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Structural changes

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Content

1. Introduction

Over the last approximately ten years the Czech economy has gone through a stage of active structural adjustment to market economy conditions. Although the most significant changes took place as early as the beginning of the 90's, the process occurring during this period can be more appropriately described as gradual abolition of the former rigid planned economy system. This reflected at the macroeconomic level in changing weights of the basic production sectors in value added and employment, where the share of the primary and secondary sectors succumbed to the dynamic growth in the tertiary sector. However, changes within these sectors have been taking place continuously and this trend will persist as the conditions on the domestic and the worldwide market change. The aim of this section is to analyse the development on the supply side of the economy and describe major trends that have occurred over the last few years and can be detected through statistical indicators.

2. Development of industry structure

Examination of the supply side of the economy can be undertaken with various degrees of detail, from performance of the national economy as a whole to a variety of defined production sectors or individual entities. The more detailed the assessment is, the more it allows us to identify the driving forces behind the economic development. On the other hand, the vision of the economy as a whole is obscured with increasing detail. This is why a combination of macro, mezzo and micro approaches appears to be the best solution. Industry analysis in this case serves as a link between macroeconomic analysis and analysis at the company level. The study begins with the macroeconomic approach, focusing on development of economic indicators within the national economy as a whole and the basic production sectors, and gradually proceeds to the more detailed industry level. The final part of the study discusses the impact of individual industries on performance of the economy as a whole and the relationships between individual industries.

2.1 Macroeconomic view: development of basic sectors

From the point of view of the share of the main sectors in gross value added (GVA) and employment, services are a sector with the greatest share in creation of gross value added, while agriculture is a sector with the smallest share. As Table 1 shows, the structure of the Czech economy changed very slowly between 1995 and 2004. The share of agriculture (from 4.6 % to 3.3 %) and construction decreased slightly (from 9.1 % to 6.9 %), while gradual growth in the share of services could be observed (from 55.5 % to 58.8 %). The share of industry in GVA remained virtually unchanged – around 31 %. Similar development was detected in the overall employment. Development in fixed prices was somewhat different due to different development in prices as measured by GVA deflators in individual sectors. While the gross value added deflator in agriculture, forestry and industry between 1996 and 2004 was lower on average than the deflator for the entire national economy, the situation in construction and services was quite the opposite. This influence was especially significant in construction, where the share of GVA in the overall GVA in fixed prices decreased from 9.1 to 4.9 % during 1995–2004. This was influenced the most by the major increase in prices of construction work compared to the average development in prices of other products and services. Development of the GVA deflator in agriculture and forestry had the opposite

impact on the structure of the economy according to GVA. As the GVA deflator for this sector decreased on average by 1 % per year during 1996–2004, the share of GVA for this sector in the overall GVA in fixed prices grew from 4.6 % to 5.5 %.

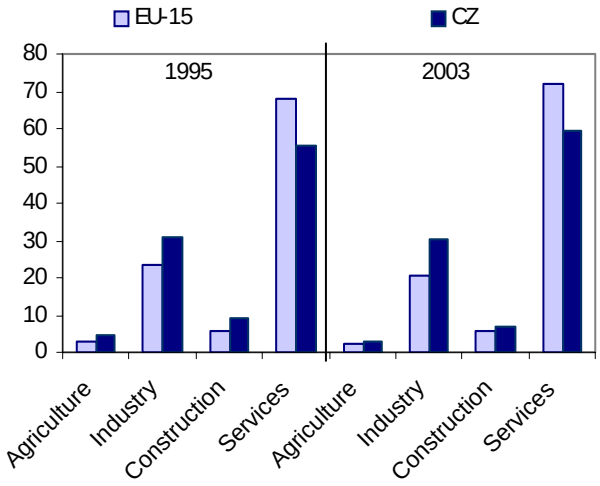
The Czech Republic has a notably low share of services in gross value added compared to other EU countries (see Figure 1, complete overview of EU countries is shown in Table 1A). Ireland is the only country with an even lower share of services in GVA and France records the highest share of all EU countries. Comparison of the structure of the Czech economy against the EU-15 average shows that the share of industry in the CR in 2003 was higher by approximately 10 percentage points and the share of services was lower by approximately 12 percentage points. The structure of the Slovenian economy resembles that of the Czech economy the most of all so-called new EU member states.[1] Comparison of the structure between 1995 and 2003 shows that most EU countries experienced a growth in the share of services to the detriment of the share of industry. This development suggests an increasing trend of transferring a part of production from industry to services. An increasing rate of outsourcing secondary activities through external suppliers is one of the reasons behind this trend.

Table 1: GVA and employment structure in the CR (%)

	GVA				Employment	
	current p.		const. p. 1995			
	1995	2004	1995	2000	1995	2004
Agriculture	4.6	3.3	4.6	5.1	6.3	4.3
Industry	30.8	31.0	30.8	33.7	30.3	29.1
Construction	9.1	6.9	9.1	5.3	10.5	8.6
Services	55.5	58.8	55.5	55.9	53.0	57.9

Source: ČSÚ, Annual NA database (1. 10. 2005), own calculations.

Figure 1: GVA structure in the CR and EU (%, current prices)

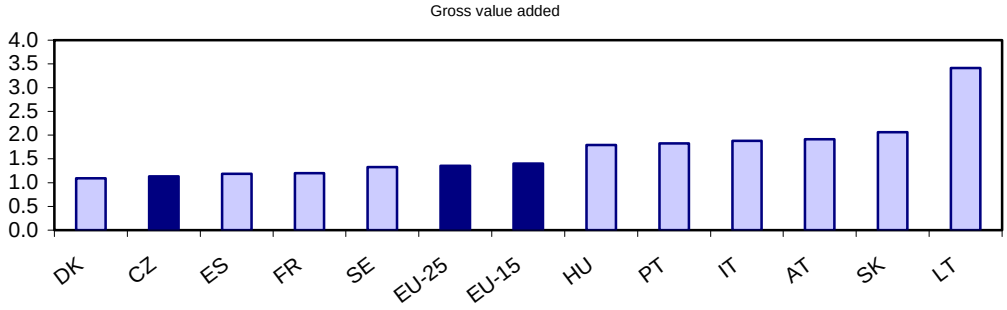


Source: EUROSTAT, New Cronos\Economy and Finance\National Accounts (1. 10. 2005), own calculation.

[1] Comparing the structure of GVA is problematic due to different price relations in individual countries. As a rule, the higher GDP per capita the relevant country records, the higher the price levels in services are (the so-called Balassa-Samuelson effect).

The degree of structural changes over time can be illustrated in a condensed form by the so-called indicator of structural change intensity. Figure 2 shows that during 1995–2002 the Czech Republic was one of the countries with the most stable economic structure in terms of the gross value added structure (Denmark was the only monitored country with a more stable structure). Lithuania and Slovakia recorded the most dynamic changes in their economic structures of all new member states and Austria reported the greatest changes in the economic structure in the EU-15 group. The period from 1995 to 2002 saw more significant changes in the CR in terms of employment in individual industries than in terms of the industry structure of value added (see Figure 2). Nonetheless, the intensity of structural changes in employment was still lower than in other transitive economies included in the comparison (Slovakia, Poland, Hungary).

Figure 2: Structural changes intensity comparison within selected EU countries between 1995 and 2002



Note: Coefficients were calculated on the level of 17 industry groups (A+B, C, DA, DB+DC, DD+DE, DF+DG, DH+DI, DJ, DK, DL, DM, DN, E, F, G+H+I, J+K, L+M+N+O+P, see table 2A). Data on the GVA structure by NACE subsections are not available for Poland. Source: EUROSTAT, New Cronos\Economy and Finance\National Accounts (1. 10. 2005), OECD (2005d), own calculation.

Comparison of structural changes according to GVA in the Czech and Slovak economy reveals that the coefficient of intensity of structural changes in Slovakia was influenced by significant changes of shares of a number of industries in the overall GVA. This concerns especially trade and transport, other services, chemical and coke industry and power engineering. The indicator of structural change intensity in the Czech Republic was influenced mainly by development of GVA in construction, agriculture and services provided to companies. However, the intensity of structural changes according to GVA between 1995 and 2002 in the Czech Republic was on average significantly lower than in Slovakia.

