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Evolution of trade patterns in the new EU member States

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EVOLUTION OF TRADE PATTERNS IN THE NEW EU MEMBER STATES

by Andrea Zaghini*

Abstract

The paper analyses the most recent evolution of the trade specialisation pattern in the 10 new EU Member States. Relying on the empirical approach of the Markov transition matrices it analyses both the changes in the external shape of the distribution of comparative advantages and the intra-distribution dynamics. The new Members show an indeed dynamic trade pattern: they were able to gain comparative advantages relatively fast in sectors in which they were lagging behind at the beginning of the transition process, notably in some "high tech" products. In addition, many specialisation improvements occurred in those items for which the world demand expands at the fastest rate, hinting to the possibility of an increase in their trade shares on world markets. Both findings can be explained by the initial need to rebuild and modernise the entire capital stock, the significant skilled-labour force endowment, and the large FDI inflows that allowed them to skip intermediate states of technological development.

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1. Introduction[1]

The evolution over time of trade specialisation is a phenomenon that often reflects deep structural changes in the whole economic system of a country. It usually takes long time to unfold since comparative advantages in trade are not gained in few days and are structural almost by definition. However, there are few exceptions to this common pattern. It might happen that sudden changes in the modalities of production are brought about by external factors as wars, the diffusion of a completely new technology and vast institutional changes. In this paper we analyse one of such exceptional cases: the evolution of the trade specialisation pattern in the eight countries of the former communist bloc that have joined on May 2004 the European Union.[2]

The development of trade in the new EU member States has been remarkable in the 1990s. The degree of openness increased dramatically; the integration with the EU market (boosted by the Association Agreement signed bilaterally by those countries) led to a doubling of their market shares in EU trade; FDI soared, allowing almost entirely the financing of large current account deficits (IMF, 2000). Thus, in spite of the limited data availability for those countries (1993-2001), the radical changes in the productive structure occurred during the years of the transition process from a centrally planned economy towards a fully-fledged market economy allows us to witness important modifications in the distribution of comparative advantages.

Even though trade creation and trade diversion effects will most likely continue to influence the international specialisation pattern of the eight countries under analysis in the early years of EU membership, it is worth to study the evolution that has already

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[2] The countries are: the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic and Slovenia. Even tough Cyprus and Malta did not belong to the former communist bloc and did not undergo any transition process, they have also joined the EU. Thus, for the sake of completeness they are included in the present study. However, they are dealt with mainly in footnotes.

characterised them since the start of the transition process. We propose two exercises. First, we analyse the developments over time of the distribution of comparative advantages to address the issue of the persistence of international specialisation models. In particular, we take into account the evolution of trade patterns both with respect to the change in the overall degree of specialisation (i.e., the development of the external shape of the distribution), and with respect to intra-distribution dynamics (i.e., the changes within the distribution). Second, we relate the comparative advantages switchovers to the evolution of world demand, in order to verify whether the specialisation pattern has moved towards the most dynamic manufactured goods, as it has happened, for instance, in several emerging Asian economies (Carolan et al., 1998).

In analysing the specialisation dynamics of the new EU member States, we rely on a recent strand of the literature, which is trying to address the issue of overtaking the limit of the empirical trade analysis in the context of the traditional concept of trade specialisation (Ricardian and Heckscher-Ohlin models). In fact, the empirical literature has been involved in the study of the international specialisation pattern of countries mainly from a static point of view, i.e. at a given point in time, whereas the theoretical literature on growth and trade highlights the dynamic and endogenous properties of comparative advantages (Krugman, 1987; Lucas 1988, Grossman and Helpman, 1991). However, the theoretical literature often yields ambiguous conclusions. For instance, sector-specific learning-by-doing is a self-reinforcing mechanism that typically induces persistence, while knowledge spillovers and technology transfers give rise to mobility. Eventually, whether a country exhibits persistence or mobility over time is a matter of empirical assessment.

To bridge the gap between theory and empirical works Proudman and Redding (2000), Brasili et al. (2000) and Redding (2002) borrowed from the cross-country studies on income convergence the empirical approach of the Markov transition matrices. Through this approach it is possible to exactly identify the movements over time of the entire distribution of comparative advantages characterising a given country. With respect to the quoted papers, we apply this methodology to a larger number of items and we employ a different index of specialisation. In particular, we compute the Lafay Index of international specialisation for 208 items of the 3-digit Standard

International Trade Classification (SITC). The choice of a different index is attributable to several appealing features the Lafay index shows with respect to alternative measures of specialisation. In particular, it is possible to control for intra-industry trade and business cycle variations.[3]

Even though many differences remain among the eight countries, both in the degree of specialisation and in the capacity of adjusting towards a rapidly changing world demand, our findings point to the appearance of a new pattern of international specialisation away from the trade flows structure inherited from the past. In fact, they show significant comparative advantages in many manufactured goods and they rely less on natural resources and raw materials than other emerging economies. Moreover, they generally display a trend of increasing specialisation and high mobility. In addition, some countries (Hungary, Estonia and the Czech Republic, in particular) exhibit a fast catching-up in some "high-tech" products, in spite of the significant technological gap inherited from the planned economy era. Finally, when taking into account the world demand dynamics, three countries (Estonia, Hungary and Slovenia) show a positive comparative advantage in the group of the 52 most demanded products, although a widespread improvement in the exchange of many expanding items has been recorded.

This unexpected catching-up might be explained by referring to a positive legacy of state socialism: human capital endowment with respect to both health standard and level of education was relatively high in many countries of the communist bloc compared to market-oriented economies with similar level of per-capita income. This fact, together with the proximity to the EU market and the strong inflows of FDI attracted by the prospect of the enlargement, have helped firms to surpass intermediate steps in development and benefit fully of the most updated technology, at least in some industries. Once these factors have been taken into account, the trade specialisation evolution of the new EU member countries over the 1990s is fully consistent with the broadening of the Krugman (1986) "ladder model" proposed recently by Landesmann

[3] However, a comparison with the results derived by using the RCA (Revealed Comparative Advantage) index by Balassa (1965) is provided for the main findings of the study.

and Stehrer (2001), which support the possibility of relatively quick specialisation adjustments towards the sectors for which the productivity gains are the largest.

The paper is organised as follows: in Section 2 we introduce the analytical framework of both static and dynamic trade analysis, in Section 3 we examine the international specialisation pattern of the new EU member countries and assess the structural stability of the model; in Section 4 we investigate the evolution of the specialisation pattern with respect to the world demand; Section 5 concludes.

2. Empirical trade analysis: data description and methodology

The main dataset for the analysis of the trade specialisation scheme of the new EU member States is the World Trade Analyzer (WTA) by Statistics Canada. This dataset consistently recompiles UN trade data over the period 1993-2001 for the whole set of countries. Needless to say, the reference period, which immediately follows the "transformational recession" induced by the early phase of the transition process, has been one of dramatic changes in these countries, many of which did not even exist as independent States at the beginning of the1990s. Such deep structural changes have strongly affected the productive structure and accelerated their integration into the world trade (Fisher and Sahay, 2000). The use of the WTA dataset shows however some drawbacks. In particular, it does not allow to distinguish between 'quantity' and 'price' effects, since trade flows are expressed only in nominal terms (current dollars).

The measure of the extent of a country's specialisation in a given sector is based on the index of international specialisation proposed by Lafay (1992). The choice of the right index depends on many circumstances; our opinion is that in the current context of increasing intra-industry trade, a careful assessment of international comparative advantages requires to take into consideration not only exports but also imports. In fact, the process of International fragmentation of production (IFP), i.e. the mechanism by which foreign firms delocalise into other countries part of their production, both through the establishment of affiliates and subsidiaries and by outsourcing agreements with local firms, generates trade flows in both directions of parts, semi-finished and intermediate goods. The distortion introduced in the analysis depends on the level of data

disaggregation: for fairly aggregated groups of products the size of intra-industry trade flows becomes quickly significant and any evaluation of the trade performance based only on exports turns out to be a poor indicator. The Lafay index (LFI), by taking into account the difference between exports and imports in each sector, allows to control for intra-industry trade flows. In this respect it is superior to both the traditional Revealed Comparative Advantages index by Balassa (1965) and the Beneficial Structural Change index by Bender and Li (2002). The issue of intra-industry trade is particular relevant for the countries under analysis, since IIT flows among old and new EU member States have grown in importance throughout the whole Accession process (Fidrmuc et al., 1999; Kandogan, 2003).

A second important characteristic of the Lafay index is linked to distortions introduced by macroeconomic fluctuations in the measurement of comparative advantages. In fact, since comparative advantages are structural, almost by definition, it is crucial to eliminate the influence of cyclical factors, which can affect the magnitude of trade flows in the short-run. By considering the difference between each item's normalised trade balance and the overall normalised trade balance the Lafay index is able to take into account this kind of distortions.[4]

For a given country, *i*, and for any given product, *j*, the Lafay index is defined as:

$$(1) \qquad LFI_j^i = 100\left(\frac{x_j^i - m_j^i}{x_j^i + m_j^i} - \frac{\sum_{j=1}^{N}(x_j^i - m_j^i)}{\sum_{j=1}^{N}(x_j^i + m_j^i)}\right)\frac{x_j^i + m_j^i}{\sum_{j=1}^{N}(x_j^i + m_j^i)};$$

where x_j^i and m_j^i are exports and imports of product *j* of country *i*, towards and from the rest of the world, respectively, and *N* is the number of traded items. According to the index, the comparative advantage of country *i* in the production of item *j* is measured by

[4] For instance, the deterioration in the trade balance of a single item may well reflect a similar evolution in the overall trade balance (due to standard business cycle fluctuations) without having implication for the relative distribution of the comparative advantages.

the deviation of product *j* normalised trade balance from the overall normalised trade balance. The normalisation of each sector is obtained by weighting each product's contribution according to the respective importance in trade, i.e. the share of trade of product *j* (imports plus exports) on total trade.

Given that the index measures each group's contribution to the overall normalised trade balance, the following relation holds: $\sum_{j=1}^{N} LFI_j^i = 0$. Positive values of the Lafay index indicate the existence of a comparative advantage; the larger the value the higher the degree of specialisation. Similarly, negative values points to de-specialisation.

The definition of RCA index (the traditional export performance ratio proposed by Balassa) is the following:

$$(2) \qquad RCA_j^i = \frac{x_j^i \Big/ \sum_{j=1}^{N} x_j^i}{x_j^W \Big/ \sum_{j=1}^{N} x_j^W}$$

where x_j^W is the world export of item *j*. The RCA index is thus a comparison of the national export structure with the world export structure. In order to further clarify the difference between the Lafay and the RCA index, the former may be defined as a net-trade indicator of specialisation, while the latter can be labelled as a single-flow indicator of trade intensity (Iapadre, 2003).

The index of specialisation allows us to rank the items according to the magnitude of the comparative advantage and thus defines a distribution at any given point in time. However, in this paper we are also concerned with the dynamics of trade patterns, i.e. the evolution of the distribution over time. The methodological approach we are going to use in the analysis of trade dynamics is based on a technique successfully implemented in the study of cross-country income convergence and imported in the trade analysis by Proudman and Redding (2000) and Brasili et al. (2000). This kind of

analysis is able to capture exactly the movements of the entire distribution over time, instead of focusing on some indicators with limited explaining-power.

