BULGARIAN GDP EXPENDITURE STRUCTURE: GROWTH IMPACT AND CONVERGENCE WITH EUROZONE

Stela Raleva[1]
e-mail: st.raleva@unwe.bg

Abstract

The study represents an analysis of the Bulgarian GDP expenditure structure and its dymanics in the period 2000 – 2019. This structure is examined through two perspectives – its impact on economic growth in the short and long run, and its convergence with the one in the Eurozone. The relevance of structural convergence is interpreted in the context of its relation to the business cycle synchronization and the effectiveness of the future common monetary policy. The research methodology includes the assessment of the impact of GDP's various components on the economic growth rate, the measurement of the rates of accumulation and consumption, and the evaluation of structural convergence through the indices of dissimilarity and divergence. Based on the empirical analysis, the conclusion is drawn that the high economic growth rate prior to 2009 was largely determined by the significant increase in investments, while during the following years there was a trend of growing decapitalization in the economy which had unfavorable implications for economic growth. At the same time the expenditure structure of the country's GDP manifested an ever increasing convergence with the one in the Eurozone, which comes to show that the economy's structural convergence appears to run counter to real convergence.

Key words: GDP, expenditure structure, economic growth, accumulation rate, consumption rate, structural convergence, business cycle synchronization, Eurozone, dissimilarity index, divergence index

JEL: E20, E22, C43, F43, O11, O47

Introduction

The study of the aggregate economic activity and its dynamics in a given economy necessitates the clarification of the structural characteristics of GDP. This can be done by pointing out the fact that the three main structures of the gross product – expenditure, income and production, contribute significantly to outlining key characteristics of the national economy which have a considerable impact on its current and future development. Specifically, the analysis of the relative importance of the individual components of the three structures and the tracing of their fluctuations over time makes possible the identification of the

---

[1] Assoc. Prof., PhD, Department of Economics, Faculty of General Economics, University of National and World Economy, Sofia, Bulgaria

key factors of economic growth whose implications are noticeable in a different time perspective. As a rule, there is considerable interest in the GDP expenditure structure, which, unlike the production and income structure, outlines factor impact both on the aggregate demand side and the short- and long-term aggregate supply. This is why this structure can be seen as an analytical tool used to study the factor dependence of economic growth in the short and long term and for the evaluation of the potential of the economy to achieve high and sustainable economic growth.

Another function of the GDP structure by components of final expenditure is that it can be used to measure the structural convergence between different economies or between an individual economy and a given integration community. This is of great importance to evaluating the progress of integration processes and predicting the response of the national economy to conducting supranational economic policies and the occurrence of other exogenous shocks. The specified response depends on the degree of the business cycle synchronization which can be based on the convergence in terms of the relative importance of the structural components of GDP. The role of this convergence is presented in earlier studies mostly in the context of the greater integration in the EU and the Eurozone membership which is related to conducting a common monetary policy.

The perspectives from which the expenditure structure is viewed are particularly topical in Bulgaria considering the low level of the real GDP per capita relative to the Eurozone and outlining the perspectives for economic growth, as well as the country's entry into ERM-II and disclosing the prerequisites for the efficiency of the future common monetary policy.

The aim of this study is to analyze the specifics and the dynamics of the Bulgarian GDP expenditure structure, to characterize the influence of different types of expenditure on the achieved and expected future rates of economic growth and to evaluate the structural convergence of the Bulgarian economy with the Eurozone. The analysis is conducted at different levels of aggregation of GDP expenditure components and covers the 2000 – 2019 period. The idea is to indicate the trends in the expenditure structure and its convergence, to outline the specifics in the periods before and after 2009 when Bulgaria was hit by the crisis and to identify the main factors that stimulate or deter growth and to follow their relative significance in time. Based on the empirical analysis certain conclusions are drawn at the end of the study about the most important limitations that economic growth faces in the mid- and long run and about the discrepancy between the structural convergence and the possibilities for achieving higher real convergence of the Bulgarian economy with the Eurozone.

General framework

In most cases the GDP expenditure structure is interpreted as outlining factor influences on the aggregate output based on changes in aggregate demand. The more cautious approach to it, however, provides the possibility for the differentiation of such expenditures which influence not only aggregate demand but also aggregate supply (Ралева, 2013, pp. 186 – 189). Furthermore, the impact of certain types of expenditure which have impact on aggregate supply in the long-run period is similar to that exerted on aggregate demand, while in the case of other expenditure, it is diametrically opposite. This peculiarity determines the different approach to the elements of the expenditure structure of GDP and the focus of the study on those that have a positive impact on the short and long-run economic growth.