It is important to bear in mind that the intensity of structural changes in Central and Eastern European countries over the monitored period is not high because major part of these changes took place before 1995. Data included in Table 2 illustrate this fact and show that the greatest structural changes in the Czech economy occurred during 1990–1995, while the following years brought far less significant changes. This is because the structure of the Czech economy was greatly deformed and substantial structural changes had to take place after 1990 due to changes in the internal and external demand.

The indicator of structural change intensity over the period 1995–1999 in the Czech Republic was relatively higher than during 1999–2003 according to the structure of gross value added, as well as the structure of employment. Major changes in the structure of value added during 1995–1999 concerned most industries, with the greatest impact of the decline in the share of construction and agriculture in the overall GVA.

Structural changes according to employment were relatively evenly distributed in two periods. Significant changes in the share of construction, agriculture, commercial services and transport in the overall employment occurred between 1995 and 1999. The period 1999–2003 on the other hand saw major changes in the share of most branches of the manufacturing and other services in the overall employment.

Table 2: Structural changes intensity in the Czech Republic

	1990–1995	1995–1999	1999–2003
GVA	3.86	1.01	0.87
Employment	..	0.89	0.77

Note: Coefficients were calculated on the level of 17 industry groups (A+B, C, DA, DB+DC, DD+DE, DF+DG, DH+DI, DJ, DK, DL, DM, DN, E, F, G+H+I, J+K, L+M+N+O+P, see table 2A). Source: ČSÚ, Annual NA database (1. 10. 2005).

The impact of individual factors on the growth of gross value added needs to be examined in connection with sources of economic growth (see Table 3). The average increase in the overall GVA for the period 1996–1999 was as low as 0.8 %. Industry and services contributed to this increase equally, while the contribution of the construction industry was negative. The average annual increase in the overall GVA of 3.2 % for the period 1999–2004 is attributable to industry and services, while agriculture and the construction industry delivered a neutral effect.

Table 3: Contributions of main sectors to total GVA growth in 1996–2004 (%, constant prices)

	1996–1999	2000–2004	2003	2004
Total GVA	**0.8**	**3.2**	**2.9**	**4.7**
Agriculture	0.1	0.0	0.1	0.1
Industry	0.8	1.4	2.1	1.9
Construction	-0.9	0.0	0.3	0.0
Services	0.7	1.7	0.4	2.8

Source: ČSÚ, Annual NA database (1. 10. 2005).

Despite the significantly greater weight of services, the contribution of industry and services to the growth of GVA remained relatively balanced throughout the period 1996–2004. This was due to the more dynamic overall real growth of GVA in industry compared to services, although even services represented a rather heterogeneous sector. The shares of both sectors in the contributions for the individual years differ to a great extent. Production of office machines, computers, television sets, coupling devices and twin-track motor vehicles was the main driving force behind the growth in the manufacturing. On the other hand, coal mining, coke production and water industry were among declining industries.

Telecommunications recorded the most dynamic growth of all sectors in services. This was a logical outcome of the widespread use of mobile phones. Banking, wholesale, wholesale procurement and processing data also experienced a rapid growth. The largest decline in the gross value added was recorded in catering and accommodation, research and development and other social activities. In industry mainly progressive sectors involving computers and other electronics quite understandably experienced dynamic growth, while heavy industry recorded a decline. The situation in services, where telecommunications and data processing reported a very dynamic growth, was similar.

The decline in research and development is somewhat disturbing as its already low share compared to other European countries had a declining tendency. The decline in

catering, recreational and social activities is surprising as a growing trend would have seemed logical in this area (activities connected with leisure time). However, it is necessary to point out in this context that comprehensive illustration of the economy tends to be very problematic in these sectors (small enterprises subject to sample surveying, stronger tendency towards interfering with accounting records, fast formation and dissolution of enterprises, etc.).

3. Qualitative aspects of structural changes

Catching up in the level of labour productivity plays a crucial role in catching up with the economic standard of developed countries. Labour productivity represents the main factor determining the living standard in individual countries. The labour productivity in the CR grew on average by 2.4 % per year during the period 1996-2003. Gross value added by contrast only grew by 1.8 % per year. To compare these figures for example with Hungary and Slovakia, the average annual growth in GVA in these countries over the same period of time was more than twice of that in the CR (3.8 % and 4 % per annum respectively). The average annual growth of labour productivity in the CR during the second half of the monitored period, i.e. during 2000–2003, was slightly higher than during 1996–1999 - 2.6 % compared to 2.2 %. However, the difference in the growth rate of GVA was even greater - 2.8 % compared to 2.1 %.

Development in individual industries differed to a great extent during the period 1996–2003. Production of means of transport recorded the strongest growth. The GVA in this sector grew on average by 15.3 % per year and labour productivity reported a growth of 12.1 %. Power engineering was on the other side of the spectrum with an overall decline in GVA and labour productivity. The average annual growth in productivity for industry as a whole sector was 4.2 %. The construction industry with the annual decrease of 3 % was a sector with the greatest decline in productivity.[2] On the other hand, agriculture reported the average growth in labour productivity of 7.6 %, mainly due to a strong decrease in employment (see Table 4).

Commercial services by contrast recorded a far greater increase in gross value added (2.4 % per year) compared to the growth in labour productivity (0.5 % per year). Employment in this sector grew significantly during the monitored period (by 1.9 % per year on average). Sectors with the greatest increase in labour productivity in services included trade, catering, transport and communications – on average by 2.8 % per year. This increase can be mainly attributed to the dynamic growth in telecommunications, while accommodation and catering reported a decrease in the real GVA. Other services recorded a slight decrease. However, measuring labour productivity in this sector is very complicated as most of the production is of a non-market character.

Mining recorded the most pronounced difference between the development of labour productivity and gross value added as a decline in value added for this sector was accompanied by a significant increase in labour productivity. The strongest increase (more

[2] The development of real GVA in the construction industry was influenced significantly by the differing development in production and intermediate consumption and their deflators. While production in the construction industry declined during 1996–1999 and did not achieve a significant increase until 2002, intermediate consumption only declined during 1996 and 1998 and started to grow significantly in 2001. This difference had a strong impact on GVA due to the high share of intermediate consumption in production in the construction industry (around 80 %) and caused completely different development in GVA and the construction production index.

than threefold) in value added was recorded in production of means of transport and electrical and optical apparatuses (on average by 15.3 % and 15 % per year, respectively). Both of these sectors experienced strong inflow of foreign investment, the cumulative figures as at the end of 2003 being approximately CZK 110 billion (and CZK 67 billion) (see ČNB, 2005c).

Table 4: Comparison of the level and dynamics of labour productivity and gross value added by industries (%)

	Labour productivity (thous. CZK, current p.)		GVA growth	LP growth
	1995	2003	1996–2003	
Total	**270**	**490**	**15.1**	**21.1**
Agriculture, forestry, fishing	200	341	18.3	79.0
Industry	275	503	28.9	38.6
Mining	337	580	-17.6	62.6
Manuf. of food and tobacco	284	540	-12.5	-3.1
Manuf. of textile and footware	124	256	-7.0	46.2
Manuf. of wood, paper, printing, publishing	207	423	107.3	91.3
Manuf. of coke, refined petrol. prod., chemicals	559	788	-4.2	15.1
Manuf. of rubber, plastic prod., mineral products	238	581	76.0	47.4
Manuf. of metal products	284	426	6.0	17.2
Manuf. of machinery and equipment	212	398	20.9	45.8
Manuf. of office mach., TV, optical and medical instr.	188	406	204.8	131.0
Manuf. of transport equip.	206	575	212.6	149.8
Manuf. of furniture, manuf. n.e.c.	177	316	57.1	53.1
Energetics	860	1427	-28.6	-7.4
Construction	236	394	-38.0	-21.5
Trade, transport, hotels and restaurants	272	501	23.7	25.2
Financial and business services	471	719	21.3	4.4
Other services	208	406	0.1	-1.7
Variation coefficient	0.66	0.54	*x*	*x*

Source: ČSÚ, Annual NA database (1. 10. 2005).