Following Quah (1993 and 1996), let $F_t(SI)$ denote the distribution across sectors of a given specialisation index at time *t*. Corresponding to F_t it is possible to define a probability measure λ such that:

(3) $\lambda_t((-\infty, si]) = F_t(si) \qquad \forall si \in \Re.$

The evolution of the distribution is then modelled as a stochastic difference equation:

(4) $\lambda_t = M^*(\lambda_{t-1}, u_t);$

where $\{u_t$: integer $t\}$ is a sequence of disturbances and M^* is an operator tracking where points in F_{t-1} end up in F_t. Thus, M^* encodes information on intra-distribution dynamics. By setting the disturbances to zero and assuming that the operator M^* is time invariant, we can iterate forward the first-order stochastic difference equation to obtain:

(5) $\lambda_{t+s} = (M^*)^s \lambda_t \qquad \forall s \in N.$

If the space of possible values for *si* is divided into a number of discrete intervals, M^* becomes a matrix, and the value of each cell turns out to be a transition probability; namely, the probability that an item beginning in a given cell *i* at time *t* moves to another distinct cell *j* at time *t+s* characterised by a different specialisation level. The probabilities may be easily estimated by counting the number of transitions out of and into each cell.

From the transition probabilities, it is possible to infer the extent of the mobility among different segments of the distribution: high values of transition probabilities along the diagonal indicate persistence, while larger off-diagonal terms imply greater mobility. Moreover, the stationary (or ergodic) distribution of Ft is obtained by taking the limit $s \to \infty$ in equation (5). Analytically, the resulting long-run distribution is simply the eigenvector associated with the largest eigenvalue of the transition probability matrix.

3. The international specialisation pattern and its evolution over time

3.1 New EU members' comparative advantages

The Lafay index for the new EU member States has been computed at a fairly disaggregate level: 208 items from the 3-digit SITC classification. In order to reduce the problem of dealing with erratic data (possibly due to exchange rate variations), we will refer to the 2-year average values of the index at the beginning and at the end of the time sample (1993-1994 and 2000-2001). Moreover, to avoid the distortions arising from trade flows that are not classified in the standard framework of the SITC classification, the group *Commodities not classified elsewhere* (9) was not considered in the calculation of the Lafay index.[5]

Table 1 reports for each country the five items of top specialisation at the end and at the beginning of the time sample and the respective shares on international markets. At the beginning of the millennium, the Czech Republic, Slovenia and Hungary show a high degree of specialisation in several items from group 7. They have large and increasing comparative advantages both in the production of motor cars and their parts (713, 781 and 784), and in that of electrical machineries and apparatus (716, 773 and 778). The Czech Republic is also strongly specialised in the exchange of *Glassware* with a world export share of 2.6 per cent. Slovenia has a large comparative advantage in *Furniture*, which increased with respect to 1993-1994, and with a world share of almost 1 per cent. While it was significantly negative in the early 1990s, the best item in Hungary in 2000-2001 is the "high-tech" *Automatic data processing machines and unit* with a Lafay index of 2.7 per cent.[6] Also for the Czech Republic several items of current

[5] The 3-digit SITC (Rev. 2) classification includes 233 different items; we have excluded all those for which data were not available for all countries and those belonging to group 9. The 208 items here considered cover a share of total trade usually close to 95 per cent for each country. The broad 1-digit categories to which we will refer in the paper are: *Food and live animals chiefly for food* (0), *Beverages and tobacco* (1), *Crude materials, inedible, except fuels* (2), *Mineral fuels, lubricants and related materials* (3), *Animal and vegetable oils, fats and waxes* (4), *Chemicals and related products* (5), *Manufactured goods classified chiefly* (6), *Machinery and transport equipment* (7), *Miscellaneous manufactured articles* (8).

[6] According to UNIDO (2003) there are only 17 items among the 208 used in this paper (and 19 in total) that can be classified as "high technology" in the SITC 3-digit classification (Rev.2). See the Table in the Appendix for the changes of the value of the Lafay index in each item for the 8 ex-transition economies in the sample.

specialisation displayed a negative value of the Lafay index at the beginning of the sample period.

Also the Slovak Republic is highly specialised in the exchange of *Passenger motor cars* (the Lafay index is 6.3 per cent). At the same time it also shows large comparative advantages in other manufactured goods from group 6 and 8 and in *Petroleum products*. Even though Poland does not display sizeable comparative advantages in high tech products, it has a specialisation pattern strongly oriented towards manufactures. The top 5 items all belong to group 7 and 8 of the SITC classification. Moreover, some of them display significant world export shares.

As for the Baltic countries, an important role in the specialisation pattern is still played in 2000-2001 by wood and its derivatives. However, they also display a strong specialisation in the exchange of many manufactured goods. Estonia shows the highest specialisation in *Telecommunication equipments and part* (764) with a Lafay index of 6.8 per cent (it was significantly negative in 1993-1994); in Lithuania two out of the ten best items are from group 7 (776 and 773); while in Latvia several of the top items belong to manufactured products from group 6 and 8.[7]

When referring to the RCA index, the main results of the analysis are broadly confirmed. In particular, both the ranking of the comparative advantages and their evolution over time are very similar. The correlation coefficient among the LFI and RCA distributions over the 208 items shows a positive value around 0.5 for each country.

[7] Concerning the two Mediterranean countries, they both concentrate their specialization pattern in a single item: Malta in *Thermionic valves and tubes* (776), and Cyprus in *Tobacco* (122), for which the world export shares are surprisingly high given the size of the two economies.

Table 1: Lafay index and world export shares

TOP 2000-2001			TOP 1993-1994		
	LFI	WES		LFI	WES
Czech Republic					
781-Passenger motor cars	9.92	0.88	*673-Iron and steel bars,rods,angles,shapes*	2.16	2.71
784-Parts & accessories of motor vehicles	6.31	1.33	*665-Glassware*	1.37	2.25
778-Electrical machinery and apparatus	4.11	1.31	*323-Coke briquettes*	1.00	14.9
821-Furniture and parts thereof	3.08	1.33	*635-Wood manufactures*	0.77	2.05
665-Glassware	2.93	2.56	*781-Passenger motor cars*	0.76	0.30
Estonia					
764-Telecommunications equipment and parts	6.78	0.36	*288-Non-ferrous base metal waste and scrap*	2.77	0.62
248-Wood,simply worked,and railway sleepers	1.95	0.69	*247-Other wood in the rough or roughly squared*	2.68	0.45
821-Furniture and parts thereof	1.69	0.26	*842-Outer garments,men's,of textile fabrics*	2.33	0.11
247-Other wood in the rough or roughly squared	1.35	1.58	*248-Wood,simply worked,and railway sleepers*	1.51	0.10
635-Wood manufactures	1.15	0.59	*562-Fertilizers,manufactured*	1.51	0.16
Hungary					
752-Automatic data processing machines & units	2.67	1.07	*011-Meat,edible meat offals*	2.04	1.18
713-Internal combustion piston engines & parts	2.66	4.05	*842-Outer garments,men's,of textile fabrics*	1.45	0.71
764-Telecommunications equipment and parts	1.97	1.09	*583-Polymerization and copolymerization products*	1.14	0.57
781-Passenger motor cars	0.98	0.47	*843-Outer garments,women's,of textile fabrics*	1.07	1.50
011-Meat	0.81	1.37	*851-Footwear*	0.99	0.73
Latvia					
248-Wood,simply worked,and railway sleepers	8.86	1.65	*334-Petroleum products,refined*	6.19	0.25
247-Other wood in the rough or roughly squared	2.30	1.45	*248-Wood,simply worked,and railway sleepers*	3.51	0.30
673-Iron and steel bars,rods,angles,shapes	2.10	0.47	*333-Petroleum oils*	2.82	0.05
635-Wood manufactures	1.82	0.49	*247-Other wood in the rough or roughly squared*	2.30	0.56
634-Veneers,plywood,improved or reconstituted	1.78	0.63	*634-Veneers,plywood,improved or reconstituted*	1.32	0.22
Lithuania					
334-Petroleum products,refined	6.83	0.48	*334-Petroleum products,refined*	7.57	0.43
842-Outer garments,men's,of textile fabrics	2.20	0.32	*562-Fertilizers,manufactured*	2.57	0.62
562-Fertilizers,manufactured	1.76	1.15	*022-Milk and cream*	1.94	0.55
821-Furniture and parts thereof	1.40	0.23	*842-Outer garments,men's,of textile fabrics*	0.91	0.09
776-Thermionic,cold & photo-cathode valves,tubes	1.35	0.05	*592-Starches, inulin & wheat gluten*	0.89	0.46
Poland					
821-Furniture and parts thereof	3.11	3.63	*793-Ships,boats and floating structures*	2.36	2.30
793-Ships,boats and floating structures	1.82	3.39	*682-Copper*	2.35	3.02
713-Internal combustion piston engines & parts	1.20	2.08	*821-Furniture and parts thereof*	2.17	1.95
842-Outer garments,men's,of textile fabrics	1.06	1.33	*842-Outer garments,men's,of textile fabrics*	1.68	1.63
761-Television receivers	0.93	2.70	*673-Iron and steel bars,rods,angles,shapes*	1.41	2.02
Slovak Republic					
781-Passenger motor cars	6.29	0.61	*674-Universals,plates and sheets,of iron*	5.33	1.22
674-Universals,plates and sheets,of iron or steel	3.11	1.31	*334-Petroleum products,refined*	1.76	0.30
334-Petroleum products,refined	2.65	0.50	*651-Textile yarn*	1.34	0.63
842-Outer garments,men's,of textile fabrics	0.93	0.41	*842-Outer garments,men's,of textile fabrics*	0.98	0.28
821-Furniture and parts thereof	0.65	0.49	*583-Polymerization and copolymerization products*	0.88	0.30
Slovenia					
821-Furniture and parts thereof	2.67	0.95	*775-Household type,elect.& non-electrical equipment*	2.06	1.15
775-Household type,elect.& non-electrical equipment	2.50	1.34	*821-Furniture and parts thereof*	2.05	0.92
781-Passenger motor cars	1.62	0.24	*635-Wood manufactures*	1.56	1.83
541-Medicinal and pharmaceutical products	1.23	0.36	*842-Outer garments,men's,of textile fabrics*	1.22	0.54
635-Wood manufactures	0.99	1.11	*541-Medicinal and pharmaceutical products*	1.12	0.46
Cyprus					
122-Tobacco manufactured	6.39	1.77	*122-Tobacco manufactured*	5.11	1.24
541-Medicinal and pharmaceutical products	1.11	0.05	*054-Vegetab.,fresh,chilled,frozen*	1.98	0.29
054-Vegetab.,fresh,chilled,frozen	0.95	0.14	*844-Under garments of textile fabrics*	1.29	0.21
057-Fruit & nuts fresh	0.74	0.10	*057-Fruit & nuts*	1.27	0.16
782-Motor vehicles for transportation of goods	0.47	0.06	*112-Alcoholic beverages*	0.94	0.14
Malta					
776-Thermionic,cold & photo-cathode valves,tubes	13.4	0.43	*776-Thermionic,cold & photo-cathode valves,tubes*	9.10	0.58
842-Outer garments,men's,of textile fabrics	2.53	0.21	*842-Outer garments,men's,of textile fabrics*	3.35	0.27
772-Elect.app.such as switches,relays and fuses	1.17	0.09	*894-Baby carriages,toys,games*	1.12	0.12
628-Articles of rubber	0.92	0.40	*761-Television receivers*	0.97	0.18
894-Baby carriages,toys and games	0.86	0.10	*892-Printed matter*	0.81	0.16

However, two characteristics are evident: first, the correlation diminished over time; secondly, it is smaller for some countries. Both issues can be related to the role of intra-industry trade. In fact, as the integration with the EU market increased over the 1990s, the flows in and out of many sectors/industries grew at a high pace, thus making the difference among the two indices more evident. This phenomenon is particularly clear for some of the most dynamics economies, as the Czech Republic, Estonia, Hungary and the Slovak Republic. Moreover, also the evolution of the overall trade balance in the new EU member States may have played a role, especially for the determination of the RCA index.

