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The qualitative competitiveness of high wage countries

Measuring the position of countries on the quality ladder

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Abstract: This paper proposes three new indicators for evaluating the competitive strategy of countries. Specifically it aims at assessing the position of high wage countries, which cannot and do not want to compete primarily in prices. For this component, sometimes called "non-price competitiveness", we complement the well known indicators on technological performance by proposing broad indicators for the product quality. Three indicators are developed and calculated for 29 countries and four economic areas, namely the US, Japan, the European Union, and seven European countries in transition. The new indicators come from the sophisticated use of unit values, providing information on the quality of aggregate exports, the price sensitivity of industries and the specialization of countries.

Focusing on technology and quality establishes a link between the issue of competitiveness and that of welfare maximization. Focusing on low costs, as the usual ratings of countries from the investor's point of view do, encourages policies which may be suboptimal from the perspective of welfare maximization, specifically for high income countries.

Keywords: competitiveness, non price competition, quality ladders, price sensitivity

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1. Purpose and relation to other studies1)

One of the significant features of economic change in the nineties is the increasing competition of developed countries by low cost producers. The former transition countries entered the West European Market, Mexico and South American Countries increase their market shares in the US, China has been accumulating a large trade surplus. The high wage countries have in principle two strategies to react: either they compete in the price by cutting costs or they spezialize in the high quality segment of the markets. The present study want to analyze to which extent individual countries specialize in high valued goods, whether they export goods in price elastic sectors or market segments or in less price elastic sectors or higher valued market segments.

A myriad of indicators is calculated for ranking the competitiveness of countries[2]). Most of them refer to the price competitiveness, some of them to "other elements of competitiveness",

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[1]) This paper was presented at seminars at UCLA, at the ECO- department of OECD and the EU- DGIII. We would like to thank Andrew Burns, Paul Geroski, Michael Landesmann, Edward Leamer, Richard Kohl, Joaquim Oliveira Martins, Michael Pfaffermayr, Pete Richardson, Peter Smith, Gunther Tichy, Nicholas Vanston for valuable comments. I also thank Dagmar Guttmann, Traude Novak und Eva Sokoll for the calculations and proof reading.

[2]) The best known country rankings may be those by the Institute of Management in Lausanne (IMD, 1996) and by the World Economic Forum in Geneva (WEF, 1996), which try to rank countries according to hundreds of indicators. The concept of the competitiveness of nations is however not uncontroversial in economics. Some authors deny that competitiveness is a problem under flexible exchange rates (Cooper, 1961), while others criticize the importance given to the competitiveness issue in economic policy. Porter, Reich and Krugman are the most prominent economists who play down the importance of the notion that the competitiveness of a nation, albeit due to different reasons and with variant amounts of vigor. Porter (1990, p. 6 ff.) comes very close to the position that the term competitiveness of a nation makes no sense, stressing that it cannot be that a country is "competitive in all industries". Porter arrives at this view after dismissing different concepts of competitiveness ("every firm is competitive", "positive balance of trade", "market share", "job creation") and then stresses that "The only meaningful concept of competitiveness at the national level is national productivity". Krugman (1994) stresses the danger of policies

or as it is labeled sometimes on "non-price competitiveness". Among the indicators on the non-price component, the indicators on technological competitiveness[3]) are the most elaborated ones. We want to complement these by presenting three measures which concentrate on the qualitative aspects of the competitive race. Up to now few indicators incorporate the softer elements of non-price competitiveness, such as successful marketing, image, consumer satisfaction, post sales service, flexibility in use, etc.

We calculate the proposed indicators on non-price competitiveness for 29 countries and for four blocs. The four blocs are Japan, the US and the European Union[4]) and for seven European countries in transition. All three regions in the triade are high wage countries, however with different strategies as far as wages, macroeconomic conditions and currency development are concerned. The transition countries have low wages, even after correction for the difference in productivity. Consequently the unit labor costs are lower in transition countries. Nevertheless the trade between the European Union and the transition countries is unbalanced in favor of the European Union. This can be explained by models presented in the New Trade Theory, where developed countries have early starter advantages, they can exploit economies of scale, and rely on sophisticated inputs to produce high value added goods for the upper segment of vertically differentiated markets. They can compete with low cost countries in Asia, Central and Eastern Europe, Central and Southern America, if and only if their products are continually innovated and improved. This is well characterized by the picture of firms or nations climbing up a quality ladder (Grossman, 1990, Grossman, Helpman, 1991).

