

**The Shape of the New Europe:
Vertical Product Differentiation,
Wage and Productivity Hierarchies**

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1 Introduction

The current process of east-west European integration is a particularly striking example of the re-emergence of strong trade and, more generally, production linkages between two groups of economies which, albeit geographically close to each other, have had minimal trade and FDI links over a forty-year period. The rapid and deep liberalization of external relations after 1989 (accentuated by the decline of economic activity in ex-CMEA countries due to ‘transformational recessions’) has led to a dramatic process of trade re-orientation and also to a rapid build-up of pressures towards a new pattern of specialization in accordance with global market pressures, mostly in conformity with predictions made by traditional trade theory. Thus, strong deficits in skill- and technology-intensive branches emerged, an accentuation of specialization towards labour-intensive branches and a decline of capital-intensive branches could initially be observed in central and eastern Europe’s trade specialization with the west (see the evidence in *European Economy*, 1995 and Landesmann, 1995).

However, at the same time as global market pressures redirected industrial and trade specialization in the central and east European (CEE) countries in conformity with comparative levels of economic development, factor endowments, etc., there was also evidence of the impact of the embarkation of some of the CEE countries on a process of catching up with more advanced western European economies (in organizational/institutional, technological and product-quality terms).

Two forces have thus been operating alongside each other: (a) the accentuation of patterns of inter-industry specialization, following the strong liberalization of trade, and (b) the beginnings of a process of catching up (very differentiated across the different CEE countries) which is traditionally associated with a decline in strong patterns of inter-industry specialization and an increase in intra-industry trade (for details on this argument and evidence, see Landesmann, 1995).

2 Diversity as a factor in catching up

Evidence on catching up suggests the emergence of strong heterogeneity across the CEE economies. For certain economies, notably Hungary and the Czech Republic, we observe strong increases in intra-industry trade with EU trading partners and a decline in the strong comparative bias against skill-, R&D- and, lately, capital-intensive branches. For other countries such as Romania and Bulgaria – with

Poland occupying a middle position – patterns of inter-industry specialization compatible with differential factor endowment positions between eastern and western European economies are further reinforced. Comparisons of both industrial and trade structures of CEE countries with northern and southern European economies show that the more advanced of the CEE economies occupy a middle position between the industrially more advanced northern EU and ex-EFTA countries on the one hand and the southern European economies (Spain, Portugal, Greece) on the other (see Urban, 1997).

The cumulative evidence of development in transition economies indicates the great importance of geographical location: the CEE economies adjacent to western Europe absorb a much greater amount of FDI than those which are geographically (and culturally) more removed. They emerge sooner from ‘transformational recessions’, they obtain easier access to international finance and they stabilize – in a feedback relationship – more rapidly, politically and economically. All these are important factors for embarking upon a catching-up process.

The potential for and speed of catching up is relatively high in CEE precisely because of the inherited unbalanced nature of assets (such as good stocks of engineering skills, insufficient capabilities/capacities in design, marketing, communication infrastructure, etc.). This, implying bottlenecks in some assets/skills and excess capacities in others, has led to inefficient utilization of existing capacities and under-performance.¹ Closing the existing gaps in skills and infrastructure, as well as in organizational and institutional structures, could thus lead to strong, positive externalities. Current developments (relatively rapid productivity growth and export growth with real appreciating currencies) in those CEE countries which have embarked upon growth are a testimony to their existence.

3 The presence of price/quality gaps in intra-industry trade

Trade theory tends to think of intra-industry trade as being of a largely horizontal type (i.e. producing differentiated products of rather similar quality but catering to differentiated tastes).² This picture is, as one would expect, grossly misleading if one studies the evidence of evolving intra-industry trade between CEE and western Europe. This trade is characterized by enormous price/quality gaps in even narrowly defined product groups (for evidence on this, see Landesmann and Burgstaller, 1997). Hence, an analysis of ‘vertical’ product differentiation in intra-

industry trade (i.e. trade with marked differences in the qualities of products supplied by the different trading partners) in these evolving trading relationships is appropriate. Catching-up processes can be described as gradual upward movements of the more backward producers in vertically differentiated product markets and, behind that, of producers operating under technologically differentiated production conditions. There is some evidence that such upgrading does occur in the more advanced of the CEE economies, Hungary in particular, and that quality upgrading correlates with the degree of cross-border corporate involvement by western firms.

