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Andrea Szalavetz

STRUCTURAL CHANGE – STRUCTURAL COMPETITIVENESS

1014 Budapest, Orszagház u. 30.
Tel.: (36-1) 224-6760 • Fax: (36-1) 224-6761 • E-mail: vki@vki.hu

SUMMARY

This paper seeks to answer questions posed by theoretical, methodological and descriptive research. Theoretically, to what extent is economic structure related to competitiveness and growth performance? Is there such a thing as 'structural competitiveness'? The main finding here is that the quality properties of economic activity are what matter in the long run, not what countries specialize in. 'Good specialization' in the short and medium run can bring spectacular improvement in performance and in competitiveness.

Although the Hungarian manufacturing mix underwent huge changes in the transition period, extent of structural rearrangement cannot itself be called an achievement. Comprehensive rearrangement does not necessarily lead to above-average competitiveness. Calculations of the extent of structural change need to be augmented by indicators of the quality properties of structural change, such as productivity, import ratio of production, or share of value added in total turnover. Analysis of the relation between economic structure and competitiveness should not be restricted to commodity structure. It should cover the economic role of services and agriculture and the manufacturing mix. Analysts usually see agriculture as a low-technology, low-productivity sector. Yet international statistics show its productivity has improved even faster than that of manufacturing in many developed OECD countries. Increased structural similarity, in terms of a rapidly rising GDP share of industry and services at the expense of agriculture, should not be achieved by neglecting agriculture. It is unwise to ignore the considerable productivity-enhancing effect of the primary sector.

The methodological question concerns the analytical value of individual structural indicators. What do these illuminate and what do they conceal? Emphasis is given to the analytical value of the technological content of production and export. The paper concludes that a high share of high-technology or ICT products within total output or exports does not in itself indicate above-average competitiveness. (1) An increase in the share of technology-intensive branches in total manufacturing value added does not shed light on the competitiveness factors with which this improving indicator can be explained (pure cost competitiveness or high local marketing competence, local innovation potential *etc.*) (2) The relatively small weight of high-technology industries in total manufacturing value added should also be noted.

The analysis is based on structural data from the Central and Eastern European (CEE) countries. The paper tries to discover whether and how structural changes in these countries match global tendencies.

INTRODUCTION AND OVERVIEW

The relationship between economic structure (sectoral structure and manufacturing mix) and competitiveness is a controversial, widely debated theoretical issue. The assumptions that structure and aggregate performance are mutually dependent and structural change (reallocation of productive inputs across industrial activities) is an important source of growth are commonplace in literature.[1] Kuznets 1979 states it is impossible to attain high rates of per capita growth without substantial shifts in the relative weights of sectors. The contribution of various industries to aggregate TFP (total factor productivity) growth shows wide variation. Returns to scale differ across sectors. What is more, the leading industries change over time. This suggests that crucial elements in the differences between countries' economic performance are their capability to switch to fast-growing sectors by changing their specialization and the speed at which they can do so.

Aggregate growth can be decomposed into a structural component, reflecting the effect of changes in the composition of the aggregate, and a quality component, reflecting the effect of changes within the factors making up the aggregate (*e.g.* productivity improvement within various sectors), with the help of shift-share analysis.[2] In contrast to the apparent logic of the assumption on the strong, causal relation between structural change and growth, the results of most quantification exercises do not support the claim that structure is a robust explanatory factor of performance.[3] The cited studies agree that the structural component of growth is not as significant as it seems at first sight.

Recent experience in countries specialized in information and communication technology (ICT) manufacturing seems to contradict these theoretical assumptions, however. In the 1990s, ICT specialization showed strong correlation with above-average growth and export performance, and with rapid catching up.

This paper discusses whether this new experience calls for modification of the theoretical assumption that there is a poor relation between economic structure and growth and competitiveness. Is it 'good specialization' that determines the competitiveness and growth performance of a country, or is it other factors? Another research question addressed in this paper is the analytical strength of individual structural indicators. What can structural indicators illuminate and what do they conceal? The analysis rests on structural data from CEE countries, since the paper also explores whether and

[1] The concept dates back to Schumpeter 1928, Fisher 1939, Clark 1940, Fourastié 1949, *etc.*

[2] For a literature review and criticism of the application, see Timmer and Szirmai 2000.

