Competitiveness of the Branch Structure of Slovak Manufacturing Industry in 1998 − 2008[1]

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Abstract

The paper analyses the competitiveness of the branch structure of manufacturing industry in the Slovak Republic between 1998 and 2008. An analysis of the competitiveness at the branch level is performed as a national economy evaluation using a branch approach, with the consequent overlapping between the perception of the competitiveness at the macro and meso levels. The actual competitiveness of Slovak manufacturing industry was analysed by means of standard indicators at the branch level (RCA, Michaely's index), and through the application of the market segmentation method.

Keywords: *manufacturing industry, competitiveness, indicators of the competitiveness at the branch level*

JEL Classification: F14, L60, O14

1. Introduction

The membership of the Slovak Republic in the European Union (EU) makes its trade performance dependent on the developments on the common market of the EU. As a member state of the EU, Slovakia also participates in the calculations of specialisation coefficients and in the subsequent assessment of the performance of the EU in international trade relations.

The positions of individual countries on the world market are presently monitored by specialisation indices which, besides evaluating the utilisation of the

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[1] This paper was compiled as part of the project GAMA/10/4 *Research of development tendencies and determinants of increasing real competitive abilities of the economy and design of a draft model of policy of competitiveness in the economic context of Slovakia*.

The authors would like to thank anonymous reviewers for many helpful comments.

comparative advantages of individual economies, also serve as a means to reveal potential competitive advantages for their further economic growth.

The literature does not give an exact, universally valid, and generally accepted definition of the "competitiveness". This is due to the impossibility of unambiguously deriving this concept from any basic economic paradigm. The most common basis for defining this term is foreign trade in its perception as supply and demand. The analysis focuses mostly on the development of the issue of comparative advantages.

As regards the branch-level competitiveness (in our case, the competitiveness of individual branches of the manufacturing industry), evaluation of the competitiveness is made at the scale of the national economy based on a branch approach. Consequently, there is an overlapping of the macro- and meso-level perceptions of the competitiveness at the scale of the national economy on the one hand and of its particular branches on the other hand.

The common denominator of these sector/commodity definitions of the competitiveness of an economy is the recommended indicator for its evaluation. That indicator is the trade balance, which reflects the volume of exported vs. imported goods. Moreover, this indicator allows drawing conclusions concerning the competitiveness of domestic production. It is clear in this regard that even competitiveness at the branch level has international trade ramifications. Branch-level competitiveness can thus be seen as the proof of the ability of respective sectors to succeed in the competitive struggle with identical or very similar sectors of other economies in placing their products or services on domestic or international markets, based on an effective utilisation of production factors used in the manufacturing of products or in the provision of services.

2. Methodology and Data

The present-day research of competitiveness is based on the utilisation of statistical methods in the evaluation of revealed and expected comparative and competitive advantages.

The actual competitiveness of Slovak manufacturing industry, its sectors (more exactly, sections) and commodities on the world markets was analysed using three of the identified methods of measurement of branch-level competitiveness, namely RCA 1,[2] RCA 2[3] and Michaely's index.[4] The option of a deeper

[2] RCA 1 (WIFO, 2002) indicator compares the ratio of export and import of particular sections of manufacturing industry to total country's import and export. Thus, it characterises the comparative advantageousness or disadvantageousness of export and its competitiveness.

analysis based on only one indicator has not been chosen, but the three indicators were applied to verify the correctness of analysis results and thus also of their information value.

In addition to the above three indicators, the market segmentation method[5] was applied to assess the competitiveness of individual sections of the Slovak manufacturing industry. This method made it possible to identify not only the competitiveness of individual sections of manufacturing industry compared to the previous indicators, but also the type of competitiveness.

The source of data for assessing the competitiveness of individual sections of Slovak manufacturing industry was the data base of the Statistical Office of the

[3] RCA 2 indicator (Balassa, 1965), defined as a ratio of the difference between export and import of commodity groups in the aggregate of export and import of these commodity groups, assesses the comparative advantageousness of export and its competitiveness.

The advantage of the RCA indicator is a predominantly relatively good availability of data for its calculation, while providing a synthetic view of the level and development of competitiveness. The logarithmic form of the calculation of RCA indicator (RCA 1) is suitable only if we want to know whether the country has comparative advantages in the given commodity (branch) or not, or the extent of their existence or non-existence. On the other hand, the coefficient form of calculation (RCA 2) is suitable for assessing the competitiveness process through net trade performance of the country in the given commodity group (branch) in time series.

[4] *Michaely's index* assesses the competitiveness at the branch level based on the difference between the share of the examined commodity group in total country's export and the share of the examined commodity group in a country's imports. Thus, Michaely's index enables to highlight a certain extent of specialisation, or insufficient specialisation in concrete commodity groups.

[5] The market segmentation method, along with the revealed comparative advantage indicator (RCA 1), is the method developed by the Austrian Institute for Economic Research (WIFO) serving to assess competitiveness at the branch level. The core of the market segmentation method is the utilisation of the data on total amounts of import and export, as well as the data on unit amount of export and import (the amount of export and import in relevant currency per unit of physical volume) of examined product groups of monitored branch for the purpose of market segmentation into markets sensitive to prices and quality. The result is the division of markets into the following four segments (WIFO, 2002). *Segment 1 – Successful quality competition* – includes the groups of products, the export unit value of which is higher than the import value and the volume of export is higher than the volume of import. This is the result of quality competitiveness or successful specialisation. This segment is a target segment for all countries. It ensures an active trade balance. *Segment 2 – Deficit of competitiveness* – includes the groups of products, the export unit value of which is higher than the import value, but the volume of export is lower than the volume of import, resulting in a trade deficit. The products of this segment lost their price competitiveness in markets where prices are important, high prices being caused by higher production costs. *Segment 3 – Successful price competition* – includes goods with lower price elasticity and unit value than those of imported goods of the same product groups in the producer's country. However, the volumes of export are higher than the volumes of import, and have a positive influence on active trade balance. This represents a successful price competition provided that no unfavourable economic consequences arise for manufacturers from low prices. *Segment 4 – Sphere of structural problems* – includes product groups and products which do not succeed in export at low export unit values. The volume of import of such products, even at higher import unit values, is higher than the volume of export, resulting in a trade deficit. The products of this segment face output barriers and fall in the sphere of structural problems requiring innovations of or changes in the production structures.

Slovak Republic and its annual data on foreign trade in the Slovak manufacturing industry in the branch statistical classification of economic activities (OKEČ – odvetvová klasifikácia ekonomických činností – NACE) in four-digit code in SKK and in kg (applying the markets segmentation method) in the period of 1998 – 2008.

