embodied services, etc.<sup>2</sup> Therefore we can use the UV to assess the quality of a heterogeneous good. The more characteristics a good accumulates (which are valued by consumers or investors), the higher its unit value will be. Like any other measure for partial productivity, the unit value increases, if "the other inputs" are increased per unit of weight, i. e. more or better labour or capital is added.

On the other hand, the unit value can be boiled down to a price, if the quantity unit in which output is measured is identical to the unit in which the input is measured and material is the most important input: if "one unit of Q" is technically linked with "one unit of  $M_0$ ", and the value added in the production process is a rather low, then the UV is the price. Let us assume h kg of concrete are produced with the input of h kg of cement and let wages, capital and other input be very low. In this case the per kg unit value of cement is identical to the price of cement (which is also that of concrete). If economic profits are zero (perfect competition assumption), then the unit value is also identical to average costs<sup>3</sup>. For homogeneous goods competition drives down the price to marginal costs, and eventually the unit value approaches unit costs. The interpretation is very different if the dimensions of input and output differ widely. For example, a car may ultimately be defined by a bundle of characteristics (speed, power, design, electronics), its value or consumer evaluation is far removed from the weight of the steel embodied. The unit value as the car price per kg is much more a sign of quality or of the efficient use of material than of a price.

### *The unit value of aggregates*

Like other empirical measures, the calculation of unit value is effected by problems of aggregation. The unit values of the aggregate "road vehicles" is a weighted average of the unit values of cars, trucks, bicycles, where metric tons are used as an implicit weight. The unit value of the subaggregate "cars", itself is the weighted average of large, medium and small cars, as it is the average of cars of high, medium and low quality.

If production shifts from a low quality to a high quality subsegment, the unit value increases. So in comparing the exports with the imports of a given country, or exports of a country at different points in time, or the exports of different countries for a specific aggregate, we will implicitly compare aggregates with different structures. But what seems to be a disadvantage, if we seek to compare "pure prices", proves to be an advantage when we seek to assess composition and quality of production. A country with a higher unit value will in some sense supply more quality, perhaps due to its ability to sell an identical product at a higher price (marketing, advertising, quality), or by specialising in a more highly priced product segment.

The same is true if one additional stage of processing is added. In principle, trade statistics try to separate goods with different stages of processing, putting raw materials in one product group, semi-finished products in another, and consumer goods in a third. But this is not always the case for more sophisticated products. If the surface of flat steel products is made more durable, if a machine is adapted to the specific circumstances in a factory, the unit values increase in a given statistical category due to an additional stage of production. What may be a disadvantage if we want to know the "true" price, is an advantage for assessing the dynamic competitiveness of firms and industries:

firms and countries which supply products with more stages of production will be more highly evaluated by consumers and can charge higher prices<sup>4</sup>. There are cases in which higher unit values of exports can not be considered as indicators of quality: for example if a semi-finished product is imported by a low cost country, and then processed or assembled by the use of cheap labour and reexported, then the unit value of exports will lie slightly higher than that of imports. The data will show this limit of a country specific approach for transition countries especially in the textile sector. In general additional stages of production increase the consumer evaluation considerably, the potential to disaggregate unit values for regional and product markets help to sort out the exceptions.

### *The notion of a quality ladder*

The notion of quality has become increasingly important in economics during the past decade. On the macro economic level, it has become obvious that the advanced industrialised countries can compete with countries well endowed with cheap labour only when they climb up the "quality ladder", by producing ever more sophisticated products. The competitive threat of Mexico to the US, of the former socialist countries to Western Europe, of China or the Philippines to Japan cannot be countered by lower wages. Grossman - Helpman (1991A, 1991B, 1992C) provide such a model, in which the South is imitating the North, using lower wages to threaten the position of the rich countries by undercutting the prices. The North can regain its advantage through innovation, both countries are thus consecutively climbing up the quality ladder<sup>5</sup>.

### *Empirical results*

If the unit value signals primarily quality and if countries in their economic development continuously have to upgrade their production from low quality to high quality products, we should expect a positive correlation between the unit value of exports and the per capita GNP. There may be an effect of secondary order: if growth is export driven and exports are fuelled by low costs, then the relationship could be weakened, if however exports rely on high quality (human capital, knowledge, research and development) the relationship should be closer. The expected relation between import unit values and per capita GNP is not so clear-cut. Richer countries could make use of the division of labour and import raw materials and semi-finished goods, this would imply a negative correlation. On the other hand richer countries tend to use quite sophisticated inputs, given the structure between raw materials and finished products. This would give rise to a positive correlation. Maybe for countries with large intra-industry trade the second relation could prove stronger, for a sample of countries with large income differences and dominant inter-industry trade the first one.

For results see table 3.12. We relate the aggregate unit values of the exports, then the unit value of the imports and finally the relative unit values each with per capita GNP. Our sample includes 29 countries, namely the OECD countries and seven countries in transition. Data are for 1993, all data were transformed into logarithms<sup>6</sup>.

The correlations are all significant and have the expected sign. The positive correlation between export unit values and per capita GNP is stronger than the negative one between import unit values and per capita GNP. But the closest correlation exists between per capita GNP and the relative unit values. If the usual statistical indicators for the fit could be taken seriously, we would say that 57 per cent of the variation in per capita GNP could be "explained" by this single indicator. I do not know about any single indicator (like investment, research and development) which has such a good fit with per capita GNP.

Table 3.12. Quality ladders, unit values and per capita GNP 1993

	Exports	Imports	Exports/imports	Exports/country exports OECD		GNP/head		
	USD per kg			rank	rank	USD	rank	
USA	1.481	1.253	1.182	6	0.629	17	24,251.9	5
Canada	0.449	1.022	0.439	22	0.191	29	18,909.1	13
Japan	2.993	3.428	0.873	9	1.272	7	33,611.9	1
Germany	3.596	2.782	1.293	4	1.528	4	23,503.2	6
France	3.003	2.864	1.049	8	1.276	6	21,692.3	9
Italy	3.343	2.491	1.342	3	1.421	5	17,260.5	14
United Kingdom	4.144	3.842	1.079	7	1.761	3	16,195.8	16
Spain	1.541	1.979	0.779	11	0.655	15	12,244.5	19
Netherlands	1.991	2.673	0.745	14	0.846	14	20,390.0	12
Sweden	2.278	3.414	0.667	17	0.968	12	21,253.6	10
Belgium-Luxembourg	1.531	1.861	0.823	10	0.651	16	20,834.6	11
Austria	2.650	3.653	0.725	15	1.126	9	22,849.5	8
Denmark	2.884	2.369	1.217	5	1.226	8	25,954.5	4
Finland	1.405	2.794	0.503	21	0.597	18	16,669.8	15
Portugal	2.459	3.181	0.773	13	1.045	10	8,580.0	21
Greece	0.536	2.577	0.208	24	0.228	26	8,670.7	20
Ireland	7.461	3.102	2.405	1	3.171	1	13,333.0	17
Switzerland	5.622	3.445	1.632	2	2.389	2	33,443.6	2
Norway	1.153	1.953	0.590	18	0.490	20	26,850.4	3
Turkey	0.910	1.324	0.687	16	0.387	21	3,032.9	24
Iceland	1.206	3.293	0.366	23	0.513	19	22,934.0	7
New Zealand	0.497	0.877	0.567	19	0.211	28	12,422.5	18
Czech Republic	0.782	4.552	0.172	26	0.332	22	3,023.5	25
Slovak Republic	0.527	4.478	0.118	29	0.224	27	2,256.3	26
Hungary	2.019	3.753	0.538	20	0.858	13	3,739.8	23
Slovenia	2.380	3.057	0.779	12	1.011	11	6,366.3	22
Poland	0.767	3.742	0.205	25	0.326	23	2,233.4	27
Bulgaria	0.664	4.545	0.146	27	0.282	25	1,276.2	28
Romania	0.719	5.758	0.125	28	0.306	24	1,159.3	29

Remark: The following OLS regressions (for caveats see text) and rank correlations can be calculated:

	Regressions <sup>1</sup>			Rank correlation coefficients	
(1) $\ln UV \text{ exports} =$	-3.393	$\ln GNP/head$	0.416 (t=3.41)	$R^2 = 0.301$	0.505 t = 3.04
(2) $\ln UV \text{ imports} =$	2.643	$\ln GNP/head$	-0.177 (t=-2.22)	$R^2 = 0.155$	-0.383 t = 2.15
(3) $\ln (UV \text{ exp/imp}) =$	-6.036	$\ln GNP/head$	0.593 (t=5.95)	$R^2 = 0.567$	0.615 t = 4.05

Note:

1. The regression coefficients should not be interpreted, because of the two sided causality,  $R^2$  may be used.

However we have to be careful not to claim any "prove" of an economic law by the statistics presented in table 3.12 for several reasons. First we do not know in which direction the causality runs. GNP per head influences unit value as well as the unit value influences GNP. My economic interpretation of the relation is, that economics in general and the quality ladder approach specifically imply that there is a two way causation. In this case OLS regressions are not adequate, and statistical measures of significance may be grossly misleading. Secondly we know that other explanatory variables are missing (like investment, human capital, R&D), so that we cannot interpret the coefficients. Most of these issues are shared with other single determinant explanations of cross section variance in per capita GNP, but I want to be especially careful to say that I could not test the quality ladder hypothesis, and that I could not prove the positive relationship. What I have done is to demonstrate that there is a strong cross section correlation between unit values and per capita GNP<sup>7</sup>.

If we look how close the relationship is and which countries fit especially good and which are outsiders we see positive and negative outliers. The negative outliers are in Iceland and Norway, in these economies natural resources determine the export structure (yielding relatively low unit values for exports), but nevertheless these countries enjoy a high per capita income. A similar picture is shown for Canada and Austria, both export relative low valued goods to a larger, rich neighbour. The dominant positive outlier is Ireland, which successfully attracts mobile technology intensive industries and got the leading position in export unit value. European countries in general perform well, see Italy and the United Kingdom. Japan has an above average though not outstanding performance in export unit values, but also a high import unit value, its relative performance contrasts to its leading position in per capita GNP.

The countries in transition fit rather well into the hierarchy, they contribute to the good fit of the correlation, since unit values of exports, relative unit values and per capita GNP go together. The same picture is to be seen if unit values of exports of transition countries are related to the unit value of all OECD exports<sup>8</sup>. The export unit values for countries in transition are all relatively low. They range from 0.5 USD per kg to 2.4 USD per kg, while in Western countries they are ranging between 0.5 USD per kg and 7.5 USD per kg. The picture for the import unit values is more complicated, some countries have import unit values higher than Western countries, mainly because of large imports of machines. Regarding the relation between export and import unit value the transition countries range between rank 12 (Slovenia) and 29 (Slovak Republic) among 29 countries (OECD countries plus transition countries). The positions taken by the transition countries in the hierarchy of relative unit values are approximately the same, as that pictured by the GNP per capita. The unit values of exports do not change over time, with the exception of Hungary which is catching up with the Western countries between 1989 and 1994. The choice of 1993 for the bulk of the statistics in this chapter is not a serious, since data for 1992 and 1994 are approximately the same. Within the bloc the assessment looks brighter for Hungary and Slovenia (where export unit values reach at least one half of import unit values), and least favourable for the Slovak Republic. The import unit values in all transition countries lie well above the average of industrialised countries, but this is partly due to the limited scope of trade considered for these countries<sup>9</sup>.

In absence of a method to overcome the problems of causality at this stage of research, we tested the robustness of the relation. We reversed the direction of causality (estimating "the other regression"), we ran regressions on lagged values (to mitigate the two sided causality problem), we disaggregated the relation into subgroups of 1-digit SITC industries (to mitigate the aggregation problem), and we deleted outliers (to overcome deleted information). The basic results proved very robust<sup>10</sup>.

### 3.4.2 The revealed elasticity approach (REVELAST) and the concept of market segmentation by Oliveira Martins (OMSEG) -- the concepts

As mentioned above, the main problem which has limited the use of the unit value specifically in disaggregated economic analysis so far, has been its twofold character. It can be either a cost indicator where low unit values signal cheap costs or it can be an indicator of quality, product differentiation and market power, where a high unit value signals superior performance.

We implement the following device (developed in 1996) to distinguish between markets in which the unit value signals costs and those in which it informs about quality differences:

*If unit values reflect costs and the product is homogeneous, then countries with lower costs should be net exporters in quantities and countries with higher costs should be net import countries. If a country is a net exporter in quantities despite the fact that it has higher unit values, then this must be due to quality differences. This assertion makes use of the fact that economic theory tells us that under quite broad circumstances demand is price elastic.*

#### **Application 1: a country specific segmentation of the markets (REVELAST 1)**

Price competition dominates if lower (higher) prices lead to high (low) quantities exported ( $UV_{exp} < UV_{imp} \Rightarrow Q_{exp} > Q_{imp}$  et v. v.), quality competition is revealed to dominate if the reverse is true ( $UV_{exp} > UV_{imp} \Rightarrow Q_{exp} > Q_{imp}$  et v. v.) . For a specific country we can there subdivide markets into those dominated by price competition and markets dominated by quality competition. We arrive at the following four segment scheme:

Segment 1 combines the industries in which the exported quantities exceed imports despite a higher unit value. This has to be the consequence of a quality lead, which is reflected in demand or, signals successful specialisation in the most sophisticated market segment. This sector is the very target for an advanced country (*successful quality competition, sector of excellence*).

Segment 2 contains price elastic goods which in the home country have a high unit value and which consequently lead to a trade deficit in the home country. Industries in this sector have lost price competitiveness in a market in which prices are important. This part of the deficit can be said to be the consequence of high production costs (*deficit in price competitiveness, outpriced sector*).

Segment 3 contains price elastic goods, which in the home country have a low unit value. This sector yields a trade surplus (*successful price competition*).

Segment 4 is the sector in which industries run a trade deficit despite low prices. In this sector there have to be some exit barriers (*structural problem area*).

Of these four segments, the first is the most promising from the perspective of technological or dynamic competitiveness. A country with high costs is well prepared for future competition, if a large part of its industry is located in the sector where high unit values are consistent with an export surplus.

## *Application 2: an industry specific classification of markets (REVELAST 2)*

The first application created market segments in which for a specific country or for the bilateral trade between two countries industry groups were put into one of four boxes. The industries in the specific boxes could change slightly from year to year, and the classification can be very different depending on the countries concerned. If price sensitivity dominates the US-Japanese trade in a specific industry, there is some probability that it may be important also for the trade of a country in transition with OECD, but there could be other factors dominating this trend.

Our second application ranks the 3-digit industries according to the number of countries in which the price sensitivity respectively the quality sensitivity dominates. We use the trade flows of 18 countries (12 EU 1992 members, USA, Canada, Japan, Hungary, Poland, Czech Republic) to calculate in how many of these countries there is a positive sign and in how many there is a negative sign between quantities and unit values. The result is an index, within the range of +18 to -18, ranking the 3-digit industries according to their revealed price or quality elasticity. This index is taken as relevant for all countries and periods of investigation. This "once for all categorisation" is therefore the other extreme to application 1, where the revealed elasticity was determined for each country and year individually.

The feasibility of quality versus price competition depends on the market structure. If products are homogeneous then markets will become fragmented and the number of firms increase with increasing market size (Oliveira Martins, 1995, 1996), low cost firms will drive out high cost firms. On the other hand in markets with important innovation and product differentiation, increasing the market size will not lead to an increase of the number of firms, the concentration rate will remain bounded from below. Firms specialised in the high quality segment will be able to pay higher wages and accrue larger margins. Oliveira Martins has developed a breakdown of industries into fragmented versus segmented markets and into industries with low and high product differentiation. The indicators used are number and size of firms, research and capital inputs. We compare this concept with our concept of revealed elasticities.

### **3.4.3 Empirical results for the individual countries**

#### *Slovak Republic*

##### *Trade balance and unit value*

The Slovak Republic's trade with OECD was approximately balanced for manufactured products. Exports of USD 1,467 billion were only slightly below imports of USD 1.577 billion<sup>11</sup>. The unit value of the exports was 0.521 USD per kg, that of the imports was much higher (4.333 USD per kg).