[3] Examples include Esteban 2000, Fagerberg 2000 and Peneder 1999.

how these countries' structural changes match global tendencies. Hungary's experience in this respect is compared with that of other CEE countries.

STRUCTURAL CHANGE AND COMPETITIVENESS

Hungary's structural transformation is considered one of the deepest of any CEE country in the first decade of transition. Hitherto absent manufacturing activities introduced by foreign investors included car assembly or office and computing machinery. The share of high technology-intensive manufacturing has greatly increased, while that of low-technology industries has significantly declined.

Table 1 quantifies the extent Hungarian manufacturing structure was rearranged and compares it with the experience of other CEE countries.

The question is whether the extent of the structural rearrangement can be called an achievement in itself – whether comprehensive rearrangement points to above-average competitiveness.

The answer is yes and no. Yes, because the period of structural change coincided with transformation into a market economy and in this way contributed to rectifying the structural distortions of the command economy. The structural change coincided with reintegration into the world economy and global patterns of manufacturing, and it was driven by foreign direct investment. These circumstances supplied the competitiveness-enhancing character of the

Table 1
Structural change in manufacturing, 1989–200, constant 1996 prices, %

	Bulgaria	Czech R.	*Hungary*	Poland	Romania	Slovakia	Slovenia
Food products, beverages & tobacco	-0.4	2.2	*-10.7*	-.2.2	5.6	-4.2	1.9
Textiles & textile products	0.7	-2.6	*-3.4*	-3.3	-0.1	-3.5	-1.9
Leather & leather products	-0.3	-1.6	*-0.9*	-1.1	0.4	-1.1	-1.7
Wood & wood products	0.4	-0.3	*-0.1*	1.0	-0.7	-1.0	-1.4
Pulp, paper, publishing & printing	1.9	2.0	*-0.7*	2.8	-0.3	2.7	-2.0
Coke, refined petroleum products, fuel	3.2	-2.5	*-4.3*	-1.4	-0.8	1.1	-0.4
Chemicals, chemical products, man-made fibres	2.0	2.2	*-10.8*	-2.0	-3.6	-1.4	0.5
Rubber & plastic products	-0.1	1.1	*1.0*	3.0	-2.2	0.4	1.5
Other non-metallic mineral products	0.5	0.6	*-1.2*	0.2	-0.6	-0.7	2.0
Basic metals & fabricated metal products	1.7	-4.5	*-5.2*	-1.2	-6.0	3.4	0.3
Machinery & equipment n.e.c.	1.8	-7.1	*-0.8*	-2.5	0.2	-8.6	-.01
Electrical & optical equipment	-4.0	6.2	*30.7*	2.7	1.8	0.5	2.6
Transport equipment	-6.6	2.8	*6.9*	3.7	3.7	12.8	-1.8
Manufacturing n.e.c.	-0.8	1.5	*-0.6*	0.2	2.5	-0.5	0.5
Total percentage rearranged	12.2	18.6	*38.6*	13.6	14.2	21.0	9.3

Source: Gács 2003, p. 143.

changes. Yet the importance of structural change should not be overemphasized even in the decade of transformation. Although patterns of specialization are dynamic and evolve over time, rapid structural change on a scale much greater than the average for the developed countries does not necessarily reflect a competitiveness improvement in the country undergoing the change. It may be taking place in a rather underdeveloped country, whose GDP level (the denominator of structural-change calculations) falls below a certain threshold. Rapid and excessive changes in the cross-section distribution of economic activities are usually exogenously driven, whereas the specialization dynamics of developed countries evolves much more endogenously, being driven by factor proportions (and changes in them) and by agglomeration forces.

Furthermore, developed countries do not exclusively respond to intensification of competitive pressure with inter-industry rearrangement. It is more a question of quality upgrading within industries – specialization in the more knowledge and technology-intensive segments of industries and in higher value-added products within the segments. So the pure extent of inter-industry rearrangement of production and export specialization refers to competitiveness improvement only under the specific circumstances of transformation. And even in there, calculations of the extent of structural change should be complemented with indicators reflecting the quality properties of that change.

