

STRUCTURAL CHANGES BY MAIN SECTORS IN EU COUNTRIES

The structural differences across main sectors within the EU countries are analysed. Defined is the extent to which the difference in labour productivity by main sectors determines the structural changes – to what extent the formed economic structures and their change is characteristic of the developed economies, those from Central and Eastern Europe and the Balkan countries. The analysis allows to get an idea of the general and specific in the structural development by main sectors of Bulgaria and the potential for realization of favourable structural changes.

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In general, favourable structural economic development is associated with changes in the production structure made in branches and sectors for which higher labour productivity is inherent. The ability of an economy to adapt to changing economic conditions through structural change determines its ability to accomplish effective economic growth (Syrquin 2007, Memedovic and Iapadre 2010).

As labour productivity in the agrarian sector is lower than in the other two major sectors,² countries with a higher relative share of the agrarian sector are expected to be at an earlier stage of structural development, which implies that the potential of their economics is weaker. These differences are also a basic prerequisite for re-directing labour force from the agrarian sector to industry and services and thus accomplish favourable structural changes in the sense of achieving higher productivity

At the same time, when comparing the economic structures of the individual countries, it should not be forgotten that the structural changes in them are determined by the development opportunities of one or another sector, so that there is a need for certain conditions to achieve this redirecting of labour force – availability of relevant comparative advantages, investment, workforce preparedness and others.

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² The three main sectors are the "agrarian sector" (agriculture, hunting and fishing), "industry" (industry, including construction), "services" (general service activities). The data provided by Eurostat has been harmonized, which is a good basis for carrying out an adequate analysis of the effect of structural change. In order to easing the analysis, some EU countries are not included, those with small economies or those that differ significantly from Bulgaria, e.g. Luxembourg and Finland.

1. Agriculture sector

The coefficient of variation for the EU countries of the relative share of GVA in the agrarian sector for the years 2000, 2008 and 2014 is respectively 68%, 61% and 49%, while for the same years, those for the share of employed is 98 %, 93% and 93% This shows that if the relative share of the agrarian sector in the formation of GVA as a whole for the EU countries shows a narrowing of the differences, these differences remain high for the relative share of the employed and more importantly they are maintained for the observed years. Logically this leads to an increase of the differences in the relative labour productivity.³ The coefficients of variation of the agricultural sector relative productivity are respectively 33% for 2000, 46% for 2008 and 50% for 2014. In other words, as regards the relative productivity of this sector by individual countries, the trend is to increase the divergence. In practice, the results show that keeping a high proportion of employed in agriculture is associated with a decline in the relative productivity of this sector.

The close correlation between the participation of the agrarian sector and the degree of economic development is confirmed by the negative correlation coefficients determined on the basis of a relative share of GVA produces in agricultural sector and GDP per capita. The increase in these coefficients over time shows that for EU countries, the share of GVA in the primary sector is more and more decisive for the per capita GDP level.

If exclude the new Central and Eastern European (CEE) member countries, this coefficient is significantly lower for each of the observed years; in this sense, it can be argued that the share of GVA produced in the agrarian sector for the countries of CEE is more relevant to the extent of their economic development than to the remaining EU countries. This can be explained by the fact that the processes of structural changes in the agrarian sector, little or much, in the mentioned "remaining" countries have largely undergone the stage of intensive structural adaptation as a result of the reduction of the employed in the sector.

Conversely, the CEE countries are in the process of visible adaptation, which also reveals the possibility of realizing structural changes leading to higher structural efficiency. The dependence between the relative share of the employed and the relative productivity of the primary sector is also negative and much more pronounced in the new member states from CEE.

The share of the employed in agriculture is highest for Romania, Bulgaria and Poland, but also for Greece and Portugal, which has an adverse effect on labour productivity for these countries in the primary sector. It is observed a process where differences between old EU members and new member states for this indicator are gradually being replaced by differences between countries with the weakest economies of the new and old EU member states and the rest of the countries.