Evident differences between individual industries can be observed not only in the dynamics, but also in the level of labour productivity. The average labour productivity in the national economy measured by gross value added per employee in 2003 was CZK 490 thousand in current prices. Power engineering recorded the highest labour productivity, which exceeded CZK 1.4 million. Banking, insurance industry, commercial services and oil-refining and chemical industry were among sectors with results high above the average figure. On the other hand, the lowest value added per employee was reported in textile and leather industry, other manufacturing and agriculture. Development of the variation coefficient suggests that the differences in productivity between individual sectors showed predominantly declining tendency between 1995 and 2003, although this development is not quite uniform (see Table 4).

Some sectors are characterised by significant differences between the dynamics of gross production and gross value added. This applies to most industries especially after 1999. The share of GVA in gross production grew between 1999 and 2003 in agriculture and power engineering only. Other sectors reported either stagnating or declining trends. This decrease was the strongest in electrical industry, from approximately 25 % to less than 16 %. This development clearly relates to production of computers and computer components in the processing regime, where value added comprises almost exclusively wages of employees and production involves assembly operations only. Production of

means of transport is a sector with the second lowest share of GVA in gross output; the recorded decrease was from 20.5 % to 17 %.

The overall development of productivity in the national economy may be influenced by development of productivity in individual industries, as well as changes in the structure of employment. The overall increase in labour productivity in the national economy can be divided into individual contributions through the so-called share breakdown analysis. The total increase in productivity over a certain period is divided into three factors. The first factor expresses net impact of changes in the structure of employment on the economy, while the third factor describes net impact of intra-industrial labour productivity. The second factor expresses combined impact of productivity and structure of employment.

Table 5: Factor contributions to labour productivity growth rate in the CR between 1995 and 2003 (%)

	TOTAL	I.	II.	III.
Productivity growth rate	21.0	0.9	0.1	20.1
Factor shares	100.0	4.3	0.5	95.3

Note: Contributions were calculated on the level of 17 industry groups (A+B, C, DA, DB+DC, DD+DE, DF+DG, DH+DI, DJ, DK, DL, DM, DN, E, F, G+H+I, J+K, L+M+N+O+P, see table 2A). Source: ČSÚ, Annual NA database (1. 10. 2005).

Table 6: Decomposition of the aggregate productivity growth in selected European transition economies (%)

	Static change effect	Dynamic change effect	Intra-industry effect
CZ	3.3	1.0	95.7
HU	8.2	3.1	88.7
PL	3.8	2.3	93.8
SK	5.9	1.6	92.4
SI	3.3	-2.9	99.7
EE	4.6	0.0	95.4
LV	-0.4	6.1	94.2
LT	2.3	0.3	97.4

Source: Havlik (2005), p. 15.

Peter Havlik completed the breakdown of contributions to labour productivity into individual factors in his study of new EU member states (mostly for the period between 1995 and 2002, see Havlik, 2005, p. 15). As Table 6 shows, the intra-industrial effect had a dominant impact on the total increase in labour productivity in all studied countries. This effect is the strongest in Slovenia, where it occurs in combination with a negative factor of dynamic changes. This is consistent with the structural burden hypothesis. This factor in all other monitored countries is positive or neutral (which is the case of Estonia). Results for Hungary showed the weakest impact of the intra-industrial effect on the total increase in productivity of all studied countries.

Changes in the structure of employment in Hungary had a relatively significant impact on the total increase in productivity, accounting for approximately 8 % of the impact. Latvia by contrast recorded the highest share of the effect of dynamic changes in the impact on the total increase in productivity of all studied countries, approximately 6 %. The effect of static changes was slightly negative. This can be explained by the fact that while employment in industries with rapidly growing productivity increases relatively significantly, the level of productivity in these dynamic industries is not yet higher than that in less dynamic sectors.

Major part of an increase in the aggregate productivity in new EU member states during 1995–2002 can be attributed to an increase in productivity in individual industries. This is consistent with the progress in developed market economies, although this situation can be somewhat surprising in view of the extensive structural changes occurring in the new member states. The reason behind this may be the fact that a major part of structural changes took place prior to 1995, as was the case in the CR – see Table 2. Comparison of the indicator of structural change intensity (see the previously mentioned Figure 2) does not show a very significant gap between the old and the new EU member states.

A similar method for breaking down an increase in the aggregate labour productivity over time can also be used when comparing differences in the aggregate labour productivity between individual countries. The economy of a country or a group of countries (such as EU-15) towards which other compared economies are meant to converge is typically used as a reference. Germany was selected as the reference country in this case. As purchasing power standard rates are not available for individual industries, the comparison needs to be based on data in current prices converted to EUR using the nominal rate. This type of calculation does not take into account the impact of different price levels in individual countries. However, this is not relevant with regard to the studied objective, i.e. contributions of individual factors to the overall growth in labour productivity.

As Table 7 shows, compared to Germany Slovakia had the lowest productivity of all studied countries in 2002 (17.2 %), followed by the Czech Republic (21.7 %) and Hungary (24 %). Differences in productivity in individual industries have clearly the strongest impact in all compared countries. Results for the Czech Republic show the lowest share of the first factor, i.e. the structure of employment in the Czech economy is the closest to the German employment structure. Hungary on the other hand recorded the highest impact of the structure of employment on lagging behind in the standard of labour productivity of all compared countries. However, Hungary is ahead of the other two countries in its standard of intra-industrial productivity. All of the studied countries are characterised by a positive contribution of the second factor, i.e. the share of employment in industries with rapidly increasing productivity grows fast. This effect is the weakest in the Czech Republic and the strongest in Slovakia.

Table 7: Contribution of individual factors to labour productivity difference of selected EU countries to Germany (%)

	Difference to Germany	I.	II.	III.
CZ	-78.3	-4.3	3.8	-77.8
HU	-76.0	-9.4	5.6	-72.2
SK	-82.8	-7.8	6.4	-81.4

Note: Coefficients were calculated on the level of 17 industry groups (A+B, C, DA, DB+DC, DD+DE, DF+DG, DH+DI, DJ, DK, DL, DM, DN, E, F, G+H+I, J+K, L+M+N+O+P, see table 2A). Source: EUROSTAT, New Cronos\Economy and Finance\National Accounts (1. 10. 2005), own calculation.

3.1 Development of activities according to their technological intensity

The importance of activities with high technological intensity[3] (high-tech industries) in a particular country is important for the position of the country's economy in the global production chain. These industries typically contribute to the economy with a range of positive effects, such as high wages and profits, rapid growth in trade and productivity and high level of innovation, which is in addition associated with distribution of positive externalities. High-tech industries of products of these industries are capable of

competing with their quality despite relatively high prices. Higher prices mean higher income for expended production factors and this has a positive impact on the amount of the national income.

Classification of economic activities according to their technological intensity is based on a methodology by OECD, which divides manufacturing sectors according to their demands on research and development into four groups: high-tech, medium high-tech, medium low-tech and low-tech. Services can also be divided into a number of groups according to the standard of knowledge utilised in individual sectors (see Table 3A). While high-tech industries are characterised by production and use of advanced technologies, in the case of knowledge industries the emphasis is placed on the use of technologies without the requirement to produce new technologies. This term therefore concerns mainly services, although production of new technologies is increasing even in this sector (this applies to telecommunications, data processing and science and research).

As Table 8 shows, the share of higher and high-tech activities in value added and employment in the manufacturing increased between 1995 and 2003. The share of these activities in GVA of the manufacturing in 1995 was 31.7 % and in 2003 the share increased to 37.7 %. Similar growth occurred in the share of high-tech activities in employment in the manufacturing. However, the period from 1995 to 2003 saw a decline in the share of value added in gross production especially in high-tech industries (a decline from 28.6 to 12.8 %). This development can be clearly attributed to increased production of computers and office machines in the inward processing regime, where imported components are assembled and subsequently mainly exported with a minimal share of value added. While the share of exports after processing of high-tech products in 1999 was less than 5 %, the same share in 2003 was 94 %.