QUALITY AND QUANTITY INDICATORS OF ECONOMIC STRUCTURE

An important quality indicator to add to analysis of changes in the industry structure of a country's GDP is productivity – value added per hour worked.[4] There are huge differences, even between developed countries, in their productivity levels, so that the indicator of industry-specific productivity level[5] is very informative, when making international comparisons and when quantifying the dynamics of catching up. If the distribution of shares of GDP of industries in a catching-up country resembles that of an advanced economy, but productivity levels in such industries remain far below those in benchmark countries, the catching-up process will still be protracted, however up-to-date the economic structure may be.

Another telling quality indicator is the import ratio of production. A country is usually considered highly competitive if its export structure shows large

[4] Eurostat publishes apparent labor productivity data of value added per persons employed in its series Statistics in Focus. Although this calculation method includes significant distortions (there are considerable differences among member states in terms of average hours worked per employee see Van Bastelaer and Vaguer 2004), the series provides useful data for international comparisons and issues since May 2004 also include the data for new members.

[5] Indicators of productivity improvement trends are less valuable without level of productivity, as catching-up countries, especially those in which the improvement is driven by foreign investors, usually show a 'latecomer' type of above average productivity improvement.

shares for emerging, technology-intensive industries. These are considered strategic because of the high export intensity of their production, so that their contribution to the total value of gross exports is considerable. Technology-intensive products, however, have high import intensity, which means that production of them has a relatively low ratio of local value added. Import intensity, of course, is very hard to influence with economic-policy measures, as it is more or less industry specific. High import ratios are typical for global industries such as office equipment or telecom equipment manufacturing. The lesson for economic policy is not to try to 'organize for local suppliers' at any cost, but to calculate net exports instead of gross exports in its analyses, before taking decisions about economic policy and the selection of strategic industries.[6]

Another way to complement the picture that emerges out of international comparisons of industry composition by technology intensity is to analyse the countries' contributions to world or to EU GDP in particular industries. Consider the case of Germany, often blamed for not having a particularly up-to-date industrial structure (Klodt and Maurer 1995; Siebert and Stolpe 2001). According to Eurostat data, Germany's high-tech exports amounted to 15.8 per cent of total exports in 2001, as opposed to an EU 15 average of 19.8 per cent. Germany's indicator pales by comparison with Ireland's (40.8 per cent) or even established EU members' like France's (25.6 per cent) or the United Kingdom's (26.4 per cent, Strack 2004).The extent to which the indicator of high-tech exports over total exports distorts conclusions about competitiveness becomes conspicuous if the contribution of Germany to EU 25 value added by industries is examined. It becomes clear (Storm 2004) that at two-digit NACE level of manufacturing activities, Germany in most cases belongs to the top two contributors (not only in *low-tech*, medium *low-tech* and medium *high-tech* industries, but in *high-tech* ones, too).[7]

As for the main quantity indicators, analysis of the relation between economic structure and competitiveness should not be restricted to the commodity structure. The economic role of services and agriculture need analysing along with the manufacturing mix. According to the WTO, the economic weight of services, especially strategic business services, has continued to increase in terms of the sector's GDP share and of its trade performance, *i.e.* its export share. Analysts benchmarking the structural performance of catch-up economies usually attach

[6] Calculating net exports at industry level, however, calls for a series of field investigations, as no reliable industry-level data is available.

[7] For instance, Germany is top contributor to EU 25 value added in the food industry (18.5 per cent of total value added), manufacture of pulp and paper products (20.7 per cent), chemicals and chemical products (24.9 per cent), rubber and plastic products (27 per cent), fabricated metal products (27.5 per cent), machinery and equipment (37.4 per cent), office machinery and computers (22.3 per cent), motor vehicles (47.1 per cent) and several others. It is second largest contributor in another industry classed as high-tech: manufacture of radio, television and communication equipment (17.4 per cent, Storm 2004).

much importance to employment reallocation from agriculture and industry to services. The next few paragraphs argue that the simplest quantitative objective of structural similarity in the 21st century often misses the point.