The rapid changes in the specialisation pattern reported in Table 1 reflect the market re-orientation of production (trade) away from goods traditionally sold into the CMEA markets and towards products sold into the EU market (Repkine and Walsh, 1999). However, the catching-up path of a developing country is usually expected to start in sectors in which the economy displays the larger comparative advantages, i.e. low-tech industries. Only when the initial gap has been closed (or broadly reduced) in those sectors, the country speeds up the closure of the gap in the next (more) technology-intensive industries. Thus, the lagging country is expected to improve in more sophisticated branches only later on, moving from step to step as if climbing a technological ladder (Krugman, 1986). Within this framework, it might also happen that in the catching-up process the economy lagging behind improves quickly in sectors in which the productivity gains are sizeable, namely where the technology gap is the largest (Landesmann and Stehrer, 2001). This “jumping-up” implies that the effort in learning, skill acquisition and organisational and managerial capacities is usually significant. Yet, the “backwardness” of the productive structure might become an advantage since it is possible to skip intermediate states of development by adopting immediately the most updated technology.

The “jumping-up” approach might help explain the international specialisation pattern that characterises the trade performance of the new EU member countries. The static analysis of comparative advantages as revealed by trade flows highlighted that even though there are still many differences in the specialisation pattern, the general model is oriented towards some “high-tech” manufactured products. This

accomplishment is indeed remarkable given the starting point of these economies. In fact, the transition from a socialist to a market economy began with a productive structure built in a framework which lacked market-induced signals about the relative scarcity of outputs and inputs and with a highly distorted system of relative prices. Moreover, the ideological suppression of profit concerns reduced innovation, entailing a growing technology gap between the centrally planned and the advanced market-oriented economies. However, the new EU member countries were also endowed with a share of skilled-labour force much larger than that prevailing in developing countries with comparable per-capita income. This circumstance might have allowed firms to skip several steps in the technological ladder by taking full advantage of the large investment flows provided by EU countries.[8]

As for the empirical evidence, Eichengreen and Kohl (1998) suggests that the increased specialisation of countries like Hungary and the Czech Republic in high tech items is almost entirely due to the flow of foreign direct investment and outward processing trade of the EU economies in newer, more technologically-sophisticated skilled-labour-intensive products. But why countries differ in their ability to attract such technological dissemination and only few economies can benefit from it? Their answer is linked to geographical, historical and political issues: less proximity to Western European markets, inferior initial infrastructure and unstable policies have made Southern and Eastern tiers of transition economies less attractive destinations for technologically-sophisticated EU investments.

The evolution of the specialisation model of the new EU member States as depicted above is confirmed by Landesmann and Stehrer (2002). They focus on the period 1995 to 2000 and compare the export structure of the 10 "transition economies"[9] with respect to a group of EU Northern countries (Belgium, France Germany and UK). In particular, they calculate the difference between each economy and the EU Northern group in the relative weight of exports in four sectors of different skill intensity (low skill, medium skill/blue collar, medium skill/white collar, high skill). They report that

[8] See Buch et al. (2003) for a recent analysis of the orientation of FDI in Europe.

[9] The eight countries also analysed in this paper plus Bulgaria and Romania.

for some countries there is still a relatively stronger representation of the low skill intensive branches in the export structure (the Baltic States and Poland), but at the same time for other countries this overrepresentation has declined sharply in the second half of the 1990s. Moreover, even if a deficit with respect to the EU Northern countries remains in the high-skill industries, it has declined below 10 per cent only for the Czech Republic, Hungary, the Slovak Republic and Slovenia.

Another work in line with these findings and with the "jumping-up" hypothesis for the Central and Eastern European countries is due to Kaitila (2001). The paper depicts how the factor intensity of international specialization has changed from 1993 to 1998 in some manufacturing sectors. In particular, the author shows that for the most dynamic economies (the Czech Republic, Estonia and Hungary) the comparative advantages with respect to the EU -- measured according to the RCA index -- have increased significantly in products with high and medium-high intensity in skilled work.

3.2 Structural stability

In order to formally analyse the changes in the external shape of the specialisation distribution over time, we first compare the values of some reference indexes at the beginning and the end of the time sample (Table 2).

Focusing on the eight ex-transition economies only, the range of the distribution has increased in all countries but Poland, usually because of an increase in the maximum value of the Lafay index. While it decreased in the Czech Republic and in Poland, the absolute value of the highest de-specialisation has increased in all the other economies. At the same time, the standard deviation, the most common index used in the empirical literature to test for changes in the degree of specialisation, has increased almost everywhere. In Lithuania and Poland the sum of the Lafay index for the top 5 items decreased, whereas for all the other economies it increased or remained almost unchanged. The number of items belonging to the central interval of the distribution ($-\sigma/8$, $+\sigma/8$), and thus those for which the Lafay index is close to zero, has strongly increased in all countries.

The preliminary picture that is possible to draw from this set of indexes is that of a widespread increased specialisation. This is signalled by the rise in the dispersion of the distribution, by the growing relative weight of the top items and by the rising number of items in the central interval of the LFI distribution, which in turn implies that the dependence on just few sectors (i.e. the very definition of specialisation) has increased. This finding is also supported by a recent work by Tajoli (2003), which reports evidence of increasing specialisation in former "Acceding countries" over the period 1994-2000, by looking at the Herfindahl index for the export concentration in 16 manufacturing sectors.

Table 2: Statistics from the comparative advantages distribution

	Czech Republic		**Estonia**		**Hungary**		**Latvia**		**Lithuania**	
	1993-94	*2000-01*	*1993-94*	*2000-01*	*1993-94*	*2000-01*	*1993-94*	*2000-01*	*1993-94*	*2000-01*
Maximum	2.16	9.92	2.77	6.78	2.04	2.67	6.19	8.86	7.57	6.83
Minimum	-1.92	-0.81	-2.01	-2.04	-2.18	-2.48	-3.82	-5.16	-2.45	-6.43
Range	4.08	10.73	4.78	8.82	4.22	5.15	10.01	14.02	10.02	13.26
Standard Deviation	0.35	0.98	0.52	0.59	0.38	0.41	0.70	0.82	0.67	0.74
Relative weight of top 5 items	5.31	23.42	9.30	11.77	5.71	8.27	14.82	15.09	12.99	12.19
Number of central items	69	84	83	111	72	105	93	123	104	113
	Poland		**Slovak Republic**		**Slovenia**		**Cyprus**		**Malta**	
	1993-94	*2000-01*	*1993-94*	*2000-01*	*1993-94*	*2000-01*	*1993-94*	*2000-01*	*1993-94*	*2000-01*
Maximum	2.36	3.11	5.33	6.29	2.06	2.67	5.11	6.39	9.10	13.44
Minimum	-3.48	-3.00	-1.81	-3.41	-1.96	-2.85	-5.22	-2.84	-2.96	-5.97
Range	5.84	6.11	7.13	9.69	4.02	5.52	10.33	9.22	12.06	19.42
Standard Deviation	0.50	0.44	0.50	0.67	0.37	0.41	0.58	0.51	0.76	1.08
Relative weight of top 5 items	8.56	7.18	9.41	12.98	6.90	8.02	9.65	9.18	14.54	18.06
Number of central items	79	93	78	116	70	96	121	140	132	160

However, by the simple analysis of Table 2 it is possible to gather only some information about the shape of the overall distribution of the Lafay index, but nothing can be said as regards the changes of the relative position of any single item. In what follows we propose an investigation of intra-distribution dynamics that allows us to analyse the mobility of items within the distribution.

The evolution of the entire LFI distribution over time may be modelled formally, employing a technique successfully used in the cross-country growth literature to analyse income convergence: the Markov transition analysis (e.g., Quah, 1993 and 1996). Table 3 reports two four-by-four transition matrices for the pooled sample (the 8

Central and Eastern European countries only): the first one is the average one-year transitions matrix, while the second matrix describes the one 8-year transition from 1993 to 2001. The pooled analysis is provided only as a benchmark, since it implies that the stochastic process determining the evolution of the LFI distribution is the same in each economy.[10]

Table 3: Transition matrices
(pooled sample)

	1-year transitions					*8-year transitions*			
	I Quartile	II Quartile	III Quartile	IV Quartile		I Quartile	II Quartile	III Quartile	IV Quartile
(3328)	0.797	0.143	0.032	0.029	(416)	0.490	0.322	0.087	0.101
(3328)	0.119	0.677	0.163	0.041	(416)	0.132	0.546	0.248	0.075
(3328)	0.018	0.167	0.710	0.105	(416)	0.041	0.243	0.601	0.115
(3328)	0.036	0.045	0.118	0.801	(416)	0.063	0.120	0.252	0.565
Ergodic	*0.224*	*0.273*	*0.272*	*0.231*	*Ergodic*	*0.136*	*0.332*	*0.350*	*0.181*

As for the one-year matrix, each cell (*i*, *j*) contains the probability that an item in the relative specialisation group *i* at time *t* transits to the specialisation group *j* at time *t*+1, with the values along the same row adding up to one. The boundaries between cells have been chosen so that the observations are equally divided into the grid cells. Thus, the upper endpoints change over time and the values of the estimated transition probabilities characterise the degree of mobility between different quartiles of the LFI distribution.[11] For instance, the first row of the matrix presents the probability that a product starting in the first quartile moves into the lower-intermediate (second quartile), higher-intermediate (third quartile) and highest (fourth quartile) state of international specialisation, respectively. The last row of the table gives the implied ergodic distribution, i.e. the limit to which the specialisation pattern would tend were the evolution process to last indefinitely. In addition, the first column of the table reports the total number of item-year observations beginning in each cell.

[10] The transition probability matrices for each country are reported in the Appendix.

[11] To test for the robustness of the results, we have also computed the transition matrices by imposing that the upper endpoints were equal to the values corresponding to the four quartiles of the initial distribution; we thus allowed the number of observations per row to vary, even though they were still roughly equally divided. The results are very similar to those reported in the table.