The differentiation in the modern expenditure structure of GDP, called GDP by components of final expenditure, of final consumption expenditure, gross capital formation and foreign trade balance, provides for internal subdivision of the factor impact of those that occur on the demand side, and those that have manifestation both on the demand side and the supply side.

The components of final consumption expenditure, which are divided into individual and collective consumption, are mostly related to aggregate demand. The study on their impact on GDP through the demand mechanism is based on the fundamental conclusions of the Keynesian economic theory. It posits the stimulating impact of the increase in personal consumption of households on the aggregate demand and the aggregate production in the short run. The impact of government consumption should also be mostly on the aggregate demand since in the long run government spending is interpreted mainly as an institutional factor. As far as the possibility for a positive effect on aggregate supply, outlined in some endogenous growth models, is concerned, it is not valid for all government spending, but only for some peculiar components, which means that the general dependence is a function of the specific structure of the government spending.

The situation is different for the gross capital formation. It corresponds to the gross investments from the traditional GDP expenditure structure and represents a sum of gross fixed capital formation and the changes in inventories of raw materials, work-in-progress, finished products etc. In Keynesian framework the increase in investments leads to the increase in aggregate demand and the aggregate production in the short run. The gross fixed capital formation itself includes expenditure for the purchase of new fixed tangible and intangible assets, i.e. net investments, and consumption of fixed capital. As far as the increase in gross fixed capital formation is the result of the growth of net investments, it is thought to be a factor influencing long-run economic growth. This is due to the

fact that the net investments represent an accumulation of capital, which, for its part, acts as one the main factors of growth on the part of aggregate supply.

The evaluation of the role the external sector plays for the dynamics of the aggregate production, considering the structure of GDP by components of final expenditure should not be limited to the trends in the foreign trade balance. Irrespective of the fact that the growing gap between exports and imports has a stimulating effect on the growth of GDP through aggregate demand, it can have different potential for impact on the economic growth in the long run. The type of impact is determined by trends in the openness of the economy gauged as a percentage of the sum of exports and imports of goods and services or of the sum of exports and imports of goods from the GDP as well as the way in which these trends correspond with the characteristics of exported and imported goods.

When defining the trends in personal consumption of households and investments, we need to take into account the fact that they are usually related to parallel fluctuations in imports. If the growing household consumption is mostly at the expense of increasing consumption of imported consumer goods, the expansionary effect on GDP, resulting from the higher consumption, is greatly crowded out by the decline in net exports. Similarly, although weaker due to the multiplier mechanism, crowding out is observed in the growth of investment which is related to expenditure for acquiring fixed imported tangible and intangible assets. Thus, a considerable part of the increase in imports and the relevant decrease in net exports is not a prime cause for limiting the growth in GDP in the short run, but manifests itself as a result of changes in personal consumption and investments with certain structural specifics of these changes.

The most beneficial option in the short run is for the higher consumer and investment expenditure to be mostly for domestic goods but in the case of a small open economy this option can be seen as implausible. In the long run, however, the increase in imported investment goods can determine higher rates of economic growth relative to those secured through growth in domestic investment goods in case the specified import is of high-tech goods.

Using the GDP expenditure structure to evaluate the degree of structural convergence of a given country with a certain integration community is relatively new and rare in economic literature. The majority of existing studies are based on the production structure of GDP which is the preferred one when conducting structural analyses and defining the structural changes at a macroeconomic level (Wacziarg, 2004). Despite that, measuring the convergence level in the relative shares of the different expenditure components of GDP, as well as the convergence of the expenditure structure as a whole, play their individual role in the formation of the entire idea about structural convergence.

A typical feature of the greater part of the existing studies on the convergence in the expenditure structure of GDP is that they were conducted at a disaggregate

level by individual components of the aggregate expenditure. In Darvas and Szapary (2004) attention focuses on the behavior of the cyclical components of the personal consumption of households, investments, export and import. When gauging the correlation between business cycles Buiter and Grafe (2002) provide even greater substantiation, suggesting that the change in the inventory be used as a leading indicator for the business cycle synchronization. Such disaggregate approaches are implemented in the analyses of convergence in the Bulgarian GDP expenditure structure (Статев, Ралева, 2006a, 2006b; Величков, 2020), and the first aggregate evaluations were published in the current year (Ралева, 2020).

