

# STRUCTURAL CHANGES IN GROSS VALUE ADDED AND THEIR RELATION TO THE ECONOMIC GROWTH OF BULGARIA IN THE PERIOD 1997-2017

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**Abstract:** *The changes in the sectoral composition of the economy reflect many processes and are an accurate indicator of the nature and rate of economic development of the state. What is more, sectoral structure is important for the analysis of economic development rate and the patterns and the increase in the productivity of all economic activities.*

*Sectoral changes are important due to their role in the production process and the different labour productivity of different economic sectors and activities. Hence, the assessment and the use of the opportunities for accelerated development of the different sectors can contribute significantly to the economic growth and the increase of labour productivity.*

**Key words:** *structural changes, gross value added, economic growth.*

**JEL:** O11, O41.

## Introduction

The analysis of structural changes in the economy facilitates solving a number of practical issues, since the sectoral structure of production is closely related to economic efficiency and development.

Therefore, gross value added (GVA)<sup>1</sup> by major economic sectors is examined to monitor structural changes in the economy. In this way, the extent

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<sup>1</sup> GVA is one of the major macroeconomic indicators that can be used when characterising the economic development of individual sectors and of the state as a whole. It is a measure of the contributions that individual sectors make to GDP and represents the difference between the value of goods and services produced in a given period (gross output) and the value of the goods and services consumed (intermediate consumption).

to which they can resist crises, their export potential and opportunities for stimulating economic growth can be taken into account.

**The aim** of this article is to outline and analyze the changes in the sectoral structure of the economy in the period from 1997 to 2017 by employing adequate statistical and econometric tools, and to identify the relation between a specific structure and the economic growth of the country. In this way, the following **tasks** can be solved: identifying the sources of any effect of the above-mentioned changes; measuring the degree of structural changes that took place in different periods of time, which will enable us to outline major trends in the restructuring of Gross Value Added (GVA) during the reviewed period.

### **Changes in the Sectoral Structure of Bulgarian Economy**

The process of improving the structure of an economy is continuous and depends on changes in certain objective conditions, market requirements, and society needs and potential. In order to make the process effective and the proportions optimal at national, regional or other levels, it is necessary to study the internal structure of the economy while approaching it as a combination of sectors and activities that are interrelated. That is why, the relative shares of economic sectors and activities in the total GVA are taken into account. They indicate the sector that contributed most to the overall increase in production.

In the process of studying the structural changes in the gross value added, data from NSI sources have been used, as well as individual and summative measures of structural changes and differences. Using these indicators makes it possible to identify the years in which significant changes in the structure of the GVA by sectors occurred.

Changes in the growth rate of the service sector in comparison to the other sectors have been used as a criterion for differentiating between the stages of development of Bulgarian economy, and the indicator employed is the coefficient of the ratio in terms of the share of the sectors in the gross value added.<sup>2</sup>

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<sup>2</sup> The coefficient can be calculated as a ratio between the relative share of GVA in the service sector and the sum of the relative shares of the agricultural and the industrial sector.

*Table 1*  
*Dynamics in the coefficient of Bulgarian economy*

<b>Year</b>	<b>Coefficient</b>
1997	0.848
1998	0.988
1999	1.212
2000	1.273
2001	1.326
2002	1.445
2003	1.451
2004	1.488
2005	1.577
2006	1.500
2007	1.597
2008	1.646
2009	1.782
2010	1.722
2011	1.895
2012	1.927
2013	2.038
2014	2.087
2015	2.062
2016	2.084
2017	2.064

*Source: Calculation made by the author based on data provided by the NSI.*

When the value of the coefficient is greater than two, it indicates that the service sector is highly-developed; values between one and two indicate an average rate of development and when the value of the coefficient is below one it indicates a low level of development. At the beginning of the analysed period, the values of the coefficient were below one. In the period from 1999 to 2012, they were between 1 and 2, i.e. the service sector registered an average rate of development. The coefficient then rose steadily and after 2013 its value ex-

ceeded 2 and the the service sector occupied a predominant share in the formation of gross value added.

The value added created in 2017 by all entities of the national economy amounted to BGN 85,413 million. The service sector had the largest relative share in the GVA with a share of (67.4%), followed by the industry (28.3%) and the agriculture (4.3%).

The reported value added in the agricultural sector in 2017 was BGN 3,693 million. In the period from 1997 to 2017 its relative share in the formation of value added decreased steadily. In 1997, its share amounted to 26.2%, then fell by 7.4% in 1998 and by another 7.8 percentage points in the period from 1999 to 2004. In 2017 the share of agriculture in GVA was 4.3%, which was still high compared to EU countries and the USA, where it was less than 3%.

There are many limitations to the development of agriculture in Bulgaria such as fragmented ownership, issues related to EU funds and programs, etc. Moreover, the reduced share of agriculture in gross value added was mainly due to the slow and unsteady growth of the sector, which resulted from the slow restructuring process. There was a significant decline in the relative share of agriculture in GVA. During the reviewed period, its share fell by more than 20 per cent - from 26.2% in 1997 to 4.3% in 2017.