Table 3 shows large values of the transition probabilities only for the diagonal elements. In particular, the persistence is strong at the two ends of the distribution: the value of cell (1, 1) and (4, 4), being around 80 per cent. This implies that it was relatively difficult for the new EU member States to improve from a situation of high de-specialisation, but it is also true that once obtained a large comparative advantage they were able to maintain it over time. However, comparing our results with those obtained by Proudman and Redding (2000) with a group of 5 industrialised economies, we can notice a significantly lower persistence for the new EU member States. In particular, the values on the main diagonal of the 1-year transition matrix derived from the pooled sample of the US, Japan, Germany, France and the UK are much higher, ranging from 83 to 90 per cent. This difference is supported by the findings in Brasili et al. (2000) – the only other paper to our knowledge that computes transition matrices for some emerging economies. They compare the trade dynamics of six industrialised and eight fast growing Asian economies and they conclude: "*our analysis shows a marked difference between the advanced and the emerging countries as far as the degree of persistence is concerned: the former have in fact a highly persistent trade pattern, whereas the latter show a rapidly changing trade specialisation*".[12]

Coming to single country experience, the probability of moving out of a given cell after one period ranges from 13% to 39%, with Estonia, Latvia, Lithuania and the Slovak Republic showing a somewhat larger mobility than the remaining countries. Slovenia exhibits a very low mobility: for instance, the probability of an item moving away from the first grid cell is as low as 13%, and that of shifting from the first to the fourth is only 0.9%, the smallest in the whole sample. At the same time, an item of large comparative advantage has a probability of almost 85% to remain in the top specialisation interval. Among the countries with large estimated mobility, Latvia shows the lowest probability of remaining in the same sector for the lower and lower-

[12] See also Laursen (2000) for similar results in a more traditional framework of empirical trade analysis.

intermediate quartile (74 and 62 per cent, respectively), Estonia has the lowest value in the upper-intermediate quartile (67 per cent), and Lithuania in the upper quartile (74 per cent).

Concerning the 1993-2001 pooled transitions matrix, each cell (*i*, *j*) contains the probability that a sector in the relative specialisation group *i* in 1993 (time *t*) transits to the specialisation group *j* in 2001 (time *t*+8). As expected, given the longer period over which estimates are based, from Table 3 it is possible to see that diagonal values are now smaller than in the one-year matrix, thus suggesting a larger mobility within the LFI distribution. It is also interesting to notice that the values relative to the two ends of the distribution on the main diagonal are now of the same magnitude of those in the middle of the distribution, with cell (1,1) being the smallest of the values along the main diagonal. This circumstance might be interpreted again as ex-transition economies being able to gain comparative advantages relatively fast in sectors for which they initially displayed a large gap in terms of international competitiveness. Thus somehow supporting the idea that they were able to jump to the technological frontier in sectors in which they were strongly lagging behind in the early phases of the transition.

When looking at single country developments, there is again large heterogeneity. For instance Slovenia shows very high probabilities of an item remaining both in the first and in the fourth quartile, while in Poland not only the probability of remaining in the fourth quartile displays the highest value (75 per cent), but that of moving away from the fourth quartile to the first half of the distribution is almost zero. The opposite is true for Hungary, for which the probability of remaining in the first quartile or at most moving to the second is 86 per cent. In the Czech Republic the estimated matrix suggests that the probability of shifting position after 8 years is not strongly dependent of the initial quartile, since the values on the main diagonal range from 47 to 57 per cent only.

In order to facilitate direct cross-country comparisons, we propose two indexes, which formally evaluate the degree of mobility throughout the entire LFI distribution (Shorrocks, 1978). The index M^1 captures the relative magnitude of diagonal and off-diagonal terms by evaluating the trace of the transition probability matrix, while index M^2 refers to the determinant of the matrix:

(5) $$M^1 = \frac{K - tr[M^*]}{K - 1}; \qquad M^2 = 1 - |\det(M^*)|.$$

Where M^* is the transition matrix, and K the number of rows/columns. Table 4 reports the value of the two indexes for each country: the higher the value, the larger the estimated mobility. For the one-year matrix, both indices provide the same ranking: Slovenia, the Czech Republic, Hungary and Poland show a more persistent pattern of specialisation, while the three Baltic countries and the Slovak Republic are more dynamic economies. Concerning the 1993-2001 transition matrix, the two indices suggest a slightly different order. It is confirmed the position of Slovenia, Hungary and Poland among the most static countries, but the Czech Republic is now with the Baltic countries in the group of the most dynamic economies.

Thus, even taking into account cross-country heterogeneity, also the indices of mobility signal in all countries a rapid adjustment away from the international specialisation pattern inherited from the past and toward a free-market pattern of comparative advantages (possibly not yet fully accomplished).

Table 4: Indexes of mobility from the transition matrices

	one-year transition matrix		*1993-2001 transition matrix*	
	M1	M2	M1	M2
Czech Republic	0.304	0.673	0.590	0.956
Estonia	0.392	0.787	0.660	0.960
Hungary	0.310	0.685	0.519	0.917
Latvia	0.411	0.815	0.596	0.946
Lithuania	0.367	0.761	0.718	0.999
Poland	0.317	0.706	0.468	0.919
Slovak Republic	0.328	0.713	0.526	0.950
Slovenia	0.278	0.644	0.442	0.873
Cyprus	0.393	0.792	0.513	0.913
Malta	0.311	0.686	0.462	0.859

Comparing these findings with the results from recent studies on other emerging market economies it is possible to detect many similarities among the specialisation

pattern of some CEE countries (Slovenia, Czech Republic and Hungary) and fast developing Asian economies such as Thailand, Malaysia and the Philippines (Bentivogli and Monti, 2001; Bender and Li, 2002). In particular, the change over time from a large disadvantage to a significant advantage in some "high tech" goods, is reported by Stehrer and Wörz (2003) for a group of 6 Asian countries (Hong Kong, Indonesia, South Korea, Malaysia, Singapore and Thailand) and by Caselli and Zaghini (2005) for Mexico, even though in a much longer time horizon (1981-1997 and 1980-2000, respectively). However, comparison with other economies are of extreme difficulty dealing with the ex-transition countries, since they represent a somewhat unique case given the impressive institutional changes and substantial economic transformations they experienced in recent years.

4. Trade patterns and the world demand dynamics

The results of the stability analysis performed in the previous section highlight a relatively strong mobility in the specialisation pattern of the countries under analysis. We now address the issue of whether these changes have resulted in an "efficient" adjustment of the productive structure towards the most dynamic items. In particular, we compare the evolution over time of the trade advantages of each country with respect to the world demand. A specialisation model is labelled as "efficient" when the country gains comparative advantages in those items for which the world demand has increased the most, thus implying the ability of the economy to strengthen its trade shares on world markets.

A simple way to check the performance of the new EU member States is to look at the cumulative distributions of the Lafay index. The exercise is performed as follows. In a first step, we order the 208 items of the 3-digit SITC classification according to the average growth rates of world imports in the 1990s, for each item we then add the values of the Lafay index following the ascending order of the world rank (for the

comparative advantages distribution in 1993-1994 and in 2000-2001 separately), finally, we compare the two cumulated curves.[13]

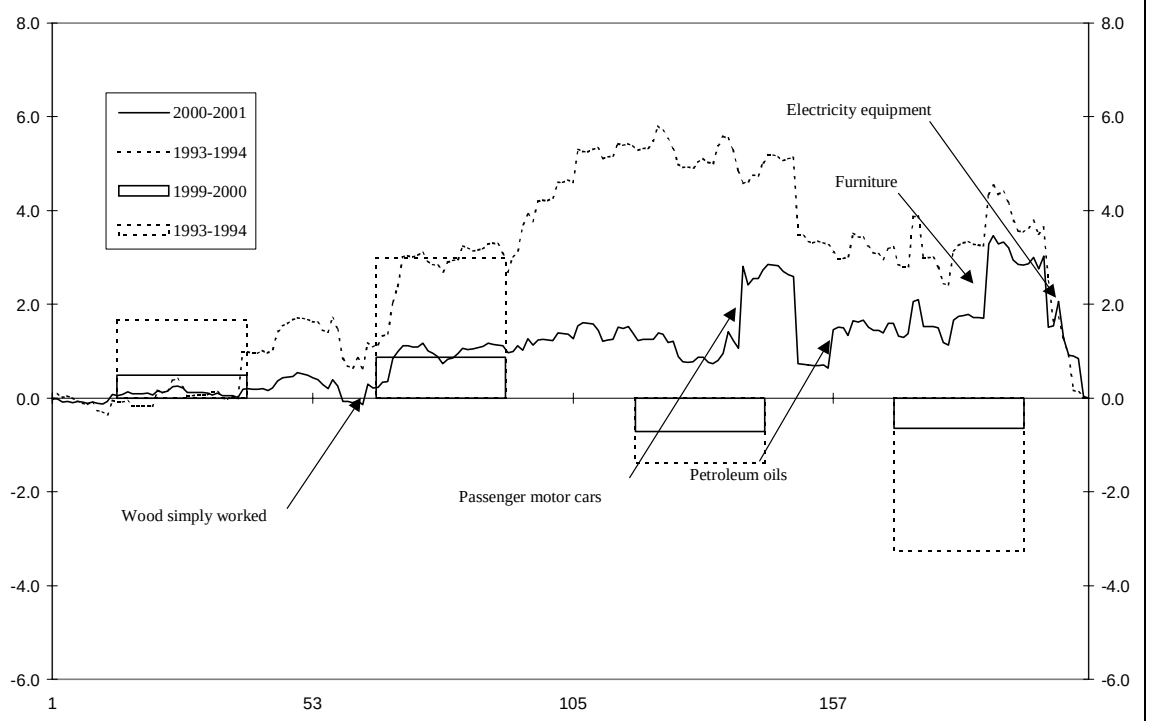
Before constructing the cumulated Lafay curves, it is worth to shortly discuss the characteristics of the world demand over the last decade of the past century. The rate of growth of world imports over the period 1990-2000 averaged to 6.7 per cent a year, with 15 items (almost all non-manufactured goods) displaying a negative rate. Among the 208 items selected in the paper, the rate of growth ranges from a negative rate of 5.3 per cent of the worst performing item (*Works of art & Antiques*) to a positive 19.3 per cent of the best item (*Optical instruments and apparatus*). Grouping the 208 products into four sets starting from the slowest to the fastest, we can classify them as low (1^{st} to 52^{nd}), medium-low (53^{rd} to 104^{th}), medium-high (105^{th} to 156^{th}) and high (157^{th} to 208^{th}) growth items. The bulk of non-manufactured goods (more than three quarters) belongs to the first half of the table, while the vast majority of manufactures (almost two thirds) are located in the second half of the rank. In particular, in the high growth set, in which the rate of expansion ranges from 7.0 to 19.3 per cent, there are only 8 items belonging to groups 0 to 4 of the SITC classification.