##### The four quadrants: country specific revealed price elasticity (REVELAST 1)

We start with classifying the trade between the Slovak Republic and the OECD according to the criteria whether the unit values are higher or lower in the Slovakian exports (compared to its imports from OECD) and to the criteria whether quantities exported or imported are larger. This gives a four



quadrant segmentation based on the trade between the Slovak Republic and the bloc of all OECD countries.

The sector in which the Slovak Republic is too expensive (and the country consequently suffers a trade deficit) is rather small: the Slovak Republic exports USD 57 million and imports USD 157 million. Cars are the single most important category (exported cars are more expensive than imported ones, but the import quantity is far greater). This indicates a difference in the class of the cars imported and exported (vertical differentiation in intra-industry trade).

The largest positive contribution to the trade balance of the Slovak Republic is given in the sector, where the Slovak Republic is cheap and markets are price elastic. This sector comprises 77 industries, which export USD 1.072 billion and import only USD 555 million. The largest surpluses occur in some basic good industries (SITC 673 - flat steel, SITC 661 - cement, SITC 651 - textile yarns, and SITC 641 - paper, SITC 562 and 821 - fertilisers and furniture). The six most important industries (where importance is measured by the Slovak Republic's trade surplus) accrue a joint surplus of USD 337 million.

The sector in which export unit values and exported quantities are higher (as seen from the Slovak Republic's perspective) is rather small. It comprises 8 industries, six of them are in the apparel and shoe area. The exports amount to USD 255 million, imports are USD 47 million. The two non apparel industries are basic chemical industries. Usually in our segmentation we interpret industries in this segment as industries in which quality is important and the home country is able to compete by quality. In the total European trade these industries are among the most price sensitive (see Aiginger, 1996). The result could potentially be explained by the consumption structure: the Slovak Republic could import rather cheap products for domestic consumption, but exports products produced in some excellent factories for the world market. Another explanation could be that the Slovak Republic is importing semi-finished goods, which are processed by the means of cheap labour and then are reexported<sup>12</sup>. In this case the concept of country specific segmentation according to unit values is misleading. While higher unit values, even if reached by additional stages of processing are adding quality and consumer evaluation, in this case the simplest and most labour intensive production stage is cut out and done in a low wage country.

The largest negative balance comes from the sector in which exports are cheaper, but nevertheless imports dominate. This sector comprises 50 industries, imports amount to USD 811 million, exports are only USD 83 million. Slovakian industries in this sector are not competitive, although the prices are rather low. The largest deficit accrue for machinery industries and computers. Quality is important in these industries, but insufficient in the Slovak Republic.

#### *Price or quality dominated markets: industry specific revealed price elasticity (REVELAST 2)*

The results indicate that the definitions which sectors are price sensitive should not be based on one country alone, but on price sensitivity or market characteristics in a larger number of countries. We therefore first used the ranking by Aiginger for 18 countries<sup>13</sup> to group industries into three groups of "highly price sensitive industries", "medium price sensitive industries" and "quality sensitive industries". Then we use the market segmentation by Oliveira Martins to classify the Slovak Republic's trade.

The first group contains those industries where in most countries bilateral trade balances were decided by the lower unit costs (53 "highly price sensitive industries"), the second group was that in

which the rank were in the middle (52 "medium price sensitive industries"), the third group was that in which the majority of the bilateral balances were decided by quality (53 industries with revealed quality competition)<sup>14</sup>.

The results are as expected: in the group with high price elasticity the Slovak Republic is a net exporter. Exports in 1993 are USD 857 million, imports only USD 388 million. These figures represent 58.4 per cent of exports and 24.6 per cent of imports. In the middle group exports are USD 256 million, imports USD 442 million (this amounts to 17.5 per cent of exports and 28.0 per cent of imports). In the group with revealed quality sensitivity, the Slovak Republic exports of USD 354 million, this is less than half of the imports of USD 747 million. Industries in which quality decides about net trade, thus contribute a deficit for the Slovak Republic of USD 393 million. Only 24.1 per cent of the exports, but 47.4 per cent of the imports fall into this category.

#### *Heterogeneity and segmentation: Oliveira Martins market segments (OMSEG)*

The same picture is drawn when we use Oliveira Martin's market segments. In the "fragmented, low differentiation" sector the Slovak Republic exports USD 681 million and imports USD 390 million, accruing a surplus of USD 291 million. This group is that with the highest price elasticity in the cross country REVELAST approach, in the individual industries most bilateral balances reveal price sensitivity.

In the fragmented high differentiated sector, the Slovak Republic suffers a trade deficit of USD 482 million. This sector comprises a majority of industries which is price sensitive, but also some machinery industries which are quality sensitive as revealed by Aiginger's method.

The segmented low differentiation sector in the Slovak Republic enjoys a trade surplus of USD 262 million. All industries are price sensitive with the notable exception of vehicles (parts, tractors, vehicles, SITC 784). This is one of the most quality intensive industry (only three balances are decided by price, in eleven bilateral balances the higher pricing country has also a quantity surplus). Interestingly but not unexpectedly this industry is the only one in the group in which the Slovak Republic has a trade deficit.

In the final group of segmented high differentiation industries the Slovak Republic suffers a trade deficit of USD 182 million. The industries are on average less price sensitive than the low differentiated sectors.

#### *Poland*

##### *Trade balance and unit value*

Poland's exports of manufacturing products to OECD countries were USD 7.387 billion, while imports were USD 10.353 billion, resulting in a trade deficit of USD 2.966 billion. The unit value of the exports was 0.755 USD per kg, far behind that of imports of 3.600 USD per kg. The unit values are low, not only if compared to the unit values of Western countries, but the export unit values somewhat higher than in the Slovak Republic.

Compared to 1989 imports and exports grew very fast. Poland had however a trade deficit in 1989 of USD 239 million. The unit value was 0.755 USD per kg in exports, exactly today's level, the unit value of imports declined (1989: 4.351 USD per kg). The unit values and the relation between the export and the import indicator are remarkable stable if judged from the radical shifts of the political and economic environment.

*The four quadrants: country specific revealed price elasticity (REVELAST 1)*

Again we split the trade between OECD and Poland into sectors according to the relative unit values respectively quantities traded. In this step the quadrants are defined by unit values and quantities between Poland and the OECD bloc.

The sector in which Poland is expensive and consequently suffers a trade deficit yields exports of USD 222 million and imports of USD 603 million, both ratios are tenfold those in 1989, but the sector in total remained small. Successful exports at low unit value is an important sector for Poland's trade balance with exports of USD 3.965 billion and imports of USD 2.498 billion. Furniture, copper and wood manufactures are the largest industries in which low prices result in a large trade surplus. If compared to 1989 the relation between exports and imports and the composition of industries is stable.

The sector in which unit values and export quantities is higher in Poland is small if compared to the price sensitive sectors and contains only 11 industries, but it creates exports of USD 1.922 billion (against imports of only USD 357 million). The most important industries are apparel industries (additionally important industries are fertilisers in 1993, and pottery in 1989). The picture is similar to that in the Slovak Republic. These industries are among the most price sensitive in our general ranking, but the Slovak Republic and Poland can export more at a higher price. This can be explained only by a very strong market segmentation.

*Price or quality dominated markets: industry specific revealed price elasticity (REVELAST 2)*

In the next step we record the trade performance for the group of highly price sensitive industries, moderately price sensitive industries and quality sensitive industries (using Aiginger's ranking for 18 countries).

For price sensitive industries Poland has a positive trade balance: exports of USD 3.724 billion stand against imports of USD 2.615 billion, yielding a trade surplus of USD 1.110 billion. In the moderately price sensitive sectors Poland suffers a deficit of USD 1.357 billion, in the quality sensitive sector the deficit is USD 2.719 billion (exports USD 2.014 billion, imports USD 4.733 billion).