3. Analysis Results

The branch-level competitiveness[6] was assessed using the definition according to which the competitiveness of a branch can be defined as its ability to successfully face the competition of identical or very similar industries of other economies in placing its products or services on the domestic and foreign markets, with an effective utilisation of production factors in the manufacture of products or the provision of services

The selection of indicators for assessing the branch-level competitiveness was thus made in the light of the objective of the assessment, which was to ascertain whether particular sections [manufacturing as D-category pursuant to the branch statistical classification of economic activities (NACE) is divided into 14 subcategories (DA to DN) and subsequently into 23 sections (15 to 37)][7] of the manufacturing industry did or did not succeed in establishing themselves on the domestic market and foreign markets]. In our opinion, the evidence of such establishment is provided by the existence of a higher volume of products placed on a foreign market by a domestic branch compared to the volume of products placed on the domestic market by an identical or a very similar foreign branch.

[6] The need to assess the competitiveness of the branch structure of manufacturing industry of the Slovak Republic arose from several facts. The manufacturing industry has a key position in the export sector of the Slovak economy. The manufacturing industry is, in principle, the only branch of the national economy that is able to contribute to a more intensive utilisation of domestic product factors, especially labour force, and to contribute to the expansion of total demand – at first external and then domestic – through its expansion to international markets. Its position in the national economy complex, its technological level and the ability to succeed in foreign markets affect the overall rate of economic growth and employment of the entire national economy (Šikula a kol., 2003, pp. 65 – 66). The extent to which the manufacturing industry will be able to initiate export-driven economic growth which, in our opinion, it is the most feasible method to cope with the process of convergence with more developed economies, will depend to a considerable extent on external and domestic economic conditions. The fact is that this sector of national economy is, much more than other sectors, confronted with and influenced by changes in the international parameters in terms of its performance both on the input and output sides. At the same time, it is also extraordinarily sensitive to the conditions for its development created by the domestic economic policy.

[7] Individual sections of the manufacturing industry were, in accordance with the OECD classification of branches according to technological intensity, divided into four identified technological segments: high technology segment, medium-high technology segment, medium-low technology segment, low technology segment.

The above information was obtained using the RCA coefficient, Michaely's index, and the market segmentation method. Moreover, the market segmentation method made it possible to establish whether the decisive factor for placing Slovak products on foreign markets was their price or their quality.

The competitiveness of the particular sections of the Slovak manufacturing industry assessed by the calculated values of indicators of revealed comparative advantages, RCA, and by the Michaely´s index, is reflected in the data presented in the following table (Table 1).

The sections representing the most important groups of production in volume terms, which achieved positive values of RCA indicators within the branches with low technological intensity, included garment manufacture, manufacturing of leather products, wooden and cork manufacturing, production of pulp, paper and paper products, publishing, printing and playback of recorded media, furniture manufacturing and manufacture not classified elsewhere; within the branches with medium-low intensity they included the production of coke, refined oil products and nuclear fuels, production of non-metal mineral products, metal production, building of ships and boats; within branches with medium-high technological intensity they included the manufacture of motor vehicles, trailers, semitrailers, manufacture of railway and tramway locomotives and rolling stock.

The above sections of the Slovak manufacturing industry have succeeded in placing a larger volume of products than did identical or very similar foreign sections on the Slovak market, thus achieving a comparative advantage through positive RCA values in exports to all markets. Conversely, sections with negative values of RCA indicators and thus with comparative disadvantages include – within branches with low technological intensity – the production of food, beverages, tobacco processing, textile production; within the branches with medium--high technological intensity they include the manufacture of chemicals and chemical products (excluding the manufacture of pharmaceuticals, chemical products and plant products for medicinal purposes), production of machinery and equipment, production of motorcycles and bicycles within the production of other transport equipment; within branches with high technological intensity they include the production of pharmaceuticals, chemical products and plant products for medicinal purposes, production of office equipment and computers, production of radio, television and communication equipment and apparatus, production of medical, precision and optical instruments, watches and clocks.

The data on the specialisation and competitiveness of the particular sections of Slovak manufacturing industry assessed according to Michaely's index are given in Table 1.

T a b l e 1

Competitiveness of Slovak Manufacturing Industry in the Classification of Branches by Technological Intensity Analysed by RCA1, RCA2 and Michaely´s Index and the Shares of Particular Groups of Commodities, by Technological Intensity, in Export and Import of Manufacturing Industry