For the pooled sample of the 8 ex-transition economies, Figure 1 depicts the comparison of the cumulated Lafay curves at the beginning and at the end of the time sample. In the figure we also report as histogram the cumulated value of the index in each of the four 52-item sets described above. The dotted line refers to the average 1993-1994, while the continuous line refers to the average 2000-2001, for both the cumulated curve and the histogram. On the *x*-axis there are the items ordered according to world demand over the 1990s, whereas on the *y*-axis there is the cumulated value of the Lafay index. By construction, the cumulative distribution starts with the value of the index (positive or negative) associated to the slowest item (*Works of art & Antiques*) and ends at zero when adding the value of the index (positive or negative) associated to

[13] Since the cumulated curves are computed by adding up the values following the developments in the world demand, two caveats must be born in mind. First, although the growth rates of world imports are averages over a relatively long time-span (a decade), the standing is computed on values at current prices (US dollars) and thus it might be influenced by currency volatility. Secondly, in the ordering the relative weight of each item is not considered, so that a good whose demand has increased very rapidly gets a high position in the standing, even though it represents a small share of the world demand.

the fastest item (*Optical instruments and apparatus*).[14] Thus, following the rank reported on the *x*-axis, the cumulative distribution is increasing in the items displaying a comparative advantage, since a positive value is added, while it is decreasing when a negative value of the Lafay index is found.

Figure 1: Comparative advantages ordered according to the world demand
(pooled sample,Cumulative Lafay Index on the Y-axis)



Following our definition of efficiency, a reduction over time of the comparative advantage (or an increase in the disadvantage) in the low and medium-low growth groups is interpreted as "positive", whereas a reduction of the advantage (or an increase in the disadvantage) is considered "negative" if reported in the medium-high and high growth groups. The underlying rationale is that a dynamic economy, whose productive structure is relatively flexible and competitive, should be able to improve its comparative advantages in favour of products whose world demand has been increasing more rapidly.

[14] Note that the fact that the cumulated curve ends always at zero is due to the definition of the Lafay index, which implies that the sum of all values is zero regardless of the ordering (see Section 2).

The shape of the 1993-1994 curve highlights a pattern that is common to many developing countries. Although the cumulated value for each growth set is relatively mild, comparative advantages are massed in the first part of the rank, while deficiencies are mainly located in the most dynamic items. Important changes are reported at the end of the 1990s. The 2000-2001 curve is much closer to the horizontal axis, thus indicating that negative and positive signs alternate almost in a continuos way. Moreover, the depicted changes are always in the right direction: for the low and medium-low growth sets of items the comparative advantages have more than halved, in the medium-high and high growth sets the cumulated negative values of the Lafay index have been significantly reduced.

From Table 5 and from the distribution of each country reported in the Appendix, it is possible to see that the cumulated distributions at the beginning of the time sample suggests a strong similarity in the trade specialisation of the Baltic countries: they are ascending in the first part of the rank and descending in the second. Yet, the values at the end of the period hint to different evolutions over time. On the one hand, Latvia increased its specialisation in the medium-low set, in which it already had a large advantage (essentially due to the presence of wood and wood by-products), and it did not change much in the other sets. On the other hand, Lithuania and Estonia switched to a positive value in the medium-high and high growth set, respectively. The improvement in Lithuania was due mainly to an increase in the specialisation in refined petroleum products.[15] In Estonia, although a relatively significant specialisation in the production of wood was maintained, a strong positive value of the Lafay index emerged in the production of a highly requested manufactured item: *Telecommunications equipment and parts* (6.8 per cent in 2000-2001 from -1.3 in 1993-1994). Moreover, Estonia was able to switch – although in a less significant fashion – from disadvantages at the beginning of the period to advantages at the end in other fast growing items, some of which usually classified as "high-tech" (*Rotating electric plant and parts*; *Non-*

[15] However, at the same time a decrease of about the same size in crude oil in the high growth group must be acknowledged. This circumstance is due to Russian oil travelling trough the country and thus it does not represent a true comparative advantage or disadvantage.

electric engines & motors; *Measuring, checking and analysing instruments*). Also the circumstance that all the changes in the histograms were in the right direction points to an efficient structural adjustment in trade flows.

Table 5: Cumulative Lafay index in growth groups

	Czech Republic		Estonia		Hungary		Latvia		Lithuania	
Growth group	*1993-94*	*2000-01*	*1993-94*	*2000-01*	*1993-94*	*2000-01*	*1993-94*	*2000-01*	*1993-94*	*2000-01*
Slow	5.18	1.45	3.81	0.44	1.35	0.20	4.36	3.31	3.10	2.61
Medium-slow	1.46	0.34	4.66	3.91	5.07	-0.10	5.97	9.72	4.72	2.36
Medium-high	0.96	2.43	-5.27	-5.26	-2.81	-1.44	-8.05	-10.78	-3.01	2.93
High	-7.60	-4.22	-3.20	0.91	-3.61	1.34	-2.29	-2.25	-4.82	-7.89
	Poland		**Slovak Republic**		**Slovenia**		**Cyprus**		**Malta**	
	1993-94	*2000-01*	*1993-94*	*2000-01*	*1993-94*	*2000-01*	*1993-94*	*2000-01*	*1993-94*	*2000-01*
Slow	1.80	1.02	-1.69	-0.29	-3.18	-2.25	3.90	6.71	-1.74	-1.30
Medium-slow	5.97	3.09	7.71	3.49	-2.05	-2.39	-0.91	-1.16	-5.37	-7.36
Medium-high	-1.98	-1.70	1.77	7.80	0.55	2.06	-1.33	-1.24	-6.68	-8.04
High	-5.80	-2.41	-7.79	-10.99	4.68	2.59	-1.66	-4.32	13.80	16.70

In Poland and Hungary the scenario in 1993-1994 was close to that of the Baltic countries: the cumulated curve is increasing in the first half of the rank and then gradually decreasing with just few big upwards and downwards jumps. The outlook has improved significantly at the end of the time sample, especially for Hungary, with the changes in the histograms being always in the right direction. Though important switches from negative to positive comparative advantages were not registered, Poland was able to improve a lot in the high growth set, by reducing the disadvantage in the production of oil and strengthening the specialisation in two largely traded items from group 8: *Outer garments of textile fabrics* and *Furniture and parts thereof*. Stronger changes characterised the evolution of the Hungarian trade pattern. In 2000-2001, the first half of the curve is almost flat, with negative and positive values of the Lafay index alternating evenly: the only significant comparative advantage that was maintained over time is that in the production of *Meat* (0.8 per cent).

The second half of the distribution, and in particular the part concerning high growth items, underwent major changes: the value of the cumulated Lafay index for the last 52 items increased from –3.6 to 1.3 per cent. This happened because Hungary was able to reach a large comparative advantage, from a disadvantage at the beginning of the

period, in several fast growing manufactured items (*Telecommunications equipment and parts*; *Automatic data processing machines & units*; *Internal combustion piston engines & parts*) thus successfully adapting the specialisation pattern towards the most dynamic products.

The Czech and the Slovak Republic are both characterised by a strong and increasing comparative advantage in the medium-high growth set. In particular, the product for which they recorded the largest progress, and which account for almost the whole improvement in the set, is *Passenger motor cars*. The Slovak Republic switched from a negative value (–0.8 per cent) to a large positive one (6.3 per cent), whereas the Czech Republic improved its specialisation in both *Passengers cars* and in the related item *Parts & Accessories for cars and motor vehicles for transportation*. However, the changes in the specialisation scheme of the Czech Republic are more evenly distributed than those of the Slovak Republic. The former economy improved its relative position in all four growth groups, while the latter underwent adjustment in the wrong direction in the first and fourth set. In particular, in the high growth group the Czech Republic reduced its dependence from oil, maintained its comparative advantages in the production of *Glassware*, *Furniture* and *Wood manufactures*, and switched from negative to positive specialisation in two of the best performing items of the 1990s: *Equipment for distributing electricity* and *Electrical machinery and apparatus*. Meanwhile, in the same set, the Slovak Republic augmented the despecialisation in *Petroleum oil*, *Natural Gas* and *Medicinal and pharmaceutical products*, letting the cumulate value of the Lafay index reaching -11 from -7.8 per cent in 1993-1994.

With respect to world imports, Slovenia is the new EU member country with the best pattern of international specialisation: its comparative advantages are mainly located in the second half of the rank, while disadvantages are to be found in the low and medium-low growth sets. Although the cumulated value of the top growing items has slightly shrunk over time, Slovenia maintains a significant advantage and it is the

country with the largest number of positive values of the Lafay index in the group (22 items).[16]

5. Conclusions

The paper has studied the evolution of the specialisation pattern of the 10 countries which have joined the EU in May 2004 by analysing their comparative advantages as "revealed" by trade flows over the period 1993-2001. Obviously, the relevant time horizon is too short to come to a conclusive assessment and the very concept of revealed comparative advantages can only be applied to the countries of the former communist bloc with extreme caution, since they inherited production capacities intended to serve the Council for Mutual Economic Assistance (CMEA), whose policy bias towards autarky disregarded potential gains from international trade. Yet, preliminary evidence suggests that the structural changes that have happened at institutional, political and economic levels have already triggered important productive shifts and affected significantly the trade specialisation pattern.

In the early 1990s the eight countries from Central and Eastern Europe and the Baltic started the transition toward the market economy with a relatively abundance of agricultural land, raw materials as well as skilled and unskilled labour. However, the legacy of the long planned-economy period resulted in outdated capital stock and technology. Because of the different factor endowment with respect to the EU, early analyses of trade patterns (Begg et al., 1990; Collins and Rodrik, 1991) hinted that transition economies would have specialised in products intensive in labour, raw materials and land. This paper suggests instead that less than 10 years later they show significant comparative advantages in many manufactured goods especially from group

[16] As for Cyprus and Malta, the two economies are characterised by a single-item specialisation and they show indeed little mobility over time. The differences between the 1993-94 and 2000-01 distributions are due almost entirely to a further increase in the value of the Lafay index for *Tobacco* and *Thermionic photo-cathode, valves and tubes*, respectively. Thus, as expected, both countries display a strong positive advantage in a single set of items and a negative specialisation in the remaining three. But while Cyprus has its maximum comparative advantage in the low growth group, Malta can enjoy a strong position in the fastest growing group.

7 of the SITC classification (*Machinery and Transport Equipment*) and some "high-tech" products.

The extensive presence of foreign firms and large FDI inflows have accelerated the process towards the disclosure of a new set of intrinsic comparative advantages, which were somehow hidden by CMEA trade flows. These early signs of convergence have to be interpreted positively for the overall economic integration within the EU. Even thoug it might render the new member States more open to Europe-wide sectoral shocks, the similarity in production and trade structures among new and old members will reduce the risk of weakening the common market functioning.