The importance that structural convergence has to strengthening the integration in the Eurozone is predetermined by the understanding that the Maastricht convergence criteria for joining the Eurozone are nominal convergence criteria while the sustainability of the Eurozone depends on the convergence in the economic structures of the member countries. The explanation is that the occurrence of certain macroeconomic shocks has a different impact on the different segments of the economy and that is why the bringing together of structural differences is perceived as a necessary condition for business cycles synchronization. This synchronization, for its part, is a prerequisite for conducting effective supranational monetary policy due to the effect the similar structural characteristics of the economies have on the monetary policy transmission mechanisms and on the dynamics of the aggregate production and the general price level. (MPC Task Force of ECB, 2004).

The achievement of a higher level of structural convergence should not be perceived as an end in itself, but should be related to the long-term goals of the national economy, concerning mostly the realization of long-run economic growth. Conceptually, this presupposes a different attitude to the process of structural convergence depending on how close or how far from the Eurozone a country is. In the first case it should be evaluated as a positive phenomenon considering the existing interrelatedness with the other types of convergence. It should also be taken into consideration that closing the structural differences can correspond to suppressing some sources of growth and in this way to be in conflict with the long-term goals of the economy, the achievement of the other types of convergence being one of them (Wacziarg, 2004).

Methodology and data

The empirical analysis is preceded by an adjustment of the modern structure of GDP by final expenditure components to the traditional expenditure structure of GDP. For this purpose personal consumption of households is represented as the sum of individual consumption of households and individual consumption of non-profit institutions, servicing households (NPISH's). The indicated way of

grouping expenditure is actually oriented to the institutional sector which does consumption, rather than to the institutional sector which makes the expenditure. Another possible approach is for individual consumption of NPISH's not to be considered to be personal consumption of households where, however, will arise a pragmatic issue related to conducting a complete analysis of the expenditure structure due to the inability to include those expenditures in the other components.

Government expenditure in the traditional expenditure structure is formed by summing up the individual consumption of the general government related to providing individual services to households and collective consumption which includes expenditure for providing collective services to the community. This way of grouping is based entirely on the institutional sector which incurs those expenditure, which is not in agreement with the leading principle when calculating personal consumption of households and does not correspond to the distinction between final individual and collective consumption.

In the complex analysis of the GDP expenditure structure in the current study it is assumed that gross investments are equal to the gross capital formation. This assumption differs from the traditional practice, according to which tracing the dependence of the dynamics of GDP from investments does not use the gross capital formation but the gross fixed capital formation. The approach adopted facilitates the comprehensive characterization of the expenditure structure of GDP and makes it possible to evaluate the relative contribution of the changes in the inventory to the total investments.

The computation of the rate of economic growth is carried out by using annual chain rates of real GDP growth based on the respective indices of the physical volume. Because of certain methodological issues related to the data about the gross output for the period up to 1999, the year 2000 is accepted as the starting point of the analysis of the expenditure structure. This means that when viewing the dynamics of the real GDP and the contribution of the different components of the expenditure structure to this dynamics, there is an additional shortening of the dynamic order with 2001 being the starting year.

When calculating the contribution of final expenditure of households, investments, government consumption and net exports to economic growth, a methodological peculiarity, substantiated and used by Eurostat, is taken into consideration. It is that the contribution of each of the expenditure components is the result of the product of its index of the physical volume for each year and the weight of this GDP component over the previous year, taken as a whole number. Considering the complex nature of each of the four components of the traditional expenditure structure of the gross product, preliminary calculation of the index of the physical volume of each of them should be carried out, based on the respective indices of its sub components.

In this study the convergence in the GDP expenditure structure is calculated by applying the dissimilarity index and the divergence index, where both are based on the underlying Krugman specialization index (1991a, 1991b).

The dissimilarity index was formulated by Von Hagen and J. Traistaru (2005) and is presented through the following formula:

$$DISSIM = -\sum |S_{nx} - S_{EZx}| \qquad (1)$$

where S_{nx} is the share of the expenditure component x in the GDP of the country and S_{EZx} is the share of the same expenditure component of GDP in the Eurozone. The negative sign in front of the sum of deviations for the individual components of the expenditure structure predetermines the way the received value of the index is interpreted and the higher it is (the lower it is as an absolute value) the smaller the difference and the higher the structural convergence.