A detailed examination of price/quality gaps between eastern and western European producers and of the general positions of CEE producers in quality-segmented product markets of intra-EU trade by Landesmann and Burgstaller (1997) contained three important findings (also see appendix A). First, the evidence suggests extremely high price/quality gaps and very little representation of CEE producers in the high-quality segments of trade with the EU. These gaps and under-representation in the high-quality segments are very striking, also in comparison with those characterizing the less developed regions of Europe and those outside Europe. The measured gaps, which put CEE economies on par with the export performance (in quality terms) with the lowest-quality exporters (China, India, Turkey) indicate that there is substantial scope for catching up here.

Second, shifts in the positions of CEE producers with respect to the two variables above over the period 1988–90 to 1992–94 were rather dramatic in relation to other international competitors. These shifts show again a clear bifurcation in the developments of two groups of CEECs, the ‘western’ CEECs (comprising the Czech Republic, Hungary, Poland and Slovenia) and the ‘eastern’ CEECs (comprising Bulgaria, Romania, Russia and Slovakia). For the most recent period, 1994 compared to 1992, furthermore, substantial price gap closures could be found for many sub-branches of the engineering sectors, irrespective of the degrees and directions of exchange rate to PPP rate movements. Furthermore, substantial price gap closures (at current ECU exchange rates) proceeded with, at the same time, substantial improvements in the market share positions of CEE exporters (for an analysis of the experience of exchange rate movements and of the development of market shares jointly with price/quality gap closures.

Third, while upward movements in the exchange rate relative to the PPP rate relate in the general sample (comprising all economies

exporting to the EU) positively with upward movements in the price/quality position of exporters during the early transition period, this relationship is much less visible amongst CEE exporters. For the more recent period, 1994 compared to 1992, furthermore, substantial price-gap closures could be found for many sub-branches of the engineering sectors, irrespective of the degrees and directions of exchange rate to PPP rate movements. Furthermore, substantial price-gap closures (at current ECU exchange rates) proceeded with, at the same time, substantial improvements in the market-share positions of CEE exporters. This evidence does seem to support the view that initial quality positions of CEE producers did not fully reflect underlying developmental levels.

4 Trade theory and catching-up

The evidence of strong vertical product and production differentiation between eastern and western European producers implies that some of the conjectures of traditional trade theory – Heckscher-Ohlin-Samuelson (HOS) theory – should be applied in a very cautious manner to draw out the implications of the fast moving process of east-west European integration. In particular, the Stolper-Samuelson theorem which conjectures that a strong global pressure towards factor price equalization would be exerted through competition in the product markets, has to be applied only with very strong modifications. Catching-up economies, particularly those with very strong gaps in capability structures, are operating in different technological and organizational environments and, furthermore, are catering largely to different ‘quality segments’ of international product markets than are the more advanced western European producers. If quality segmentation is rather extreme (as the evidence mentioned above indicates) one should expect eastern and western European producers to operate in largely ‘non-competing’ product spectra or, at least, to sell with high quality discounts attached to their products, so that the situation is rather removed from a direct application of the Stolper-Samuelson theorem. Nonetheless, over time, as catching up gains momentum and as the linkages of cross-border corporate integration thicken, the strong quality segmentation gets reduced and a wider and wider range of products become ‘competing products’. It is then that the pressures on western European factor markets increase; at the same time, of course, real-wage catching-up processes in eastern Europe are also in progress.

Evidence on wage rates, labour productivities, and labour unit costs show a dramatic increase in the range of productivity levels, compensation rates per employee and in labour unit costs across the European continent as a result of east-west European economic integration. A recent study by Landesmann and Egger (1997) has compiled detailed wage-rate, productivity and labour-unit-cost data at the branch level for the entire range of east and west European economies and shows that the coefficients of variation of productivity levels and compensation rates have increased dramatically on the European continent and now approach the values which could be calculated for the range of Asian economies. Hence the picture of vertical differentiation discussed above with respect to product qualities supplied by east and west European producers has its complement in cost variables (compensation rates, productivity levels, labour unit costs) which traditionally point to international hierarchies in production conditions.