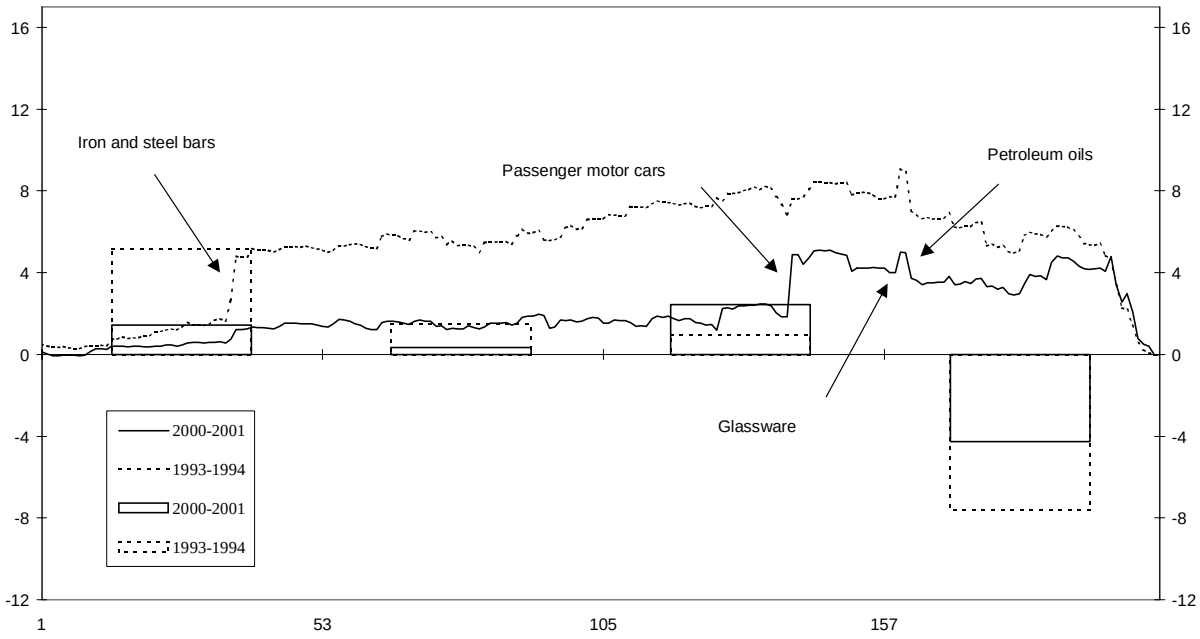
Even though the evidence of high mobility in the pattern of international specialisation is at odds with some theoretical models of trade and growth, this unexpected evolution of the trade pattern might be attributable to the phenomenon known as "advantage of backwardness". The need to rebuild and modernise the entire capital stock and the production plants allowed firms to jump close to the technological frontier, at least in some sectors, by installing the most modern apparatus and benefiting from the most update technology. In the particular case of countries analysed this hypothesis is supported by two factors: the relatively abundance of skilled workers and the knowledge and technology transfers brought about by large FDI inflows from EU countries. Furthermore, the evolution of the trade specialisation pattern in those countries is fully consistent with the theoretical "jumping-up" approach proposed recently by Landesmann and Stehrer (2001) and based on the Krugmann "technological ladder" framework.

However, since the new EU member countries have liberalised and reformed their economies to a varying degree, and given the differences in their earlier manufacturing bases, political stability, administrative reforms and geographical locations, different developments in comparative advantages result across-countries. The Baltic countries are still largely relying on natural resources; the Czech Republic, Hungary and Slovenia are the most oriented towards manufactures with Poland and the Slovak Republic following closely. Cyprus and Malta display instead a specialisation pattern that largely differs from the rest of the sample since they are strongly committed to the export performance of a single item.

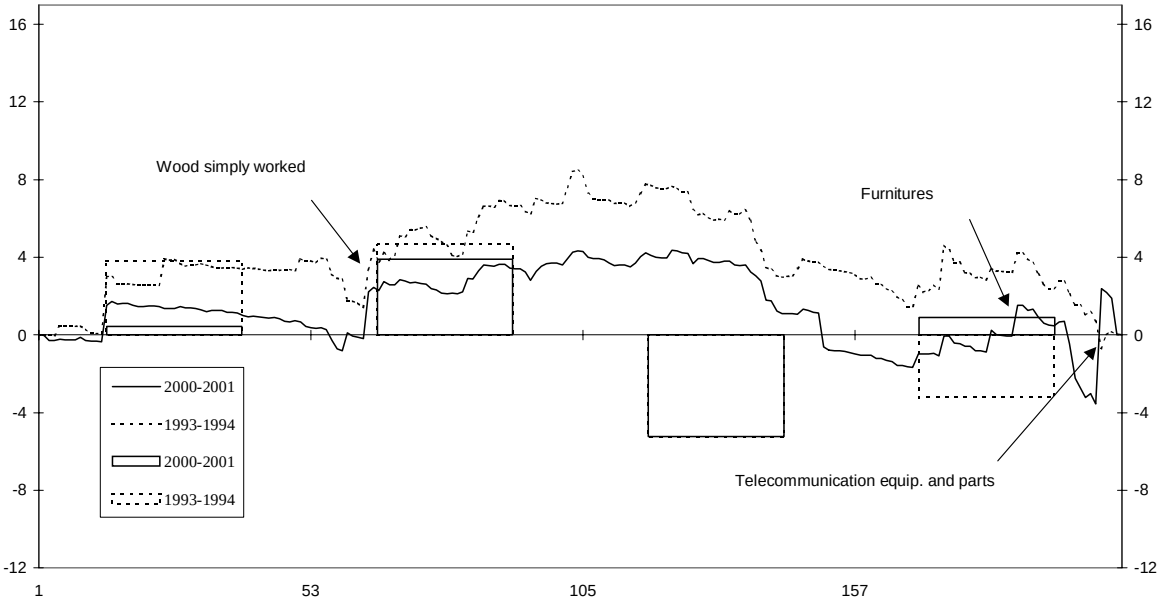
As for the ability of these countries in adjusting to the world demand, a common pattern of trade specialisation linked the countries at the beginning of the 1990s: with the exception of Slovenia (and Malta), they all showed strong comparative advantages in the production of items for which the world demand was relatively weak and gathered their disadvantages in the most dynamic products. Important changes unfolded over the decade: within the beginning of the 21st century several countries (Estonia, Czech Republic, Slovak Republic, Hungary and Poland) were able to switch their comparative advantages toward those items for which world demand has been more sustained. Thus, their specialisation models might be labelled as “efficient”. Though they might expect to witness in the medium- to long-run a slow down in the speed of adjustment of the productive pattern, their overall weight on international trade might well increase over time.

Appendix

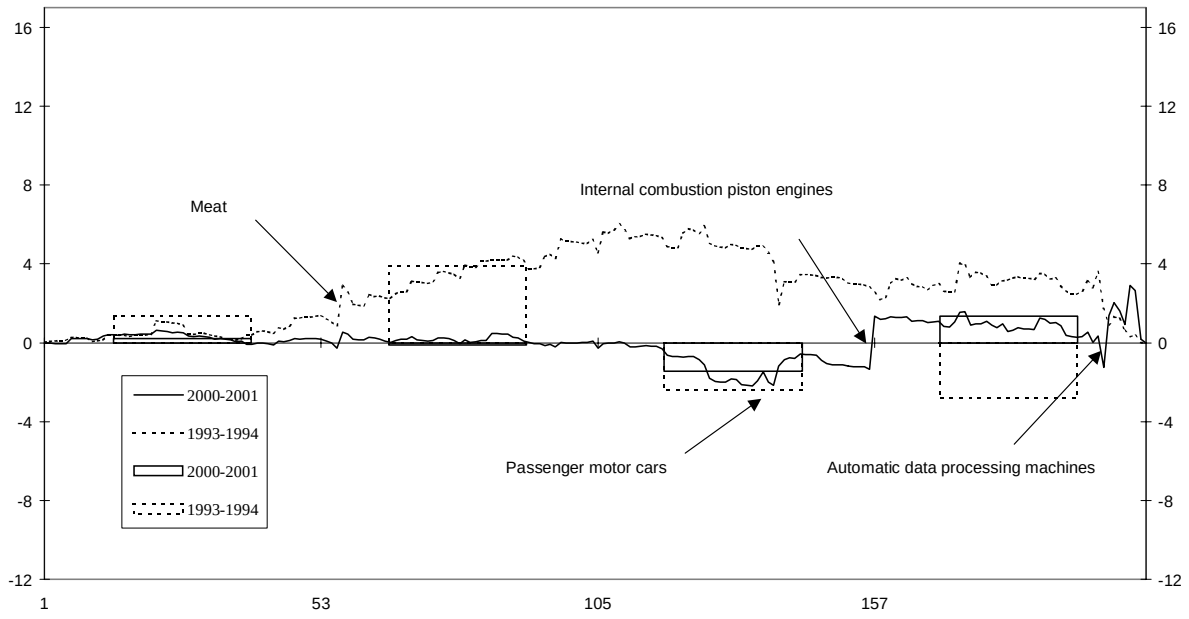
Czech Republic: Comparative advantages ordered according to world demand



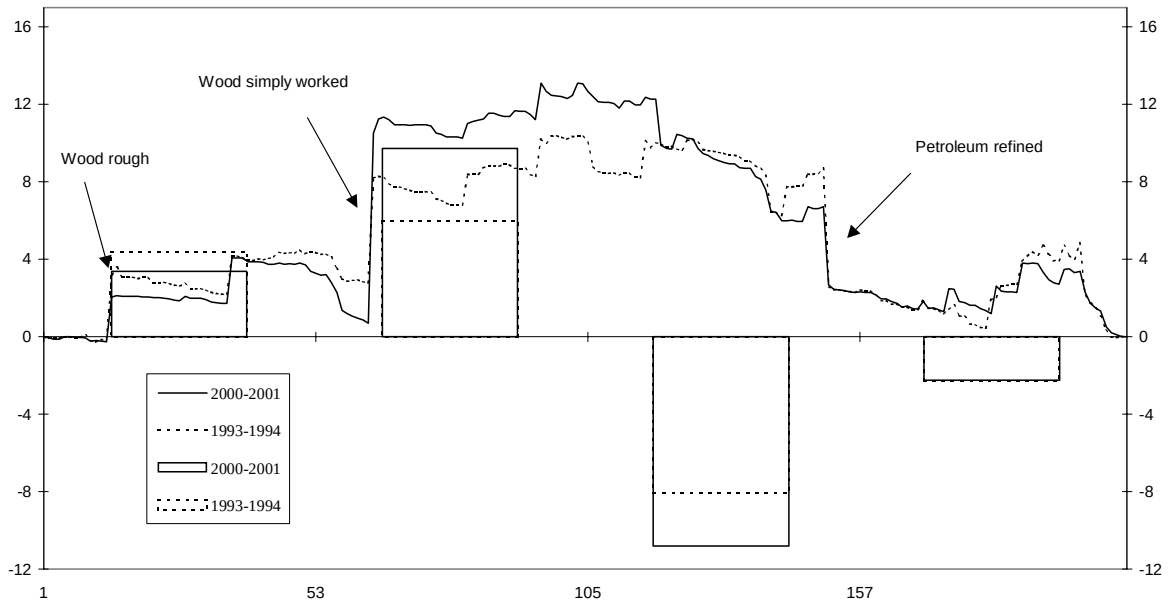
Estonia: Comparative advantages ordered according to world demand