The relation is rather similar to that in 1989, in which for price sensitive industries, Poland had a trade surplus of USD 160 million. In the medium price sensitive sectors trade was balanced (deficit of USD 17 million), in the quality sensitive sectors the deficit was USD 381 million, the rising deficit in the medium sensitive sector may be an indicator that the structural adjustment process worked slowly.

*Heterogeneity and segmentation: Oliveira Martins market segments (OMSEG)*

The OMSEG results underline these findings. Poland had a surplus of USD 994 million in the "fragmented, low differentiation" group in 1993, and a balanced trade in the "segmented, low differentiation group" (USD +42 million). The deficit in the fragmented, high differentiation segment is USD 2.391 billion and in the segmented, high differentiation area it is USD 1.611 billion. The last sector had a balanced trade in 1989, the deterioration comes from two industries: Poland had a surplus in SITC 791, 786 which vanished up to 1993, and Poland has now a huge deficit in trade with road vehicles (SITC 781, 782, 783).

*The Czech Republic*

*Trade balance and unit value*

The Czech Republic exported good of USD 5.631 billion and imported goods of USD 7.198 billion. The unit value of the exports was higher than in other countries in transition (0.769 USD per kg) but less than in Hungary and Slovenia, and only one fifth of that of imports.

*The four quadrants: country specific revealed price elasticity (REVELAST 1)*

The sector in which Czech industry is outpriced (higher unit value plus a deficit) exports USD 141 million and imports USD 367 million, but in this case the unit value margin is very low for the sector with the largest deficit. This is electrical machinery in which the Czech Republic exports relative sophisticated products, but cannot use this to create a surplus.

The sector of successful price competition (exports are cheaper and the exported quantity is higher) comprises 85 industries, nominal exports are USD 4.049 billion and nominal imports are USD 3.284 billion. The largest surpluses are created in iron and steel (SITC 676, 673), furniture, cement and glass.

The sector in which an export surplus is created despite of higher unit values comprises 10 industries. Exports of USD 683 million are confronted with imports of USD 249 million, six industries are in the textiles and clothing sector, two chemical industries, arms and ammunition and waste add a little surplus.

The non-competitive sector in which export unit values are low, but the balance is nevertheless negative comprises 52 industries, imports of USD 3.297 billion are countered by exports of only USD 758 million. Data processing, electrical industries and special instruments are the main contributors to this sector's deficit.

*Price or quality dominated markets: industry specific revealed price elasticity (REVELAST 2)*

In price sensitive industries the Czech Republic exports USD 2.271 billion, while its imports are only USD 1.774 billion, this is 40.3 per cent of exports and 24.6 per cent of imports. In the sector of medium price elasticity the Czech Republic earns a deficit of USD 811 billion. In the quality sensitive group the exports of USD 2.182 billion amount to 38.7 per cent, while imports are USD 3.434 billion

or 47.7 per cent. While the structure of the deficits is similar to that in other countries, the shares of price sensitive industries in exports as well as in imports are rather high.

*Heterogeneity and segmentation: Oliveira Martins market segments (OMSEG)*

The Czech Republic has a surplus of USD 669 million in the sector of low differentiated and fragmented industries, and one of USD 268 million in the low differentiated and segmented sector, but deficit of USD 1.618 billion respectively USD 886 million in the differentiated sectors.

**Slovenia**

*Trade balance and unit value*

Slovenia exported USD 3.649 billion, while it imported USD 3.578 billion in 1993, creating a small surplus of USD 71 million. Export unit values were 2.367 USD per kg, quite near the unit value of imports of 2.999 USD per kg, both values are not far away from Western European countries.

*The four quadrants: country specific revealed price elasticity (REVELAST 1)*

The sector where Slovenia has a higher unit value but exports less comprise 29 industries, exports of USD 485 million are confronted with imports of USD 972 million, the largest industries are passenger cars and other vehicles (parts, tractors etc.).

The sector in which the exports are cheaper and exported quantity is higher comprises 61 industries, exports reach USD 1.929 billion, imports only USD 1.222 billion. The largest surplus comes from domestic electrical and non electrical equipment, furniture and some electrical machinery, two additional positive balances come from basic metals and tires, so it is a mixture of success in basic goods industries and electrical machinery.

The sector in which an export surplus is created despite of a higher unit value comprises 14 industries and exports of USD 934 million are confronted with imports of USD 242 million. Apart from the textile industries which again fall in Slovenia into this sector, a surplus comes from the wood manufacturing industry.

The structural problem area (in which export unit values are low, but the balance is nevertheless negative) comprises 52 industries, imports of USD 1.142 billion are forth times as high as exports (USD 301 million). Different kinds of fabrics contribute the largest part of the deficit, some machinery sectors follow (pumps, centrifuges, special instruments).

*Price or quality dominated markets: industry specific revealed price elasticity (REVELAST 2)*

In price sensitive industries Slovenia exports USD 1.489 billion, while it imports reach only USD 1.046 billion, the resulting surplus is larger than the very small deficit in the medium elastic industries (USD 87.5 million) and in the low elastic sector (USD 284 million).

*Heterogeneity and segmentation: Oliveira Martins market segments (OMSEG)*

Slovenia has a surplus in the low differentiated and fragmented industries, which equals the sum of the three deficits in the other sectors which are of approximately the same size.

**Bulgaria**

*Trade balance and unit value*

Bulgaria has a large deficit in its exports of manufacturing. Exports of USD 1.045 billion are surpassed by imports (USD 1.312 billion) by more than 25 per cent. The unit value is 0.648 USD per kg for exports but 4.300 USD per kg for imports.

*The four quadrants: country specific revealed price elasticity (REVELAST 1)*

In price sensitive industries Bulgaria accrues losses in 21 industries in which its exports have a higher unit value than its imports, with exports of USD 38 million and imports of USD 225 million. Motor cars and electronical data processing are the industries with the largest deficit in this segment.

The sector in which the exports are cheaper and exported quantity is higher comprises 73 industries, nominal exports are USD 598 million and nominal imports are USD 355 million. The largest surpluses are created in copper, iron and fertilisers.

The sector in which an export surplus is created despite of higher unit values comprises 6 industries and exports of USD 320 million are confronted with imports of USD 73 million, all industries are in the textiles and clothing sector.

The non competitive sector in which export unit values are low, but the balance is nevertheless negative comprises 51 industries, imports of USD 649 million are countered by exports of only USD 88 million.

*Price or quality dominated markets: industry specific revealed price elasticity (REVELAST 2)*

In sectors with high price elasticity Bulgaria exports USD 509 million and imports USD 308 million. In medium elastic markets Bulgaria has a small deficit, in markets with low elasticity the deficit is USD 329 million, exports cannot pay for one half of the imports in this segment.

*Heterogeneity and segmentation: Oliveira Martins market segments (OMSEG)*

Bulgaria has a large surplus in the sector of low differentiated fragmented industries, and a small one in the low differentiated segmented sector, but deficit of USD 319 million respectively USD 176 million in the differentiated sectors.

## *Hungary*

### *Trade balance and unit value*

Hungary exported manufacturing products of USD 4.502 billion but imported goods for USD 6.553 billion in 1993, the trade deficit amounted to USD 2.051 billion, and Hungary had the lowest coverage of imports by exports. The unit values of exports were 1.965 USD per kg, that of imports 3.625 USD per kg.

### *The four quadrants: country specific revealed price elasticity REVELAST 1)*

The sector with high unit values but low quantities comprises 22 industries with exports of USD 503 million and imports of USD 1.164 billion. The overwhelming part of the deficit comes from the import of cars, perfumeries and transistors come with relatively small amounts on the second and third place.

The sector in which Hungary is successfully competing in price comprises 65 industries, nominal exports are USD 2.464 billion and imports reach only USD 1.874 billion. The largest surpluses are created in clothing, but also in steel industry and aluminium and polymers of Ethylene, so that partly very labour and partly very capital intensive products contribute to the surplus in this sector.

The sector in which an export surplus is created despite of higher unit values comprises 9 industries and exports of USD 929 million are confronted with imports of USD 435 million. The industries are more heterogeneous than in other countries, only 3 are in the textiles and clothing sector, chemical and engineering industries, pottery and explosives complement this sector of excellence.