	RCA1			RCA2			Michaely			1998		2003		2008	
	1998	**2003**	**2008**	**1998**	**2003**	**2008**	**1998**	**2003**	**2008**	Export	Import	Export	Import	Export	Import
Branches of high technologies	**–0.87**	**–0.81**	**–0.06**	**–0.49**	**–0.40**	**–0.04**	**–0.0743**	**–0.0691**	**–0.0102**	5.49	15.25	5.70	14.42	19.41	23.93
244 Pharmaceuticals	–0.72	–1.35	–1.42	–0.43	–0.60	–0.61	–0.0135	–0.0199	–0.0170	1.31	3.14	0.71	3.10	0.62	2.99
30 Office machinery and computers	–1.22	–0.36	–0.21	–0.61	–0.19	–0.11	–0.0203	–0.0062	–0.0029	0.87	3.43	1.45	2.35	1.37	1.97
32 Radio, television and communication equipment, devices	–0.60	–0.62	0.23	–0.38	–0.31	0.11	–0.0189	–0.0220	0.0296	2.33	4.96	2.62	5.51	16.34	15.07
33 Health, precious and optical equipment and clocks	–1.15	–1.21	–1.26	–0.59	–0.55	–0.56	–0.0166	–0.0179	–0.0202	0.79	2.89	0.78	2.95	0.91	3.75
353 Aicrafts and spacecrafts	–1.32	–1.16	0.24	–0.64	–0.53	0.11	–0.0051	–0.0030	0.0003	0.19	0.83	0.14	0.51	0.16	0.15
Branches of medium-high technologies	**0.05**	**0.19**	**0.22**	**–0.07**	**0.08**	**0.10**	**0.0212**	**0.0840**	**0.0730**	42.31	46.70	48.98	45.54	42.66	39.90
24 excl. 244 Chemicals and fibres without pharmaceuticals	0.07	–0.31	–0.35	–0.06	–0.17	–0.18	0.0058	–0.0170	–0.0139	8.32	8.98	4.81	7.39	3.73	6.18
29 Machinery and equipment	–0.48	–0.19	–0.01	–0.33	–0.11	–0.01	–0.0478	–0.0166	–0.0010	8.01	15.01	8.28	11.26	7.73	9.12
31 Electrical machinery and apparel	–0.05	0.00	0.07	–0.13	–0.01	0.03	–0.0029	0.0001	0.0034	5.31	6.53	6.39	7.20	5.94	6.45
34 Motor vehicles, trailers and semi-trailers	0.40	0.54	0.49	0.10	0.25	0.23	0.0616	0.1156	0.0826	19.11	14.90	28.50	18.79	24.45	17.46
352 Other transport equipment – railway and tramway locomotives and rolling stock	0.40	0.31	0.42	0.10	0.14	0.20	0.0046	0.0023	0.0022	1.44	1.12	0.90	0.74	0.74	0.56
354 Other transport equipment – motorcycles and bicycles	–0.12	–0.26	–0.54	–0.16	–0.14	–0.27	–0.0002	–0.0003	–0.0004	0.13	0.16	0.10	0.15	0.06	0.12
Branches of medium low technologies	**0.60**	**0.31**	**0.31**	**0.20**	**0.14**	**0.15**	**0.1343**	**0.0667**	**0.0594**	30.48	19.46	25.78	21.37	25.53	21.78
23 Coke, refined oil products, nuclear fuels	0.92	1.04	0.76	0.35	0.47	0.36	0.0208	0.0273	0.0243	3.53	1.63	4.33	1.73	5.21	2.82
25 Rubber and plastic products	0.01	–0.32	–0.11	–0.10	–0.17	–0.06	0.0002	–0.0151	–0.0036	3.90	4.51	4.15	6.43	3.54	4.59
26 Other non-metallic mineral products	0.62	0.30	0.15	0.21	0.13	0.07	0.0152	0.0063	0.0018	3.38	2.12	2.51	2.10	1.55	1.55
351 Ships and boats	1.06	0.29	3.20	0.41	0.13	0.92	0.0077	0.0006	0.0013	1.20	0.48	0.24	0.20	0.16	0.01
27 Metals	1.00	0.74	0.46	0.38	0.34	0.22	0.0917	0.0528	0.0338	14.87	6.37	10.36	5.58	10.56	7.79
28 Metal structures, metal products	–0.04	–0.12	0.04	–0.12	–0.07	0.01	–0.0014	–0.0051	0.0017	3.60	4.36	4.20	5.33	4.51	5.02
Branches of low technologies	**0.19**	**0.17**	**0.00**	**–0.01**	**0.07**	**–0.01**	**0.0364**	**0.0294**	**0.0001**	21.70	20.92	19.56	18.66	12.38	14.39
15 Food products and beverages	–0.53	–0.40	–0.44	–0.35	–0.21	–0.22	–0.0198	–0.0118	–0.0128	2.92	5.76	2.44	4.12	2.65	4.78
16 Tobacco processing	–0.45	–0.95	–3.87	–0.31	–0.46	–0.96	–0.0015	–0.0020	–0.0014	0.27	0.49	0.13	0.38	0.00	0.19
17 Fabrics production	–0.76	–0.81	–0.41	–0.45	–0.40	–0.21	–0.0236	–0.0222	–0.0048	2.13	5.29	1.81	4.61	1.10	1.92
18 Garment manufacturing	1.35	1.00	0.18	0.52	0.45	0.08	0.0333	0.0166	0.0017	4.60	1.38	2.70	1.12	1.15	1.12
19 Leather products	0.40	0.44	0.30	0.10	0.20	0.14	0.0070	0.0083	0.0034	2.16	1.68	2.39	1.74	1.50	1.30
20 Wooden and cork production	1.16	0.66	0.26	0.45	0.30	0.12	0.0152	0.0083	0.0020	2.27	0.83	1.76	1.03	1.00	0.89
21 Cellulose, paper, paper products	0.63	0.27	0.43	0.21	0.12	0.21	0.0183	0.0072	0.0073	4.01	2.48	3.14	2.71	2.37	1.79
22 Publishing, printing, recorded media	0.42	0.54	0.40	0.11	0.25	0.19	0.0035	0.0031	0.0012	1.05	0.80	0.75	0.49	0.42	0.33
36 Furniture manufacturing and manufacturing not classified elsewhere	0.20	0.71	0.20	0.00	0.33	0.09	0.0040	0.0221	0.0034	2.30	2.20	4.44	2.46	2.18	2.08

Source: Own calculations based on data from the database of the Statistical Office of the Slovak Republic on foreign trade in manufacturing industry and own calculations based on data from the Statistical Office of the Slovak Republic for foreign trade of the SR.

The results of the assessment of the competitiveness of Slovak manufacturing industry using Michaely's index[8] are comparable with assessment results obtained through RCA indicators. The Table 1 shows the shares of particular groups of commodities, broken down by technological intensity, in exports and imports[9] of the manufacturing industry.

In comparison with the previous indicators, assessment of the competitiveness of individual sections of Slovak manufacturing industry, using the market segmentation method, makes it possible to determine not only their competitiveness, but also the type of competitiveness. Based on the total volume of export and import of commodities marked with codes 15 − 36 in the branch classification of economic activities, and on the recalculated amounts of their exports and imports stated in Slovak currency per unit of physical volume,[10] the monitored commodities of the particular sections of Slovak manufacturing industry were divided into the following segments (Table 2) based on their competitiveness.[11]

[8] Michaely's index identifies the competitiveness of sections that correspond to the specialisation areas of the Slovak manufacturing industry, namely garment, leather, wood production, pulp and paper production, publishing, printing and playback of recorded media, furniture manufacturing, coke production, production of refined oil products, and production of other non-metal mineral products, metal production, and manufacture of motor vehicles, trailers and semitrailers; in the area of making other transport equipment, it includes the building of ships and boats, the manufacturing of railway and tramway locomotives and rolling stock. Conversely, sections where the Slovak manufacturing industry does not achieve sufficient specialisation according to Michaely's index, report comparative disadvantages. These are the same industries as in the assessment of comparative advantageousness by RCA indicators. They include food production, textile production, manufacturing of machinery and equipment and manufacturing of electric and optical equipment excluding the manufacturing of electric machinery and devices.

[9] Based on data given in Table 1, Slovakia achieves lower values in the share of high-technology segments in total export of manufacturing industry compared with other technological intensity segments. Although a more detailed comparison of the structure of export of Slovak manufacturing industry by technological intensity reveals a relatively unfavourable position of the high-technology segment in 1998 and 2003, the situation has begun to change gradually as a consequence of the gradual development of international production cooperation in the manufacturing of radio, television and communication equipment and apparatus. While this type of manufacture recorded export shares of 2.33% and 2.62%, respectively, in 1998 and 2003, in 2008 its share was as high as 16.34%. In the medium-high technology segment, the predominant position in the Slovak manufacturing industry is held by the production of motor vehicles, trailers and semitrailers. The prevalence of export over import is evident in the manufacture of other means of transport. The export and import ratio deteriorated in the trade in chemicals and fibres (excluding pharmaceuticals). The tendency to the gradual balancing out of the trade balance is evident in the production of machinery and equipment as well as in the production of electric machinery and apparatus. In manufacturing industry exports, the predominant position within the branches with medium-low technological intensity is held by the production of metals and of coke, refined petroleum products and nuclear fuels. These branches provide a stable positive balance in the trade in medium-low technologies. In the segment of branches with low technological intensity, the Slovak industry is confronted with the production of newly industrialised countries (mainly in the textile industry), but also of monoculture countries (food, beverages, tobacco). In these cases, trade in these commodities has displayed a significant downward trend in Slovakia.