Table 2
The GDP share of services and of business services (2001, %)

	Services	Business services
Austria	67.1	47.2
Czech Republic	55.8	40.9
Denmark	71.7	45.6
Finland	64.2	43.0
France	72.5	49.3
Germany	69.4	48.0
Hungary	*64.4*	*42.9*
Ireland	54.5	38.5
Italy	69.5	50.0
Japan	67.9	46.3
Korea	53.9	37.8
Netherlands	71.4	48.4
Poland	65.0	44.4
Slovakia	63.8	48.8
Spain	67.9	47.7
United Kingdom	72.6	50.6
United States	77.3	55.3

Source: OECD STAN Indicators Database, 2004 No. 01

By now, pure structural similarity indicators have ceased to be as telling in the case of transforming economies, as they were in the socialist era, when the share of services was considerably lower, than that in developed countries. The macroeconomic structures of transforming countries have become much more similar to those of developed countries. Although transforming economies have undergone a manufacturing-based modernization process, the share of services has spectacularly increased.

Differences in the macroeconomic structure have prevailed in two respects. The share of strategic business services and the weight of service exports both remain below those found in developed countries *(Table 2* and *Table 3)*.

Table 3
The volume of exports of commercial services (ECS) and share of service exports in commodity exports (CE), 2002

Country	ECS USD billion	ECS/CE %
USA	272.6	39.3
UK	123.1	44.0
Germany	99.6	16.2
France	85.9	25.9
Japan	64.9	15.6
Spain	62.1	52.1
Hong Kong	45.2	23.7
Austria	34.9	44.3
Ireland	28.1	31.9
Korea	27.1	16.7
Denmark	25.5	44.7
India	23.5	47.7
Sweden	22.5	27.7
Poland	10.1	24.6
Hungary	*7.7*	*22.4*
Czech Republic	7.0	18.2

Source: WTO, International Trade Statistics, and own calculations.

Table 3 presents the volume of service exports and their share in commodity exports, among leading service exporters and some transforming countries. The indicators reflect a much larger gap between the developed countries and the new EU members than the one indicated by simple structural-similarity comparisons (GDP shares of individual sectors). This makes them more useful tools of competitiveness analyses.

Economists usually see agriculture as a traditional, low-technology, low-

productivity sector. A simplistic interpretation of such analyses could also suggest that the more economic weight agriculture loses, the more a country's competitiveness improves. International productivity statistics, on the other hand, show in the past decade the significant productivity improvement that could be observed in developed countries, not only as the result of productivity improvement in manufacturing. Although academic journals and press news kept emphasizing the tremendous productivity improvement in information technology-producing sectors, analysis of productivity data reveals that in many of developed OECD countries, the productivity of agriculture improved even faster than that of manufacturing.

Table 4
Labour productivity improvement 2001/1990 (%)

	Agriculture	Manufacturing
Austria	170.5	151.9
Belgium	154.5	134.8
Canada	133.7	139.6
Denmark	194.4	132.8
Finland	180.5	173.4
France	148.6	146.6
Germany	119.0	114.5
Italy	176.0	124.8
Netherlands	130.5	132.5
Norway	179.6	110.8
Portugal	134.6	130.7
Spain	154.2	119.2
Sweden	134.9	195.5
United Kingdom	99.6	131.5
United States	127.7	147.0

Source: OECD, STAN Indicators Database, 2004 No. 01, own calculations.

The data in *Table 4* confirm that the productivity role of agriculture should not be ignored. The main structural problem with agriculture for new EU members is not its sheer size – the excessive GDP share of the sector – but its inferior productivity, poor mechanization and bad environmental management. Increased structural similarity in terms of a rapidly rising GDP share of industry and services at the expense of agriculture should be achieved not by neglecting agriculture. The economic policy of catching-up countries has to promote technological upgrading of agriculture, incorporation of new agro-biotechnology *etc.*, and should not renounce the considerable productivity-enhancing effect of the primary sector.