5 The importance of diversity in attracting FDI

The picture of vertical product and producer differentiation is also essential for understanding the dynamics and pattern of FDI and of cross-border corporate integration between eastern and western Europe. The analysis of FDI flows and cross-border corporate integration is complex, as the enormous theoretical and empirical literature on this topic testifies (for an overview, see Markusen, 1995). However, there are a number of tendencies in FDI developments in CEE which support the arguments made above: First, as mentioned above, there were and are clear gaps in CEE's production capabilities and, also, gaps in catering for domestic demand structures once these could be expressed more freely in the market after the transition. The closure of these gaps through FDI activities and cross-border corporate integration is an important factor explaining early patterns of FDI. Second, as can already be seen from evidence in those countries and industries in which more dramatic FDI and OPT (Outward Processing Trade) activities have developed, the presence of foreign enterprises, through FDI, joint ventures and OPT activities, plays an important role in the upward movement within the vertically differentiated structure of east-west European production and trade relationships. In countries which receive a relatively high inflow of FDI, enterprises with foreign participation account for an overproportionate amount of export (and import) and investment activity (see Hunya, 1996, Zemplerová, 1996). Wage levels are generally higher in enterprises with foreign participation, they attract skilled

manpower more easily and they are prime customers of financial institutions.

Corporate strategies in the current era are designed to exploit vertically differentiated production conditions globally. A variety of studies (see, e.g., Borrus, 1995, Doherty, 1995) have pointed out that, in order to organize their operations worldwide, US and Japanese firms, in particular, have built up corporate cross-border networks (sometimes with and sometimes without ownership control) which have exploited the differentiation in technological capabilities and cost conditions across south-east Asian countries and regions. As the degree of differentiation of production conditions has vastly increased in Europe as a result of east-west European integration, it is quite likely that similar networks initiated by western European (but also US, Japanese and Korean) firms will evolve as part of the overall economic integration process of western and eastern Europe.

6 The relationship between trade, FDI and the labour market

The relationship between trade structures, FDI flows and labour-market developments has recently occupied many economists in the west (for an overview of this – largely American – literature, see e.g. Baldwin, 1995; for a review of the debate see Wood, 1995). Careful studies (see, e.g., Murphy and Welch, 1991; Borjas, Freeman and Katz, 1992; Leamer, 1994; Sachs and Shatz, 1994) found significant effects of evolving international trade patterns, FDI and migration flows on employment and wage structures in the west. These studies mostly concern developments in the 1980s and concentrate on north-south trade and migration patterns. It is clear that this topic is of great relevance for east-west European relationships and particularly for countries with close geographical proximity to each other.

However, as mentioned under 4 above, there is a danger in applying standard trade theory in too simplistic a manner to the situation of increasing trade and corporate links between catching-up and more advanced economies. Development processes in central and eastern Europe are characterized by rather strong heterogeneity: certain regions, segments of the company sector and of the labour market are developing rather rapidly, other regions and segments are stagnating or lagging strongly behind. Consequently, the evolution of demand structures, the access to capital markets and to skilled labour show strong features of segmentation. In such circumstances, competitive pressures are strong within segments but weak across segments, although the boundaries

between segments are shifting as modernization gains momentum in the CEE economies.

There is evidence of a rather dramatic increase in inter-industry wage differentials in CEE since the onset of transition, approaching in some economies the type of wage dispersion observed in the west. However, more work is required to reveal the evolution of wage structures within industries (across firms), across skill groups, etc. The simple differentiation between skilled, semi-skilled and unskilled segments of the labour force, which is adopted in the literature on the impact of 'globalization' on labour markets in advanced and catching-up economies, is, probably, insufficient to grasp the complexity of the gradual and problematic restructuring of the existing skill structure of the labour force in eastern Europe. As mentioned above, while the general standards of education are high (see e.g. Hamilton and Winters, 1992), there are severe gaps in the availability of certain skills as the existing skill structure has been built up over a long period in which it did not have to comply with the requirements of an open, market-oriented economy. Hence, just as with the physical capital structure, so does the stock of human capital undergo a difficult process of adjustment; and the evolving wage structure in central and eastern Europe reflects this, with very high spot prices showing up the short supply of certain professional skills (accountancy, management, legal practice) and with low wages (and/or deteriorating job prospects) reflecting the redundancy of other types of acquired skills.

From the available evidence it does look as if the longer-term comparative advantage of some of the more advanced of the CEE countries might not necessarily be cheap labour *per se* but a relatively cheap skilled labour force although due account has to be taken of the gaps in the skill structures mentioned earlier. Furthermore, exploitation of this potential presumes that necessary structural skill-adjustment processes proceed successfully (supported by suitable government schemes of training and retraining and an overhaul of educational and training structures) and without too much effect of high transitional unemployment on skill erosion. The current emphasis of FDI on more capital- and technology-intensive activities in manufacturing (which are also areas in which the complementarities between capital and skilled labour are particularly high) in some of the CEE countries can be taken as evidence that their longer-term comparative advantages do not seem to lie exclusively in low-tech, low-skill production.