T a b l e 2

Competitiveness of Manufacturing Industry of SR Analysed by Markets Segmentation Method

Branches	*Branch statistical classification of economic activities (OKEČ)*	**1998**												**2003**												**2008**											
		1st segment			***2nd segment***			***3rd segment***			***4th segment***			***1st segment***			***2nd segment***			***3rd segment***			***4th segment***			***1st segment***			***2nd segment***			***3rd segment***			***4th segment***		
		Export (mil. Skk)	*% share*	*No. of commodities*	*Export (mil. Skk)*	*% share*	*No. of commodities*	*Export (mil. Skk)*	*% share*	*No. of commodities*	*Export (mil. Skk)*	*% share*	*No. of commodities*	*Export (mil. Skk)*	*% share*	*No. of commodities*	*Export (mil. Skk)*	*% share*	*No. of commodities*	*Export (mil. Skk)*	*% share*	*No. of commodities*	*Export (mil. Skk)*	*% share*	*No. of commodities*	*Export (mil. Skk)*	*% share*	*No. of commodities*	*Export (mil. Skk)*	*% share*	*No. of commodities*	*Export (mil. Skk)*	*% share*	*No. of commodities*	*Export (mil. Skk)*	*% share*	*No. of commodities*	*Export (mil. Skk)*	*% share*	*No. of commodities*
High-tech	244	0	0.0		3 203	0.8	1	1 184	0.3	1	0	0.0		0	0.0		0	0.0		1 258	0.2	1	4 300	0.5	1	0	0.0		0	0.0		0	0.0		8 129	0.5	2
	30	0	0.0		0	0.0		0	0.0		3 225	0.9	2	0	0.0		0	0.0		0	0.0		11 355	1.4	2	0	0.0		0	0.0		4 748	0.3	1	13 136	0.9	1
	32	0	0.0		2 243	0.6	1	0	0.0		6 344	1.7	2	0	0.0		9 078	1.1	1	0	0.0		11 484	1.4	2	0	0.0		8 325	0.6	1	200 290	13.4	1	4 709	0.3	1
	33	0	0.0		0	0.0		0	0.0		2 914	0.8	4	0	0.0		0	0.0		0	0.0		6 114	0.8	4	0	0.0		6 943	0.5	2	0	0.0		4 993	0.3	2
	353	0	0.0		0	0.0		0	0.0		704	0.2	1	0	0.0		0	0.0		0	0.0		1 106	0.1	1	0	0.0		0	0.0		2 133	0.1	1	0	0.0	
∑		0			5 446			1 184			13 187			0			9 078			1 258			34 359			0			15 268			207 171			30 967		
Medium high-tech	24	0	0.0		8 987	2.4	5	16 302	4.3	3	5 837	1.5	10	17 637	2.2	2	2 853	0.4	5	3 565	0.4	2	13 650	1.7	9	3 399	0.2	1	19 900	1.3	10	6 205	0.4	2	19 240	1.3	5
	29	1 098	0.3	1	0	0.0		13 717	3.6	5	14 728	3.9	16	16 749	2.1	2	0	0.0		15 290	1.9	3	32 893	4.1	17	29 433	2.0	1	13 564	0.9	5	46 592	3.1	8	11 309	0.8	8
	31	0	0.0		0	0.0		13 671	3.6	2	5 907	1.6	5	15 662	1.9	1	0	0.0		24 660	3.1	2	9 776	1.2	4	31 040	2.1	2	21 940	1.5	4	24 571	1.6	1	0	0.0	
	34	54 531	14.4	1	0	0.0		0	0.0		15 969	4.2	2	177 243	22.1	2	46 180	5.7	1	0	0.0		0	0.0		275 461	18.5	2	43 704	2.9	1	0	0.0		0	0.0	
	352	5 297	1.4	1	0	0.0		0	0.0		0	0.0		7 020	0.9	1	0	0.0		0	0.0		0	0.0		9 652	0.6	1	0	0.0		0	0.0		0	0.0	
	354	0	0.0		4	0.0	1	119	0.0	1	341	0.1	1	0	0.0		799	0.1	2	0	0.0		3	0.0	1	0	0.0		793	0.1	2	0	0.0		2	0.0	1
	355	0	0.0		0	0.0		38	0.0	1	0	0.0		0	0.0		0	0.0		133	0.0	1	0	0.0		105	0.0	1	0	0.0		0	0.0		0	0.0	
∑		60 925			8 990			43 846			42 782			234 312			49 832			43 648			56 323			349 091			99 901			77 369			30 551		
Medium low-tech	23	0	0.0		0	0.0		12 735	3.4	1	279	0.1	2	33 394	4.2	1	0	0.0		0	0.0		577	0.1	2	0	0.0		0	0.0		66 806	4.5	1	1 194	0.1	2
	25	0	0.0		3 789	1.0	2	4 675	1.2	1	5 911	1.6	4	0	0.0		1 349	0.2	1	13 352	1.7	1	18 249	2.3	5	18 023	1.2	1	28 177	1.9	5	39	0.0	1	0	0.0	
	26	5 677	1.5	5	163	0.0	8	5 541	1.5	6	1 079	0.3	6	8 314	1.0	4	1 129	0.1	7	7 325	0.9	5	2 924	0.4	9	6 743	0.5	2	3 871	0.3	11	8 642	0.6	5	936	0.1	7
	27	43 483	11.5	3	259	0.1	3	10 893	2.9	5	203	0.1	2	69 181	8.6	3	75	0.0	2	8 996	1.1	3	2 929	0.4	4	117 432	7.9	6	2 115	0.1	2	17 880	1.2	3	434	0.0	1
	28	3 292	0.9	2	107	0.0	1	8 154	2.2	5	1 739	0.5	5	4 267	0.5	2	1 861	0.2	2	10 862	1.4	5	15 925	2.0	4	24 071	1.6	6	22 261	1.5	4	2 708	0.2	1	9 836	0.7	2
	351	4 432	1.2	1	7	0.0	1	0	0.0		0	0.0		1 796	0.2	1	0	0.0		48	0.0	1	0	0.0		2 042	0.1	1	24	0.0	1	0	0.0		0	0.0	
∑		56 885			4 325			41 998			9 211			116 953			4 414			40 584			40 605			168 311			56 448			96 076			12 399		
Low-tech	15	1 620	0.4	3	1 525	0.4	10	2 966	0.8	3	4 653	1.2	17	2 635	0.3	2	3 745	0.5	12	4 146	0.5	2	8 630	1.1	17	10 332	0.7	4	7 959	0.5	17	9 779	0.7	2	6 570	0.4	10
	16	0	0.0		0	0.0		0	0.0		997	0.3	1	0	0.0		0	0.0		0	0.0		1 012	0.1	1	0	0.0		0	0.0		0	0.0		44	0.0	1
	17	3 635	1.0	3	0	0.0		0	0.0		4 217	1.1	7	8 283	1.0	3	1 117	0.1	2	0	0.0		4 793	0.6	5	5 097	0.3	2	4 194	0.3	4	625	0.0	1	4 464	0.3	3
	18	16 858	4.5	4	4	0.0	1	0	0.0		93	0.0	1	21 039	2.6	4	61	0.0	1	0	0.0		42	0.0	1	13 360	0.9	3	1 680	0.1	2	0	0.0		22	0.0	1
	19	6 518	1.7	1	536	0.1	1	0	0.0		925	0.2	1	15 975	2.0	2	0	0.0		0	0.0		2 745	0.3	1	17 237	1.2	1	871	0.1	1	0	0.0		1 504	0.1	1
	20	0	0.0		0	0.0		8 129	2.2	4	259	0.1	2	0	0.0		0	0.0		10 379	1.3	4	3 425	0.4	2	0	0.0		321	0.0	2	8 012	0.5	3	4 689	0.3	1
	21	7 280	1.9	1	180	0.0	1	6 358	1.7	4	955	0.3	1	0	0.0		384	0.0	1	20 537	2.6	3	3 659	0.5	3	0	0.0		1 862	0.1	2	27 389	1.8	4	1 729	0.1	1
	22	0	0.0		68	0.0	2	3 476	0.9	2	311	0.1	3	269	0.0	1	57	0.0	1	5 551	0.7	4	9	0.0	1	0	0.0		190	0.0	2	5 243	0.4	3	25	0.0	2
	36	93	0.0	1	499	0.1	4	6 687	1.8	4	1 206	0.3	4	0	0.0		1 956	0.2	4	31 318	3.9	5	1 537	0.2	4	1 526	0.1	1	6 177	0.4	7	20 735	1.4	5	0	0.0	
∑		36 004			2 812			27 616			13 617			48 201			7 320			71 931			25 852			47 554			23 254			71 783			19 045		