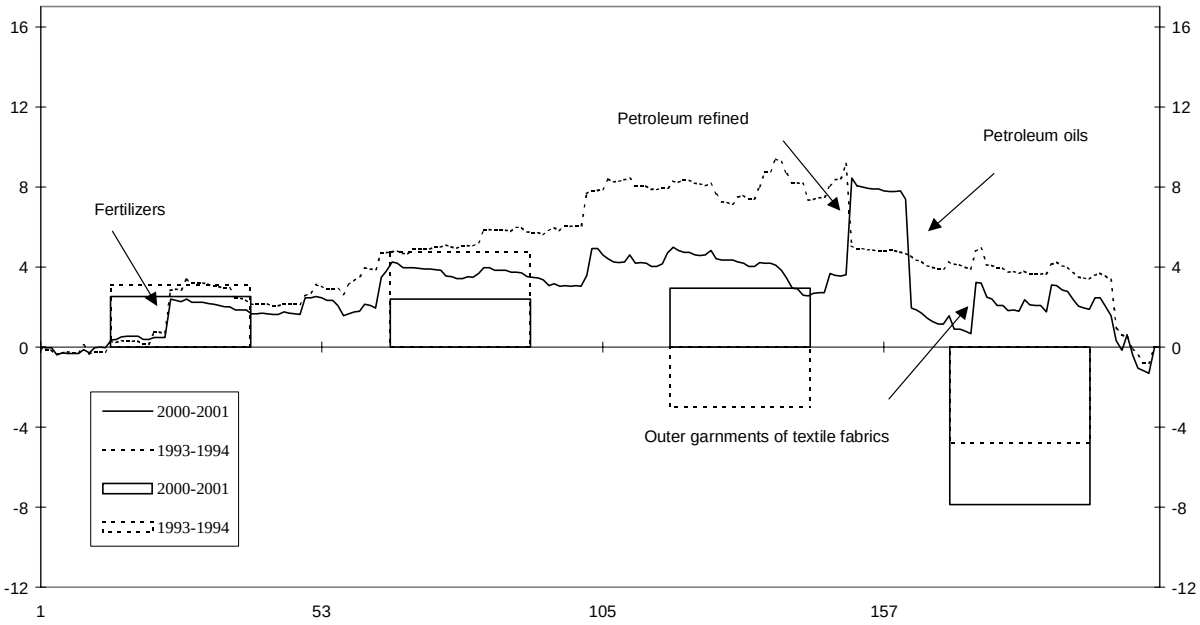
Hungary: Comparative advantages ordered according to world demand



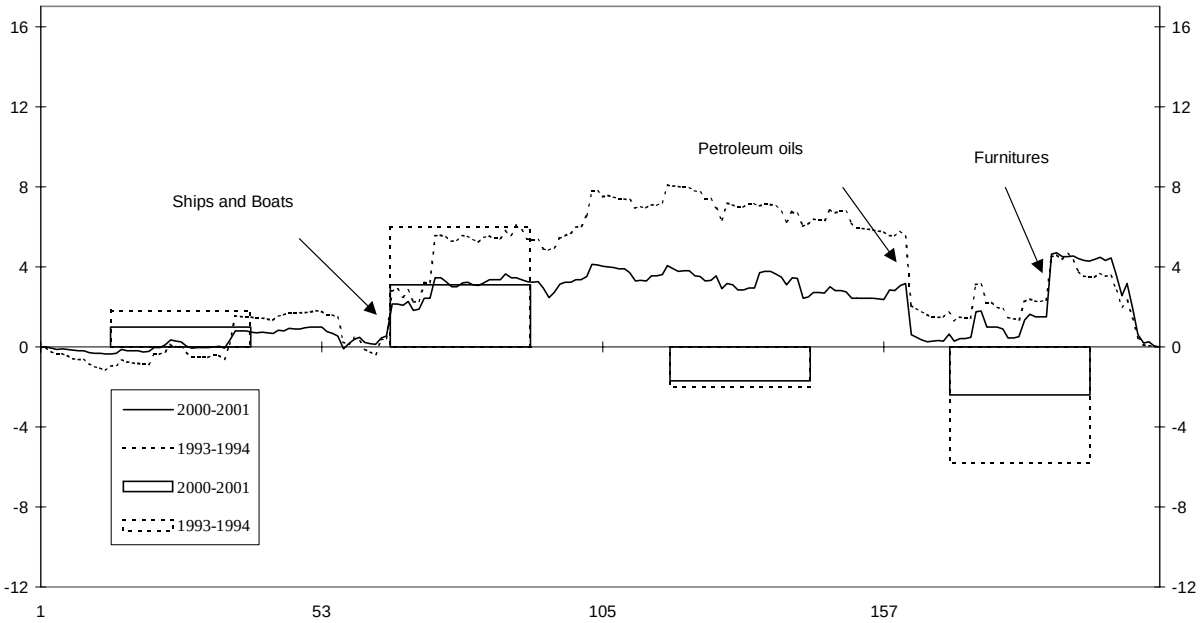
Latvia: Comparative advantages ordered according to world demand



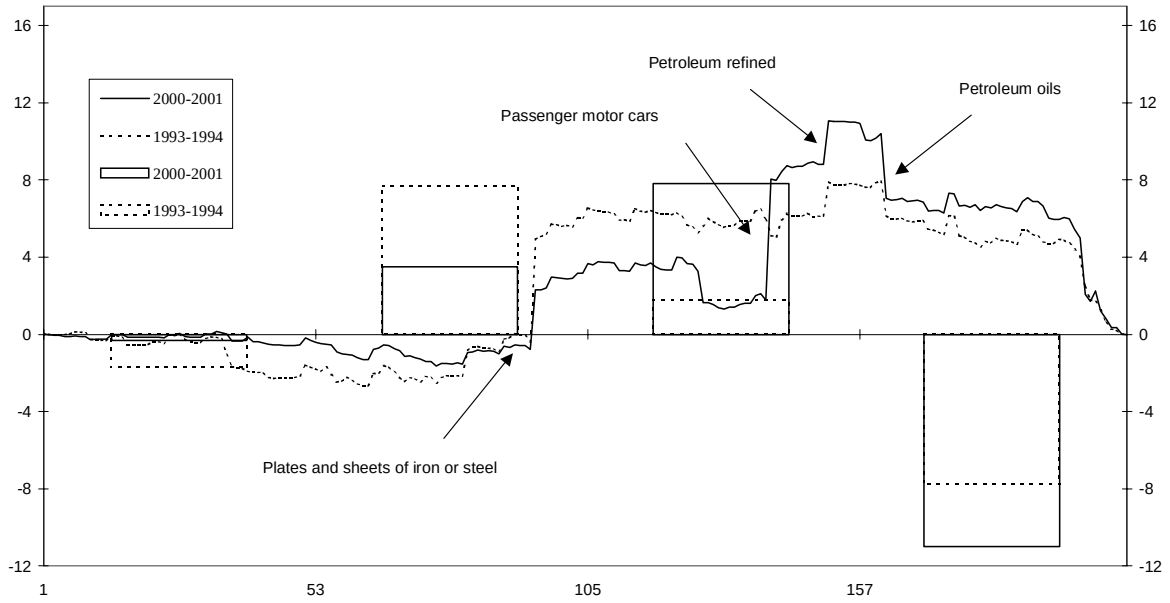
Lithuania: Comparative advantages ordered according to world demand



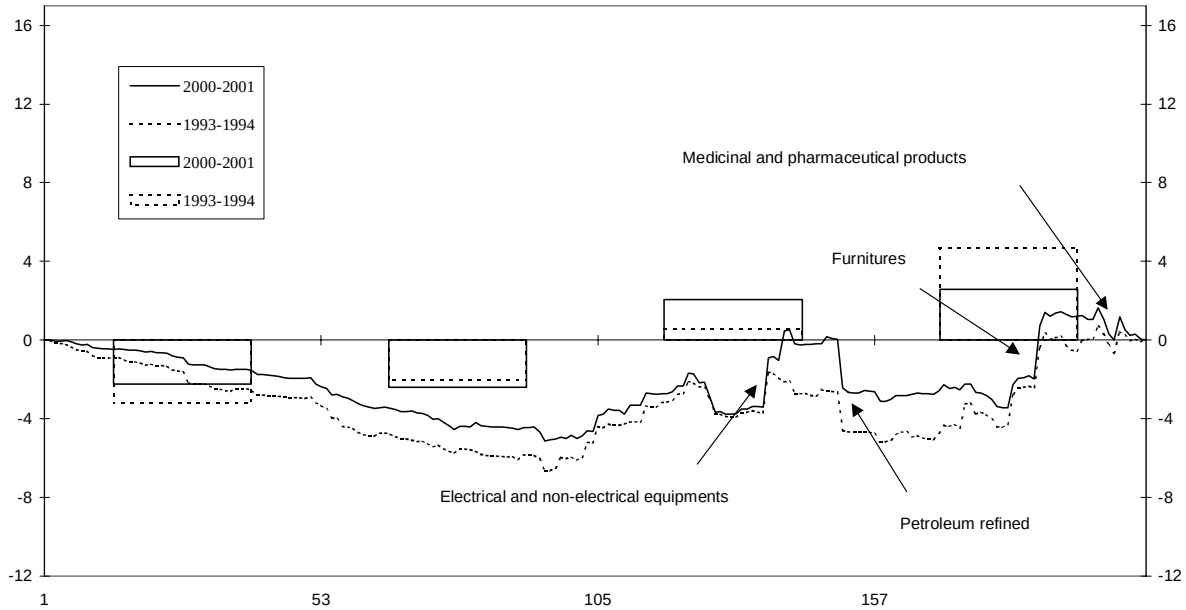
Poland: Comparative advantages ordered according to world demand



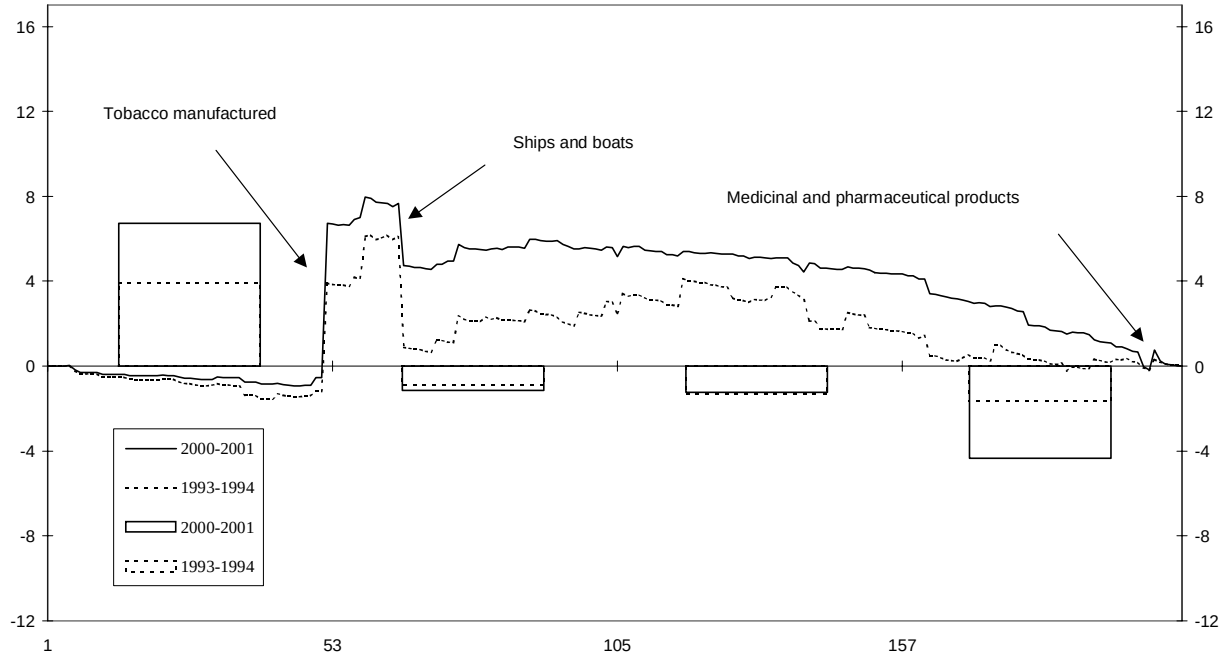
Slovak Republic: Comparative advantages ordered according to world demand