Table 8: Shares of activities by technology and knowledge intensity on GVA and employment in manufacturing and services in the Czech Republic (%)

	Gross value added		Employment		GVA to gross output ratio	
	1995	2003	1995	2003	1995	2003
HT	5.6	6.8	5.4	6.6	28.6	12.8
MHT	26.1	30.9	27.0	29.3	25.4	22.0
MLT	33.9	30.2	27.6	27.9	27.1	26.9
LT	34.3	32.1	40.1	36.2	24.6	27.2
Total	**100.0**	**100.0**	**100.0**	**100.0**	**25.9**	**23.6**
KIS_HT	5.6	8.3	5.0	4.8	56.8	54.8
KIS_MS	21.7	20.5	12.7	14.7	53.8	47.2
KIS_FS	5.8	4.8	2.9	2.7	48.3	38.6
KIS_OT	15.5	16.2	22.5	21.6	56.0	57.9
LKIS_MS	39.7	37.3	42.4	41.2	48.5	46.9
LKIS_OT	11.7	13.1	14.4	15.1	64.6	60.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**52.7**	**50.0**

Note: Technology and knowledge intensity in manufacturing: HT – high, MHT – medium-high, MLT – medium-low, LT – low, knowledge intensive services (KIS): HT – high-tech, MS – market, FS – financial, OT – other. Knowledge less intensive services (LKIS): MS – market, OT – other. Source: ČSÚ, Annual NA database (1. 10. 2005).

[3] "Demands on research and development activities as illustration of the achieved level of knowledge is the key criterion for including industries in the high-tech group. These demands are expressed as a share of expenditures of research and development in production (turnover or value added)" (Kadeřábková, 2005, p. 1).

The share of high-tech activities in gross value added in services also increased between 1995 and 2003, from 5.6 to 8.3 %. This was accompanied by a slight decrease in the share in employment, which suggests a strong increase in productivity of the high-tech group. Telecommunications have the greatest weight in this group. However, market services with lower technological intensity are a sector with the highest weight in gross output, value added and employment and account for approximately 40 % of services as a whole. These sectors include trade, catering and accommodation and land transport.

Table 9: Comparison of the level and dynamics of the labour and GVA (groups of activities by technol. intensity, in %)

	Labour productivity (thous. CZK. current p.)		GVA growth	LP growth
	1995	2003	1996–2003	
TOTAL manufacturing	**234**	**454**	**54.3**	**56.1**
High-tech	244	462	351.9	295.5
Aircraft and spacecraft [b)]	139	371	49.2	93.3
Pharmaceuticals [a)]	776	798	6.3	-16.6
Office machinery	293	275	4953.1	2520.7
Radio, TV, comm. equip.	143	461	143.7	80.6
Medical, optical instrum.	210	419	45.8	35.1
Medium-high-tech	227	479	87.4	83.2
Electrical machinery	188	395	149.7	82.5
Motor vehicles	228	614	304.1	147.4
Chemicals [a)]	408	748	35.4	48.7
Railroad equipment [b)]	183	447	-0.3	77.1
Machinery, equip. n.e.c.	212	398	21.3	46.5
Medium-low-tech	288	493	12.4	12.6
Coke, refined petr. prod.	897	1168	-87.6	-56.3
Rubber and plastic prod.	175	578	149.0	42.6
Other mineral products	267	583	51.6	58.9
Ships and boats [b)]	32	166	576.9	276.3
Basic metals	352	528	-15.8	39.1
Fabricated metal prod.	233	385	21.3	7.9
Low-tech	200	403	21.8	24.9
Manufacturing n.e.c.	177	316	23.5	20.7
Wood, prod of wood	144	318	89.8	86.6
Paper, publish., printing	293	545	106.2	75.0
Food and tobacco	286	540	-18.1	-9.2
Textile prod., footware	124	256	-6.5	47.6

Note: Data in real terms were obtained by using GVA deflator a) for manufacturing of chemicals (NACE 24), b) for manufacturing of other transport equipment (NACE 35). Source: ČSÚ, Annual NA database (1. 10. 2005).

Comparison of the level and dynamics of GVA and labour productivity between 1995 and 2003 is shown in Table 9. The table shows that compared to other groups high-tech industries are not among the sectors with the highest labour productivity. In 2003 low-tech group recorded the highest labour productivity and high-tech industries were third in the comparison of labour productivity. Pharmaceutical industry had the highest labour productivity of all high-tech sectors. On the other hand, the high-tech group recorded the highest dynamics of real value added and labour productivity between 1996 and 2003, achieving the average annual growth of 20.7 % in GVA and 18.8 % in LP. Stating the figures for the manufacturing as a whole for reference, gross value added in the manufacturing between 1996 and 2003 increased on average by 5.6 % per year and labour productivity rose on average by 5.7 % per year. The phar-

maceutical industry is an exception in the high-tech group with the average annual growth in GVA over the same period by 0.8 % and decline in labour productivity.

The relative trade indicators grew compared to production in the Czech Republic between 1995 and 2003. This development involved the share of export in production and indicators of import penetration. The share of export in the local production in the manufacturing grew from 42 to 52 %. The indicator of import penetration also rose, from 45 to 52 % (see Table 4A). While the share of export in production shows the importance of foreign trade for the relevant industry, the indicator of import penetration expresses the share of import in the local demand and reflects the competitiveness of local companies in relation to imported products.

In 2003, high-tech sectors recorded the largest share of export in production, to be exact 62 % in sectors with high technological intensity and 70 % in sectors with higher technological intensity (see Table 4A). This share has increased since 1995 by 5 and 12 percentage points respectively, reflecting the growing importance of foreign markets for high-tech industries. The share of import in the local demand for high-tech products decreased between 1995 and 2003 from 79 to 69 % (see Table 4A) unlike in other products, where the share increased slightly (see Tables 4A, 5A). Closer examination of individual industries with higher and high technological intensity reveals the highest share of production intended for export in machinery and equipment, to be exact a share of 84 % in 2003. On the other hand, the share of production intended for export in industries with low and lower technological intensity is significantly lower than in technologically advanced industries. The lowest share of approximately 13 % was recorded in the food industry. The share of export in the manufacturing in the Czech Republic in 2003 was relatively high in international comparison, significantly exceeding the EU average (see Table 4A). This share was above the average level practically in all groups of industries, the highest values compared to the EU average being recorded in industries with higher technological intensity, in particular engineering.

The product approach provides a more detailed examination of the importance of high-tech industries in foreign trade. This approach defines technologically advanced industries in greater detail according to three to five-digit codes of SITC classification. The share of high-tech products in the total export of goods almost doubled between 1999 and 2003, from 6.4 % to 12.4 %. The same share decreased slightly in 2004. The strongest growth was recorded in export of computer technology, where the volume of export increased almost tenfold. Electronics and telecommunications represented the second most important group of exported high-tech products with the volume of export increasing approximately four times.

Import of technologically intensive products grew much slower and its share in the total import of goods only increased from 12.4 % to 15.9 % between 1999 and 2003. Similarly to export, this share decreased slightly in 2004. Electronics and telecommunications account for the largest share in import of high-tech products, followed by computer technology (6.4 % and 4.7 % of the total import of goods in 2003 respectively). Approximately half of the value of high-tech products imported in 2003 was imported for processing. This means that assembly was carried out in the CR and finished products were subsequently exported. This concerned especially electronic components and computer technology.

4. Input-output approach to structural analysis

Modern economies are characterised by strong inter-industrial connections. However, standard structural analysis tools focus on examining isolated industries and disregard mutual connections between these. This limitation of the structural analysis tools is eliminated by applying the so-called input-output analysis,[4] which uses tools for quantifying mutual connections between objects (industries or sectors) in the economy.

4.1 Analysis of output multipliers in the CR and their comparison with selected countries[4]

Symmetric input-output tables for 1995. 2000 and 2002 were used to calculate matrixes of direct and comprehensive coefficients. Tables for 2000 were used for the purposes of international comparison as these tables were available for all compared countries (CR, Hungary, Poland, Slovakia and Germany). Output multipliers for 1995 and 2002 were calculated for the Czech Republic. We can reasonably assume that structural changes reflecting in the value of these multipliers occurred during this period and this led to relative changes in the importance of individual industries in terms of their multiplication effect. I-O tables expressing the total consumption, i.e. local production and export were used for the purposes of the calculation. If we were to examine exclusively the impact on the domestic output, the share of the local production in the total resources of individual industries needs to be taken into account (see Figure 3).