The purpose of this article is not to present a new model for the competition between the "North" and the "South", but to present indicators on product quality. All three measures are derived from the unit value concept. The twofold character of this measure has thus far limited its application: it can be either a measure of costs and/or prices, or a measure of quality and/or productivity. We disentangle these aspects by splitting industries into two groups,

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focusing on competitiveness: "Competitiveness is a meaningless word when applied to national economies and the obsession with competitiveness is both wrong and dangerous", Krugman (1994) p. 44.

[3]) See OECD, 1995, Grupp, 1995.

[4]) The European Union is defined in its present borders with 15 member countries.

namely: those in which prices define the competitive edge, and those where quality is decisive. This provides information on the "revealed price elasticity" of industries and countries.

The paper is structured as follows. The next section relates the unit value, which will be used for the three indicators, to other economic concepts. Section 3 presents the three indicators on qualitative competitiveness. The aggregate unit value of exports is a measure for determining the position on the quality ladder. Secondly we offer a technique which helps us to distinguish between industries in which prices, respectively quality, are the most important determinant of competition (industry specific concept). Thirdly, we define a tableau of successfully (and unsuccessfully) competing sectors either group additionally split into those industries in which prices respectively quality define the competitive edge (country specific approach). Section 4 applies the three approaches to 29 countries and four areas. Section 5 summarizes the results, the shortcomings and the relation to other indicators.

2. The unit value - the concept and the relation to other economic concepts

We start with discussing the indicator "unit value" and to compare it with conventional economic concepts.

The unit value of exports is defined as nominal export 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[5]).

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[5]) 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 behavior is different from country to country. We have to use techniques which minimize 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. The European countries are excellent reporters, the US do not report quantities for quite a lot of industries in SITC 7.

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, labor, capital and material input. Now we add an output price P and distinguish two types of material, M_u and M_w, - material used (embodied) in the final product, and material not embodied ("waste"). The unit value is defined as $UV = P*Q/M_u$, 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 labor 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.[6]). 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 labor 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_U", 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 approaches to the price of

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[6]) 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.

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. For homogeneous goods competition drives down the price to marginal costs, and eventually the unit value approaches unit costs[7]).

The empirically calculated unit values are effected by aggregation problems. The unit value of road vehicles is a weighted average of that of bicycles, cars, trucks. It increases if one additional stage of processing is added. If the surface of flat steel is made more durable, the unit value increases. But what seems to be a disadvantage if we want to analyze "pure prices", proves to be an advantage when we seek to assess composition and quality of products. A country with a higher unit value of exports will produce products of higher quality, concentrate on high value added goods and supply an additional value adding stage of production[8]).

The twofold character of the unit value as price and as quality indicator has thus far limited its use in economics. In most disaggregated studies it is used as a price (see Aiginger, Pfaffermayr, 1997 A, B). In some macroeconomic studies it is used as indicator on quality (Wolfmayr, 1997, OECD, 1997). We will show in the next chapters that for aggregates costs and quality may go parallel, and for disaggregated analyses that the data contain information, which tell us to some extent whether a specific unit value reflects prices or quality.

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[7]) 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.

[8]) There are of course some cases, where higher unit values of exports relative to those of imports do not indicate higher quality. This can be the case if raw materials are imported and processed n low wage plants and then reexported. This limits the country specific approach for transition countries.

3. Three Indicators on Quality

The overall measure: the unit value of exports

As the most comprehensive measure on the quality of the products supplied by an economy we take the unit value of exports of manufacturing products ($UV_{exp, SITC\ 5-8}$). In climbing up the quality ladder an economy has to pay higher wages and stays competitive only if it upgrades the quality of production and exports. The unit value of the aggregated exports should reflect the cost push as well as the upgrading of production, whether upgrading means vertical product differentiation of goods, or shifting to higher value added sectors or adding a further stage of processing. There may be an effect of secondary order: if growth is export driven and exports are fueled by low costs, then the relationship between unit value and per capita GNP could be weakened, but probably only for some limited period. If however exports rely on high quality (human capital, knowledge, research and development) the relationship should be very close.