The divergence index was suggested by Van de Coeving (2003) and is computed by him for the EU and the countries in Southeastern Europe (except for Bulgaria), the USA and Japan and the last two countries are used as comparison. This index is calculated in the following way:

$$DIV = -\sum \frac{(S_{nx} - S_{EZx})^2}{S_{EZx}} \qquad (2)$$

where x is the variable for which the divergence is calculated, n is the country, and S_{nx} and S_{EZx} are the relative shares of each individual structural component in the totality for the country and for the Eurozone, respectively.

If DIV = 0, then the relative share of the individual expenditure component of GDP follows the changes in the Eurozone and when the index is negative, the relative share of the respective component diverges from that in the Eurozone. The higher the index value, i.e. the smaller it is as an absolute value, the higher the structural convergence of the country with the Eurozone.

Raising to the second power of the difference between the relative share of the structural variable for the country and for the Eurozone determines the much higher weight in the divergence index of the structural component with the biggest change. In this way, on the one hand, higher sensitivity of this index is guaranteed compared to the preceding one and on the other, it becomes predetermined to a very high degree by the component with the highest dynamics.

In the process of conducting the empirical analysis the selected two indices will not be perceived as competitive but as complementary. In their capacity as gauges of the structural convergence they have already been used in the Bulgarian economic literature when evaluating the convergence in the production and income structure of the Bulgarian GDP relative to the Eurozone, as well as the expenditure structure for the period from 1997 until 2005 (Статев, Ралева, 2006; Ралева,

2007, 2019). When interpreting the results in the following empirical analysis it will be taken into consideration that they have different methodological specifics and have particular advantages and drawbacks. Because of these specifics the existence (or lack) of structural convergence will be viewed as substantiated (or revoked) if the outlined trend is confirmed by the results for the two indices.

The empirical study of the expenditure structure of the Bulgarian GDP is conducted by using the annual data provided by NSI and Eurostat. When computing the relative shares of the individual types of expenditure in GDP, the respective data about them are calculated in constant prices based on values in 2015[1]. The same is applied to gauging the contribution of these expenditures in the reported rates of economic growth, in which case it is relied on their indices of physical volume as the weighing of the given indices is based on data in constant prices from the previous year.

Dynamics and contribution to economic growth

As it can be seen from Figure 1, the relative share of the typically largest component of GDP – personal consumption of households varied around 60% with the mean value for the period under consideration of 60.9%. The lowest relative shares of personal consumption were registered before and during 2005 when they remained under the average. After that year these shares exceeded 60% and varied within relatively narrow limits. More significant increases were recorded in 2007, 2012 and 2019 and the highest value of 64.1% was reached during the third year. Thus, for the entire period the maximum deviation in the relative share of personal consumption of households was 8.6 percentage points which, considering the high relative weight in GDP, allows for this component to be classified as relatively stable. The values of individual consumption of households as such were predetermined by the individual consumption of households whereas the contribution of individual consumption of NPISH's was symbolic and amounted to 0.8% on average [2].

Government consumption for the period amounted to 18.2% of GDP on average and showed a downward trend. During the first five years the values exceeded 20% and in two of those years – 2000 and 2001, they were even higher than the values of the relative share of gross capital formation. A more considerable drop was observed during the next four years while after the crisis in 2009 they changed insignificantly and remained within the 16 – 17% of GDP. The gap between the highest and lowest level of the relative share of government consumption was 6.4 percentage points, which was less that the difference in the highest values of personal consumption of households, but higher than it in relative terms. Individual government consumption marked an insignificant predominance of government consumption in the internal structure