The non competitive segment in which export unit values are low, but the balance is nevertheless negative comprises 61 industries, imports of USD 3.081 billion are more than five time the exports. This sector contributes to the deficit more than in all other countries. Many engineering industries contribute, but also plastics, paper, fabrics, leather. Hungary has shortages of some basic products, the industry has not yet developed sophisticated products which could cover this deficit either by price or by quality competition.

### *Price or quality dominated markets: industry specific revealed price elasticity (REVELAST 2)*

Hungary's surplus in price elastic industries is smaller (USD 268 million) than that of other countries, its deficit in the semi-price elastic industries is three times that surplus, the deficit in the inelastic sector is six times as high as the surplus in the first segment.

### *Heterogeneity and segmentation: Oliveira Martins market segments (OMSEG)*

Hungary has only a surplus in the fragmented low differentiated sector, segmented market structures lead to a small deficit, differentiation to two large deficits (the larger one in the fragmented).

## **Romania**

### *Trade and unit value*

Romania exports goods of USD 2.225 billion, nearly as much as it imports (USD 2.340 billion). The export unit value is one of the lowest among the transition countries (0.709 USD per kg), its import unit value is relatively high (5.761 USD per kg).

### *The four quadrants: country specific revealed price elasticity (REVELAST 1)*

High prices and low net exports are revealed in 23 industries. Exports of USD 94 million are confronted with imports of USD 265 million, the deficit is USD 170 million, the largest deficit comes in food processing machines, electrical distribution equipment and electro-medical equipment, three very basic industries with very low exports of Romania and a high import demand.

The sector of successful price competition comprises 61 industries, they accrue a surplus of USD 1.097 billion. The largest surpluses come from furniture, clothes, flat iron, fertilisers and apparel.

The sector in which an export surplus is created despite of higher unit values comprises only five industries: men's clothing, footwear, glassware, steam turbines and leather.

The non competitive sector in which export unit values are low, but the balance is nevertheless negative comprises 68 industries, with a deficit of USD 1.479 billion. Fabrics and fibres is the largest industry, many industries in the transport, machine and electrical areas follow.

### *Price or quality dominated markets: industry specific revealed price elasticity (REVELAST 2)*

Exports more than double imports in the price elastic segment, but the opposite relation prevails in the medium elastic class.

### *Heterogeneity and segmentation: Oliveira Martins market segments (OMSEG)*

In both low differentiated areas Romania enjoys a trade surplus, in both high differentiated sectors according to Oliveira Martins Romania suffers a deficit.

## **3.4.4 Summary, differences among countries**

### *The differences among the countries*

Slovenia has the best performance shown in several indicators (see tables 3.12, 3.13, 3.14, 3.15, 3.16, 3.17, 3.18). It has a slight trade surplus in manufacturing, it has the highest export unit value (slightly under the OECD average), and the best relation between export and the import unit value (0.78). The analysis of the market segments reveal that the deficit in the structural problem area is much smaller than in the other transition countries (23.3 per cent of trade, against more than



53.4 per cent) and that the surplus in the price competitive sector is larger than the deficit in the outpriced sector. The deficit in the sector in which quality is more important than price is smaller than in other countries. This sector exports approximately one quarter of total Slovenian exports. The deficit in the differentiated sectors is low, specifically that in the segmented high differentiated sector.

The performance of Hungary differs according to the specific indicator chosen. The trade deficit in the manufacturing sector is large, but the unit value of exports is the second highest under the countries investigated, absolutely and in relation to that of the imports. The sector of successful competition in quality is very small (8.9 per cent of the trade flow, the second lowest), the structural problem area is nearly as large as on average. What is specific to Hungary is that the outpriced sector is larger than that of successful price competition. Consequently Hungary's surplus in the price sensitive sector is much smaller than on average (4.9 per cent instead of 13.4 per cent of trade volume) and its deficit in the quality sensitive industries larger (28.1 per cent vs. 24.2 per cent). The tentative picture is that Hungary has achieved relative high levels of wages relatively to other countries, without increasing productivity enough and without dispensing of the structural problem areas.

The Czech Republic has a relatively low export unit value. It is approximately that of Poland and slightly higher than that of Romania and Bulgaria. But this country also has a rather high import unit value hinting at an ambitious restructuring program by the means of importing sophisticated inputs. The structural problem area is 14 per centage points lower than on average, the price competitive sector clearly outweighs the outpriced sector. The surplus in the price sensitive sector is smaller than on average, but so is the deficit in the qualitative sensitive industries. The tentative conclusion is that the Czech Republic is on an ambitious restructuring route, coping successfully with some past problems, but without having reached a new equilibrium.

Poland has a similar export unit value, but a lower import unit value, and a somewhat larger trade deficit in manufacturing as compared to the Czech Republic. Competitiveness in the quality sensitive industries as well as in the price sensitive industries are quite high, but so is the deficit in the structural problem area (10 points higher than average). The surplus in the price elastic industries is on average, but the deficit in the quality sensitive industries is very large. The tentative picture is that of an economy with a large sector of unsolved problems and a small promising sector.

The Slovak Republic has the lowest export unit value among the transition countries, it is the third lowest one in our sample (OECD plus countries in transition). The Slovak Republic imports sophisticated products like the Czech republic (the import unit value is higher than that of most advanced OECD countries). The main difference to other transition countries is that the share of the sector with successful price competition is the second largest behind Romania. The picture is not easy to interpret. Either the Slovak Republic has kept low wages and attracts capital for investment from some source, or prices are still not set at full costs, but just in a way to be price competitive (implying losses for firms with soft budget constraints).

Romania has an average export unit value for transition countries, but the highest import unit value. It has a rather large sector of successful exporting goods with high unit values, but it also has an above average share of structural problem industries. Romania is extremely successful in price elastic sectors, leading to the same question as in Slovak Republic.

Bulgaria is to some degree similar to Romania, but has a higher trade deficit and slightly lower unit values (on both sides of the balance). The sector of successful price competitiveness is larger than on average but lower than in Romania, it mainly contains industries in the apparel and footwear industry. A large part of the exports are imports reprocessed by the use of cheap labour.

### *The picture for the indicators on qualitative competitiveness*

The export unit values for countries in transition are all relatively low. They range from 0.5 USD per kg to 2.4 USD per kg, while in Western countries they are ranging between 0.5 and 7.5 USD per kg. The picture for the import unit values is more complicated, some countries have import unit values higher than Western countries, mainly because of large imports of machines. Regarding the relation between export and import unit value the transition countries range between rank 12 (Slovenia) and 29 (Slovak Republic) among 29 countries (OECD countries plus transition countries). The positions taken by the transition countries in the hierarchy of relative unit values are approximately the same, as that pictured by the GNP/head. The unit values of exports do not change over time, with the exception of Hungary which is catching up with the Western countries between 1989 and 1994. The choice of 1993 for the bulk of the statistics in this chapter is not a serious, since data for 1992 and 1994 are approximately the same.

As far as the sectoral balances (country specific approach, REVELAST 1) are concerned the sector with successful price competition is larger for the transition countries (13.4 per cent of the trade volume) than the same sector in the EU countries (2.3 per cent). For transition countries the surplus accrued in this sector of successful price competition is larger than the deficit suffered in the outpriced sector (2.2 per cent), while in the EU the deficit in the outpriced sector (1.3 per cent) is slightly lower than the surplus in the price competitive sector. On the other side the sector with structural problems (less import despite low unit values) amounts to very high 53.4 per cent in the transition countries relative to 1.2 per cent in the EU countries. These two differences — small outpriced sector, but large structural problem sector — is that which is expected for countries with low wages and insufficient structural change. The relatively large sector which had been called successful quality intensity in studies of industrialised countries is somewhat misleading in context with countries in transition: most of the industries in this quadrant are apparel and footwear industries, often imports are re-exported after adding a low value added processing stage. The sectoral balances are much larger relative to trade in the individual industries, demonstrating that inter-industry trade is still more important in transition countries than in industrialised countries.