The relation between the unit value of exports and that of imports ($UV_{exp, SITC\ 5-8}/UV_{imp, SITC5-8}$) will reflect the relative quality of goods produced in a specific country relative to those imported. The expected relation between the denominator of this relation (import unit value) and per capita GNP is not clear-cut. Richer countries could make use of the division of labor and import raw materials and semi-finished goods, this would imply a negative correlation between import unit values and per capita GNP. On the other hand richer countries tend to use quite sophisticated inputs, implying a positive correlation. It could be expected that for countries with large intra-industry trade the second relation would prove stronger, for a sample of countries with large income differences and inter-industry trade the first one. Depending on the sign of this partial correlation, the relative unit values will vary closer or loser with per capita GNP than the export unit value alone.

The unit value as a tool of segmenting industries (industry specific measure)

The price elasticity of demand differs across industries. We can implement the following devise to reveal the importance of price competitiveness:

If prices are the only determinant of demand, then countries with lower costs should be net exporters in quantities, while countries with higher costs should be net importers[9]*). If a country is a net exporter in quantities, despite higher unit values, then this success must be due to quality differences.*

This assertion makes use of the fact that economic theory tells us that - ceteris paribus - demand is price elastic. If net trade does not follow the price relation, something else must have happened; if this is the case for a specific industry in many countries, we conclude that "quality is revealed to be important".

We use the trade balances of 18 countries[10]) to classify all three digit industries into those which are highly price sensitive, moderately price sensitive and quality sensitive. *Price sensitive* are those industries in which unit value differences and quantity differences have different signs, *quality sensitive* industries are those in which higher (lower) unit values in exports lead to larger (smaller) quantities exported. Our data base contains 153 industries, class boundaries are set to obtain three groups with approximately 50 industries in each. We call this *industry specific classification*, since industries are classified once for all countries.

A segmentation of bilateral trade flows (the country specific measure)

In the real world quality differences and some degree of heterogeneity exist in all industries. The once-and-for-all split of industries in the industry specific method, disregards this diversity. We therefore exploit the relation between unit values and quantities traded in *each* industry and *each* country for producing the results listed in Table 3:

The first segment reports the industries with successful quality competition (positive net exports despite high unit values). The second segment reports industries with a deficit in price

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[9]) Note that in this case the conditions for prices to be the decisive determinant coincides with the conditions for unit value to reflect costs. In general we assume something similar to a demand function with two components, $x = a\,p + b\,v$, where p, x, v are price, quantity and quality, a and b are coefficients.

[10]) The calculation was done in Aiginger (1996) for 1993, using the export and import flows of the 12 EU countries, plus those of the US, Japan and Canada representing the large non-EU countries; and Hungary, Poland and the Czech Republic as examples of countries in transition.

competitiveness (high unit value of exports, low exported quantity), and the third those with successful price competitiveness (low unit value, high exports). The forth segment is called structural problem area, ist scope is revealed by an export deficit, although the unit values indicate low prices.

This classification is country specific, the same industry can at least theoretically be classified differently in different countries. The idea is the same as in the industry specific segmentation: accruing a quantity surplus at higher unit values, implies high quality, suffering a deficit despite low unit values informs about inferior quality. For a high wage area the segmentation has important policy implications. Ceteris paribus, a country with a large sector of successful quality competition is less endangered by rising wages and low cost competitors, than one focusing on price competition. Countries with a large structural problem have a deeper economic problem, than just relatively high wages.

4. Application of the concepts

Unit value and GNP per head

Table 1 shows the expected positive relation between unit values and per capita GNP. The unit value of EU exports is more than three times as large as that of the exports of transition countries[11]). The unit value of Japan ($ 2.99) is even higher than that of the European Union, though some individual members of the EU have higher values (Germany, United Kingdom) as is the case for Switzerland. The unit value of the US is biased downward, since the US underreport unit values in high tech industries (missing data). The extent of the bias can be assessed if we take the mirror statistic (trade from OECD to US) and then correct for the bias that US trades higher valued goods with OECD than with the rest of the world. This would

[11]) See Table 1, the unit value of exports are $ 2.69 respectively $ 0.83. This comparison is to some extent biased in favor of the transition countries. Since the trade statistics of these countries were not reliable for 1993, we used the mirror statistics from OECD as a reporter to the transition countries. The degree to which the unit values of trade with OECD is higher than that for total trade the export unit values are biased upwards. The effect proves to be even larger on the import side however (see the high unit values for most transition countries).

yield a "corrected" unit value for US of $ 4.7 and rank the US as nation with the 3rd highest unit value.