The relative share of industry in the formation of gross value added in the economy increased by only 0.4% over the period - from 27.9 in 1997 to 28.3% in 2017. This was not the case with the service sector, which had more than 67% of the value added generated in the economy. This growth resulted from activities that were essential not only to the service sector, but to the national economy in general. These were transportation, communications, trade, finance, credit and insurance, financial and business services. The relative share of the gross value added generated by the activities in the services sector was more than 67%, an increase of more than 20% compared to the value of the indicator in 1997.

Over the researched period, the industry did not significantly change its relative share of gross value added, in contrast to the service sector and agriculture. The declining share of agriculture was accompanied by an increase in the share of the service sector. Those changes also resulted in a continuous increase of the value of the Integrated Coefficient of Structural Changes (ICSC), which increased nearly three times over the period.

To make a comparison, we next present changes in the structure of gross value added of two other economies – the USA and China. In the first one, the share of agriculture was less than 3%, while the share of the service sector amounted to nearly 80%; in Chinese economy, the share of agriculture fluctuated between 10% and 15%, and that of the service sector was less than 50%. Bulgarian economy ranked somewhere in between.

Table 2. Sectoral structure of the economy as a percentage and the Integrated Coefficient of Structural Changes in Bulgaria in the period from 1997 to 2017.

Sectors of economy	Y E A R S																				
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
1. Agriculture	26.2	18.8	16.3	13.9	1.4	12.2	11.7	11.0	9.4	8.6	6.2	7.3	5.6	4.9	5.3	5.3	5.3	5.3	4.8	4.4	4.3
2. Industry	27.9	31.5	28.9	30.1	29.6	28.7	29.1	29.2	29.4	31.4	32.3	31.4	30.3	29.5	29.3	28.9	27.6	27.1	27.9	28.0	28.3
3. Services	45.9	49.7	54.8	56.0	57.0	59.1	59.2	59.8	61.2	60.0	61.5	61.3	64.1	65.6	65.4	65.8	67.1	67.6	67.3	67.6	67.4
Total GVA:	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
ICSC $K_s$	***	0.11	0.16	0.19	0.20	0.22	0.23	0.24	0.25	0.26	0.29	0.27	0.30	0.31	0.306	0.308	0.316	0.319	0.321	0.325	0.325

Source: Calculations based on data provided by the NSI.

\*The Integrated Coefficient of Structural Changes (ICSC)  $K_s$  was calculated by the formula proposed by Gatev, K., Methods for Analysis of Structures and Structural Effects, 'Stopanstvo' University Publishing House, Sofia, 2007, p. 48.

Table 3  
Sectoral structure of the US economy (as a %)

Sectors	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2016	2017
Agriculture	2	2	2	2	1.4	1.2	1	0.9	1.2	1	1.2	1.2	1.1	0.9
Industry	18	18	18	18	26.1	23.2	20.3	20.9	19.8	20.4	22.1	22.1	19.4	18.9
Services	80	80	80	80	72.5	75.6	78.7	78.2	79	78.6	76.7	76.7	79.5	80.2
ICSC	-	0	0	0	0.098	0.0602	0.024	0.031	0.019	0.026	0.0465	0.0465	0.015	0.0123

Source: Statisticheski godishnik 2007, p. 138; Statisticheski spravochnik 2008, p. 213; Eurostat yearbook 2008, p. 104; <https://www.cia.gov/library/publications/the-world-factbook/geos/us.html> and author's calculations.

Table4  
Sectoral structure of Chinese economy (as a %)

Sectors	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2016	2017
Agriculture	15	15	15,2	14,5	14,8	13,6	12,5	11,9	11	10,6	9,6	10,1	8,6	8,3
Industry	35	50	51,2	51,7	52,9	50,1	47,2	48,1	49,5	49,2	46,8	46,8	40,7	39,5
Services	50	35	33,6	33,8	32,3	36,3	40,3	40	39,5	40,2	43,6	43,1	50,7	52,2
ICSC	-	0,239	0,259	0,261	0,281	0,229	0,177	0,187	0,204	0,198	0,1604	0,1613	0,0947	0,0918

Source: Statisticheski godishnik 2007, p. 138; Statisticheski spravocnik 2008, p. 213; Eurostat yearbook 2008, p. 104; <https://www.cia.gov/library/publications/the-world-factbook/geos/us.html> and calculations by the author.