The construction industry had the highest value of the output multiplier in both examined years. An increase in the value of this multiplier from 2.36 to 2.54 occurred between 1995 and 2002. Closer examination of the structure of this increase (see Table 6A) shows that it was influenced from 90 % by higher consumption of subcontracted construction work per unit of construction production.[5] The share of local production in the overall resources in the construction industry is almost one hundred percent.

The largest increase in the value of the multiplier between 1995 and 2002 was recorded in the electrical industry as the multiplier increased by 0.29 (from 1.67 to 1.96). This was influenced mainly by production of office machines and television sets. The share of local production in the overall resources increased at the same time by 8 % (from 50 to 58 %). This means that the impact of the electrical industry on the local production between 1995 and 2002 increased significantly.

A substantial increase in the value of the output multiplier also occurred in transport and communications (land and air transport and telecommunications), other manufacturing (production of furniture), timber industry, automotive industry and agriculture. The value of the output multiplier in production of means of transport grew mainly due to increased intermediate consumption of rubber and plastic products. The increase in the output multiplier in agriculture was influenced the most by a higher share of consumption of financial and business services. Consumption of companies classified under the same industry had the greatest impact on the value of the output multiplier in other industries.

[4] Publications by international institutions are also beginning to use the input-output analysis as a tool for examining competitiveness. This is for example the case of "EU Sectoral Competitiveness Indicators" (see EC, 2005), a publication comparing output multipliers in EU-15 countries at the level of 6 basic sectors.

[5] This conclusion may at first appear to be in contrast with the decrease in the share of the construction industry in the aggregate GVA. However, the output multiplier does not depend on the size of the relevant industry but represents a relative indicator in relation to the unit of final demand.

The greatest decrease in the output multiplier between 1995 and 2002 was recorded in the leather Industry, where the multiplier fell by 0.3 (from 1.83 to 1.53). What's more, the share of imported leather products in the overall resources grew significantly from 45 % in 1995 to 58 % in 2002. This means that the demand for leather products has a continuously decreasing impact on the overall performance of the economy. A significant decline in the output multiplier also occurred in the chemical and the textile industry. What's more, a decrease in the share of resources provided by local companies was recorded in both of these cases at the same time, causing a further decline in the overall impact of this industry on the total domestic production.

In order to determine the importance of individual industries in the CR in terms of their demand effect compared to other economies, output multipliers need to be calculated also for these economies. Table 10 presents comparison of five countries. The output multiplier in all compared countries reaches high values in the food and the tobacco industry and this value is the highest of all industries in Hungary and Poland. The CR and Slovakia recorded the highest values of the output multiplier in the construction industry and power engineering. Mineral mining is a sector with the lowest multiplication effect in all of the compared countries.

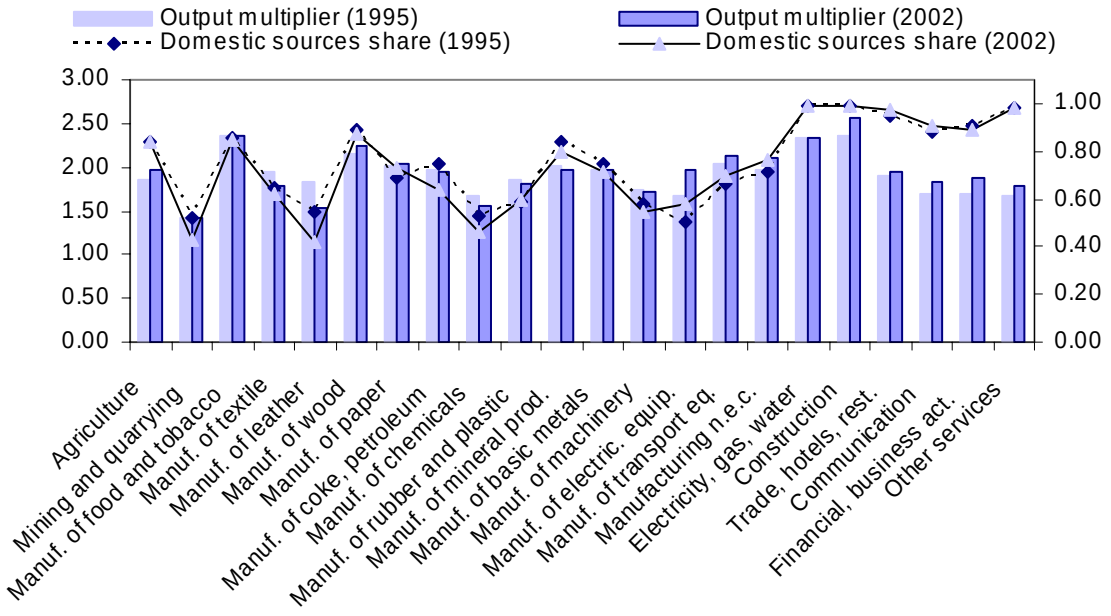
Table 10: Comparison of output multipliers within selected countries (2000)

	CZ	HU	DE	PL	SK
Agriculture	1.93	2.18	1.62	2.15	2.08
Mining and quarrying	1.38	1.17	1.24	1.37	1.12
Manuf. of food, tobacco	2.26	2.45	2.03	2.48	2.17
Manuf. of textile	1.78	1.73	1.47	1.71	1.41
Manuf. of footware	1.60	1.66	1.36	1.68	1.55
Manuf. of wood	2.23	1.87	1.91	2.24	2.09
Manuf. of paper prod.	1.94	1.87	1.83	1.96	2.00
Manuf. of refined petrol	1.82	1.71	1.87	1.97	1.97
Manuf. of chemicals	1.54	1.53	1.74	1.60	1.65
Manuf. of rubber, plast.	1.72	1.63	1.81	1.77	1.74
Manuf. of mineral prod.	1.94	1.68	1.80	1.95	2.03
Manuf. of metals	1.95	1.71	1.85	1.97	2.13
Manuf. of machinery	1.71	1.51	1.81	1.59	1.69
Manuf. of electrical m.	1.74	1.81	1.60	1.54	1.56
Manuf. of motor vehicl.	2.12	1.88	2.05	1.86	1.96
Manuf. n.e.c.	2.08	1.74	1.76	2.03	2.00
Energetics	2.43	1.76	1.74	2.05	2.78
Construction	2.54	1.95	1.92	2.16	2.26
Trade, hotels, restaur.	1.83	1.91	1.66	1.71	2.04
Transport services	1.93	1.72	1.78	1.85	1.98
Financ., business serv.	1.80	1.53	1.45	1.84	1.68
Other services	1.74	1.53	1.42	1.48	1.66

Source: ČSÚ, ŠÚSR, Input-Output tables, EUROSTAT, New Cronos\Economy and Finance\National Accounts (1. 10. 2005), own calculation.

The CR has a significantly higher multiplication effect in power engineering compared to other countries with the exception of Slovakia. Output multipliers for production of means of transport, textile industry, other manufacturing and transport and communications are also higher than in other countries. Timber industry, production of other non-metal mineral products (intended mainly for construction), metallurgy and business and financial services play a major role in the CR and Poland. Hungary and Poland have the highest values of the output multiplier for agriculture. Germany has the highest multiplier in engineering industry and production of rubber and plastic products of all compared countries.

Figure 3: Comparison of the output multipliers by activities in the Czech Republic between 1995 and 2002



Source: CZSO, Input-output tables, own calculation.

Output multipliers were also calculated for groups of industries within manufacturing and services with the same technological or knowledge intensity (see Table 11). Comparison of individual countries shows that high-tech sectors in the manufacturing in Hungary have the highest multiplication effect and the second highest multiplication effect was recorded for the Czech Republic. The value of output multipliers in industries with low and lower technological intensity in all countries except for Hungary is higher than in industries with higher and high technological intensity. This means that activities with low technological intensity tend to have a higher multiplication effect.