The balances according to the industry specific approach are also quite striking. Table 3.14 presents the trade performance of countries in the highly, in the moderately price elastic sector, and in the industries revealed to be quality sensitive<sup>15</sup>. All countries in transition as well as Turkey, Norway and Portugal have a positive performance in highly price sensitive industries, but an extremely high deficit in the quality sensitive industries. The surplus in price sensitive industries is especially large in Romania and in the Slovak Republic, small surpluses are revealed in Hungary and the Czech Republic. All transition countries have substantial deficits in the moderately quality intensive industries and still larger ones in the qualitative elastic industries. On the other side Switzerland and Germany have high deficits in the price sensitive industries and significant surpluses in the quality sensitive industries. Canada, Norway and Austria are again found to be high income countries with a specialisation in price sensitive industries. USA and Japan have relative deficits in the price elastic goods, but are not specialised in quality sensitive industries (see RCA values in Table 3.14). The main strength of these countries lie in the moderately price sensitive industries. Specifically Japan accrues

40 per cent of its total surplus in this sector. All seven countries with a positive specialisation in the quality sensitive sectors are European countries. Spain ranks far better in this ranking than in per capita income due to its specialisation in car industry.

The transition countries suffer a deficit in the differentiated industries and enjoy a surplus in the homogeneous industries as classified by Oliveira Martins. These results nicely fit into the expectations of economic theory that developed countries specialise in differentiated market and compete by quality, while new entrants with low wages try to undercut prices in mature and well standardised markets.

Table 3.13. Country specific segmentation

	Successful quality competition		Deficit in price competitiveness		Successful price competition		Structural problem area	
	Share <sup>1</sup>	RCA <sup>2</sup>	Share <sup>1</sup>	RCA <sup>2</sup>	Share <sup>1</sup>	RCA <sup>2</sup>	Share <sup>1</sup>	RCA <sup>2</sup>
USA	6.1	0.786	-20.7	-0.162	5.1	0.450	-10.4	-0.846
Canada	4.8	1.025	-13.9	-0.790	43.0	0.780	-22.7	-1.210
Japan	14.0	1.307	-9.3	-1.571	76.7	0.396	-8.9	-2.526
Germany	26.4	0.352	-7.8	-0.507	7.2	0.097	-1.4	-0.635
France	5.0	0.733	-7.4	-0.120	1.9	0.124	-6.7	-0.351
Italy	18.9	0.088	-4.4	-1.723	29.1	-0.902	-12.8	-2.338
United Kingdom	3.3	0.968	-15.0	-0.075	0.9	0.277	-13.4	-0.376
Spain	4.3	1.855	-13.4	-0.303	5.3	0.414	-24.6	-0.535
Netherlands	4.1	0.537	-14.3	-0.232	7.8	0.395	-9.5	-0.356
Sweden	14.4	0.425	-6.5	-0.378	19.3	0.628	-15.5	-0.900
Belgium-Luxembourg	20.3	0.496	-12.0	-0.551	11.7	0.276	-5.6	-0.774
Austria	6.8	0.931	-21.3	-0.315	6.0	0.435	-15.5	-0.595
Denmark	24.1	1.041	-16.0	-0.480	5.6	0.328	-20.9	-0.980
Finland	13.0	1.085	-21.8	-1.221	51.1	1.037	-18.8	-1.297
Portugal	5.1	1.565	-5.0	0.054	27.7	1.355	-61.9	-1.170
Greece			-51.3	-0.690	6.0	1.604	-73.3	-1.420
Ireland	43.8	-0.879	-18.7	-0.727	5.3	0.385	-8.9	-1.218
EU	4.5	0.171	-1.3	-0.076	2.3	0.026	-1.2	-0.216
Switzerland	24.0	2.137	-29.2	-0.005	9.5	1.533	-28.0	-1.007
Norway	0.2	0.757	-25.5	-0.297	17.7	1.266	-46.8	-0.731
Turkey	14.2	2.152	-33.3	-2.301	25.9	-0.670	-92.8	-1.430
Czech Republic	6.8	1.253	-3.5	-0.709	11.9	0.455	-39.6	-1.224
Slovak Republic	13.7	1.752	-6.6	-0.953	34.1	0.727	-47.9	-2.212
Hungary	8.9	1.135	-12.0	-0.464	10.7	0.649	-44.8	-1.251
Poland	17.6	2.020	-4.3	-0.663	16.5	0.799	-63.3	-1.347
Slovenia	19.1	1.331	-13.5	-0.714	19.6	0.437	-23.3	-1.354
Bulgaria	21.0	1.695	-16.0	-1.563	20.7	0.743	-47.8	-1.774
Romania	19.2	1.914	-7.5	-0.981	48.1	1.374	-64.8	-2.556
Transition countries <sup>3</sup>	14.8	1.771	-2.2	-0.325	13.4	0.606	-53.4	-1.151

*Notes:*

1. Sectoral balance in relation to trade volume of SITC 5 - 8  $(=(\text{exports} + \text{imports})/2)$ , 1993.
2. Relation between exports and imports in the sector, divided into the same relation for total manufacturing (logarithm). This indicator helps in assessing the relative magnitude of shares for countries with large imbalances of trade. Note however that the concept forces all RCA to be positive in the first and third sector, and to be negative in the second and fourth.
3. Trade with the OECD only (the mirror statistic is used).

Table 3.14. Industry specific segmentation

	Highly price sensitive industries		Moderately price sensitive industries		Revealed quality sensitive industries	
	Share <sup>1</sup>	RCA <sup>2</sup>	Share <sup>1</sup>	RCA <sup>2</sup>	Share <sup>1</sup>	RCA <sup>2</sup>
USA	-10.3	-0.109	-0.2	0.194	-9.5	-0.048
Canada	30.0	0.545	-6.6	-0.367	-12.3	-0.582
Japan	19.9	-0.110	29.4	0.375	23.8	-0.155
Germany	-2.5	-0.343	7.2	0.034	19.7	0.162
France	-3.9	-0.068	-2.0	-0.003	-1.3	0.043
Italy	16.2	0.191	3.2	-0.172	11.4	-0.049
United Kingdom	-6.2	0.027	-4.6	0.081	-13.4	-0.073
Spain	-9.6	-0.118	-14.7	-0.358	-4.1	0.208
Netherlands	-0.7	0.100	-4.2	-0.044	-7.0	-0.060
Sweden	3.5	0.050	-1.2	-0.117	5.2	0.039
Belgium-Luxembourg	5.6	0.031	1.9	-0.068	7.2	0.016
Austria	-4.1	0.089	0.5	0.258	-20.4	-0.237
Denmark	-4.4	-0.075	0.6	0.091	-3.3	-0.009
Finland	35.1	0.696	-0.2	-0.229	-12.8	-0.633
Portugal	12.5	0.666	-15.2	-0.415	-31.4	-0.490
Greece	-5.3	1.212	-44.2	-1.117	-69.1	-1.407
Ireland	23.4	0.352	-4.1	-0.383	2.1	-0.150
EU	1.0	-0.600	-0.1	0.299	3.1	0.481
Switzerland	-17.9	-0.407	-6.7	-0.084	2.9	0.278
Norway	3.1	0.653	-22.5	-0.336	-36.4	-0.590
Turkey	15.5	1.354	-30.1	-0.721	-71.9	-1.791
Czech Republic	7.7	0.492	-12.6	-0.278	-19.5	-0.208
Slovak Republic	30.8	0.866	-12.2	-0.474	-25.8	-0.675
Hungary	4.9	0.509	-13.9	-0.135	-28.1	-0.450
Poland	12.5	0.691	-15.3	-0.263	-30.7	-0.517
Slovenia	12.2	0.333	-2.4	-0.124	-7.9	-0.209
Bulgaria	17.0	0.730	-11.8	-0.213	-27.9	-0.539
Romania	41.8	0.984	-20.9	-1.050	-25.9	-0.836
Transition countries <sup>3</sup>	13.4	0.656	-13.0	-0.307	-24.2	-0.446

## Notes:

1. Sectoral balance in relation to trade volume of SITC 5 - 8  $(=(\text{exports} + \text{imports})/2)$ , 1993.
2. Relation between exports and imports in the sector, divided into the same relation for total manufacturing (logarithm).
3. Trade with the OECD only (the mirror statistic is used).