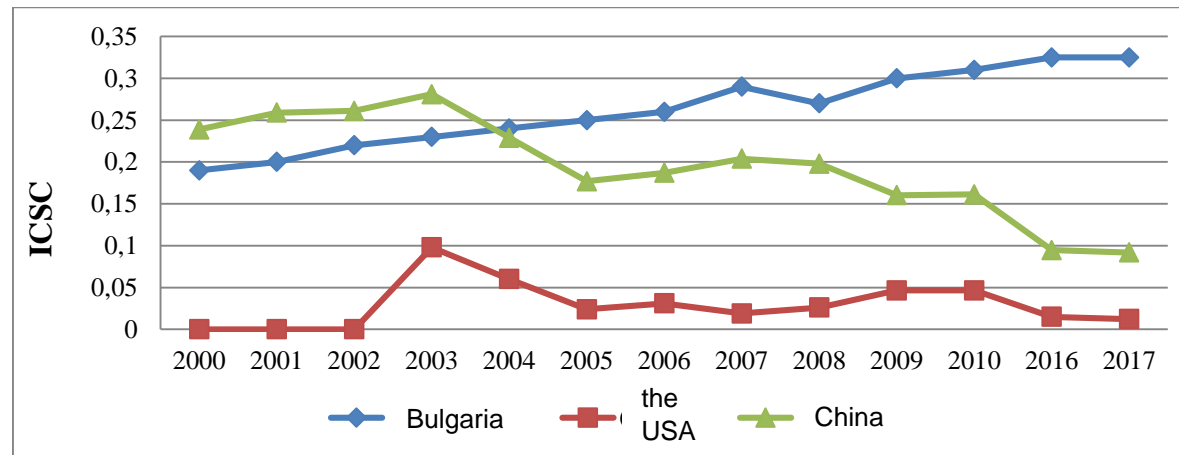


Figure 1. The Integrated Coefficient of Structural Changes (ICSC) of the three economies, illustrating the structural changes in them

Those tables and Figure 1 indicate that Bulgarian economy has undergone greater structural changes, the values of the ICSC being the highest and growing steadily. Chinese economy ranks second with lower values of the coefficient which have been declining further in recent years. Structural changes in the economy of the USA have been less marked and in some years no changes were registered at all.

These findings indicate that the current state in the development of the service sector in the United States is the result of changes which took place long before the reviewed period and the structure of the economy has now stabilized around these values. In Bulgarian economy, the service sector had the largest share at the beginning of the researched period and the structure of the economy has been adapting gradually to such a proportion. Changes in Bulgarian economy therefore tend to be more dynamic and are still taking place. As for Chinese economy, it differs from most of the world economies, as the share of the service sector is still lower, and has only recently exceeded the share of the industry.

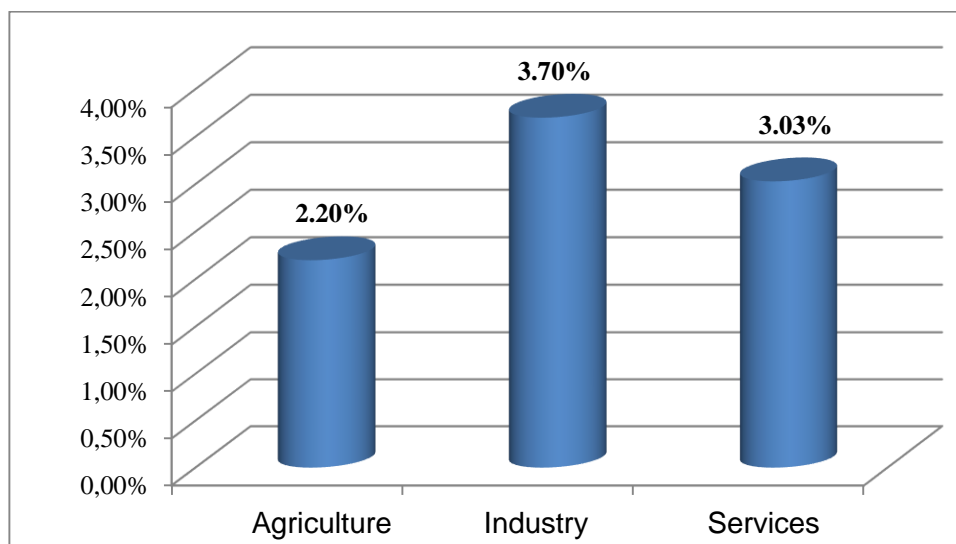
The dynamic changes in Bulgarian economy are studied in greater detail by examining GVA growth rates over several consecutive years.

*Table 5*

*GVA growth rate by economic sectors compared to the previous year*

<b>Year</b>	<b>Agriculture</b>	<b>Industry</b>	<b>Services</b>
<b>1997</b>	35.3	-12.7	-16.9
<b>1998</b>	1.2	11.9	-1.8
<b>1999</b>	5.5	-6.8	5.9
<b>2000</b>	-10.3	11.1	6.4
<b>2001</b>	0.3	4.1	4.7
<b>2002</b>	4.7	4.7	5.9
<b>2003</b>	-2.3	5.7	4.7
<b>2004</b>	2.3	4.1	5.7
<b>2005</b>	-9.5	4.7	8.3
<b>2006</b>	-1.0	7.8	7.1
<b>2007</b>	-29.7	14.0	7.5
<b>2008</b>	29.6	2.7	-0.4
<b>2009</b>	-3.5	-8.0	0.5
<b>2010</b>	3.9	1.6	-1.1
<b>2011</b>	19.3	16.2	4.8
<b>2012</b>	0.8	-0.85	1.1
<b>2013</b>	0.9	-4.83	1.5
<b>2014</b>	1.13	0.95	3.4
<b>2015</b>	-4.05	8.27	5.01
<b>2016</b>	-3.94	4.98	4.8
<b>2017</b>	4.9	7.96	6.5

*Source: Calculations made by the author based on data from [www.stat.bg](http://www.stat.bg) and the NSI.*



*Figure 2. Average GVA growth rate in the three sectors during the period from 1997 to 2017  
(Calculations based on available data by employing the arithmetic mean rate of change.)*

The dynamics in the development of the three economic sectors was different and this affected the structural changes in the economy. The difference in the development of three sectors was not significant yet, the industry and the service sectors registered a higher growth since more investments were made in them, the number of companies operating in the service sector was much higher, and the situation on the global market was relatively favourable during the period, except for the years of the crisis.