for the period – of 51.2% compared with 48.8% for collective consumption. This internal structure illustrates certain specifics in time with the highest imbalance in favour of individual consumption observed in the period between 2001 and 2004 and then between 2008 – 2009 when it reached maximum levels of nearly 55%. During most of the remaining years the contribution of the two components of government consumption was almost equal and in 2005 – 2006 and after 2014 collective consumption was predominant.
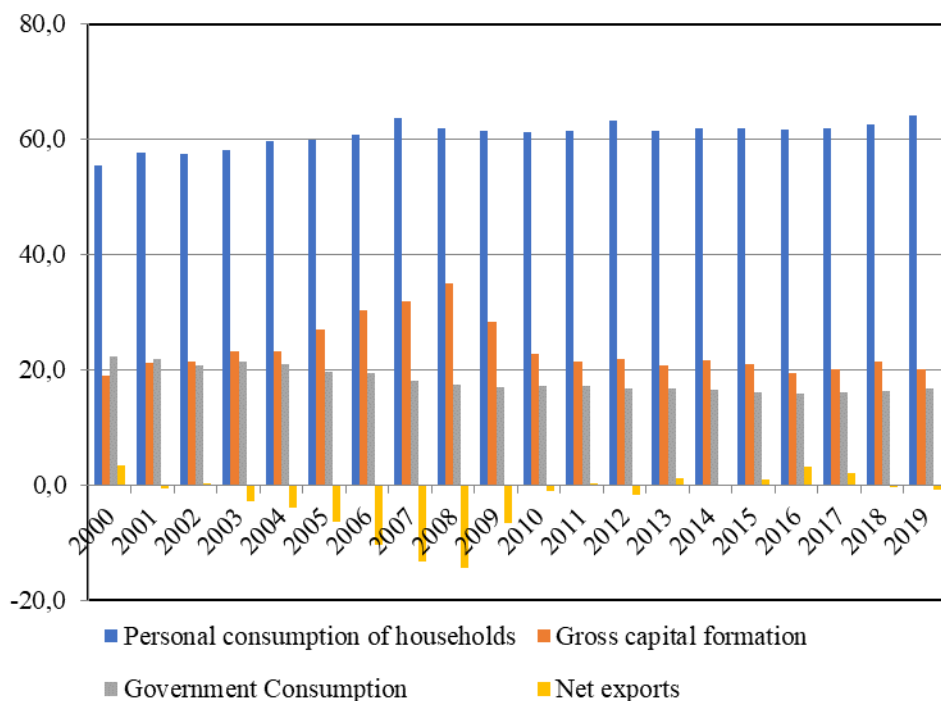
Source: NSI and own calculations

Figure 1: Dynamics of GDP expenditure structure (in %)

The investments, measured by gross capital formation, had a mean relative share of GDP of 23.5% but their values featured considerable instability. In the beginning of the period they were relatively low with minimum levels of 18.9% reported in the first year. After that the relative weight of investments marked a gradual increase and in 2003 – 2004 it stabilized at 23.3%. During the next four years investment growth accelerated and in 2008 investments accounted for 34.9% of GDP. The most significant part in that was due to the increase in the investment activity in 2005, 2006 and 2008 by 3.7, 3.3 and 3.1 percentage points respectively, while in 2007 it was relatively more moderate. During 2009 – the year when the Bulgarian economy was experiencing the most severe crisis and in

the after-crisis 2010 the relative share of investments in gross output decreased consecutively, reaching 28.3% and 22.7% resulting in a cumulative drop for the two years to 12.2 percentage points. During the entire following interval the share of investments remained below the average for the period as a whole and in 2006 – 2017 and in 2019 it was around 20% of GDP. The gap between the highest and lowest value of this share amounted to 16 percentage points, or 85%, which was indicative of the significant instability of the investment expenditure.

The gross fixed capital formation, whose mean relative weight was 91.4%, contributed the most to the size of investments. The relative share of the change in inventories of the total investments was higher prior to 2008 and in 2018 when it was measured by predominantly two-digit numbers. During the remaining years the changes in inventories were comparatively moderate and remained at levels of around 5% of the total investments. The relative share of gross fixed capital formation in investments reached the highest level in 2013 – 100.8% and in 2015 – 99.3%, where the former value was due to a decrease in inventories during that year, which was the single one for the entire period.

Due to the distinctly predominant contribution of the gross fixed capital formation, its internal structuring into net investments and fixed capital consumption and into private and public investments was a matter of interest [3]. The first structural cut makes it possible to outline the impact of investments on the long-run economic growth which were realized by the accumulation of capital. The second cut shows the relative importance of the private and public investments and makes it possible to outline the perspectives for the investment activity in different states of the government budget [4].