Table 3.15. Market type oriented segmentation

(4 Oliveira-Martins sectors 1993)

	Fragmented low differentiation		Fragmented high differentiation		Segmented low differentiation		Segmented high differentiation	
	Share <sup>1</sup>	RCA <sup>2</sup>	Share <sup>1</sup>	RCA <sup>2</sup>	Share <sup>1</sup>	RCA <sup>2</sup>	Share <sup>1</sup>	RCA <sup>2</sup>
USA	-2.7	-0.060	-5.0	0.039	-11.7	-0.766	-0.5	0.188
Canada	-4.7	-0.502	-13.3	-0.876	36.2	0.866	-5.3	-0.310
Japan	-2.6	-1.133	29.9	0.206	3.8	-0.380	47.6	0.165
Germany	-0.3	-0.262	11.1	0.212	4.1	0.009	9.2	-0.020
France	-2.8	-0.100	-3.5	-0.066	3.9	0.282	-4.7	-0.046
Italy	33.0	1.019	9.1	0.045	2.6	-0.154	-12.0	-0.700
United Kingdom	-3.1	0.042	-3.8	0.124	-8.6	-0.277	-10.6	0.010
Spain	0.3	0.289	-18.5	-0.658	-4.9	0.022	-3.8	0.181
Netherlands	-0.7	0.076	-3.0	-0.015	-2.9	-0.084	-4.8	0.005
Sweden	-3.7	-0.278	-0.4	-0.050	14.1	0.567	-6.4	-0.234
Belgium-Luxembourg	2.9	-0.007	-2.5	-0.283	3.4	0.027	11.1	0.120
Austria	-5.2	0.013	-4.3	0.075	2.6	0.373	-15.7	-0.313
Denmark	11.1	0.562	5.5	0.277	-7.0	-0.348	-18.8	-0.558
Finland	-0.2	-0.268	-6.0	-0.526	42.8	1.183	-11.4	-0.648
Portugal	26.3	1.042	-20.0	-1.015	-10.7	-0.511	-28.0	-0.642
Greece	-0.3	1.324	-35.9	-1.661	-27.1	-0.454	-53.3	-1.335
Ireland	-3.4	-0.428	7.7	0.126	-5.3	-0.941	18.1	0.170
EU	3.5	0.146	1.3	0.010	1.5	0.043	-2.1	-9.995
Switzerland	-16.4	-0.399	8.9	0.681	-10.2	-0.662	-20.6	-0.177
Norway	-16.6	-0.239	-23.2	-0.758	7.6	0.763	-22.1	-0.614
Turkey	32.3	3.897	-48.8	-1.498	-18.9	2.284	-49.4	-2.276
Czech Republic	10.4	0.619	-25.2	-0.742	4.2	0.522	-13.8	-0.241
Slovak Republic	19.2	0.631	-31.6	-1.513	17.2	1.097	-12.0	-0.471
Hungary	2.5	0.451	-20.3	-0.632	-3.4	0.115	-15.9	-0.128
Poland	11.2	0.647	-27.0	-1.177	0.5	0.367	-18.2	-0.373
Slovenia	19.1	0.514	-8.1	-0.461	-2.5	-0.160	-6.5	-0.262
Bulgaria	10.9	0.531	-27.1	-1.120	8.1	0.813	-14.9	-0.364
Romania	28.4	0.614	-25.6	-1.634	8.7	0.925	-16.5	-0.872
Transition countries <sup>3</sup>	12.1	0.587	-23.2	-0.906	2.0	0.374	-14.8	-0.313

*Notes:*

1. Sectoral balance in relation to trade volume of SITC 5 - 8  $(=(\text{exports} + \text{imports})/2)$ , 1993.
2. Relation between exports and imports in the sector, divided into the same relation for total manufacturing (logarithm).
3. Trade with the OECD only (the mirror statistic is used).

Table 3.16. Quantitative indicators on competitiveness

	Trade balance 1994				Market shares 1994				Market shares			
	SITC 0 - 9		SITC 5 - 8		SITC 0 - 9		SITC 5 - 8		SITC 0 - 9		SITC 5 - 8	
	% of GNP	rank	% of GNP	rank	rank	rank	rank	rank	1994/89 <sup>1</sup>	rank	1994/89 <sup>1</sup>	rank
Czech Republic <sup>2</sup>	-5.25	7	-5.11	7	0.30	2	0.34	2	116.7	1	158.8	1
Slovak Republic	1.51	2	1.99	2	0.08	6	0.10	6				
Hungary	-3.58	6	-4.79	6	0.23	3	0.24	3	15.0	4	41.2	4
Poland	-2.17	5	-2.48	5	0.46	1	0.45	1	70.4	2	125.0	2
Slovenia	2.21	1	4.48	1	0.14	4	0.18	4				
Bulgaria	-0.57	4	-1.51	4	0.06	7	0.06	7	50.0	3	100.0	3
Romania	-0.51	3	-0.08	3	0.10	5	0.12	5	-41.2	5	-20.0	5
Transition countries	-2.11		-2.28		1.38		1.49		102.9		74.7	

Notes:

1. Relative change.
2. Data for 1989 former CSFR.

Table 3.17. Qualitative indicators on competitiveness

	Czech Republic	Slovak Republic	Hungary	Poland	Slovenia	Bulgaria	Romania	Transition countries
UV exports								
SITC 5-8	0.769	0.521	1.965	0.755	2.367	0.648	0.709	0.909
Rank	3	7	2	4	1	6	5	
UV exports/UV imports	0.18	0.12	0.54	0.21	0.79	0.15	0.12	0.24
Rank	4	6	2	3	1	5	7	
Share of SITC 7	30.7	20	31.5	23.6	32.9	13.2	9.5	25.7
Rank	3	5	2	4	1	6	7	
Successful quality competition	6.8	13.6	8.9	17.6	19.1	20.8	19.2	14.7
Rank	7	5	6	4	3	1	2	
Structural problem area	-39.6	-47.8	-44.8	-63.3	-23.3	-47.7	-64.8	-49.8
Rank	2	5	3	6	1	4	7	
Revealed quality sensitive industries	-19.5	-25.8	-28.1	-30.7	-7.9	-27.9	-25.9	-24.2
Rank	2	3	6	7	1	5	4	
Highly price sensitive industries	7.7	30.8	4.9	12.5	12.2	17	41.8	13.4
Rank	2	6	1	3	4	5	7	
Heterogeneous high differentiation	-39.0	-43.6	-36.2	-45.2	-14.6	-42.8	-42.1	-38.0
Rank	3	6	2	7	1	5	4	
Exports								
Human capital intensive								
Share	35.4	24.9	42.7	25.1	40.1	23.5	13.9	31.2
Rank	3	5	1	4	2	6	7	
Resource intensive								
Share	23.0	35.3	14.2	29.6	14.9	40.8	24.5	24.2
Rank	3	6	1	5	2	7	4	
Market shares								
Human capital intensive								
Share	0.22	0.05	0.19	0.21	0.13	0.02	0.03	0.83
Rank	1	5	3	2	4	7	6	
1994/1989 <sup>2</sup>	188.9		111.1	75.0		0.0	0.0	102.9
Rank	1		2	3		5	4	
Resource intensive								
Share	0.63	0.29	0.28	1.08	0.21	0.18	0.23	0.65
Rank	6	5	4	7	2	1	3	
1994/1989 <sup>2</sup>	148.6		-9.7	157.1		200.0	-39.5	74.7
Rank	3		2	4		5	1	
Average of ranks	3.1	5.3	2.6	4.5	1.9	4.9	4.9	