*Table 6  
Dynamics in the development of the sectors in Bulgaria, average annual growth rate of GVA, %*

GVA	1997-2000	2000-2003	2003-2006	2006-2009	2009-2012	2012-2015	2015-2017	1997-2017
<b>Agriculture</b>	-12.3	-2.2	-3.1	-3.0	-0.3	-0.5	-0.5	-21.9
<b>Industry</b>	+2.2	-1.0	+2.3	-1.1	-1.4	-1.0	+0.4	+0.4
<b>Services</b>	+10.1	+3.2	+0.8	+4.1	+1.7	+1.5	+0.1	+21.5

*Source: Calculations made by the author*

Changes in the structure of the economy were mainly due to differences in the rate of decline and less so to the rate of growth in some sectors. Having



the sectors of the economy restructured basically implied changes in economic ratios and priorities. The key factors for those changes were changes in the lifestyle, in the number of the population, new production and consumption demands, etc. In result, resources were transferred to the service sector, which is less dependent on exports, as most of services are provided locally.

The lagging modernization and diversification of production, which remained analogous to cheaper foreign products, seriously impeded the expansion of Bulgarian export, and hence, the better development of the industry. The range of the commodities that were sold abroad did not create prerequisites for expanding or diversifying Bulgarian production and export, although it indirectly encouraged companies to improve and modernize their production. (For further information on the dependencies between economic growth and the negative impact which the structure of the economy had on the foreign trade of the country, see: Statev, St., *Finansovo razvitie i ikonomicheski rastezh – patyat na Balgariya: 1991-2006*, S., UI 'Stopanstvo' 2009, pp. 170-172).

Increased labour productivity and new technologies make it possible to put in less labour in the production of goods and more labour in the provision of services both for personal consumption and for production. The provision of services enables people to manage their lives better, to have more leisure available and to use it more effectively. In addition, the service sector contributes to improving the performance of industry and agriculture by catering to labour-intensive activities which are not typical to those sectors.

The structure of Bulgarian economy is becoming similar to that of the economies in developed countries, where the share of agriculture is less than 3%; that of industry - about 30%, and the share of the service sector exceeds 65%.

Improvements in the structure of the economy are determined by the need to balance between and develop comprehensively individual activities. In order to analyse structural changes and their dynamics, we also need to take into account the dynamics in the structure of gross value added; the stability of and the equilibrium in the sectoral structure, as well as the findings of a comparative analysis of the dynamics in structural changes of the GVA by employing the average annual rates of its growth. Other useful indicators about the changes that took place during the researched period are those measuring structural changes in gross value added.

### **Indicators Measuring Structural Changes in Bulgarian Economy**

The first indicator is the coefficient of unevenness of the structure. As Figure 3 illustrates, the structure of Bulgarian economy has become increasingly uneven due to the high concentration of activities in the service sector and the declining shares of the other sectors.

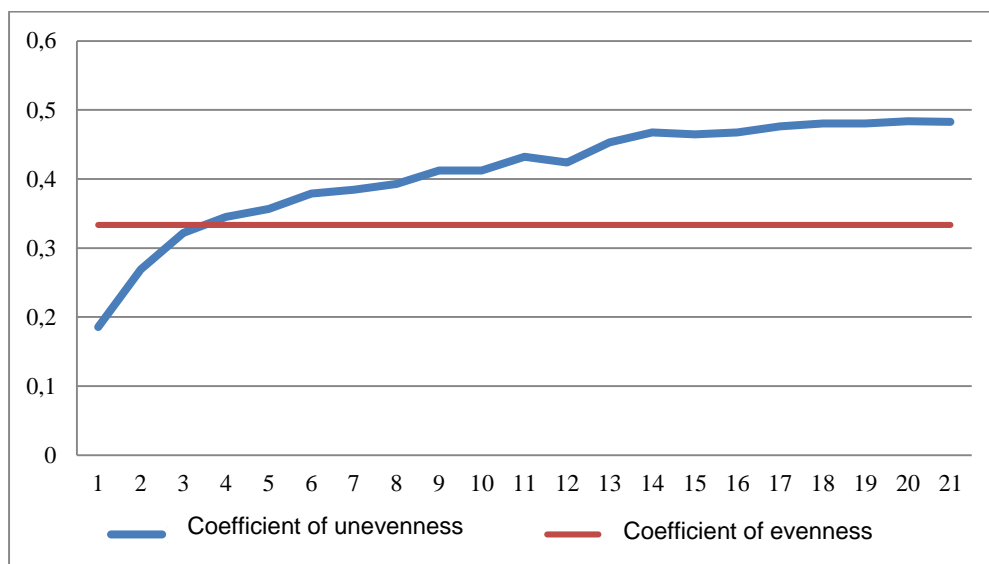


Figure 3. Coefficient of structural unevenness  
*Calculations made by the formula, proposed by Gatev (Gatev, K., 2007, p.81)*

The structure of the national economy was more or less even till 1999 and 2000, yet, that was not its optimum. The structure of the national economy became increasingly uneven after that. We should note though that structural changes can occur even when no changes in the degree of unevenness are registered.