The import unit values show the expected ambiguous picture. Japan has a specifically high import unit value, which comes from the sophisticated imports from the US. Switzerland is a typical high income country importing also high quality products (though quality in exports is even higher). The EU has an intermediate unit value, it is below that of Japan, but above the original value for the US in Table 1[12]). The import unit values of the transition countries look rather high, but this comes mainly from the fact that only trade data between the transition countries and the OECD are used[13]).

Table 1 shows the rank correlation between the hierarchies of the export unit values, of import unit values and of the relative unit values each with per capita income[14]). 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 percent 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.

However we have to be careful not to claim any "prove" of an economic law by the statistics presented 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 interpretation of the relation is, that economics in general and the quality ladder approach specifically imply

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[12]) But below the corrected value (3,565 $, derived from the mirror statistic of OECD exports into US and corrected for the OECD/world bias, see lower part in Table 1).

[13]) The bias is rather large, since the transition countries import the high value added goods from the OECD, where data are available, they indicate that the total unit value could be about half or only one third of that for total imports.

[14]) For the regressions all data were transformed into logarithms. 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 and Table 2 and 3 report exports to OECD-countries only. In table 1 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.

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 univariate 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.

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 neighbor. 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.

In absence of a method to overcome the problems of causality at this stage of research, we tested the robustness of the relation. We used per capita GNP at purchasing power parities[15]), 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), we rerun the regression with the corrected unit value for the US and we deleted outliers (to overcome deleted information). The basic results proved very robust.

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[15]) 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).

Price and quality sensitive industries

Table 2 presents the trade performance of countries in the highly, and in the moderately price elastic sector, and in the industries revealed to be quality sensitive[16]). We use a measure of Revealed Comparative Advantage to adjust for the overall positive or negative trade balance and interpret the relative specialization. All countries in transition, as well as Turkey, Ireland and Portugal, have a positive performance in highly price sensitive industries, but an extremely high deficit in the quality sensitive industries. The European Union shows an underproportional surplus (a relative deficit) in the price sensitive industries, and a large surplus in the qualitative sensitive industries. For the US and Japan all depends whether absolute or relative figures are used. In absolute figures the US have the largest deficit in the price sensitive sectors, and a somewhat smaller in the quality elastic sectors. In terms of comparative advantage, the deficit in the price elastic sectors persists, the balance in the quality elastic sector approaches zero, a weak specialization in the moderately price elastic sector exist. Japan has absolute surpluses in all three sectors, the largest in the moderately price elastic sector. In relative terms this specialization is underlined, the position in quality sensitive industries is due to relative low unit values in high tech industries specifically with the US (see Aiginger, 1996B).

Switzerland and Germany have specifically 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 specialization in price sensitive industries. Specifically, Japan accrues 40% of its total surplus in this sector. All six countries with a positive specialization in the quality sensitive sectors are European countries. Spain ranks far better in this ranking than in per capita income, due to its specialization in the car industry.

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[16]) The relation of exports to imports in each sector is, however, relative to the same relation for total manufacturing, yielding a type 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 of all quality sensitive industries are in the numerator (usually the RCA is calculated for individual industries).

Segments of excellence and problem areas

Table 3 presents the four quadrants derived from country specific information concerning the revealed importance of quality and price[17]). The European Union shows an excellent performance in the quality sensitive industries. The sector of successful price competition is not large, however larger than the sector with a deficit in price competitiveness. The structural problem area is for the combined area of all EU-countries the smallest sector[18]). Japans position is revealed as successfully competing in prices, the surplus of the sector of successful quality competition is absolutely large, but relatively small. The US have a good position in the sector of successful quality competition, specifically if we correct for the overall trade deficit. This comes from the strong US performance in telecommunication and electronics as is shown in Aiginger (1996 B).