STRUCTURAL CHANGE IN HUNGARY AND GLOBAL STRUCTURAL TENDENCIES

The technological content of production and exports

The apparent improvement in Hungary's competitiveness in the 1990s is strongly linked to changes in the composition of its manufacturing mix, *i.e.* to the spectacular increase in the manufacturing and export shares of high-technology industries in general and information technology hardware in particular.

Table 5
Share of high-technology value added in total manufacturing value added
(%)

	1988	1992	1995	1999	2000	2001
Austria	9.3	9.8	9.9	9.7	9.7	9.3
Czech Republic	-	1.5	5.2	5.7	6.2	-
Denmark	9.0	10.3	10.8	14.4	15	15.3
Finland	6.8	8.0	11.0	21.8	23.7	21.4
France	11.7	11.7	13.0	14.0	14.0	14.1
Germany	10.6	10.3	8.8	10.4	11.1	10.4
Hungary	-	-	-	*14.0*	*14.5*	*15.3*
Ireland	-	17.2	22.9	25.5	-	-
Italy	8.9	8.9	8.2	8.9	9.2	9.8
Japan	15.9	15.3	16.0	17.8	18.7	16.7
Korea	15.7	13.9	18.6	19.7	21.2	-
Poland	-	-	-	7.7	6.9	-
Spain	6.8	7.5	7.1	6.7	6.6	6.9
United Kingdom	14.1	14.4	14.5	16.3	17.1	-
USA	20.3	21.4	20.1	22.1	23.0	-

Source: OECD STAN Indicators Database, 2004 No. 01.

Table 6
Share of ICT-producing industries in total manufacturing value added
(%)

	1995	1999	2000	2001
Austria	7.2	7.0	7.5	6.8
Czech Republic	2.7	3.6	4.2	-
Finland	8.9	20.1	22.4	19.2
France	6.7	6.8	6.8	6.1
Germany	4.9	5.5	6.3	5.1
Hungary	-	*9.6*	*9.5*	*9.5*
Ireland	15.0	16.3	-	-
Italy	4.2	3.5	4.6	4.1
Japan	12.7	13.9	15.1	12.6
Korea	15.4	16.7	18.1	-
Poland	-	5.5	4.7	-
Spain	3.6	3.3	3.3	3.2
United Kingdom	8.3	8.9	-	-

Source: OECD STAN Indicators Database, 2004 No. 01

Table 5 gives an international comparison of the share of high-technology industries (including not only ICT, but pharmaceuticals, aerospace, scientific instruments, *etc.*) and *Table 6* the evolution of the manufacturing share of ICT. The spectacular evolution of these quantity indicators, in line with the main structural tendencies worldwide, has greatly improved the performance of the country, but not necessarily its competitiveness. A high share of high-technology or ICT products within total output or exports does not point in itself to above-average competitiveness in itself, for two reasons.

(1) Changes in the composition of the manufacturing mix do not reveal the answer to the big question of what kind of competitiveness factors the high (increasing) share of technology-intensive branches in total manufacturing value added can be explained by. Is it pure cost competitiveness, due to a relatively low wage level, or some other type of competence offering more sustainable competitiveness, such as network competence, marketing competence, local innovation potential, *etc.* These questions can be answered by examining the evolution of various industry characteristics. One is the share of net wages within companies' total costs and within total value added. According to calculations in Pitti 2003 and 2005, the share of net wages in Hungary continued to diminish in Hungary from 1995 to 2003, within companies' total costs

and within total value added. Since gross wages in ICT production make up a large part of local value added in transforming and developing countries specialized in ICT manufacturing, Pitti's results point to a lack of quality upgrading in these industries. The high share of wages in total value added suggests labour intensity of local production. In fact, although the production technology is highly technology-intensive and the output (office machinery parts and components) is also high-tech, the processing activity is not knowledge-intensive. It does not need special education or skills. Technology and knowledge intensity should therefore be examined not at industry level – following the OECD industry classification of low, medium-low, medium-high and high-technology industries – but on an industry-segment level, or even one of specific manufacturing activity (Thompson and Thompson 1985). Another industry feature connected with the factors that explain competitiveness is the share of value added in total turnover. According to Eurostat (Götzfried 2004), the average value of this indicator was 22 per cent in Hungarian manufacturing in 2001, but only 18 per cent in high-tech manufacturing. These compare poorly with EU 25 averages of 27 and 28 per cent.