In addition to this indicator, the indicators presented in Table 7 may also be employed to research the structure of Bulgarian economy.

Moreover, the rate of structural transformation can be represented as a ration between the weight (or the index) of structural change and the time period in question. The weight of structural change is presented as the difference between the share of the structural indicator in the current period and the share of the same indicator in the base period (Suharev, 2013, p. 57).

The results of these indicators make it possible to draw the following conclusions: the ratios between the values of the individual aggregate measures indicate that there was a significant increase in structural dynamics at the end of the researched period in contrast to the beginning of the period. When using the index of differences, the linear coefficient of absolute structural changes, the unweighted quadratic coefficient of absolute structural changes, the unweighted linear coefficient of relative structural changes, the Euclidean distance and the aggregate indicator of structural changes, estimated increase is 0.38 times. When using the relative structure index and the unweighted linear coefficient of relative structural changes, estimated increase is 0.63 times; and when using all the other aggregate measures, the change in structural dynamics is in the range from 0.44 to 0.47 times compared to the beginning of the researched period.

Table 7

Values of the aggregate indicators of structural changes

(About the methodology for calculating the indicators, see: Yankova, N., Statisticheskio izsledvane na strukturni izmeneniya, akademichno izdatelstvo "Marin Drinov", Sofia, 2007, pp. 23 and 65)

Relative share of individual sectors				I N D I C A T O R S <sup>3</sup>									
Year	Agriculture	Industry	Services	1 <sup>4</sup>	2 <sup>5</sup>	3 <sup>6</sup>	4 <sup>7</sup>	5 <sup>8</sup>	6 <sup>9</sup>	7 <sup>10</sup>	8 <sup>11</sup>	9 <sup>12</sup>	10 <sup>13</sup>
1997	26.2	27.9	45.9	-	-	-	-	-	-	-	-	-	0.06777
1998	18.8	31.5	49.7	14.8	0.4943	4.9333	0.1648	5.23323	49.5892	1.6939	9.0642	6,4094	0.06648
1999	16.3	28.9	54.8	10.2	0.3181	3.4	0.1060	3.60648	40.2882	1.0346	6.2466	4,4170	0.10429
2000	13.9	30.1	56.0	4.8	0.2107	1.6	0.0702	1.69706	14.6430	0.6553	2.9394	2,0785	0.12583
2001	13.4	29.6	57.0	2.0	0.0704	0.6667	0.0235	0.70711	8.1854	0.2101	1.2247	0,8660	0.13520
2002	12.2	28.7	59.1	4.2	0.1568	1.4	0.0523	1.48966	17.1651	0.4606	2.5807	1,8248	0.15758
2003	11.7	29.1	59.2	1.0	0.0566	0.3333	0.0189	0.37417	2.8693	0.3216	0.6481	0,4583	0.16203
2004	11.0	29.2	59.8	1.4	0.0734	0.4667	0.0245	0.53541	5.2284	0.2128	0.9274	0,6557	0.17193
2005	9.4	29.4	61.2	3.2	0.1757	1.0667	0.0586	1.23288	12.1052	0.5166	2.1354	1,5100	0.19656
2006	8.6	31.4	60.0	4.0	0.1727	1.3333	0.0576	1.42361	14.5514	0.4771	2.4658	1,7436	0.19788

<sup>3</sup> Source: calculations made by the author

<sup>4</sup> 1 The index of differences – calculated in comparison with the previous year

<sup>5</sup> 2 The index of relative structure - – calculated in comparison with the previous year