Legend: 1st. segment – successful quality competition; 2nd segment – deficit of competitiveness; 3rd segment – successful price competition; 4th segment – sphere of structural problems; the percentage share: the share of export of particular sections in given segment to total national export.

Source: Own calculations based on data from SO of SR database on foreign trade in manufacturing industry.

The competitiveness of individual sections of the Slovak manufacturing industry broken down according to the OECD classification of branches by technological intensity was divided into four segments based on the market segmentation method.

The commodities produced in sections included in the 1st segment are able to successfully compete with their quality. This segment includes the commodities whose unit export values and export volumes are higher than unit import values and import volumes. This is the target segment for all countries. Within the branches with medium-high technological intensity, which showed comparative advantages according to RCA indicators and adequate specialisation according to Michaely's index, the first segment with a growing share in total national exports (from 14.4% in 1998 to 18.5% in 2008) was the manufacturing of motor vehicles including their engines (from 2003 onwards, also the manufacturing of bodies for motor vehicles, manufacturing of trailers and semitrailers). Within the branches with medium-low technological intensity, a quality-based competition in the metal production sector was achieved in the production of basic iron, steel and of ferrous alloys and production of precious metals and aluminium; as regards the production of metal structures and parts of structures, not including production of machinery and equipment, it was achieved in the manufacturing of builder's carpentry and joinery of metal and manufacture of central heating radiators and boilers (at the same time, national export dropped during the reporting period from 11.5 in 1998 to 7.9% in 2008). Within the branches with low technological intensity, namely textile production and processing and dyeing of furs,

[10] The foreign trade database of the Statistical Office of the Slovak Republic contains complete data on the physical volume of export and import for the monitored commodities of particular sections of Slovak manufacturing industry expressed in kilograms, concerning analysis years 1998 and 2003. The information value of the analysis of competitiveness in 2008 carried out by the market segmentation method may be affected by the fact that the reporting on units of physical volume of particular exports and imports within the INTRASTAT-SK system is not obligatory. In this system, undertakings (reporting units) have a simplified reporting duty (they do not need to report physical volumes of exports and imports) if the aggregate value of goods they dispatched or received is equal or higher than the exemption threshold or lower than the simplification threshold.

[11] The development of the competitiveness of Slovak manufacturing industry was positive and showed an improving tendency. According to the Statistical Office, the share of export of commodities that successfully competed by quality and achieved an active trade balance maintained the level of 43% throughout the reporting period of 2003 to 2008, while that of commodities that successfully competed by price rose from 31% in 1998 to 35% in 2008. The share of exports showing a competitiveness deficit and having a negative trade balance rose from 6% in 1998 to the level of 15% in 2008. In the sphere of structural problems with a trade balance deficit, it declined from 21% in 1998 to 7% in 2008. Based on these data and in comparison with the developed countries of the European Union (where quality competitiveness prevails in exports, price competitiveness is not higher than 15% and the share of export of problematic commodities in competitiveness terms is negligible), the Slovak manufacturing industry achieves a lower competitiveness level despite a positive development trend.

a similar development was observed in the production of work wear, production of other outerwear and of underwear; within the leather industry, it was observed in the production of footwear (whose share in total national exports fell, however, from 4.5% in 1998 to 0.9% in 2008).

The commodities produced in sections placed in the 2nd segment show a competitiveness deficit. This segment includes the commodities whose export unit values are higher than import unit values, but export volumes are lower than import volumes, resulting in a trade deficit. The commodities of this segment lost their price competitiveness on markets where prices are important. Their high prices are due to higher production costs. Within the branches with high technological intensity, a deteriorating performance was observed during the reporting period in the manufacturing of pharmaceuticals, chemical products and plant-based products for medicinal purposes. While in 1998 to 2003, the production of basic substances for the manufacturing of pharmaceuticals competed by price, the competitiveness of the production of pharmaceuticals was declining (with the competitiveness deficit moving to the field of structural problems), and in the period of 2003 to 2008 both of these two subsections were included into the field of structural problems.