Germany has the largest positive trade balance in the sector of successful quality competition, followed by Denmark and Belgium. The relatively good performance of most countries in transition, as in Turkey, is to some extent misleading, and illustrates the limits of a country specific concept. A large part of the surplus comes from the re-export of imported material. This sector primarily contains subindustries in the textile and apparel sector. These industries are revealed to be price sensitive in the industry specific concept, and the unit value in this case does not reflect quality, but rather the stages of production. The European countries have typically large deficits in price competitiveness, while the countries in transition have their lowest deficit here. Successful competition in price is - as expected - high in transition countries. The largest surplus, however, is accrued by Japan, indicating that a very large part of its surplus can still be attributed to low prices. Among the other European countries, Finland, Italy, and Portugal rely on low prices. Large problem areas are shown in the countries

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[17]) The segments are derived from country specific balances. The balances are put then, however, in relation to the average of imports plus exports ([M + X]/2). Note the signs of the trade balance, are to some extent misleading, since the four quadrants are defined in a way which make the signs in the first and third quadrant positive and in the second and forth negative (this is also the reason why we did not publish RCA's for this table).

[18]) These data are derived from total exports and imports of the 15 EU countries (in the definition of today's EU). If the data for the EU are calculated from the average over the countries, the picture is biased by the extreme high shares of structural problem areas in Portugal and Greece.

of transition and in Greece, hinting at exit barriers in the industries where exports are low despite low prices. The smallest is revealed for Germany[19]).

5. Summary

This paper introduced three indicators which measure the soft components of non-price competitiveness, the absolute unit value of exports (1), the share of exports in sectors in which quality competition prevails (ii) and the share of exports sold in the sector in which unit value of exports is higher than the unit value of imports. These indicators complement hard evidence on "non- price competitiveness" coming from technological indicators. The more important quality becomes, the less contested markets are by low cost competitors. This condition is specifically important for high income nations confronted by neighbors with abundant labor. They have to concentrate on sophisticated inputs (skills, innovation, research, specific capital) and to supply new markets or the upper segment of vertically differentiated markets. All these phenomena lead to higher unit values of exports.

The absolute unit values of exports, the industry specific, and the country specific segmentation, each provide information on the quality of the products each country produces. The information partly but not fully overlaps with that provided by the conventional per capita GNP or by technology indicators. The specialization of Iceland and Norway in resource intensive goods, which is attributable to their natural resources, and the specialization of Canada and Austria, which results from the dominance of a neighboring country, is not reflected in per capita GNP. The extreme specialization of the US and Japan in moderately price intensive goods, and the fact that the Japanese surplus still accrues to a large extent from successful price competition, is sharpened by the new indicators. The future oriented specialization of Switzerland and Germany - and to some extent of the European Union in general - in quality sensitive industries and segments is in some contrast to the evidence

[19]) A similar split of industries is proposed by Oliveira Martins (1995, 1996) who distinguishes between fragmented and non fragmented industries and between lightly and highly differentiated industries.

provided by the technology indicators in which Europe lags behind the US and Japan. This evidence is, however, consistent with the positive trade balance of the European Union, which exists despite Europe's high and rising wage rates.

Some information may be spurious, while a hopefully smaller portion may perhaps be misleading. A definite advantage of unit values is, that if needed, the data can be further disaggregated, finally up to thousands of 6-digit industries, to illustrate the underlying trade flows and to correct aggregation problems or errors in the data. This is usually not possible for National Accounting data or for technology indicators. Our tentative conclusion is that these three indicators can help to enrich the understanding of the competitive race, specifically the process and speed at which nations climb up the quality ladder.

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Table 1: Quality Ladders, Unit Values and per Capita GNP 1993

Country	Exports	Imports	Unit value Exports/imports		Export UV country/ export UV OECD		GNP/head	
	$/kg			Rank		Rank	US $	Rank
USA	**1.481**	**1.253**	1.182	6	**0.629**	17	**24,251.9**	5
Japan	**2.993**	**3.428**	0.873	9	**1.272**	7	**34,294.7**	1
EU-15	**2.690**	**2.692**	0.999	–	**1.143**	–	**18,703.2**	–
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	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
Canada	0.449	1.022	0.439	22	0.191	29	18,909.1	13
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
Transition countries	0.826	3.918	0.211	–	0.351	–	3,594.7	–

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

		Regressions[20])				Rank correlation coefficients	
(1) ln UV exports =	– 3.393	ln GNP/head	+ 0.416	(t = 3.41)	R2 = 0.301	0.505	t = 3.04
(2) ln UV imports =	2.643	ln GNP/head	– 0.177	(t = –2.22)	R2 = 0.155	– 0.383	t = 2.15
(3) ln (UV exp/imp) =	– 6.036	ln GNP/head	+ 0.593	(t = 5.95)	R2 = 0.567	0.615	t = 4.05

Robustness check:

USA[21])	4.699	3.565
EU[22])	2.673	2.628
Transition countries[3])	1.123	4.269

[20]) The regression coefficients should not be interpreted, because of the two sided causality, R2 may be used.