Table 11: Output multipliers by technological and knowledge activities groups (selected countries, 2000)

		CZ	HU	DE	PL	SK
Primary sector		1.66	1.76	1.45	1.80	1.48
Construction		2.55	2.00	1.94	2.19	2.29
Energetics		2.52	1.99	1.76	2.20	2.81
Manufacturing	HT	1.63	1.84	1.52	1.42	1.43
	MHT	1.86	1.71	1.88	1.72	1.78
	MLT	1.94	1.78	1.87	2.01	2.11
	LT	2.06	2.04	1.82	2.15	1.90
Services	KIS HT	1.85	1.63	1.46	1.85	1.75
	KIS_MS	1.75	1.52	1.39	1.84	1.66
	KIS_FS	1.97	1.70	1.84	2.09	1.72
	KIS OT	1.75	1.58	1.41	1.51	1.63
	LKIS_MS	1.87	1.87	1.69	1.73	2.08
	LKIS_OT	1.75	1.49	1.42	1.46	1.69

Note: Technology and knowledge intensity in manufacturing: HT – high, MHT – medium-high, MLT – medium-low, LT – low. Knowledge intensive services (KIS): HT – high-tech, MS – market, FS – financial, OT – other. Knowledge less intensive services (LKIS): MS – market, OT – other. Source: ČSÚ, ŠÚSR, Input-output tables, EUROSTAT, New Cronos\Economy and Finance\National Accounts (1. 10. 2005), own calculation.

The largest difference in services was detected between output multipliers for knowledge intensive and other activities in Poland. This means that the multiplication effect

of knowledge intensive activities is higher than that of other services. In Slovakia and Hungary by contrast the values of multipliers tend to be higher in activities with lower knowledge intensity.

The highest value of the output multiplier in the Czech Republic, Germany and Poland was recorded in financial services, while the highest multiplier in Slovakia and Hungary was detected in market services with lower knowledge intensity, which include for example trade, accommodation and catering, and ground transport. The Czech Republic has relatively small differences between the value of multipliers in individual industry groups in services. This means that there is no significant difference in the multiplication effect of activities with higher or lower knowledge intensity.

4.2 Identification of industrial complexes

The analysis of inter-industrial linkages was carries out to classify industries according to their impact on the growth of the economy as a whole. However, the economic growth in the national economy depends on the industrial structure of the relevant country. The economic growth in countries where a rapidly developing sector or industry has a significant weight will be more dynamic than in those countries where sectors or industries with slower development have the greatest weight.

In addition, the economic growth of individual industries will be influenced by the intensity of interconnections between individual industries. For example, if a certain industry successfully penetrates a foreign market, the positive impact of this development will also extend to industries with strong supplier-customer relations with the relevant industry. Identifying these interconnections allows us to envisage the impact of demand factors on individual industries and industrial complexes.

The structural analysis defines industrial complexes as groups of productive activities with intensive exchange of inputs. Identifying these groups allows us to detect the mutual influence of individual industrial complexes. Involvement in these industrial complexes brings the benefit of bulk saving, which in turn reduces cost, uncertainty and risks. What's more, the existence of these complexes increases positive externalities (spillover) of new technologies, knowledge and innovations (see Hoen, 2002, p. 133). Industrial complexes have the strongest impact if they include companies that use the same technologies or have strong supplier-customer relations. This is why inter-industrial connections and industrial complexes are two closely connected concepts.

Besides having its own analytic significance, identification of industrial complexes can also be used as a criterion for determining the level of aggregation. Input-output tables often include large volumes of detailed data and these data need to be aggregated in order to be able to work with the data or publish analysis results. The data for individual industries can be aggregated based on a similar cost structure or, for example, the intensity o mutual connections. This is why identification of industrial complexes can be used as guidance for aggregating individual industries.

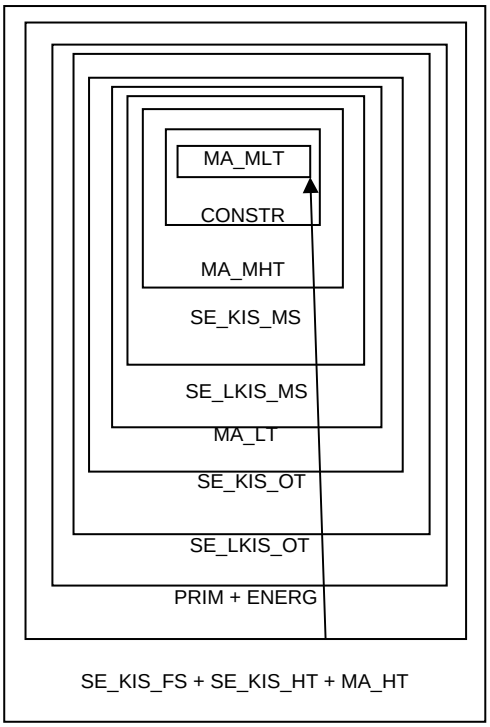
The cluster analysis can be used to identify industrial complexes. This type of analysis involves selecting a certain group of industries with strong supplier and customer interconnections and forming the so-called clusters. The input-output table with the most detailed structure available (i.e. 58 industries) for 2002 was used to identify industrial complexes in the CR.

9 industrial complexes in total were identified in the CR:[6]

1. Metal industry – metallurgy – secondary raw material processing
2. Power engineering – oil and natural gas processing – oil and natural gas extraction
3. Clothing industry – textile industry
4. Rubber and plastic products – chemical industry
5. Air transport – auxiliary activities in transport
6. Production of office machines and computers – production of electric machines and appliances
7. Production of furniture – timber industry – forestry
8. Catering and accommodation – tobacco industry – food industry – agriculture
9. Financial services – trade – activities of social organizations, recreation, culture – waste removal – business services.

Strong supplier-customer relations can be detected inside these complexes. This means that if the demand for the product of the first industry in a particular cluster changes, chain reaction will follow and this change will also have an impact on all other industries in the relevant cluster. This analysis only allows us to identify relation at the level of aggregation for which a symmetric table is completed. Connections inside industries determined in this manner (which tend to be the strongest) remain hidden. This is another reason why symmetric tables should be completed with as detailed level of aggregation as possible.

Figure 4: Linkages among industrial complexes on different technology and knowledge intensity level in the CR, 2002



Note: Technology and knowledge intensity in manufacturing: HT – high, MHT – medium-high, MLT – medium-low, LT – low. Knowledge intensive services (KIS): HT – high-tech, MS – market, FS – financial, OT – other. Knowledge less intensive services (LKIS): MS – market, OT – other. Source: CZSO, ŠÚSR, Input-output tables, own modification.

[6] Industrial complexes are not listed according to their significance. Their importance cannot be determined using this analysis.

5. Conclusion

Structural changes in the Czech economy reflecting in a changing structure of employment and added value were not significant during 1995-2004 with regard to basic production sectors. Major changes involving a decline in the share of agriculture and industry and an increase in the share of services occurred before 1995. Development in fixed prices was different from development in current prices due to various GAV deflators in individual sectors. This is why the intensity of structural changes between 1995 and 2004 was among the lowest in the EU. The share of services in aggregate GAV in European comparison is the second lowest after Ireland, while the share of industry is the second highest. The growth rate of aggregate GAV and contributions of individual sectors to this growth differed greatly during periods 1996–1999 and 2000–2004. The average annual growth rate of GAV during the second period was 3.2 %, while the same rate during the first period was as low as 0.8 %. The construction industry had a significantly negative impact on the overall growth of GAV during this period. Industry and services influenced the growth rate of GAV positively during both periods and this positive impact was significantly higher during 2000–2004. Industries with the highest dynamics of gross added value during the entire monitored period included electrical industry and production of means of transport and telecommunication and financial and business services.

The increase in the total labour productivity in the national economy during 1996–2004 was higher than the increase in gross added value (2.4 compared to 1.8 %) due to a decline in total employment. Both, the level and dynamics of labour productivity differed greatly between individual industries of the national economy. The greatest differences in development of labour productivity and GAV were detected in agriculture, where labour productivity grew faster than GAV as a result of decreasing employment, and in business services, where a significant growth in employment brought about a significantly slower growth of labour productivity compared to the growth of GAV. The share of intermediate consumption in gross production increased between 1995 and 2004, especially in real representation. This was influenced especially by strengthening intercompany cooperation.

Breakdown of the increase in the total productivity into individual factors showed that the increase in productivity in individual industries had the greatest impact of the growth of the aggregate productivity, accounting approximately for 95 %. However, a change in the structure of employment to the benefit of industries with higher levels of productivity also had a positive impact. Similar development occurred in most new EU member states. Comparison of the levels of productivity in the Czech Republic, Hungary and Slovakia compared to the level of productivity in Germany also revealed that this difference is influenced the most by low levels of productivity in individual industries. The level of aggregate productivity in individual countries converted using a nominal rate ranged between one sixth and one quarter of the level achieved in Germany. The industrial structure also has a negative impact on differences in the level of productivity, this impact being the lowest in the CR.