In the manufacturing of radio, television and communications equipment and apparatus, the loss of competitiveness by price was recorded in the production of electronic valves and tubes and other electronic components. As a consequence of adverse economic impacts of low manufacturers' prices, structural problems in the sector of medical, precision and optical instruments and the production of watches and clocks grew over into a competitiveness deficit during the reporting period reflected in the loss of price competitiveness in the manufacturing of instruments and appliances for measuring, checking, testing, navigating and other purposes and in the production of clocks and watches. A similar development was observed within the branches with-medium high technological intensity in the production of chemicals and chemical products that had a 2% share in total national exports during the reporting period, especially in the production of industrial gases, other basic organic chemicals, soaps, detergents, cleaning and polishing preparations, cosmetics, glues and gelatines, essential oils, chemical products for photographic purposes and in manufacture of prepared unrecorded media. Identical development was observed also in the manufacture of motor vehicles, trailers and semitrailers, namely as regards the production of parts and accessories for motor vehicles and their engines, which accounted for approximately 3% of total national exports during the reporting period.

The commodities belonging to the sections placed in the 3rd segment achieve successful price competitiveness. This segment, where export unit values are lower

than import unit values and, at the same time, export volumes are higher than import volumes, includes price-competitive price-elastic commodities. Analogically to the first segment, also this third segment ensures a positive trade balance.

As a consequence of the gradual expansion of international manufacturing cooperation in the production of radio, television and communication equipment and apparatus and the acquisition of strategic foreign partners, the relatively unfavourable position within the branches with high technological intensity, the manufacturing of radio and television receivers, audio or video recording or reproducing apparatus, was gradually changing during the reporting period along with the increase of their share in total exports from 0% in 1998 to 13.4% in 2008. Within the branches with medium-high technological intensity, namely the production of machinery and equipment, the sections that maintained their position in the 3rd segment during the reporting period included the production of mining and construction machinery and equipment, electric and non-electric domestic appliances (with an average 3.0% share in total national exports); the manufacture of bearings, gears, gearing and control elements improved its competitive position (moving to the 1st segment). As regards the production of other electric machinery and apparatus n.e.c., the manufacture of electrical equipment for engines and vehicles was competitive by price, and improved competitiveness (price competitiveness) was also recorded in the manufacture of electric motors, generators and transformers and the manufacture of lighting equipment and electric lamps. Within the branches with medium-low technological intensity, the manufacturing of refined petroleum products was predominant. As regards price competitiveness, a mention should be made of the production of metals and metal products, especially metallurgical treatment of pig iron, cold forming, steel tubes production, cold rolled narrow strips. These branches ensured a consistently positive balance in the trade in medium-low technologies. Within the branches with low technological intensity, price competitiveness was achieved in furniture production, especially in exports of chairs, seats, kitchen furniture, other furniture for office and shop premises.

The commodities of sections placed in the 4th segment experience structural problems. This segment includes the commodities with low export unit values that fail in export. The volume of imports of these commodities, even at higher import unit values, exceeds the volume of export, resulting in the trade deficit. The commodities of this segment encounter output barriers. They fall in the area of structural problems and require innovation and modification of production structures. In the Slovak manufacturing industry, this segment included the sections in which the RCA indicators and Michaely's index revealed comparative disadvantages and inadequate specialisation. Structural problems and/or their

milder form represented by the deficit of competitiveness were encountered by most branches with high technological intensity, especially the manufacture of office machinery and computers, manufacture of television and radio transmitters, apparatus for line telephony and telegraphy, manufacture of apparatus for sound or video recording or reproducing, manufacture of medical and surgical equipment and manufacture of optical and photographic equipment.

The production of chemicals and chemical products (except the production of pharmaceuticals), which belongs to the branches with medium-high technological intensity, was placed in the fourth segment because of structural problems, experienced especially in connection with chemical substances not included elsewhere, other basic inorganic chemicals, pesticides, agrochemical products, cosmetics and hygienic products, soaps, detergents, cleaning and polishing preparations, coating substances, varnishes and similar covering preparations. Structural problems affected also the manufacturing of metal structures and metal products, as well as the manufacturing of machinery and equipment, especially the manufacturing of machine tools, other machines for common purposes not included elsewhere, pumps, compressors, lifting and handling equipment, cooling and ventilating equipment, excluding home equipment. Electric and non-electric home appliances successfully competed by price during the whole period, thus earning their place in the third segment. Within the branches with medium-low technological intensity, the competitiveness deficit deepened in the manufacturing of rubber and plastic products down to the level of structural problems, requiring innovation and modification of production structures. This was especially the case of other plastic products such as foils, plastic packaging, hoses and plastic profiles. Within the branches with low technological intensity, namely the production of food and beverages and tobacco processing, structural problems hit most seriously the production and canning of fruit and vegetables, the production of crude oil and fats, the production of refined oils and fats, the production of cocoa, chocolate, sweets, mineral water and the production of soft drinks, as well as the production of tobacco products itself. The sphere of structural problems related also to the production of fabrics, especially woven, knitted and crocheted ones.

4. Discussion

The results of the analysis of the competitiveness of the branch structure of Slovak manufacturing industry could be summarized in the following conclusions:

In general, there is a relatively close interdependency between the commodity structure of competitiveness and structure of the economy, especially industrial

production, on the one hand, and the level of economic development of the country on the other hand. Based on the groups of commodities in which a country is internationally competitive, it is possible to assess the overall economic advancement and level of the country.

The Slovak manufacturing industry is generally competitive on international markets, especially in the traditional types of production characterised by a lower degree of processing, lower value added rate, relatively higher capital and raw-material intensity, as well as in labour-intensive commodities. In general, this applies to the commodities that are relatively homogeneous, highly elastic in price, less demanding for science, research and for education and skill level.

Low competitiveness is found in the Slovak manufacturing industry as regards products with a higher degree of finalisation and sophistication, more demanding for science, research and for a high level of qualification[12] which, as a rule, obtain relatively higher prices per kilogram and have a higher foreign exchange effect. The results of the analysis of the competitiveness of the branch structure of Slovak manufacturing industry reveal that branches with sophisticated production and higher value added are not sufficiently capable of asserting themselves in the face of foreign competition, despite their price advantageousness. The reason is the absence of a long-term process of building consumers' fidelity for certain product brands, often connected with such benefits as quality and guarantee, technical parameters or provision of guarantee service or after-guarantee service, or other benefits. In the present-day situation of overcrowded markets, where a significant part of these markets is controlled by supranational corporations, customers make their choices on the basis of habit, continuity and orientation on well-tested brands with long-term tradition, further intensified by aggressive promotions. Therefore, the entry in an already occupied market requires making considerable price concessions. Another specific aspect that needs to be mentioned in this connection is the origin of products. Producers and exporters from Slovakia face an additional task on the international markets, and not only those of the EU – to eliminate the lack of trust by customers. The simple fact of coming "from the East" is perceived as a synonym of low quality.