7 Quality segmentation and phases of catching up

As regards the impact of eastern European developments upon western European labour markets, we would expect the type of dynamics analysed in the north-south trade and FDI literature to gain momentum over time, as eastern European producers gain weight in western European markets³ and in intra-corporate European production chains; as the ‘quality segmentation’ in product markets weakens and, hence, as east European producers (or subsidiaries of western companies in eastern Europe) start to compete directly with western producers over a wider range of products in western and home markets. Theory suggests that the strongest pressure of adjustment in the west would be exerted by the emergence of a strong pattern of inter-industry specialization; this, we feel, however, will not be characteristic of the more advanced of the eastern European economies, given the scope for catching up in these economies. There, the already growing tendencies for intra-industry trade will tend to build up and strengthen the pressures for a quality- (and skill-) upgrading process on producers in the western economies. In this context we should reiterate that real wage catch-up is as much a feature of an overall catching-up process and, hence, what are now considered as extraordinarily high wage gaps between eastern and western Europe will get eroded over time. The competitive challenge is a function of the relationship between ‘real cost’ and ‘quality’ catching up, and here, we expect that eastern European producers are going to differ from the east Asian ‘miracle economies’ in that these latter economies managed to mount a strong challenge to western producers by allowing, for considerable periods, quality catching up to outstrip real cost catching up; this is less likely to be the case in eastern Europe where social aspirations and political possibilities tend to exert a stronger pressure towards rapid real income growth.

The analysis of the impact of evolving industrial specialization patterns between eastern and western Europe (involving both trade relationships and direct corporate integration) upon the labour markets in both parts of Europe becomes an extremely important topic when there are quality gaps present. In the context of a potential process of catching up, specialization structures (reflected either in trade flows or in intra-corporate production-location decisions) are symptomatic only of specific phases of that catching-up process and differ between the phases (see the by now voluminous literature on the south-east Asian development process). As there is evidence already (see above) that catching up is and will continue to proceed at widely different speeds (if

at all) in different regions of central and eastern Europe, the pattern of industrial specialization is differentiated both across the time dimension (following the phases of a development process) and the regional dimension. Hence the impact of east–west European integration and of industrial specialization upon labour markets in both western and eastern Europe should be seen in the context of this dynamic and differentiated process.

For some time to come, competition from CEE producers will exert significant pressure upon the lower-cost, lower-quality segments of west European production. This will contribute towards additional pressure on industrial and skill upgrading, particularly in the countries which are geographically more exposed to such competition. From the point of view of longer-term industrial development, such a move – if successfully managed – should have a positive impact on ‘endogenous’ growth in the more advanced western European economies. Government policies in the west should be directed to support the necessary skill and technological upgrading process.

On the part of the CEE economies, one has to consider the impact of the integration of substantial segments of their economies into the chains of international production interlinkages. Attention will increasingly focus on the extent of ‘spillover effects’ between the activities with foreign corporate participation and the rest of the domestic economies. Evidence from Asian experience suggests that the depth and breadth of these spillovers are vital for the overall development process. On another issue, one also has to pay attention to the impact of selective migration flows of higher-skill categories (‘brain drain’) on the endogenous growth process. The interdependence between upward movements in the sophistication of the industrial structure and the demand for skilled labour and reduced incentives for selective migration is important here. The evolution of the ‘push factor’ of migration from eastern Europe will be as much a function of the expectations concerning the characteristics and the time horizon of the economic and social catching-up process as of the actually observed initial income gaps.

8 Conclusion

There is still great uncertainty about the longer-term characteristics of east–west European integration. The argument made here is that these characteristics depend particularly upon the extent, speed and nature of catching-up processes of CEE economies. Consequently, one should be careful in drawing conclusions from applications of relatively static

theories of trade and industrial specialization to the process of east–west European integration; this care should extend to the analysis of the implications of this integration process for the structural dynamics of eastern and western European labour markets.

Looking at the integration process from a dynamic perspective, one should pay increasing attention to the potential impact of the economic integration process of these two complementary parts of the European continent upon the dynamism of the European economy as a whole which, in the current global context, is of vital importance for Europe's future position in the world economy. Concern for the analysis of the timeframe of catching-up processes in the current liberalized conditions of east–west European relations, of the factors which constrain the embarkation upon speedy catching up including the extent, geographical coverage and characteristics of cross-border corporate linkages and of the emerging regional diversity of growth processes in this region should become paramount.