(2) The second reason is the still tiny weight of these industries. Much higher than the average growth and productivity performance by the ICT sector often allows experts and decision-makers forget that the sector influences a tiny part of the economy and even of manufacturing, compared the weights of industries of medium or low technology intensity. No matter how spectacularly the performance of an industry evolves, if it hardly contributes to total manufacturing performance, the aggregate indicators will undergo only a minor change.

Table 7
Share of ICT production and of industries featuring low technology intensity[8] (LTI) in total manufacturing value added, %

	ICT		LTI	
	2000	2001	2000	2001
Austria	7.5	6.8	35.6	35.0
Czech Republic	4.2	-	34.2	-
Finland	22.4	19.2	37.8	37.3
France	6.8	6.1	31.7	31.8
Germany	6.3	5.1	24.1	23.2
Hungary	*9.5*	*9.5*	*30.4*	*33.3*
Ireland*	16.3	-	37	-
Italy	4.6	4.1	37.9	38.8
Japan	15.1	12.6	29.8	30.1
Korea	18.1	-	21.3	21.7
Poland	4.7	-	44.2	-
Spain	3.3	3.2	37.4	37.4
United Kingdom*	8.9	-	36.8	37.3
United States	-	-	30.8	31.2

* 1999 data.
Source: OECD STAN Indicators Database, 2004 No. 01.

Table 7 compares the manufacturing shares of ICT production and that of low technology industries. The data show that even in countries classified as spe-

[8] The technological classification of manufacturing industries follows the OECD (Directorate for Science Technology and Industry) guidelines provided in the STAN Indicators Database (Annex 3, pp. 28-31)
http://www.oecd.org/dataoecd/60/28/21576665.pdf.

cialized in high-technology manufacturing, such as Ireland and Finland, or even in developed OECD countries, industries featuring low technology intensity contribute to a considerable share of total manufacturing value added.

Research and development intensity

Much has been written about the dramatic changes in the innovative activities in CEE countries, taking place as a consequence of industrial transformation.[9] sources for local R and D were slowly ending and the trend gradually reversing by the second half of the 1990s.[10]

Table 8 gives an international comparison of R and D expenditures as a percentage of value added in manufacturing and *Tables 9* and *10* quantify the evolution of the same indicator in two selected mature industries: machinery and equipment, and transport equipment.[11] The huge differences in R and D intensity between more and less advanced economies are conspicuous. R and D intensity shows a continually increasing trend in advanced economies, while the

Table 8
Business R and D expenditures (BRD) as a proportion of value added in manufacturing, %

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Belgium	5.2	5.7	5.6	5.4	5.8	5.9	5.9	6.4	6.8	7.7
Czech Republic	2.8	2.3	2.0	2.0	1.7	2.1	2.4	2.2	2.1	2.1
Denmark	4.2	4.5	4.5	4.7	5.1	5.1	5.9	6.0	~	~
Finland	5.5	5.1	5.4	5.6	6.8	7.2	7.5	8.6	8.8	9.4
France	7.3	7.7	7.5	7.2	7.3	6.9	6.8	7.1	6.9	~
Germany	6.4	6.7	6.6	6.7	6.8	6.9	7.0	7.5	7.7	7.7
Ireland	2.5	2.9	3.1	3.0	3.1	2.7	2.4	2.2	~	~
Italy	2.8	2.6	2.4	2.2	2.3	2.2	2.0	2.1	2.2	2.4
Japan	7.4	7.4	7.6	7.9	8.1	8.5	8.9	9.0	9.2	9.9
Korea	~	~	~	5.2	5.6	5.6	4.7	4.7	5.3	6.0
Netherlands	5.0	5.0	5.1	5.1	5.3	5.4	5.1	5.8	5.6	~
Poland	~	~	1.2	1.0	1.1	1.0	1.2	1.3	1.0	1.0
Spain	2.0	1.9	1.7	1.7	1.9	1.8	2.1	2.1	1.8	1.8
United Kingdom	5.7	5.8	5.4	5.1	5.0	5.0	5.3	5.9	60.	6.6
United States	8.3	8.0	7.9	8.1	8.9	9.1	8.8	8.3	8.5	~

Source: OECD STAN Indicators Database, 2004 No. 01

Local R and D intensity of production in most transforming countries is still far behind that of advanced economies, although dissolution of science and technology systems and reduction of re-

[9] Dyker 1997; Radosevic 1998.