*Notes:*

1. Data for 1989 former CSFR.
2. Relative change.



Table 3.18. Country specific segmentation

	Exports	Imports	Trade balance	Trade volume	Import coverage	RCA <sup>1</sup>
Successful quality competition						
Czech Republic	682.7	249.3	433.4	466.0	2.74	1.253
Slovak Republic	254.8	47.3	207.5	151.0	5.39	1.752
Hungary	929.3	434.7	494.6	682.0	2.14	1.135
Poland	1,921.7	357.4	1,564.3	1,139.6	5.38	2.020
Slovenia	933.6	241.9	691.6	587.8	3.86	1.331
Bulgaria	319.9	73.3	246.6	36.7	4.36	1.695
Romania	517.6	80,269.8	437.4	298.9	6.45	1.914
Transition countries	4,909.0	1,100.6	3,808.4	3,004.8	4.46	1.771
Deficit in price competitiveness						
Czech Republic	141.2	366.7	-225.5	253.9	0.39	-0.709
Slovak Republic	56.6	157.1	-100.5	106.8	0.36	-0.953
Hungary	502.6	1,163.6	-661.0	833.1	0.43	-0.464
Poland	221.8	603.0	-381.2	412.4	0.37	-0.663
Slovenia	485.4	972.1	-486.7	728.7	0.50	-0.714
Bulgaria	37.8	225.1	-187.4	112.6	0.17	-1.563
Romania	94.3	264.5	-170.2	179.4	0.36	-0.981
Transition countries	701.5	1,279.6	-578.1	990.6	0.55	-0.325
Successful price competition						
Czech Republic	4,049.1	3,284.4	764.7	3,666.8	1.23	0.455
Slovak Republic	1,072.3	554.9	517.5	813.6	1.93	0.727
Hungary	2,464.3	1,874.0	590.4	2,169.2	1.32	0.649
Poland	3,964.9	2,498.3	1,466.6	3,231.6	1.59	0.799
Slovenia	1,929.2	1,221.6	707.6	1,575.4	1.58	0.437
Bulgaria	598.3	355.4	242.8	177.7	1.68	0.743
Romania	1,494.9	397.7	1,097.2	946.3	3.76	1.374
Transition countries	12,299.8	8,840.8	3,459.0	10,570.3	1.39	0.606
Structural problem area						
Czech Republic	758.5	3,297.1	-2,538.6	2,027.8	0.23	-1.224
Slovak Republic	83.0	810.7	-727.7	446.8	0.10	-2.212
Hungary	605.6	3,081.1	-2,475.4	1,843.3	0.20	-1.251
Poland	1,278.8	6,894.7	-5,615.9	4,086.7	0.19	-1.347
Slovenia	300.7	1,142.1	-841.5	721.4	0.26	-1.354
Bulgaria	88.3	649.8	-561.5	324.9	0.14	-1.774
Romania	117.9	1,597.1	-1,479.2	857.5	0.07	-2.556
Transition countries	4,346.4	18,111.8	-13,765.4	11,229.1	0.24	-1.151

Table 3.18. Country specific segmentation (continued)

	Exports	Imports	Trade balance	Trade volume	Import coverage	RCA <sup>1</sup>
Total industries						
Czech Republic	5,631.5	7,197.5	-2,538.6	6,414.5	0.78	
Slovak Republic	1,466.6	1,569.9	-103.3	1,518.3	0.93	
Hungary	4,501.9	6,553.3	-2,051.5	5,527.6	0.69	
Poland	7,387.3	10,353.5	-2,966.2	8,870.4	0.71	
Slovenia	3,648.8	3,577.8	71.0	3,613.3	1.02	
Bulgaria	1,044.3	1,303.8	-259.5	651.9	0.80	
Romania	2,224.8	2,339.6	-114.9	2,282.2	0.95	
Transition countries	22,256.7	29,332.8	-7,076.0	25,794.7	0.76	

Note.

1. Relation between exports and imports in the sector, divided into the same relation for total manufacturing (logarithm).

## NOTES

- 1 There are, however, also limits in the availability of unit values. For some industries, the weight in kg is not reported, be it that the denominator is reported in a different unit (square meters, volume, pieces etc.) or be it that there is no denominator available at all. The reporting behaviour is different from country to country. We have to use techniques which minimise the importance of this difference. Among these techniques is a computational procedure which calculates unit values at the n- digit level only if the data on the n+1-digit level are complete. We follow the strategy sticking to one reporting country as much as possible. For Germany as a reporter, for example, unit values are available for all but five 3-digit industries, comprising more then 90 per cent of German exports.
- 2 The unit value also increases with higher market power. We may at first feel uneasy with this, since in the usual structure conduct performance paradigm, market power is not related to quality. In Schumpeterian models, in the theory of quality ladders, and in the new trade theory, market power is however related to innovation, early starting advantages and successful vertical differentiation.
- 3 This holds under the assumption that trade barriers do not play a crucial role.
- 4 To show how each stage of fabrication and refining increases the unit value, let us look at a chain of products produced from the same basic input, but which are refined and processed at each stage of the production process:  
  
Germany , 1992: The unit value of iron ores is 0.06 USD per kg, that for flat steel is 0.47 USD per kg, steel pipes have a unit value of 1.03 USD per kg. The unit value of machines is 13.21 USD per kg, for computers it is 61.1 USD per kg, for medical instruments the unit value climbs to 206.64 USD per kg. Finally, software and intellectual property, knowledge have theoretically infinite unit values.
- 5 Microeconomics tells us that the willingness to pay, on the part of the consumer, can be increased by horizontal or vertical product differentiation. Horizontal product differentiation leads to a price premium, due either to value placed by consumers on diversification as such (love of variety approach), or because a specific new product comes nearer to the ideal variety preferred by some consumer (preferred variety approach). Product innovation results in a product assessed as superior by all consumers (vertical product differentiation). At a given regional market products at different prices can coexist, if they have different product attributes.
- 6 The unit values in this table slightly differ from those in the country tables, since different parts of industries are deleted in different methods of aggregation. In table 3.12 unit values are calculated on the 4-digit levels, and then aggregated. For calculations for the transition countries the mirror statistics are used: instead of using the transition countries as reporters the OECD countries are used as reporting countries.

- 7 The adequate statistical tool to test this is the correlation coefficient, the Spearman rank correlations are reported in table 3.12, the Pearson correlation coefficients can be calculated from the coefficients of determination.
- 8 Ranks of countries given by the export unit values are the same as ranks defined by the relative export unit values of a country relative to OECD exports.
- 9 As of 1993 transition countries did not report reliable trade data, so we had to use the mirror statistics (OECD as a reporter). This excludes the trade between the transition countries and non OECD countries. Total import unit values for the transition countries are much lower than the unit values for imports of transition countries from OECD (this is not the case for exports). Data for 1994 in which the Czech Republic and Slovenia are reporters still show higher import unit values than export unit values, but not to the same extent as in OECD trade.
- 10 Using per capita GNP at PPP gave the same correlation results as those at currency value (for exports, imports and relative unit value: +0.39, -0.45, +0.57).
- 11 Data for 1993, all OECD countries, SITC 5 - 8, excluding positions in which values and quantities were not reported for the same subgroups. Exports of Slovakia were proxied by imports of the OECD countries from Slovakia, imports of Slovakia are in fact the exports of OECD countries into Slovakia. Today some of the countries called in this paper countries in transition are members of OECD, correctly we would have to say OECD countries excluding countries in transition or OECD countries by the definition of 1993.
- 12 The relative weight of these factors cannot be assessed. Experts tend to weigh the second factor larger, but there is some evidence against it: most transition countries import textiles (yarns and fabrics) and reexport apparel products, in this case imports and exports belong to different 3-digit industries. If we split the 3-digit industries into 4-digit industries we still find a higher export unit value in the transition country for the majority of 4-digit industries.
- 13 The 18 countries are the 12 EU countries (before the last enlargement, USA, Japan, Canada, the Czech Republic, Hungary and Poland).
- 14 Since in the overall balances price elasticity is more important than quality elasticity, the groups were not totally symmetric. In the first group negative signs dominate positive ones by 12.2 : 3.3, in the second group by 9.1 : 5.7, in the third positive signs dominate by 8.2 : 6.2.
- 15 The relation of exports to imports in each sector is put in relation to the same relation for total manufactured industries, yielding some kind of Revealed Comparative Advantage Ratio (RCA), however in this case the ratios for the aggregate of all price sensitive industries, then of all moderately price sensitive industries and finally all quality sensitive industries are in the numerator (usually the RCA is calculated for individual industries).

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