Notes

1. The unbalanced nature of existing capacities/capabilities was revealed even more strongly following the liberalization process after 1989/90.
2. There are exceptions to this description and analysis of intra-industry trade: see particularly the contributions by Shaked and Sutton (1982) and Gabszewicz and Thisse (1979), as well as the analysis of quality competition in models by Flam and Helpman (1987), Grossman and Helpman (1991), Taylor (1993), etc.
3. In 1996, the combined market share of all CEE countries in EU markets in manufacturing as a whole hardly exceeded the market position of a small advanced western economy such as Austria.

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Annex A

Differentiation of Product Quality on EU Markets

This annex analyses the pattern of vertical product differentiation in EU product markets. In the main text of the paper we outlined the importance of vertical product differentiation both for the analysis of catching-up processes as well as the analysis of the impact of east-west European integration on developments on labour markets in both eastern and western Europe.

The database used for the analysis in this annex is Eurostat's Detailed Trade Statistics which contain detailed information on trade values and volumes at the 8-digit CN (Combined Nomenclature, 6-digit NIMEXE before 1992) product level of trade to and from EU countries. We used this database to analyse the pattern of quality differentiation in intra-branch trade for some selected industries. In particular, the focus was to analyse the positions of different central and eastern European producers in the quality spectrum of trade with the EU. We compared their positions with those of a series of reference countries or country groups (EU Northern countries, EU Southern countries; Turkey; non-European advanced economies such as the USA, Japan; groups of Asian reference countries such as the NICs1 comprising Hong Kong, Singapore, Taiwan and Korea; NICs2 comprising Malaysia, Indonesia, Thailand and the Philippines; China, India, etc.)

Two types of exercises were carried out. Firstly, we simply calculated product prices (value per kg) at the detailed product level across the whole range of competitors in EU markets (more precisely, in total EU imports including intra-EU trade); we then constructed industry-level 'price/quality gap indicators' Q_j by comparing a country's product prices with the average EU import prices and aggregating these price ratios for individual 3-digit NACE industries j , using the different products' shares in a country's exports to the EU as weights. We write the industry-level (weighted) price/quality gap indicator as:

$$Q_j^c = \sum_{i \in I(j)} \left(\frac{p_i^c}{P_i^{EU}} \right) \cdot s x_i^c$$

where p_i^c is the price (per kg) at which country c sells exports of the product item i on EU markets (refers here to the EU 12 market); p_i^{EU} is the average price of product item i in total EU 12 imports; sx_i^c is the share of product item i in country c 's exports to the EU 12 market. Thus,

$$\sum_{i \in I(j)} sx_i^c = 1$$

where Ij is the set of product items i belonging to NACE industry j .

Secondly, we compared the compositions of a country's exports to the EU within a particular 3-digit NACE industry by ranking products traded within that industry by their prices per kg in the EU as a whole. We could then examine the extents to which a country's exports belonged respectively to the 'high-', 'medium-' and 'low-quality' segments of the product spectrum traded on EU markets in this branch. (For details on the methodology employed, see Landesmann and Burgstaller, 1997.)

Results from an examination of price/quality gaps. In Fig. A.1 we can see an example of the calculation of price/quality gap indicators for a range of economies for one NACE industry (NACE 32 mechanical engineering). The indicators have been scaled so that they take on the value of 1.0 for total EU imports; values below 1.0 imply that a particular country sells its (weighted) commodity basket on EU markets within that industry at a price below the average of total EU imports (including intra-EU trade); the opposite is true for values above 1.0.

The following general results emerge from an inspection of these results for a range of industries (the industries we examined were engineering industries, textile, clothing and leather products and food, drinks and tobacco): (1) There seems to be something of an EU market integration effect, i.e. EU members sell broadly at lower prices on EU markets than comparable countries such as the (ex-)EFTA countries Austria, Switzerland and the Scandinavian countries. (2) There might be some evidence of an impact of high/low values of exchange rates, such as indicated by the very high values for the price/quality variables for Japan and Switzerland; however, there is mostly remarkable stability of the indicators over the years, particularly in the case of most of the CEECs which experienced dramatic exchange rate movements over the period. (3) There is strong evidence for significant price/quality gaps between the CEECs and comparable countries of Southern EU (Spain, Portugal, less with Greece) and the groups of NICs in the engineering branches, but much less so in the textile/clothing/footwear and the food/drink groups of industries. (4) The pattern of differentiation across the CEECs, particularly between the group of 'western CEECs' (the

Czech Republic, Hungary, Poland, Slovenia) and the group of 'eastern CEECs' (Bulgaria, Romania, Russia) over the period 1988 to 1994 is remarkable, and also much more pronounced for the engineering industries than the textile/clothing/footwear and the food/drink groups of industries.