Assessment of the situation with regard to the level of technological intensity in individual activities shows that the so-called high-tech industries in the Czech Republic are not among those with the highest labour productivity. However, between 1996 and 2003 these industries on average recorded the highest dynamics of real gross added value and

labour productivity. The share of gross added value in gross production in this group of Industries is also relatively low. This is largely caused by a considerable share of assembly operations in these activities. The rapid growth in the volume of export between 1999 and 2003 was mainly caused by the increased export in the active finishing regime, which accounted for 94 % of the export of high-tech products in 2003.

Comparison of the values of production multipliers in the Czech Republic between 1995 and 2002 shows the largest increase in the impact of the construction industry and electrical industry. The multiplier value also increased in production of means of transport, timber industry, other processing industry and agriculture. Especially the construction industry and power engineering, but also production of means of transport, textile industry and transport and communication services, have a relatively higher multiplication effect compared to other countries (Poland, Hungary and Germany). From the perspective of technological and knowledge demands, industries with medium to low level of technological intensity tend to have higher production multiplier values than high-tech activities. Hungary is the only exception in this regard.

Besides the multiplication effect of individual industries, mutual connections between individual industries are also important for performance of the economy as a whole. Industries with the strongest demand links can be grouped into certain clusters, inside which demand multiplication effects reflect relatively rapidly. These clusters also created positive conditions for spreading technologies, knowledge and innovations. One industry in a particular cluster is always the primary industry and other industries are tied to it through demand connections (they supply the inputs). Primary industries in the CR include especially metal industry, metallurgy, clothing industry, production of rubber and plastic products, air transport, production of office machines, production of furniture, catering and accommodation, and financial services. However, more “refined” differentiation of these connections would require tables with a more detailed industrial structure. Assessment of the situation with regard to interconnection of activities at various levels of technological and knowledge intensity revealed that high-tech activities in the processing industry and services are among the so-called primary industries, i.e. demand for production of these industries also reflects in increased demand for other industries.

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Table 1A: Comparison of GVA structure within EU-25 (%. current prices)

	1995				2003			
	Agricul-ture	Industry	Construct.	Services	Agricul-ture	Industry	Construct.	Services
CZ	4.6	30.8	9.1	55.5	2.8	31.4	6.6	59.2
DK	3.6	20.3	4.5	71.5	2.2	20.0	5.0	72.7
EE	8.0	23.2	6.1	62.8	4.2	21.9	6.4	67.5
ES	4.4	22.1	7.5	66.0	3.7	19.1	10.0	67.2
FI	4.5	28.1	4.4	63.0	3.4	25.2	5.3	66.1
FR	3.2	21.1	5.2	70.5	2.6	15.9	5.6	75.8
IE	7.3	33.1	5.3	54.4	2.7	33.0	8.2	56.2
IT	3.2	24.9	5.1	66.6	2.5	21.6	5.0	70.8
LT	11.4	25.8	7.3	55.5	6.2	24.8	7.1	61.9
CY	5.1	14.5	8.4	72.0	4.0	12.3	7.8	76.0
LV	9.0	25.2	4.5	61.3	4.3	17.2	5.6	72.9
LU	1.0	15.0	6.2	77.8	0.5	10.6	5.8	83.2
HU	6.7	26.3	4.6	62.4	3.3	25.5	4.9	66.4
MT	2.9	25.6	3.3	68.3	2.4	22.2	4.5	71.0
DE	1.3	25.4	6.8	66.6	1.1	24.5	4.3	70.1
NL	3.5	22.4	5.4	68.6	2.4	18.9	5.8	73.0
PL	6.5	29.7	7.1	56.7	3.0	24.5	6.0	66.5
PT	5.8	22.1	6.4	65.8	3.7	19.3	6.7	70.3
AT	2.7	22.5	7.8	66.9	1.9	22.4	7.7	68.0
EL	9.9	16.0	6.4	67.7	6.7	13.9	8.8	70.5
SK	5.9	33.1	5.1	55.9	4.0	26.5	5.3	64.3
SI	4.2	30.5	5.4	59.9	2.6	30.2	5.7	61.6
SE	2.7	25.7	4.4	67.2	1.8	22.9	4.4	70.8
UK	1.9	25.9	4.9	67.2	1.0	18.1	5.9	75.1

Source: EUROSTAT, New Cronos\Economy and Finance\National Accounts (1. 10. 2005), own calculation.

Table 2A: Exports of high-tech products and exports after processing and their share on the total exports in 1999–2004 (%)

	Exports				**Exports after processing**			
	1999	2001	2003	2004	1999	2001	2002	2003
TOTAL high-tech of which:	6.4	9.2	12.4	12.1	4.8	91.0	93.4	94.1
Aerospace	0.36	0.43	0.34	0.25	0.6	46.6	82.0	91.4
Computers-office machines	0.87	2.86	6.28	6.02	1.6	92.2	95.1	93.6
Electronics-telecommunications	1.26	2.77	3.34	3.22	2.7	137.6[1)]	131.8[1)]	131.4[1)]
Pharmacy	0.26	0.18	0.15	0.15	0.0	11.5	13.8	8.1
Scientific instruments	0.51	0.64	0.74	0.83	7.6	72.8	57.7	61.5
Electrical machinery	1.50	1.05	0.60	0.77	0.2	91.8	87.8	83.7
Chemistry	0.38	0.22	0.22	0.19	0.1	3.8	3.4	2.2
Non-electrical machinery	0.98	0.85	0.62	0.58	20.1	28.3	26.4	25.8
Armament	0.31	0.20	0.16	0.13	5.3	11.7	1.3	0.9

1) data on total exports and exports after processing are not consistent. Source: ČSÚ, foreign trade database (1. 11. 2005).

Table 3A: Imports of high-tech products and imports for processing and their share on the total imports in 1999–2004 (%)

	Imports				**Imports for processing**			
	1999	2001	2003	2004	1999	2001	2002	2003
TOTAL high-tech of which:	12.4	15.0	15.9	15.1	22.8	40.0	50.2	49.7
Aerospace	0.62	0.66	0.74	0.34	5.3	5.2	4.5	5.0
Computers-office machines	2.84	4.21	4.65	4.78	16.5	41.2	53.6	51.9
Electronics-telecommunications	4.24	5.74	6.38	5.82	32.6	59.6	72.9	76.6
Pharmacy	0.84	0.70	0.77	0.69	0.1	1.0	1.0	0.3
Scientific instruments	1.32	1.33	1.45	1.38	31.1	23.4	19.7	17.9
Electrical machinery	0.58	0.68	0.41	0.63	64.9	55.5	60.4	50.6
Chemistry	0.68	0.67	0.68	0.72	12.1	8.8	5.8	6.9
Non-electrical machinery	1.19	0.97	0.70	0.68	5.3	4.8	5.3	5.2
Armament	0.06	0.03	0.08	0.06	5.7	1.4	2.7	0.8

Source: ČSÚ, foreign trade database (1. 11. 2005).