<sup>6</sup> 3 Linear coefficient of absolute structural changes

<sup>7</sup> 4 Linear coefficient of relative structural changes - unweighted

<sup>8</sup> 5 Quadratic coefficient of absolute structural changes - unweighted

<sup>9</sup> 6 Quadratic coefficient of absolute structural changes – weighted

<sup>10</sup> 7 Quadratic coefficient of relative structural changes

<sup>11</sup> 8 Euclidean distance

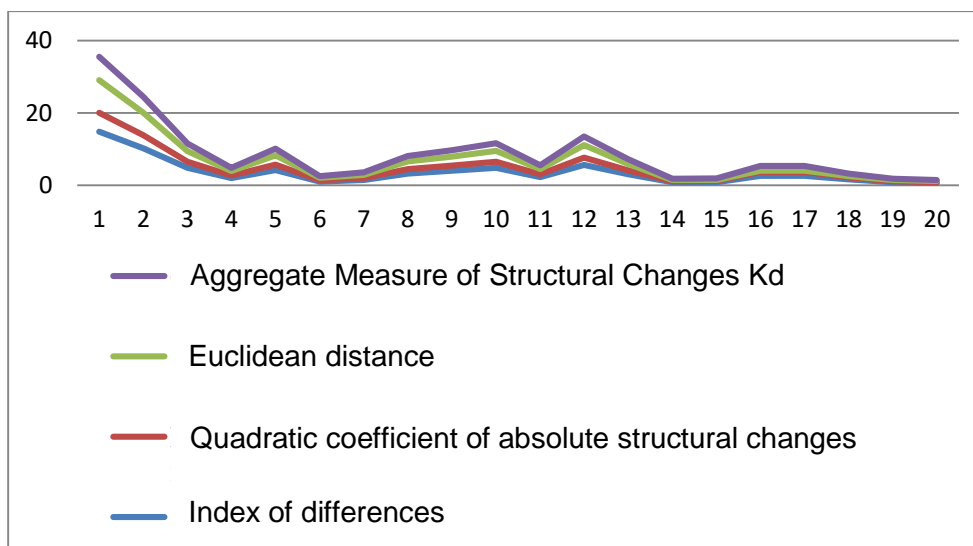
<sup>12</sup> 9 Aggregate measure of structural changes Kd

<sup>13</sup> 10 Entropy coefficient of unevenness E<sub>R</sub>

2007	6.2	32.3	61.5	4.8	0.3327	1.6	0.1109	1.71464	14.4903	0.8562	2.9698	2,1000	0.23868
2008	7.3	31.4	61.3	2.2	0.2085	0.7333	0.0695	0.82865	6.0104	0.4700	1.4353	1,0149	0.22194
2009	5.6	30.3	64.1	5.6	0.3136	1.8667	0.1045	1.99499	23.2311	0.7499	3.4554	2,4434	0.27663
2010	4.9	29.5	65.6	3.0	0.1748	1.00	0.0583	1.0614	12.898	0.3791	1.8385	1,3	0.28594
2011	5.3	29.3	65.4	0.8	0.0914	0.267	0.0102	0.2828	2.1420	0.1861	0.4899	0,3464	0.34808
2012	5.3	28.9	65.8	0.8	0.0198	0.267	0.0022	0.3266	3.8926	0.0889	0.5657	0,4	0.34838
2013	5.3	27.6	67.1	2.6	0.0647	0.867	0.0072	1.0614	12.6508	0.2901	1.8385	1,3	0.34939
2014	5.3	27.1	67.6	2.6	0.0665	0.867	0.0028	1.0614	12.6508	0.1131	1.8385	1,3	0.34979
2015	4.8	27.9	67.3	1.6	0.1283	0.533	0.0143	0.5715	4.9752	0.2685	0.9899	0,7	0.35032
2016	4.4	28.0	67.6	0.8	0.0914	0.267	0.0102	0.2944	2.6653	0.1872	0.5099	0,3606	0.35122
2017	4.3	28.3	67.4	0.6	0.0364	0.2	0.0040	0.2160	2.2952	0.0780	0.3742	0,2646	0.35123

When studying changes in the structural dynamics for two different years, we can employ most of the indicators in Table 7, as they give similar results. The index of relative structure index and the unweighted linear coefficient of relative structural changes are less reliable since employing them will give values higher than the real ones. This issue has been discussed in detail by Kazinets, A. S., *Izmereniye strukturnykh sdvigov v ekonomike*, M., 1969, p. 112.

The most reliable values are those obtained through the quadratic coefficients of the absolute and relative structural changes.



*Figure 4. Dynamics of the values of some aggregate measures of structural changes in the GVA of Bulgarian economy.*

The graphical presentation of the dynamics of some aggregate indicators of structural changes based on data from year 1997 shows that trends in their development was similar.

The specific values of the Entropy coefficient calculated over the years indicated that the structure of the economy was began to follow a sustainable and harmonious growth rate, as the coefficient increased from 0.07 at the beginning of the period to 0.35 at the end of the period.

Structural changes measured through the Euclidean distance show that the structure of the economy in different years was steadily becoming different from the structure of the economy in 1997 which is employed as a base structure in the analysis.

Structural changes in GVA are similar to structural changes in the number of people in employment. Figure 5 presents data about the integral coefficient of those structural changes, the structure of the economy in 1997

being used as a base structure. Obviously, both coefficients followed an upward trend in their development, yet the GVA coefficient grew faster than the integral coefficient of structural changes in the number of people in employment.