We move on to report results from simple (descriptive) cross-industry regression analysis: Here we used the calculated price/quality gap indicators for the full range of engineering industries (about 20 NACE 3-digit industries), then calculated 3 year averages for the periods 1988-90 and 1992-94 and regressed these simply on country (or country group) dummies.⁴ These regressions provide an overview of the significance of price/quality gaps across the range of 3-digit NACE industries considered. Comparisons across the two periods (1988-90 and 1992-94) show, furthermore, interesting shifts in the performances of the different countries or country groups.

Fig. A.2a plots the estimated coefficients on the country dummies for the groups of engineering industries for the two periods 1988-90 and 1992-94. We can clearly see the hierarchical range of different quality producers and this range conforms to our expectations. We can see the industrially advanced economies with (mostly) positive coefficient estimates for the prices they fetch on EU markets (always in relation to the EU average import prices) - they are significant at the 5% level only for the USA, Japan, Switzerland and Sweden -, then moving to moderately negative coefficient estimates for Italy, Spain and Portugal, the NICs1 and NICs2 (for the former insignificant at the 5% level and for the latter two, significant only in the earlier period), to the group of distinctly low quality producers comprising some Southern European economies (Greece, Turkey), all of the central and eastern European economies, as well as China and India; for this group of low-quality producers highly significant negative parameter estimates were obtained.

Important and interesting are the developments of the CEECs' positions from the base period 1988-90 to 1992-94: We can clearly see a bifurcation into two groups: the group of 'western' CEECs (comprising the Czech Republic, Hungary, Poland and Slovenia) and the group of 'eastern' CEECs (comprising Bulgaria, Romania, Russia and Slovakia); the former group experiences a distinct improvement in their positions while the latter group is further falling behind. This can be clearly seen from the estimates presented for country groups in Fig. A.2b (EASTW stands here for 'western CEECs', EASTE for 'eastern CEECs').

Results from examining product quality segmentation. We start again with an example of calculating the relative representation of different

national producers in the high-, medium-, and low-quality product segments of a particular industry. Fig. A.3 presents a chart for NACE industry 342 (electrical machinery). If all three bars for a particular country were of equal size (.333) then the products belonging to the different quality segments (QI for high-, QII for medium-, QIII for low-quality segments) would be represented in a particular country's exports to the EU in exactly the same proportions as they are represented in total EU imports (including intra-EU trade). Bars below that value would indicate an 'under-representation' of a country's exports in this quality segment, bars above that value would show an 'over-representation'.

Over the range of countries and country groups depicted, we can see that the CEECs belong to a small set of countries (such as Turkey and China) which mostly exports electrical machinery products in the lowest quality segment; alternatively, there is a very strong under-representation in the high-quality segment of EU product markets. Individual industries can throw up some unreliable results which, however, get washed away if one pools the information over a set of 3-digit NACE industries. Thus we move again to reporting our simple, descriptive regressions estimating country dummy coefficients to find evidence for significant under- or over-representation of a country's exports in particular product quality segments. We focus on the high-quality segment and, again, on the range of engineering industries.

Figs. A.4a and b present again the estimated dummy coefficients⁵ for the different suppliers to the EU market in the form of a bar chart; negative bars indicate an under-representation, positive bars an over-representation (always relative to the overall structure of EU imports) in the high-quality segments of EU engineering products. We can see – confirming our analysis of the quality gap indicators above – that the central and eastern European producers have significantly extended the range of countries situated at the low-quality end of EU engineering imports. Similar results could be found for the other industries (textiles, clothing and footwear and food and drinks) which we examined (see Landesmann and Burgstaller, 1977, for details).

The monitoring of price/quality gap closures and of their relative positioning in the different quality segments of EU product markets will continue to be an important aspect of the monitoring of catching-up processes of CEE economies. Of course, there is also always the possibility and also some evidence for 'falling behind' as well. The next stage of the research – currently under way - is to bring a fuller set of variables together which all relate to the question of potential and actual catching-up of CEE

economies: Relationships between industry-specific variables such as closures of productivity and wage gaps and the product quality gaps are the obvious ones. Also the relationship between real exchange rate appreciation and product quality improvements should be further analysed. Finally, our research goes in the direction to use information of labour force composition (by occupational and educational groups) and of the industrial allocation of FDI, joint venture and outward processing trade to bear on the question of where and to which extent industrial upgrading takes place across the CEECs.