Table 4A: Import penetration and export to production ratio in activities at medium-low and low technological intensity within selected EU countries

	Total manu-facturing		High-tech activities												Medium-high-tech activities											
			Total		Aerospace		Pharmaceu-ticals		Computers. office equi-pment		Electronics-communica-tion		Precision instruments		Total		Electrical machinery		Motor vehicles		Chemicals (except pharmaceu-ticals)		Other transport equipment		Machinery and equip-ment	
	Import penetration ratio[3]																									
	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001
CZ [1]	45	52	79	69	87	78	64	80	102	59	80	74	70	68	63	68	55	67	57	54	84	75	47	40	62	84
AT	49	64	68	102	136	661	63	109	152	126	42	72	79	107	76	87	76	90	97	101	67	83	38	62	71	77
DK	53	65	101	120	..	..	73	95	126	145	95	129	103	100	77	83	62	74	106	111	76	90	111	112	68	67
FI	31	37	67	52	50	84	58	74	78	123	63	39	75	58	54	56	49	70	128	152	50	54	25	50	45	37
FR	29	38	42	59	55	49	19	47	72	101	45	64	33	48	38	48	30	48	35	38	44	57	40	43	41	56
DE	29	40	56	101	100	156	36	84	62	109	57	107	38	65	29	39	17	32	34	35	36	53	39	43	26	37
IT	21	31	40	64	46	76	20	49	83	91	41	62	43	61	32	45	16	28	52	59	36	48	25	43	23	38
NL	63	84	93	211	7335	80	62	101	296	2437	52	90	107	291	83	94	102	148	99	113	70	85	173	122	85	72
PT	38	48	69	85	176	180	36	67	92	99	72	79	81	85	66	75	60	57	82	98	47	63	67	36	70	73
ES	25	35	50	68	114	89	19	47	76	75	58	80	58	71	43	56	33	41	45	66	37	48	36	41	52	59
SE	37	45	65	62	50	103	48	57	98	109	58	45	64	70	46	52	54	66	41	40	55	73	23	27	45	54
UK	34	48	57	101	60	125	29	71	75	102	59	131	50	64	46	57	39	55	52	62	43	55	31	39	49	55
EU [2]	12	20	28	48	42	61	11	27	44	70	30	45	24	40	13	19	10	22	11	15	16	22	20	26	11	20
	Export to production ratio[3]																									
CZ [1]	42	52	57	62	90	63	35	50	113	64	63	64	43	54	58	70	53	72	57	65	81	63	61	50	50	84
AT	45	63	55	102	..	..	56	111	1045	175	32	73	71	109	73	87	81	91	96	101	55	78	32	69	71	80
DK	57	67	101	117	..	..	85	98	206	347	95	139	102	100	75	82	58	80	113	130	63	87	118	142	76	74
FI	38	48	59	61	9	70	36	55	69	384	62	59	71	64	50	58	49	73	137	195	38	48	9	21	46	47
FR	29	39	42	62	68	66	24	53	62	102	39	66	29	45	41	51	37	53	40	44	47	61	39	36	39	55
DE	32	47	54	101	100	142	46	90	46	117	51	108	47	74	42	54	24	38	48	55	46	60	42	39	43	57
IT	23	35	31	56	48	72	15	50	76	79	26	53	32	55	33	50	19	32	39	50	22	37	35	52	42	61
NL	64	85	93	222	..	75	61	101	392	1624	46	84	108	237	82	94	102	160	99	120	76	90	..	128	82	73
PT	29	39	42	71	..	..	11	36	52	97	59	72	46	59	38	64	57	56	56	97	20	36	30	23	36	51
ES	19	31	28	50	121	85	10	33	52	51	33	66	24	47	36	52	25	37	49	67	22	39	15	44	34	45
SE	41	51	66	67	46	103	67	79	97	136	65	55	65	72	50	58	49	66	54	50	43	66	18	23	52	64
UK	31	43	57	101	70	124	40	74	69	102	52	128	51	64	45	53	36	54	45	48	46	58	17	19	51	55
EU [2]	13	21	24	44	49	63	17	40	21	49	20	38	23	40	19	27	13	24	16	22	20	29	15	18	23	33

1) for CR data for 1995 and 2003. 2) EU includes quoted countries except for CR. Intra-EU trade is excluded. 3) import penetration = share of imports on domestic demand (estimated as production minus exports plus imports). Production indicators is defined as group of organizations (industry classification), whereas imports and exports are classified as groups of products (product classification) and are not fully comparable. The indicators are also distorted by counting re-export (values higher than 100 %). Source: OECD (2005d), ČSÚ, annual NA database (5. 11. 2005), own calculation.

Table 5A: Import penetration and export to production ratio in activities at medium-low and low technological intensity within selected EU countries

	Medium-low-tech activities														Low-tech activities											
	Total		Petroleum refining		Rubber and plastics		Non-metallic mineral products		Shipbuilding		Basic metals		Fabricated metal products (except machinery)		Total		Other manufactur-ing industry		Wood and furniture		Paper and printing		Food. beverages. tobacco		Textiles. clothing. leather	
	Import penetration ratio[3]																									
	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001
CZ [1]	34	45	17	45	59	52	27	29	93	26	41	54	29	39	28	32	35	39	19	18	39	41	14	16	56	73
AT	38	45	23	40	64	66	21	27	52	241	53	59	35	38	31	45	38	50	20	23	33	36	12	31	71	90
DK	45	46	47	42	52	58	26	31	25	42	78	82	31	32	38	51	38	44	50	50	28	30	29	43	85	143
FI	28	28	31	32	40	36	19	20	25	28	31	38	21	17	14	19	30	33	8	9	9	10	7	16	59	70
FR	22	25	22	19	27	32	15	20	14	29	42	47	12	15	22	28	27	35	16	23	17	21	16	19	39	61
DE	22	27	28	27	22	29	16	20	16	50	37	45	12	15	27	31	30	40	20	19	16	21	17	20	64	85
IT	16	20	18	17	16	22	7	9	11	35	36	45	5	7	14	21	11	18	15	16	11	16	15	19	14	26
NL	52	53	47	68	80	78	39	28	-83	13	94	104	34	29	46	49	45	51	58	48	33	31	34	39	112	131
PT	29	38	30	28	36	49	10	15	17	13	54	75	28	40	22	29	30	28	11	21	19	26	16	24	31	42
ES	17	21	23	21	22	30	8	9	18	26	27	37	13	14	14	21	18	23	14	18	14	17	10	17	22	39
SE	37	39	50	42	50	57	27	30	69	24	42	53	22	22	23	30	39	41	9	15	13	16	14	25	84	103
UK	24	27	18	27	25	26	18	19	13	8	43	50	14	18	25	30	37	39	29	31	18	18	19	22	45	68
EU [2]	9	12	13	14	8	12	5	7	9	18	19	24	4	7	10	14	14	21	9	12	5	6	6	8	21	36
	Export to production ratio[3]																									
CZ [1]	39	46	13	27	54	48	46	44	97	59	45	50	37	48	31	33	41	54	44	30	34	39	12	13	62	72
AT	40	44	6	15	67	65	26	26	38	402	56	65	37	36	30	47	32	48	35	43	41	48	8	31	64	87
DK	43	40	42	33	54	59	32	27	54	37	54	67	35	32	48	59	61	57	42	39	18	20	51	63	82	162
FI	34	40	30	40	34	35	18	24	44	77	47	51	22	21	32	40	23	23	48	45	51	54	5	10	38	50
FR	21	24	14	16	26	31	16	20	24	49	42	45	12	14	20	26	19	26	12	18	13	17	20	24	31	51
DE	22	31	15	21	26	39	15	23	46	66	36	47	15	22	20	27	25	37	9	18	16	23	13	18	49	77
IT	17	24	14	18	23	34	17	23	11	58	22	31	12	17	19	29	33	48	5	8	9	14	9	15	30	44
NL	56	60	76	86	76	76	31	22	..	33	94	104	32	28	50	54	33	44	33	21	31	33	52	57	121	151
PT	19	25	24	13	15	34	18	20	30	19	12	42	21	33	29	32	19	22	38	42	20	25	9	13	49	56
ES	17	21	25	18	18	30	11	17	47	26	27	30	10	13	9	19	10	21	7	11	9	16	7	16	15	36
SE	39	44	48	49	45	56	17	26	71	57	52	61	25	27	28	39	34	41	36	42	40	50	6	15	58	107
UK	21	24	24	30	21	21	16	16	15	16	33	44	13	16	16	17	26	24	3	5	11	12	14	15	30	44
EU [2]	9	13	12	14	9	15	7	11	24	33	14	19	6	9	8	13	12	18	4	8	6	9	6	9	14	26

1) for CR data for 1995 and 2003. 2) EU includes quoted countries except for CR. Intra-EU trade is excluded. 3) import penetration = share of imports on domestic demand (estimated as production minus ex-ports plus imports). Production indicators is defined as group of organizations (industry classification), whereas imports and exports are classified as groups of products (product classification) and are not fully comparable. The indicators are also distorted by counting re-export (values higher than 100 %). Source: OECD (2005d), ČSÚ, annual NA database (5. 11. 2005), own calculation.

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