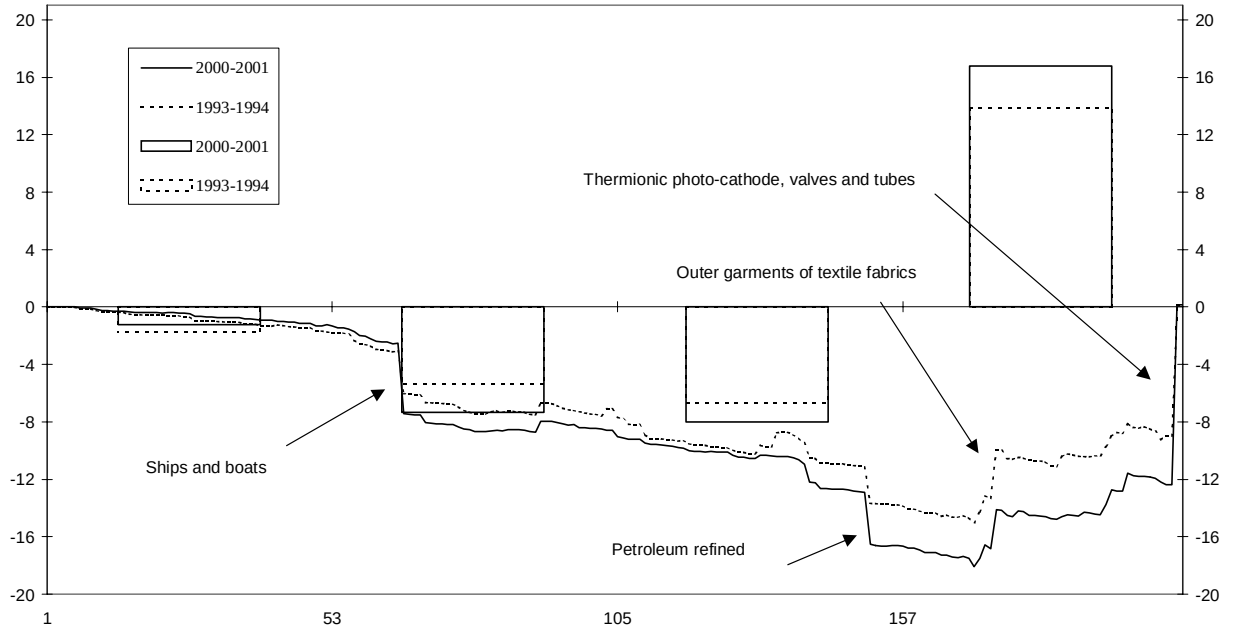
Slovenia: Comparative advantages ordered according to world demand



Cyprus: Comparative advantages ordered according to world demand



Malta: Comparative advantages ordered according to world demand



Transition probabilities - Czech Republic

	1-year transitions					*8-year transitions*			
	I Quartile	II Quartile	III Quartile	IV Quartile		I Quartile	II Quartile	III Quartile	IV Quartile
(416)	0.815	0.108	0.048	0.029	(52)	0.577	0.288	0.077	0.058
(416)	0.132	0.721	0.120	0.026	(52)	0.154	0.538	0.269	0.038
(416)	0.005	0.149	0.748	0.099	(52)	0.077	0.173	0.577	0.173
(416)	0.034	0.034	0.127	0.805	(52)	0.096	0.058	0.385	0.462
Ergodic	*0.237*	*0.267*	*0.280*	*0.213*	*Ergodic*	*0.203*	*0.281*	*0.358*	*0.157*

Transition probabilities – Estonia

	1-year transitions					*8-year transitions*			
	I Quartile	II Quartile	III Quartile	IV Quartile		I Quartile	II Quartile	III Quartile	IV Quartile
(416)	0.805	0.147	0.036	0.053	(52)	0.385	0.423	0.096	0.096
(416)	0.118	0.647	0.168	0.067	(52)	0.115	0.692	0.135	0.058
(416)	0.053	0.185	0.666	0.096	(52)	0.058	0.404	0.423	0.115
(416)	0.041	0.063	0.149	0.748	(52)	0.058	0.231	0.135	0.577
Ergodic	*0.236*	*0.275*	*0.264*	*0.224*	*Ergodic*	*0.131*	*0.534*	*0.182*	*0.152*

Transition probabilities - Hungary

	1-year transitions					*8-year transitions*			
	I Quartile	II Quartile	III Quartile	IV Quartile		I Quartile	II Quartile	III Quartile	IV Quartile
(416)	0.796	0.149	0.024	0.031	(52)	0.654	0.212	0.038	0.096
(416)	0.115	0.709	0.159	0.017	(52)	0.096	0.577	0.250	0.077
(416)	0.022	0.139	0.755	0.084	(52)	0.058	0.288	0.635	0.019
(416)	0.046	0.019	0.125	0.810	(52)	0.096	0.077	0.365	0.462
Ergodic	*0.230*	*0.275*	*0.300*	*0.195*	*Ergodic*	*0.186*	*0.356*	*0.360*	*0.090*

Transition probabilities – Latvia

	1-year transitions					*8-year transitions*			
	I Quartile	II Quartile	III Quartile	IV Quartile		I Quartile	II Quartile	III Quartile	IV Quartile
(416)	0.736	0.197	0.022	0.046	(52)	0.423	0.327	0.096	0.154
(416)	0.154	0.615	0.178	0.053	(52)	0.154	0.615	0.096	0.135
(416)	0.014	0.188	0.654	0.144	(52)	0.019	0.212	0.615	0.154
(416)	0.031	0.084	0.123	0.762	(52)	0.038	0.192	0.250	0.519
Ergodic	*0.210*	*0.285*	*0.276*	*0.255*	*Ergodic*	*0.124*	*0.371*	*0.274*	*0.231*

Transition probabilities - Lthuania

1-year transitions

	I Quartile	II Quartile	III Quartile	IV Quartile
(416)	0.813	0.132	0.026	0.029
(416)	0.103	0.649	0.151	0.096
(416)	0.007	0.202	0.700	0.091
(416)	0.041	0.067	0.154	0.738
Ergodic	*0.216*	*0.283*	*0.277*	*0.224*

8-year transitions

	I Quartile	II Quartile	III Quartile	IV Quartile
(52)	0.346	0.423	0.096	0.135
(52)	0.192	0.385	0.385	0.038
(52)	0.058	0.250	0.558	0.135
(52)	0.154	0.115	0.308	0.423
Ergodic	*0.157*	*0.297*	*0.396*	*0.149*

Transition probabilities - Poland

1-year transitions

	I Quartile	II Quartile	III Quartile	IV Quartile
(416)	0.820	0.149	0.026	0.005
(416)	0.108	0.661	0.200	0.031
(416)	0.019	0.168	0.712	0.101
(416)	0.038	0.029	0.075	0.858
Ergodic	*0.233*	*0.254*	*0.262*	*0.250*

8-year transitions

	I Quartile	II Quartile	III Quartile	IV Quartile
(52)	0.558	0.308	0.058	0.077
(52)	0.115	0.442	0.404	0.038
(52)	0.058	0.096	0.788	0.058
(52)	0.000	0.000	0.192	0.808
Ergodic	*0.077*	*0.222*	*0.429*	*0.272*

Transition probabilities – Slovak Republic

1-year transitions

	I Quartile	II Quartile	III Quartile	IV Quartile
(416)	0.760	0.166	0.048	0.026
(416)	0.135	0.685	0.156	0.024
(416)	0.007	0.159	0.731	0.103
(416)	0.048	0.029	0.082	0.841
Ergodic	*0.209*	*0.270*	*0.270*	*0.252*

8-year transitions

	I Quartile	II Quartile	III Quartile	IV Quartile
(52)	0.481	0.288	0.135	0.096
(52)	0.077	0.577	0.269	0.077
(52)	0.019	0.154	0.731	0.096
(52)	0.077	0.096	0.192	0.635
Ergodic	*0.096*	*0.289*	*0.354*	*0.261*

Transition probabilities - Slovenia

1-year transitions

	I Quartile	II Quartile	III Quartile	IV Quartile
(416)	0.870	0.096	0.024	0.010
(416)	0.089	0.731	0.168	0.012
(416)	0.019	0.144	0.719	0.118
(416)	0.007	0.038	0.108	0.846
Ergodic	*0.231*	*0.260*	*0.268*	*0.240*

8-year transitions

	I Quartile	II Quartile	III Quartile	IV Quartile
(52)	0.654	0.212	0.058	0.077
(52)	0.154	0.538	0.231	0.077
(52)	0.019	0.135	0.750	0.096
(52)	0.000	0.096	0.173	0.731
Ergodic	*0.106*	*0.304*	*0.390*	*0.200*

Changes in the Lafay index for the "high tech" items from 1993-1994 to 2000-2001(1)

	CZE	EST	HUN	LAT	LIT	POL	SLK	SLN
541-Medicinal and pharmaceutical products	-	+	-	+	-	-	-	+
712-Steam & other vapour power units,steam eng.	-	+	-	+	-	+	+	+
716-Rotating electric plant and parts	+	+	-	-	-	+	+	+
718-Other power generating machinery and parts	-	+	-	+	-	+	+	+
751-Office machines	+	-	-	+	+	+	-	-
752-Automatic data processing machines & units	+	+	+	-	-	+	+	-
759-Parts of and accessories suitable for 751-	+	+	+	+	+	+	+	-
761-Television receivers	+	+	+	-	-	+	-	+
764-Telecommunications equipment and parts	-	+	+	+	-	+	+	+
771-Electric power machinery and parts thereof	+	+	+	-	-	+	+	-
774-Electric apparatus for medical purposes	+	+	+	+	+	+	+	+
776-Thermionic,cold & photo-cathode valves,tub	-	+	-	-	+	+	-	+
778-Electrical machinery and apparatus,n.e.s.	+	+	-	-	-	+	-	-
792-Aircraft & associated equipment and parts	-	+	+	-	+	+	+	-
871-Optical instruments and apparatus	+	-	-	+	-	-	-	-
874-Measuring,checking,analysing instruments	+	+	+	-	-	+	-	-
881-Photographic apparatus and equipment	+	+	+	+	+	+	+	-

(1) *High tech* items accordino to UNIDO(2003)

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