[10] This took the form of new R and D establishments, increasing R and D expenditures, and home-base exploiting, home-base augmenting and technology-acquiring investments in local R and D. On the classification of investment in R and D, see Le Bas and Sierra 2002. On the reversal of the trend, see Inzelt 2003.

[11] Unfortunately the OECD STAN Indicators Database does not contain data for Hungary.

Table 9
BRD as a percentage of value added in machinery and equipment
(%, NACE 29)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Belgium	12.6	12.7	12.5	12.2	11.9	12	12.1	13.5	14.3	16.5
Czech Republic	5.0	4.4	3.1	2.3	2.0	2.3	2.5	2.4	2.2	-
Denmark	8.3	9.1	8.4	8.7	8.8	8.7	9.3	9.5	-	-
Finland	12.3	11.9	13.8	14.5	16.2	17.2	17.3	19.1	18.4	19.8
France	14.1	15.1	15.2	13.9	13.4	13	12.3	12.1	12.9	-
Germany	8.6	9.3	9.3	9.7	9.1	8.6	8.6	8.9	8.4	9.4
Ireland	5.7	6.8	7.5	6.0	7.0	7.0	7.1	6.0	-	-
Italy	5.2	5.0	5.0	4.7	4.7	5.1	4.1	4.3	4.3	4.7
Japan	12.9	13.6	14.5	14.6	14.6	15.1	16.5	17.2	17.2	19.9
Korea	-	-	-	10.7	11.9	13.1	13.2	13.3	12.3	18.1
Netherlands	10.3	11.0	12.9	13.9	15.0	15.4	15.0	16.9	17.6	-
Poland	-	-	2.8	2.3	2.2	2.3	3.3	3.2	2.5	-
Spain	5.5	5.1	4.1	4.4	4.2	4.6	5.1	4.9	4.6	3.8
United Kingdom	9.0	9.4	7.9	7.1	7.1	6.4	6.8	7.3	8.0	9.9
United States	13.8	12.8	13.2	13.7	15.7	17.4	16.3	15.4	16.5	-

Source: OECD STAN Indicators Database, 2004 No. 01

trend in catching-up economies is much less clear. Average R and D intensity in manufacturing hides considerable industry-specific differences.

Concentration, specialization and competitiveness

When examining the structural indicators of developed countries to see how the Hungarian changes fit into global tendencies, some time was devoted to the competitiveness aspects of concentration and specialization. Although concentration refers to the geographical concentration of industries this paper examines concentration patterns at country level, exploring the extent to which Hungary – as opposed to some advanced economies – relies on one (or a couple of) sectors of economic activity. The other side of the coin is specialization of regions, or in this paper of countries. There are several methods of measuring specialization (Herfindahl index, Gini index, *etc.*) This paper considers a country specialized if the average deviation of the share of each industry in the total national manufacturing value added is higher than the EU average, in line with the method applied by Eurostat in Storm 2004.

The Hungarian production and trade structure is considered highly concentrated. A small number of products and companies account for a large share of output and export.[12] High concentration is assessed as unhealthy because it makes the country vulnerable to fluctuations in the international business cycle.

[12] *In 2000, the share of the top three foreign-owned exporters in total Hungarian exports came to 25.1 per cent. Source: Figyelő*, TOP 200, 2001.