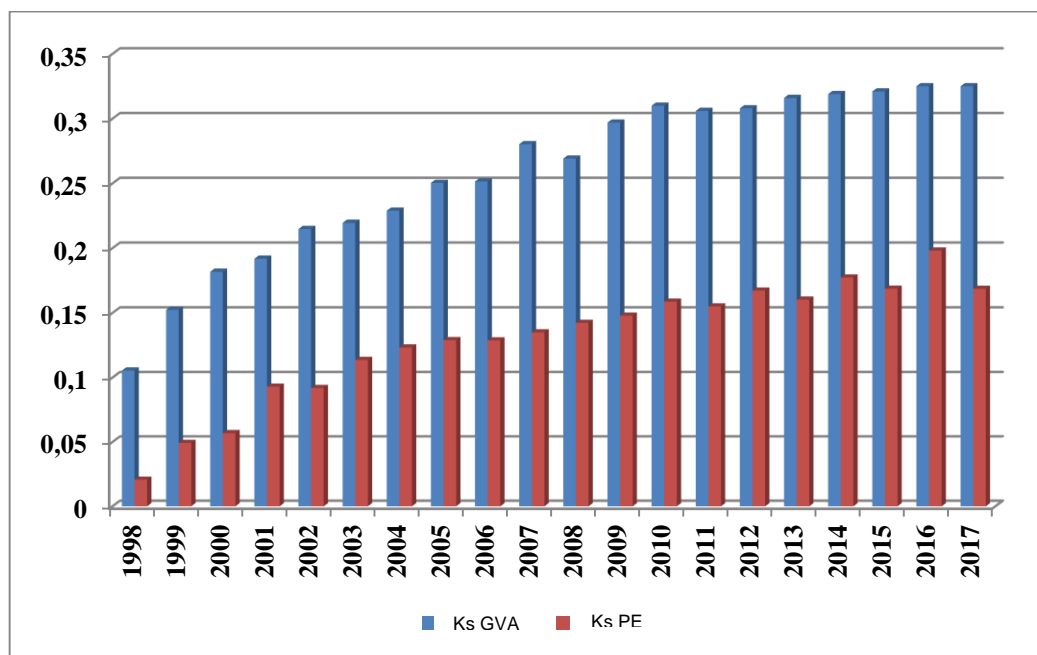


Figure 5. A comparison between the integral coefficients of structural changes in GVA and the number of people in employment (PE) during the researched period.

The analysis of data about the structure of the economy indicate the transformation of the economy was accompanied by intensive growth in the service sector. That sector became the main source of GDP growth, and hence GVA, over the researched period. The volume of resources allocated to the sector increased, which has been the trend on a global scale, too, as there is significant potential for developing and expanding the activities in the service sector.

The dominance of the service sector is mainly due to two major types of factors: methodological and economic ones. The former refer to the change in the classification of activities by the NSI.<sup>14</sup> Introduced changes in the classification of activities altered the structure of the economy and the service sector

<sup>14</sup> According to the classification used by the NSI, commerce, transportation and communications belonged to the industry sector before 1997. They later began to be classified as activities belonging to the service sector, hence the service sector expanded as those are key activities with a large relative share, which resulted in the growing share of the service sector in the formation of GDP.

became the dominant one. Nevertheless, it was the impact of economic factors that was decisive. Those included the decline of manufacturing which resulted from the loss of traditional markets and deteriorating international markets that affected Bulgarian export-oriented branches of the economy. Consequently, a substantial share of investments and labour resources were reallocated from industry to the service sector.

The changes that were thus introduced in the structure of Bulgarian economy can hardly be defined as real restructuring, since they resulted from the declining output of industry and agriculture. Those changes were due to the inefficiency of the two sectors, i.e. they were an instance of negative structural adjustment. The inefficient performance of the production structure had a negative impact on labour productivity in the long run.

Substantial differences in the productivity of the different sectors of the economy indicate inefficient allocation of resources, which is reflected by the low overall productivity of factors. This is typical for developing countries. On the other hand, such inefficiency of the allocation of resources can promote economic growth. Having some of the factors of production reallocated from poorly performing sectors to sectors whose productivity is high can encourage growth even when the internal productivity of those sectors remains unchanged. Such growth is mainly promoted by structural changes and is an important prerequisite for future economic development (McMillan, M., Rodrik, D., 2011, p. 49).

The biggest issue for Bulgarian economy has been the "leak" of value added. For a small open economy like ours, the "leak" of value added is a natural process, since the potential of the economy is largely fulfilled through foreign trade and the lack of facilities for modern production stimulates the export of products that are at the initial stages of the value added chain. Globalisation processes, which promote the export of value added, had a negative impact on Bulgarian economy. The lack of barriers to the free movement of goods and services resulted in having price levels in Bulgaria rapidly reach the price level in countries with totally different income levels, the convergence of prices thus resulting in the real impoverishment of Bulgarian households. Globalization of labour markets proved to be an issue whose consequences were even worse, since the lack of a sound government policy in terms of the highly qualified workforce in the country results in the migration of that workforce and zero return on the investments made in education and training.

The export of value added is thus due to the unfavorable sectoral structure of Bulgarian economy. It also undermines the foundations of the national economy and reduces its potential for long-term development.

Changes in the sectoral structure of the economy result from a number of processes and are a reliable indicator of the type and rate of economic growth. What is more, the sectoral structure of an economy is essential when analyzing economic development rates and ratios and is crucial for improving the performance of different economic activities.