The problem of low relative labour productivity for countries such as Romania and Bulgaria are less relevant to their specific level of productivity than the high share of

³ The average relative productivity of given country is 100%, the relative productivity for each sector is determined by dividing the relative share of the GVA in the sector with the relative share of the employed in it.

employees in this sector – Slovenia has lower relative labour productivity than in Bulgaria, but the relative share of employed in this sector for this country is 8.3%, with 19.4% for Bulgaria and 30.0% for Romania in 2014.

It can definitely be argued that the magnitude of the relative share of GVA and especially of the share of employed in agriculture is an indicator that gives a clear idea of how a country is positioned in terms of the level of its economic development within the EU. The high relative share of the employed in agriculture is indicative of the fact that the processes of restructuring the economy by key sectors, such as shifting the labour force from the agrarian sector to higher productivity sectors, the industrial and services sectors exist as favourable possibility. The strength and dynamics of implementing such a process, especially in terms of the growth in the number of employees in the industry, depends on its competitiveness in a given country and the ability to grow the sector while retaining its labour productivity.

As a rule, the high share of people employed in the primary sector finds opportunities for labour transfer, above all in the industry.⁴ The implementation of similar processes in Bulgaria is very limited, the reason for this is that the employed in agriculture are predominantly elderly people, which for a number of reasons is difficult to redirect to the industry; also lack of necessary qualification that impedes the redirection of labour forces from agriculture to industry.

At the same time, the population density in Bulgaria is much lower than that of almost all EU-28 countries, which is one of the reasons for the high relative share of the employed in agriculture (the picture for the employed per unit of arable land will in no case show such great differences as those obtained by comparing the relative share of the employed in agriculture.) In the case of Bulgaria, as a reason for preserving a high relative share of the employed in agriculture certain role play and the unfavourable demographic characteristics.

All this indicates that there may be real changes in the structure of the employed in the main sectors as a result of changes in the relative share of the employed in agriculture in Bulgaria, but they will be realized rather as a result of the decrease of the absolute employment in this sector, without resulting from the transfer of employees in the other two sectors, there will in practice be an increase in relative productivity in agriculture without, however, an absolute increase in the added value produced. So, in the case of a drop in agricultural employment, some increase in relative labour productivity in the agrarian sector may be expected, but there will be no significant overflow of employees in industry and services, which will increase economic efficiency in general.

Therefore, it must be assumed that the tendency in the countries with a high relative share of the agricultural population, which are also with a higher density of the population, to increase the number of employed in industry and services at the expense of the overflow of labour force from agriculture in the case of Bulgaria is very limited – a very large increase of the employed in the industry and the services on this line cannot be expected. It is obvious that for Bulgaria the share of the employed in agriculture will remain high

⁴ It is accepted that the redirection of the employed from agriculture goes towards the industry and, to a lesser extent, to the services

compared to that of the other EU countries, which will lead to comparatively lower relative labour productivity in this sector.

2. Industry sector

The magnitude of the relative shares of GVA and those employed in the industry cannot be directly linked to the degree of economic development, at least in the way this can be done for the agricultural sector. Typical for the CEE countries is the higher share of both GVA and those employed in industry compared to the other EU countries. The average figures for these countries for GVA and employed in 2014 are respectively 30.7% and 28.4%, which determines a relative productivity of 108.1%. The value for the other EU countries is 21.3% for GVA and 19.4% for employees with an average relative productivity of 109.6%. It is clear that the difference in the relative participation of GVA and the employed in the two groups does not lead to a difference in relative productivity, in other words, the significantly higher share of industrial workers in the CEE countries in a sense is also the result of adaptation according to the magnitude of relative labour productivity.

The GVA coefficient of variation for the new member states from CEE is 13%, for the other countries is 27%, those coefficients for the employed are 13% and 20% respectively. These data outline the following general picture: a higher share of GVA and employed for the new member states from CEE and a smaller dispersion of these indicators for them. A comparison with the period before the economic crisis (2008) shows a general tendency after the crisis has passed, of changing the relative share of GVA and employed in the EU countries in a way that had an impact on the increase of the labour productivity. This tendency is typical for both observed groups of countries, with the increase in the relative shares of the CEE countries being much higher, resulting in an increase in relative labour productivity in these countries from around 99% to 108%.