[21]) Mirror statistic is used. OECD is used as reporter, then data are corrected for difference between OECD and world exports.

[22]) Unweighted average over individual countries.

Table 2: Industry specific segmentation

	Highly price sensitive industries		*Moderately price sensitive industries*		*Revealed quality sensitive industries*	
	Share[23])	*RCA*[24])	*Share*[1])	*RCA*[2])	*Share*[1])	*RCA*[2])
USA	**– 10.3**	**– 0.109**	**– 0.2**	**0.194**	**– 9.5**	**– 0.048**
Japan	**19.9**	**– 0.110**	**29.4**	**0.375**	**23.8**	**– 0.155**
EU-15	**1.0**	**– 0.600**	**– 0.1**	**0.299**	**3.1**	**0.481**
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	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
Canada	30.0	0.545	– 6.6	– 0.367	– 12.3	– 0.582
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[25])	13.4	0.656	– 13.0	– 0.307	– 24.2	– 0.446
Robustness check:						
USA[26])	– 10.1	– 0.092	– 3.7	0.093	– 8.4	– 0.008
Japan[4])	10.3	– 0.550	43.7	0.685	35.1	– 0.070
EU[27])	4.3	0.201	– 5.5	– 0.174	– 8.4	– 0.189

[23]) Sectoral balance in relation to trade volume of SITC 5-8 (= (exports + imports)/2), 1993.

[24]) Relation between exports and imports in the sector divided into the same relation for total manufacturing (logarithm).

[25]) Trade with OECD only (the mirror statistic is used).

[26]) Mirror statistic is used.

Table 3: Country specific segmentation

	Successful quality competition	*Deficit in price competitiveness*	*Successful price competition*	*Structural problem area*
		Sectoral balance in relation to trade volume[28]		
USA	**6.1**	**– 20.7**	**5.1**	**– 10.4**
Japan	**14.0**	**– 9.3**	**76.7**	**– 8.9**
EU-15	**4.5**	**– 1.3**	**2.3**	**– 1.2**
Germany	26.4	– 7.8	7.2	– 1.4
France	5.0	– 7.4	1.9	– 6.7
Italy	18.9	– 4.4	29.1	– 12.8
United Kingdom	3.3	– 15.0	0.9	– 13.4
Spain	4.3	– 13.4	5.3	– 24.6
Netherlands	4.1	– 14.3	7.8	– 9.5
Sweden	14.4	– 6.5	19.3	– 15.5
Belgium	20.3	– 12.0	11.7	– 5.6
Austria	6.8	– 21.3	6.0	– 15.5
Denmark	24,1	– 16.0	5,6	– 20.9
Finland	13.0	– 21.8	51.1	– 18.8
Portugal	5.1	– 5.0	27.7	– 61.9
Greece	.	– 51.3	6.0	– 73.3
Ireland	43.8	– 18.7	5.3	– 8.9
Canada	4.8	– 13.9	43.0	– 22.7
Switzerland	24.0	– 29.2	9.5	– 28.0
Norway	0.2	– 25.5	17.7	– 46.8
Turkey	14.2	– 33.3	25.9	– 92.8
Bulgaria	21.0	– 16.0	20.7	– 47.8
Czech Republic	6.8	– 3.5	11.9	– 39.6
Hungary	8.9	– 12.0	10.7	– 44.8
Poland	17.6	– 4.3	16.5	– 63.3
Romania	19.2	– 7.5	48.1	– 64.8
Slovakia	13.7	– 6.6	34.1	– 47.9
Slovenia	19.1	– 13.5	19.6	– 23.3
Transition countries[29]	14.8	– 2.2	13.4	– 53.4
Robustness check:				
USA[30]	5.9	– 24.9	5.7	– 9.0
Japan[3]	19.7	– 9.5	83.8	– 4.9
EU[31]	13.5	15.4	13.2	20.6

[27] Unweighted average over individual countries.

[28] (= (exports + imports)/2), SITC 5-8, 1993.

[29] Trade with the OECD only (the mirror statistic is used).

[30] Mirror statistic is used.

[31] Unweighted average over individual countries.