## Structural Changes and the Economic Growth of the Country

In the short run, it is exactly changes in the internal structure of the economy that will have the greatest impact on the rate of economic growth in the country, therefore the focus of attention should be increasingly on those changes. At the same time, the importance of the further development of the sectoral structure should not be underestimated, since relatively small structural changes at a macro-economic level can significantly affect the trends and rates of the socio-economic development of the country. Hence, structural changes in the economy are also considered as one of the growth factors for Bulgarian economy today. It is therefore necessary to study the impact which the dominant share of the service sector has on the economic growth of the country.

*Table 8*

*Input data for analysis and for applying a regression model*

<b>Year</b>	<b>Relative share of the service sector in GVA</b>	<b>Growth rate of real GDP per capita</b>
1997	45.9	1.5
1998	49.7	5.8
1999	54.8	5.2
2000	56	8
2001	57	7.1
2002	59.1	6.5
2003	59.2	5.8
2004	59.8	7
2005	61.2	7.7
2006	60	7.4
2007	61.5	7.9
2008	61.3	6.5
2009	64.1	-3.1
2010	65.6	2
2011	65.4	4.5
2012	65.8	0.6
2013	67.1	1.4
2014	67.6	1.9
2015	67.3	4.3
2016	67.6	4.7
2017	67.4	4.9

Source: NSI

In order to determine the impact of the relative share of the service sector on the growth rate of real GDP per capita, we employed a linear regression



model. We tested statistical hypotheses about a serial correlation between input data. The findings of our test indicate that there is a serial correlation between time series members about the relative share of the service sector, which is due to an upward trend during each year of the researched period, although the growth rate is low. To eliminate the impact of that trend as a factor causing the serial correlation, when designing the regression model we introduced time (t) as a new independent variable which indicates the impact of all factors that were not included in the model as well as the serial relation.

The result of the conducted regression analysis about the relative share of the service sector in gross value added and real GDP per capita growth rate indicated a regression coefficient of 0.782 between the two variables, which implied a strong correlation between the two variables and indicated that a higher relative share of the service sector facilitated economic growth over the last years.

*Table 9*  
*Summary results of the regression analysis*

<b>Model</b>	<b>R</b>	<b>R Square</b>	<b>Std. Error</b>	<b>FChange</b>	<b>Sig. FChange</b>	<b>Durbin-Watson</b>
1	0.782	0.6115	5.922	1.605	0.000	0.181

Source: Calculations made by the author

The significance of structural changes in the service sector in the process of raising the performance of the national economy is determined by their place and role in the production process and the different labour productivity of different sectors and activities. Hence, an accurate assessment and employing available opportunities for accelerated development of different activities can contribute to promoting economic growth and increasing labour productivity.

## **Conclusion**

The indicators whose values registered the highest growth over the researched period were those about the service sector, while changes in the values of indicators about industry and agriculture were less dynamic. The activities with the greatest dynamics in the service sector were financial intermediation, the business of selling and repairing cars, especially before the downturn in the economy. The activities in the service sector grew steadily mainly due to the aggressive lending policy of banks over the period. There was a sharp decline in GVA created in the agricultural sector. Changes in the internal structure of industry were mainly indicated by the dynamic growth of construction before the crisis, while the growth rate of other activities in the sector was insignificant, and there was a decline in activities, such as energy

production, gas and water supply. These trends in industry are not associated with sustainable structural equilibrium, since the growth rate in the construction industry cannot remain high for a prolonged period of time so as to compensate for the decline in the other activities in the industrial sector.

The findings of the analysis we conducted also indicate that no major changes in the macro-economic dynamics can be predicted, since that economic structure was built relatively recently and there are not many available alternatives. The sectors which are lagging behind in their development are not likely to affect significantly the economy as a whole. This is also indicated by the relatively steady relative shares of the different sectors over the researched period.

The findings of the analysis we conducted also indicate that:

Changes in the structure of the different sectors of Bulgarian economy can hardly be defined as real structural adjustment, since they resulted from the declining productivity of manufacturing and agriculture, in other words, there was a negative structural adjustment in which the poor performance of some sectors resulted in changes in the structure of the national economy. Such lowly efficient production structure prevents the increase of labour productivity in the long run. In contrast, the process of restructuring which the economies of other countries went through, ensured a relatively steady development of the primary and especially the secondary sector of the economies and contributed to promoting the productivity of the service sector.

The aim of the analysis we have conducted of the dynamics of structural changes in the development of Bulgarian economy is to contribute to the process of further restructuring of the economy by identifying priority economic activities and trends of structural changes so as to increase their performance and to allocate resources to more productive activities.

Having so many resources invested in the service sector has undoubtedly changed the significance of services for the productivity and the economic growth of the country. Their role has not been sufficiently researched or recognized yet. The general idea about those changes has been that the service sector is registering relatively low growth rates of labour productivity and that quality of the labour used in the sector is lower compared to the quality of the labour used in the other two sectors of the economy. The findings of this research indicate, though, that the service sector and its relative share in the creation of GVA have an impact on the economic growth in the country and therefore its role should not be underestimated.

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