[12] The analysis of the branch and commodity aspect of competitiveness of the economy is also the focus of a study of the Institute for Forecasting of the Slovak Academy of Sciences (Outrata, 2008); the results of the study quantified according to the RCA indicator show a higher competitiveness of Slovak manufacturing industry (in contrast to the developed countries of the EU-27) in the commodities with low level of processing and intensity in terms of raw materials, capital and simple work, and a lower competitiveness in the commodities with high demands on scientific and research knowledge and qualified work (Outrata, 2008, pp. 31 − 32). Among the new member states of the European Union, such tendencies exist also in the economies of Estonia and Poland, while the Czech Republic, Hungary and Slovenia achieved relatively more advantageous positions in this field.

Low value-added commodities contribute to the deteriorating trade balance of Slovakia. In addition, the trade balance is further worsened by high import intensity of industrial production which, in the conditions of increased economic growth, provokes negative trade balance. The trade deficit is thus reflected in the inadequate – non-competitive offer of the domestic production translated into higher imports of not only semi-finished products, but also of final products. This structural weakness of competitiveness of the Slovak economy thus significantly contributes to the imbalances emerging in the area of domestic demand and supply, and subsequently to the external economic imbalance. As a result, the openness of the economy is higher than its optimum level. The high openness of the Slovak economy, which can be perceived as a competitive advantage on the one hand, makes the economy sensitive to conjectural fluctuations in the external economic environment on the other hand. If the structure of trade flows is inadequate, such high openness of a country may lead to the losses of national work. Diseffects may occur when the valuation of domestic production factors differs significantly from their valuation abroad. A typical example is the export of commodities based on price competition, which is indeed advantageous for the producer, but only in the short term, since it does not necessarily lead to adequate reproduction of labour and fixed assets.

With a view to improving the quality of export performance of the Slovak Republic, the focus should be placed on those branches that have the potential of maintaining comparative advantages in the longer term while, at the same time, implementing innovation and development of new commodities on the basis of a more efficient utilisation of domestic production resources.

Despite the fact that changes in the branch structure of Slovak manufacturing industry are gradually reflected in the changing structure of foreign trade and its progression towards the commodities that are less intensive for the use of primary raw materials and energy resources, a more marked orientation of Slovak manufacturing industry to exports of lower value-added goods still prevails. These commodities, as mentioned above, are more intensive for the use of imported raw materials and energy resources. The main problem of the Slovak manufacturing industry is the slow introduction of new technology- and knowledge-intensive productions within its individual branches. In the absence of such productions it is not possible to achieve faster improvements in the competition by quality.

Comprehensive improvements in the competitiveness of Slovak manufacturing industry thus call for expanding the model of product family intended for foreign consumption by products capable of yielding higher profits from marketed production.

The competitiveness of Slovak manufacturing industry is based predominantly on price- and cost competitiveness[13] made possible by relatively low labour costs.[14] The number of cases where Slovak industry competes by quality based on technical parameters, renewal of product range and design, provision of post-production services, quality of marketing activities and effective distribution networks is still insufficient.

The Slovak manufacturing industry can establish its presence on foreign markets exclusively through above-standard products; the manufacturing of such products is, however, difficult due to the high wear of the machinery and lack of own replacement and modernisation funds. The solution consists in the foreign participation in Slovak manufacturing companies, which contributes to industrial restructuring, reduction of unemployment and improvement of labour productivity[15]. In this connection, it is necessary to highlight – besides the importance of increasing the volume of such investments – also the structure of investment entering the target country in order to prevent a monoculture development of the country. This direction is manifest in the automotive industry of Slovakia which attracts the interest of several large investors; this is a positive fact but, on the other hand, such development makes Slovakia more sensitive to world markets fluctuations.

[13] The results of segmentation of commodities in SITC classification by REVELAST (Revealed Elasticity) method obtained in another study (Outrata, 2008, pp. 32 − 33) came to the same conclusion, revealing a higher share and number of commodities with price competitiveness than the share of commodities with quality competitiveness. Besides Slovakia, the predominance of price competitiveness in 2002 was the most evident, according to results of this study, in Slovenia, Poland and Estonia, while the Czech Republic displayed a more balanced share.

[14] An important role in the group of indicators of cost competitiveness is played by the comparison of labour costs. According to NBS data (2009, p. 5) Slovakia reported the lowest labour-cost values in industry within the V4 countries in 2000 − 2007. In 2008, Slovakia attained the third place before Hungary and in the beginning of 2009, it got to the second place even before Poland. Since the exchange rate of the Slovak koruna was fixed in 2008 in connection with accession to the euro area in January 2009, and the currencies of the neighbouring states were considerably weakening during the relevant period, this process may be partly ascribed to the accession of the Slovak Republic to the euro area (Hošoff and Hvozdíková, 2009, p. 25).

[15] Foreign-controlled enterprises are engaged especially in the Slovak manufacturing industry; in 2006, they accounted for as much as 62.2% of value added, 43.7% of employment and 64.4% of tangible investments in this field. The predominance of the manufacturing industry in the structure of activities of foreign-controlled enterprises is manifested by the high share of this sector in value added created by these enterprises (59.8%) as well as by total employment in these enterprises (67.8%), while domestic (nationally controlled) enterprises participated in value added with 24.2% and in employment with 33.4%. At the same time, labour productivity (value added per employed person in thousands of euro) in foreign-controlled enterprises in manufacturing industry (according to Eurostat data) attained more than a double of labour productivity of domestic enterprises in this sector. The lagging of domestic enterprises in labour productivity behind foreign-controlled enterprises in the manufacturing industry has a significant impact on their competitiveness (Gabrielová, 2009, pp. 1004 − 1008).

The extent and intensity of the beneficial impact of foreign direct investment on the knowledge base in undertakings with foreign participations in the Slovak manufacturing industry are determined by the type of innovation strategies in the subsidiaries of multinational corporations. If specialisation only focuses on assembly operations of imported components and parts (in most cases with the aim of using the comparative advantage of cheap manpower), including in branches with high technological intensity, improvements of technological abilities are very limited.[16]

Equally problematic is the participation of Slovak companies in the international division of labour, which consists mainly in inward processing activities where all necessary components are imported from abroad, and finished products (assembled in Slovakia) are taken over by the customer company, shifting Slovakia into the position of a cheap European workshop with emphasis on low labour costs and traditional industrial skills.

The position of Slovak manufacturing industry has deteriorated in those commodities where Slovak exports are confronted with the output of newly industrialised countries (predominantly textiles), as well as of monoculture countries (food, beverages, tobacco). In these areas, there is a significant tendency to reducing the volume of trading in those commodities in Slovakia.