Notes to Annex A

4. The specifications of these regressions amount to $LPG_{Cj}^{\bar{t}} = \alpha_c^{\bar{t}} \cdot dummy_c + \varepsilon_{Cj}$ which were estimated over countries (or country groups) C and across industries j belonging to a particular industry group (such as engineering or textiles, clothing and leather products) and for time periods $\bar{t} = 88-90$ and $92-94$ (i.e. three year averages). LPG refers to the dependent variable, the log of the price/quality gap variable; ε_{Cj} refers to the usual randomly distributed stochastic term; see Tables 4 and 6 for the results.
5. See fn. above for the specification of the estimated regression. We attach also tables A1.1 and A1.2 with the estimated (dummy) coefficients and their significance both for the price/quality gaps (LPG) as well as the variables which show the over-/under-representation of the different producers in the high(LQ1)- and low(LQ3)-quality segments of the EU product markets. Positive signs on the country dummies means a positive price/quality differential relative to the average (weighted) EU import product, negative signs mean a negative price/quality differential (a 'price/quality gap'). The same type of interpretation of the signs applies in the case of the parameters estimated for the countries' relative over- or under-representation in the different quality segments of the EU product markets.

Annex B

Differentiation of Cost Conditions in Europe and Asia

In this annex we shall take a look at the dramatic increase in the spreads of cost conditions which took place in the European economy as a result of east-west European integration and we shall compare these spreads with those encountered on the Asian continent.

The traditional argument in international economics is that international trade flows and also foreign direct investment occur precisely because there is supply-side differentiation across different economies. The differentiation in cost structures across different economies is traditionally deduced either from differences in endowment structures (economies are here seen as differently endowed with unskilled or skilled labour, capital, different types of raw materials, etc.) or from differences in the levels of technological know-how associated with the producers in different economies.¹ Hence, a quantitative view of the degree of supply-side differentiation is important to analyse the scope and the features of international economic integration across a particular geographic zone.²

In the following, we shall attempt to obtain quantitative estimates of the degrees of cost differentiation encountered in different manufacturing industries across the European continent. Two variables were singled out in this analysis: compensation rates of employees and levels of labour productivity. It is well-known that there are many problems in obtaining internationally comparable data for these two types of variables. Compensation rates include not only direct wage costs but also indirect labour costs (employers contributions, etc.); international comparisons of indirect labour costs are difficult because of the variety of institutional and legal arrangements and for many countries, in our case the eastern European economies, only rough estimates are available.

As far as the use of exchange rates for international comparability is concerned, the international comparability of compensation rates requires a choice of which exchange rate should be used for such comparisons. The rationale for using current exchange rates is that a cost comparison could, on the one hand, mean a direct comparison of compensation rates which have to be paid in different locations at one point of time expressed in a

common currency. However, from a long-run investor's point of view, the evolution of wage and compensation rates over a particular time horizon is important and not just the spot rates. Hence we would like to obtain estimates of the underlying trends in labour costs. From the theory concerning the deviation of purchasing power parity (PPP) from current exchange rates (the so-called Balassa-Samuelson paradox) we know that compensation rates measured at current exchange rates could be particularly low (high) in a country because its relative price structure differs from that in another country even though the real wage rates do not differ to the same degree. If one expects a convergence of price structures in the future (which would be an appropriate assumption in the case of transition economies) and one expects that nominal wage movements would compensate for the adjustment in prices (to sustain real wage levels), then one should argue that long-run comparisons of compensation rates should be conducted in PPP terms. Given the different rationales for the uses of both current and PPP exchange rates, we shall report on comparisons of the within-industry spreads of compensation rates using both these two types of conversion rates.

The comparison of (labour) productivity levels involves the international comparison of (real) production levels (see discussion in section 4) and here purchasing power parity measures would be definitely more appropriate than a comparison in current exchange rates (see e.g. Oulton, 1994). However, we know that existing measures of PPP rates are derived for the expenditure side of GDP and rarely from the production side. Especially for industry level comparisons of productivity levels this can induce serious distortions. As we do not have industry-specific measures of PPP rates we were compelled to use the aggregate GDP PPP rates and our international comparisons of productivity levels by industry will suffer from these distortions. However, as we are presenting mainly summary statistical indicators of spreads of productivity levels (coefficients of variation) we hope that the analysis will nonetheless give a rough idea of the increase in spreads in industry-level cost conditions which emerged as a result of east-west European integration.