To some extent, this more favourable development in CEE countries is also the result of better adaptation during and after the economic crisis. As a whole, the economic crisis has decreased significantly the relative participation of GVA in the industry and has negligible negative impact on those employed in the industry in EU countries. There is a more pronounced reduction in GVA in industry in 2009 and 2010, as a result of (a larger decrease in the share of non-construction industry in 2009 and a decrease in the share of construction in 2010). In these two years, the relative productivity of labour also declined. After these years, the general trend of changing of relative shares of GVA and that of employment is in a way that leads to increase the relative labour productivity, which, as mentioned above, happened mainly in the CEE countries.

For almost a 10-year period (2005-2014), the tendency in general is in decline of the relative shares of GVA and employed, which is higher for the employed, that as mentioned, determines a general trend of increase in the relative productivity of the industry. At the same time, this decline in both GVA and employed is not high, so there is no sharp decline in industry participation in GVA and employed as a whole.

The average relative labour productivity of the Bulgarian industry is slightly higher than that of the EU and substantially higher than the total for our country. This is a clear indicator of the favourable developments in the industry, which are reflected in the increased efficiency of this sector within the country's economy. Therefore, at least for the time being, the increase in the relative share of industry participation leads to an increase in the overall productivity of the country as a whole.

Bulgaria from the country with the highest share of the industrial sector in 1995 – a higher share than Romania and the lowest relative productivity has succeeded in adapting this sector relatively successfully. From relative productivity for the industry below the average as Bulgaria had in 2008 of 98%, now this productivity is 112.7%. This is the result of a higher increase in the relative share of GVA than the employed, a process that is observed in the other CEE countries and where Bulgaria has similarities to the average levels for these countries. This process can be considered positive, since the higher importance of GVA and those of employed in the CEE countries is associated with positive economic development.

3. Service sector

The development of the service sector in a sense is the result of the change in the other two major sectors. The fact that for them there are not noticeable any major fluctuations in them in the relative shares of the employed and the GVA, accordingly defines the lack of such and in the service sector. Over the last 10 years, the tendency in EU countries is to increase the number of employees in services exceeds the increase in the relative share of GVA, which means reducing the relative productivity of this sector and exhausting the possibilities for realization of favourable structural effect.

Romania, together with Bulgaria, are the two countries, which have from one hand a low share of employed in the service sector combined with the two highest levels of relative productivity for these countries. This is to some extent also a mirror reflection of the fact that the two countries have the highest share of those employed in agriculture, with low relative productivity of the agriculture.

The data on changes in GVA share and those employed during the monitored period unambiguously determine the tendency of the services sector to increase both in the formation of the GVA share and the share of the employed. Such a development can be expected on the basis of theoretical formulations for structural changes that suggest its growth. At the same time, this process will also depend on the extent to which changes in economic conditions will favour its development.

For countries with weaker economies such as Bulgaria, this process will be linked to an increase in the efficiency of the economies as a whole, due to the higher relative productivity of the sector. At the same time, the efficiency of service sector development, both for the weaker economies and the developed countries, will also depend on the implementation of structural changes in the direction of the development of more productive activities in this sector in accordance with the necessary prerequisites for this,

based above all, on the existence of comparative advantages (EU Structural Change 2015, p. 101).⁵

In contrast to the industry where the structure and comparative advantages of Bulgaria (EU Structural Change 2015, p. 100) are associated with low-tech and labour-intensive low-performing industries, which places our country at one of the last places in this respect, the picture is considerably more favourable for the service sector.

If we have to compare these sectors (industry and service) it can be noted that Bulgaria is structurally positioned, much better in the services – which, together with the fact that the relative share of those employed in this field is relatively low combined with comparative advantages in certain areas, would allow for the efficient development of the sector. Last but not least, the fact that service activities do not imply the need to make large investments would contribute to this development.