Table 10
BRD as a proportion of value added in transport equipment
(%, NACE 34–35)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Belgium	2.7	2.7	2.4	2.9	3.0	2.9	3.5	4.3	4.2	4.8
Czech Republic	6.8	9.4	10.4	15.9	10.1	12.6	14.7	12.4	10.3	-
Denmark	1.5	1.2	2.3	1.4	4.4	5.0	4.6	6.4	-	-
Finland	5.0	5.0	4.7	4.5	4.8	4.6	4.6	2.9	3.8	4.4
France	23.2	26.4	22.5	21.7	23.9	17.6	16.6	17.3	17.1	-
Germany	15.3	18.2	16.9	16.6	17.9	18.0	17.9	20	23.1	18.0
Ireland	2.9	3.2	3.5	3.5	4.2	4.1	3.6	3.1	-	-
Italy	17.2	17.2	13.5	11.8	13.1	10.2	9.6	10.7	10.2	12.1
Japan	11.6	10.4	10.2	11.3	12.1	13.6	12.7	11.9	12.7	13.4
Korea	-	-	-	11.3	12.1	12.4	7.5	5.4	8.0	6.7
Netherlands	9.3	10.9	7.5	8.1	4.2	5.5	3.8	5.0	3.9	-
Poland	-	-	3.6	3.7	2.6	3.6	3.6	5.3	3.2	-
Spain	5.4	4.6	4.3	4.2	4.2	3.7	4.2	4.7	3.6	4.4
United Kingdom	14.5	12.6	11.8	13.2	12.5	12.1	12.8	15.5	14.0	15.9
United States	23.5	20.6	19.4	22.2	22.8	21.0	17.2	18.5	16.2	-

Source: OECD STAN Indicators Database, 2004 No. 01

Table 11
Concentration of manufacturing in 2000. The shares of TOP 5 and TOP 10 three-digit industries in total manufacturing value added, %

	TOP 5	TOP 10
Austria	23.3	42.4
Denmark	31.4	49.0
Germany	32.8	52.1
Ireland	44.7	55.6
Finland	48.6	64.7
Netherlands*	33.0	50.9
United Kingdom	26.0	45.2
Czech Republic	24.8	42.4
Hungary	*37.6*	*55.9*

* 1999 data source: Structural Statistics for Industry and Services – Production Data, OECD, 2003. Own calculations.

Table 11 puts the concentration of Hungarian manufacturing in a comparative perspective. The shares of TOP 5 and TOP 10 three-digit industries in total manufacturing value added have been calculated, to determine whether the concentration is more or less industry-specific. Countries specialized in information technology like Ireland or Finland feature similarly high (and in some cases even higher) concentrations than Hungary.

As the Irish and Finnish performances suggest, the rate of concentration cannot be called bad or good in itself. If high concentration is due to a low denominator (low total manufacturing value added) – the establishment and running up of production by a new multinational company that locates production of a specific product (group) in Hungary and supplies the whole world from this location – this easily results in a high concentration. In this case, much of total manufacturing output and exports come to depend on the decisions of a single investor. If, however, high concentration is the result of a dense network of related companies operating in the same industry, such as the Finnish knowledge

cluster round Nokia, high concentration does not make the economy prohibitively vulnerable.

As for specialization, the summary and data in Storm 2004 show Hungary to be slightly more specialized in terms of value added than the EU 25 average. The most specialized EU members include both highly developed countries like Ireland and economies with big scope for further catching-up and cohesion like Latvia. Also observable are wide gaps between the development levels of certain of the least specialized countries, such as Austria, Slovenia and Portugal. So it can be concluded that level of specialization in itself has minimal explanatory power for development levels and prospects.

CONCLUSIONS

The analysis suggests that specialization is not what determines countries' competitiveness, but the quality indicators of production, especially productivity and local value added. Coincidence of transformation and intensification of fragmentation and vertical specialization initiated dramatic structural change in some countries. In some developed and catching-up countries, the relation between economic structure and competitiveness plainly looks strong. Other countries feature strong competitiveness despite an outdated, traditional structure. These cases support the idea that there is no 'optimal economic structure'. In the long term, what matters is not what countries specialize in, but the quality properties of economic activity. In the short and medium run, 'good specialization' can spectacularly improve a country's performance, but not its competitiveness.

As far as the Hungarian experience is concerned, the international comparison of the quantity indicators of structural change suggests that the Hungarian structural changes fit into the main global tendencies. However, the quality indicators point to the fact that Hungary integrated into the global patterns of economic activity at the lower end of the hierarchy of global production networks.

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