Figs. B.1a and b present the ranges of compensation rates observed in the different European industries with and without the east European producers included. As mentioned above we present the information in two versions: calculated in current US\$ exchange rate and calculated at 1993 PPP rates. We can see that the addition of the east European producers add significantly to the cost differentiation within industries. The very large gaps between east and advanced western European producers labour costs

get somewhat reduced when PPP rates are used for these comparisons but the gaps remain considerable.

Figs. B.2a and b show a comparison of compensation rates in European (including east and west) and Asian industries. Visually it is difficult to compare the spreads of compensation rates in the two continents. What is clearly visible is that the European spreads are more continuous, with the range of Northern European wage rates lying at the top followed by the Southern European (Spain, Greece, Portugal) rates, followed again by the eastern European rates. On the Asian continent, on the other hand, the singularly high position of Japanese rates leaves a large gap to the next set of countries (Singapore, Korea, Hong Kong), followed with another gap by the less developed Asian economies in our sample (Malaysia, Philippines, Indonesia, India).

A firmer quantitative assessment of the increase in spreads experienced by the European economy can be obtained by comparing the coefficients of variation (the standard deviation divided by the mean) for the different subsamples of producers within an industry. The coefficients of variation for compensation rates have been plotted in Figs. B.3a and b. Here we can see clearly the step-wise increases in these coefficients (measuring the spreads) as we look at the EU-North alone (comprising Germany, France, Netherlands, Belgium, the United Kingdom, Denmark, but also Italy), then the total west European economy (comprising EU-North and EU-South), and then the total European economy (comprising the eastern as well as the western European countries). In fact, the jump in the coefficient of variation with the inclusion of the eastern European producers is very significant and brings Europe very close to the coefficients of variation observed in Asia (the last bar on the charts). In some industries in fact, the spreads in European industries in compensation rates outstrip the ones observed in Asia; this is the case in metal products, transport equipment and other manufacturing. In other industries, particularly the more labour-intensive textile, clothing and leather products industries and in food industries the spreads observed in Asia still outstrip the ones observed in Europe.

Turning now to the comparison of productivity levels, we can again observe (Figs. B.4a and b) the increase in the ranges of productivity levels in European industries resulting from the inclusion of eastern European producers. The use of general GDP PPP rates to compare productivity levels is particularly problematic in the case of Asia, as Japan contributes (see above) very significantly to the overall spreads observed in Asian industries and it is also the one country which has a very high ratio of current exchange rate to PPP rate. Given that the only PPP rate available to us is the GDP rate, the revaluation of Japanese productivity levels in terms

of the PPP rate causes particular distortions in the Asian case, as Japan has a very high weight in the calculation of the weighted coefficients of variation³ and is also known to have particularly high prices in the non-tradable sectors which means that the downward adjustment of productivity levels in the tradable sectors obtained by using the PPP rate for Japan might be much too high. For this reason we present productivity level comparisons for Europe vs. Asia again in both current exchange rate and PPP terms. The picture we obtain replicates the one we obtained by looking at the spreads in compensation rates across Europe: Europe significantly closes the gap vis-à-vis Asia in the measured spreads of productivity levels within the different manufacturing industries as a result of integrating eastern European producers. Again some cross-industry variations exist, with Europe obtaining a higher degree of variation in industries such as metal products, machinery, electrical goods and other manufacturing products, while Asia retaining a higher spread in transport equipment, textiles, clothing and leather products and paper and printing.

Overall the picture which emerges from this part of our analysis is that European industry has become considerably more diverse as a result of integrating east European producers into the overall European economy. This has important implications for the degree to which intra-industry specialization could develop within Europe and for the extent to which European (and other internationally operating) firms can exploit the greater diversity of cost structures on the European continent in their production location decisions.

Notes to Annex B

1. More recent developments in international economics emphasize other factors, such as product differentiation combined with scale economies, strategic behaviour of firms, etc. to explain the degree and characteristics of international economic integration.
2. The geographic element comes in if some of the differentiation across producers is related to geographic distance (transport costs in particular, but also other transactions costs which could be related to distance).
3. The weights used to calculate the weighted coefficients of variation were the different economies' shares in overall production values from the respective regions.