4. Summary for Bulgaria

It is interesting to assess the impact of structural changes on individual EU countries.⁶ As a rule, economically more advanced countries have higher efficiency, while countries like Bulgaria and Romania have the most inefficient economic structures. The comparison of the economic effect of the structural changes in 2005 compared to 2014 speaks of a process of unification of the structures of the EU countries by major economic sectors. A process that shows that significant effects of structural change at the level of major economic sectors, at least for most countries, cannot be expected. Romania and Bulgaria make some exception with the relatively high effect of structural changes, but if this tendency persist, this effect will also decrease over time.

In general, Bulgaria shows changes in the structure, where the share of the sectors characterized by the participation of low technologies and low-performing industries is increasing. This development, as well as the fact that it is typical only for Bulgaria, shows that it may be the result of conjunctural specific reasons. Changes in this direction may lead to a reversal of the observed negative trend – after all it is a specific Bulgarian development that is not the result of objective economic circumstances valid for the CEE countries

The potential for developing low-performing industries is not a long-term perspective. In this respect, economic policy must be directed towards stimulating the development of industries characterized by the use of higher technologies, on the one hand, and on the other, where there is a prerequisite for this, defined by the existence of comparative advantages. As an example, can be given sub-branches of the manufacturing industry, such as the pharmaceutical and electrical industries, that fall in the group of the branches with

⁵ Obviously, an increase of the service sector at the expense of increased administration will lead to a decline in the relative efficiency of this sector.

⁶ Idea of the effect of the structural differences across major sectors for each country, can be obtained by assessing what productivity would be if the structure of the employed in the given sector is identical to the EU-28 average, thus eliminating the impact of the difference in structure of those employed in the given sectors.

approximately higher technology according EU Structural Change (2015, p.39), and in which Bulgaria has comparative advantages, (EU Structural Change 2015, p. 100). Of course, such a policy must also be in line with a number of other economic circumstances, but these two indicators - the existence of comparative advantages and the possibility of developing industries with higher technology should be decisive in a targeted economic policy.

For Bulgaria the development of the services sector is related to the realization of favourable structural changes, but in general it can be assumed that with the approaching the levels of the participation of the services to the average European ones, the relative productivity of this sector will tend to the average level for the country. As with industry, the potential for effective development is to bring about structural changes in favour of developing service sub-branches with higher efficiency. This can be achieved through the development of specific activities, where Bulgaria has comparative advantages and also areas that have high efficiency. At the same time, unlike industry, the achievement of structural changes with the development of certain service activities, as was mentioned above, does not require high investment.

The potential for a high impact of structural change is diminishing at least what concerns main sectors. However, structural changes between those sectors and the intra-sectoral structural changes compare to the other EU countries will remain relatively higher. The nature of these structural changes will differ from those in developed economies where there it is observed a reduction in the participation of the industry sector at the expense of an increase in services. The process of restructuring of the Bulgarian economy compared to that of the developed countries will be different, insofar as in the near future it is not expected obvious reduce the participation of the industry at the expense of the services.

GDP growth per capita, and a narrowing of the gap with the EU-28 average, the increase in labour productivity will probably not continue to be at the relatively high rates so far, the tendency for them is to diminish over time. The objective assessment unambiguously shows that at least for the time being, Bulgaria has little potential to develop high-tech products on the basis of existing market opportunities. Definitely for that role has the influence of the so-called "geographic factor" (Totev, Sariiski and Stoicheva, 2016, pp. 17-19).

Similar findings are made in the EU Industrial Structure Report (2013, p. 84), when comparing the Economic Complexity Index (ECI) for the period 1995-2007⁷, it is said, "In general, it is expected that countries with low ECI in 1995 to increase over the monitored period as a result of a catch-up process. However, some countries (namely Turkey, Greece, Romania and Bulgaria) appear to be deprived of the benefits of globalization and market liberalization." Obviously, the difficulties faced by these countries are typical of these geographical regions. For this reason, whenever forecasts and comparisons are made about Bulgaria's economic potential, it is necessary to keep in mind that for one reason or another, things are not always following the way they are expected to be realized on the comparison with other countries.

⁷ The Economic Complexity Index (ECI) is a composite indicator of the performance characteristics of an economic system (country).

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