[16] The results of a questionnaire survey among the largest Slovak investors carried out by Ferenčíková and Fifeková (2008, pp. 860 − 871) reveal several facts. For the most part, the subsidiaries of foreign investors represent manufacturing bases or centres of supporting services. They make minimum investment in research and development. Despite the fact that these subsidiaries use the same technology as their parent companies, only one fifth of them acknowledged the ownership of a certain specific intangible asset. Other companies perceive their competitive advantage basically as the relationship between quality and price, indicating a low level of technology transfers as a prerequisite for spillovers effects. The extent of vertical effects through backward or forward linkages and the extent of horizontal spillovers effects is also limited. Foreign companies use Slovak suppliers less than they could. Although they are more demanding as regards the supplies and allow suppliers to increase their economies of scale, their contribution is limited. Vertical spillovers effects therefore result primarily from the pressure for improvement of supplied inputs exerted by a foreign customer on the domestic supplier. The potential for vertical spillovers effects through forward linkages is low as well due to the lack of exclusive relations and a more significant cooperation between Slovak customers and foreign suppliers. Although horizontal spillover effects are partially present in the Slovak economy, they are mostly the result of considerable competitive pressure on the part of foreign investors or successful acquisition of human capital trained in foreign companies. The potential for horizontal spillovers effect is limited because of the low presence of Slovak competitors and the low level of cooperation. The level of effects differs depending on the investor's country of origin, export orientation, sector of activity, and partly on the form of investor's entry. The increase in the likelihood of occurrence of positive spillovers effects depends on the ability of economic policy instruments and measures to influence the branch structure of investments, the qualitative level of activities shifted to the host country, the investor's decision on the location of investment, and on the choice of domestic suppliers. Economic policy measures should also focus on increasing the share of domestic value added in the production of subsidiaries and on the support of domestic suppliers and thus on strengthening the links between domestic enterprises and foreign investors.

In the context of the transition towards a knowledge-based economy, there is an expansion at the macro level[17] of corporate services that place high demand on knowledge; this expansion leads to the "tertiarisation" of the manufacturing industry, i.e. to the increasing significance of the service component in the manufacturing industry[18] (Gabrielová, 2008, p. 12).

The increased intensity of research and development and of information technologies in company processes, separation of technologies from the production, and network organisation are important for introducing necessary structural changes to the Slovak manufacturing industry.

Until now, the decisive factor in the manufacturing of industrial products has been the use of material components and raw materials; more recently, however, the phenomenon of the use of key strategic raw materials (energy and especially water) comes to the fore. From this point of view, the cost of water consumption in the production is becoming an important technological element for rating the successfulness of manufactured products.[19]

The competitiveness of the Slovak manufacturing industry and its structure is a reflection of the branch and product structure of the manufacturing industry which, in spite of gradual improvements, still lags behind that of economically developed countries of the European Union.[20] The reasons for this lagging behind are the slower growth of real labour productivity based on technological

17 At the micro level, there is an increasing trend towards the separation of technologies from production activities and towards the development of the network type of organisation. The separation of production from technologies is provoked by the growing number of production locations and by the expanding opportunities to obtain technologies from various national and regional clusters.

18 Trend of provision of services along with products manufactured is noticeable especially in machinery industry and especially in automotive one (Nemcová, 2003, p. 1187).

19 One of most important phenomena of technological change is a necessity to respect new international technological standards set by not only standards such as REACH (REACH means integrated control of soil-, water and air pollution including ecological certification of all types of components used in technological manufacture), but especially by emission standards stipulating total volume of emissions allowed for particular industrial branches and therefore allowed for manufacture of certain type of production. A reduction of unit volume of CO_2 emissions means, at the same time, not only the improvement of quality parameters of products, but also the significant reduction of cost rate. From this point of view, excessive consumption of CO_2 producers means a considerable burden of production produced currently, as well as in future, and thus, it is necessary to change own technology of production of manufactured products and provided services, as well as materials, which are used for particular types of products to the extent they are produced (Staněk, 2008, pp. 10 − 11).

20 According to the study (Dujava, 2010, pp. 29 − 30) the structural gap between SR and EU-15 became larger during the period in question (1995 − 2008) based on results of indicator of structural deviation according to gross value added. While in 1995, the indicator of structural deviation amounted to *s95 = 4.74*, it has increased up to 2008 to *s08 = 5.68*. At the same time, quantitative analysis confirmed that enlarging of structural gap was the result of development in manufacturing industry, in addition to development in real-estate industry, renting and trading, in wholesale and retail trade.

and product innovation, continued low expenditures on research and development, and a long-term isolation from world market developments. This lagging behind can be overcome only through the intensive development of factors[21] that are considered to be critical for increasing and preserving competitiveness in the developed countries.

Conclusion

The development of the Slovak manufacturing industry takes place along the lines of gradually reducing structural gaps that had adversely affected its competitiveness. The manufacturing industry in Slovakia is characterised by the prevailing labour-, raw material- and capital- intensive production, mostly intended for intermediate and short-term personal consumption. Conversely, the production intensive for research and development, intended for capital investment, consumer durables and production cooperation, still has a lower weight. The existing structure is highly demanding in terms of imports and the environment, has a low value added rate, a low foreign exchange effect, and a very narrow space for the use of skilled labour in production processes and in the sphere of research and development.

As regards the level of competitiveness, the analysis has indicated that the Slovak manufacturing industry is characterised by the prevalence of price competitiveness which, however, is only successful in semi-finished products and in labour- and capital-intensive goods. As for capital goods and consumer durables or commodities with high demands on research and development expenditures, price elasticity fails to rate positively on the demanding markets.

It thus seems that in order to achieve a positive impact on the trade balance, the production of the above commodities must undergo substantial technological modernisation leading to reduced production costs and enabling product innovation. Moreover, it is necessary to ensure the development potential in those branches of the Slovak industry that are using local raw materials, and to involve the companies in international cooperation making use of the advantageous geographical situation of the country and of the space for the inflow of foreign direct investments.

[21] Sustainable development of industry is dependent on new environmental and social requirements, especially on increased demands on qualification of manpower and its long-life education in accordance with these new requirements. The transition to knowledge-based economy is not possible without competitive system of research and development. Actual, predominantly linear approach to research and development should be replaced by simultaneous activities in all fields depending on requirements of global demand. Fulfillment of requirements is possible provided that thinking is not limited by one possible perspective, based on narrow, highly specialized approaches, but a multiperspective approach is applied (Nemcová, 2006, p. 7).

The success of the Slovak manufacturing industry is thus conditional on active generation of new comparative advantages in the form of high qualification level for the sphere of modern technologies, in a considerable increase in expenditures on research and development, and in the building of infrastructure. These are the basic prerequisites for the generation of long-term growth factors. However, no benefits can be expected without continuous improvements in the institutional framework or without balanced incentives for the inflow of foreign direct investment.

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