The fixed capital consumption had a higher share in the gross fixed capital formation in its first structural cut (see Fig. 2.a). On average for the period prior to 2018 it amounted to 65.1% compared to 34.9% net investments. The lowest net investments of 22.1% and the mean of 24% were reported for 2000 and for the 2016 – 2018 interval and their specific values were nearly 2/3 lower than the average for the period. The highest levels of net investments of more than 44% were observed from 2005 until 2009 and this coincided with the comparatively higher relative shares of investment in GDP. What is more, during these two years – 2007 and 2008, the net investments exceeded the fixed capital consumption and their weights in the gross fixed capital formation were 62.6% and 51.9% respectively. In the remaining intervals the fixed capital consumption remained within the 64.9% – 77.2% range and showed diverse changes on yearly basis. The low relative weight of net investments over the last years can be defined as unfavorable not only in the short run due to its interrelation with the dynamics of investments as a whole, but also in the long run considering the low rate of

physical capital accumulation and the limited capacity to increase the production potential of the economy.

Private investment ■ Public investment

a)

Net investment ■ Consumption of fixed capital
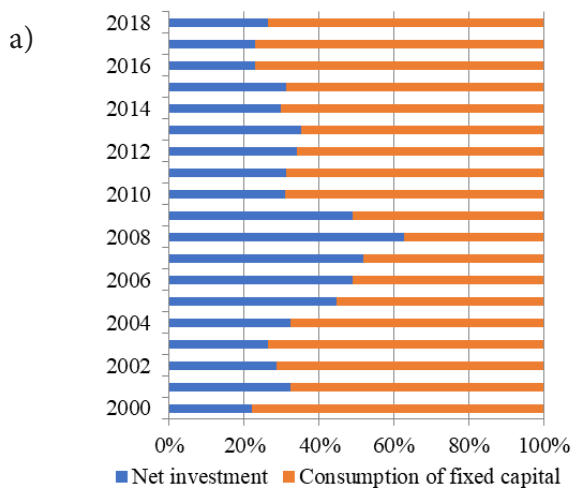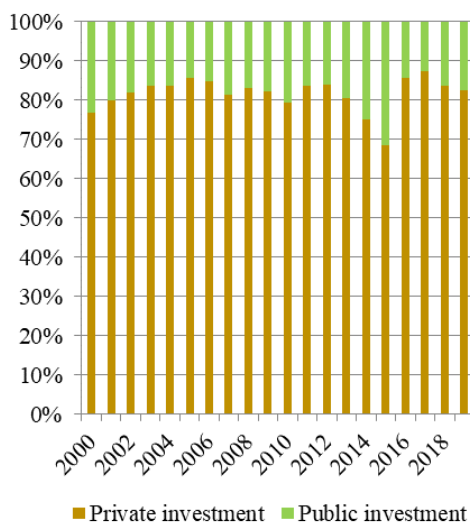
Source: NSI and own calculations

b) **Figure 2:** Internal structure of investment (in %)

The second cut of the gross fixed capital formation is associated with the differentiation between private and public investments. As it can be seen from Figure 2.b) an important role is attributed to private investments whose relative

weight was 81.7% on average for the entire period, whereas public investments amounted to 18.3%. In 2000 public investments amounted to 23.2% followed by a steady but uneven decline. This continued until 2005 when the share of public investments reached 14.3%. After that this share started to change in different directions – until 2008 and during the previous years this was due to the different rate of increase in the two investment groups. In 2009 and 2010, however, there was a decrease in both investment groups, which was more noticeable in private investments and therefore the share of government investments increased to 17.8% and 20.7% respectively. During the following years the analyzed structure of the gross fixed capital formation changed in different directions and in 2015 government investments reached the maximum level of 31.5%. Later this share marked a drastic decline in 2019 and some 83% of investments were due to the private sector. The outlined structure of gross fixed capital formation and the existing limitations predetermine the relatively more conservative behavior of public investments and their inability to play the role of the main engine of investment activity.

The potential of the economy for achieving short- and long-run economic growth depends on the ratio between the rate of consumption and the rate of accumulation, computed in this study in constant prices for 2015. The consumption rate is computed as a relative share in GDP of the sum of personal consumption of households and government consumption, whereas the accumulation rate is computed as a relative share in the gross product from investments gauged by gross capital formation. The average ratio between the consumption rate and the accumulation rate in the Bulgarian economy over the period under consideration was 3.5 and the values illustrate significant specifics over time. In 2000 the consumption rate was 4.1 times higher than the accumulation rate and the gap between them narrowed over the next years. Up to 2005 this drop was relatively modest and the ratio between the consumption rate and the accumulation rate was higher than 3. Between 2006 and 2008 the drop in the discussed ratio marked a higher rate and in 2008 it reached its minimal value for the entire period of 2.3. This increase in the relative significance of the accumulation rate illustrated the increasing positive impact of investments and capital accumulation on the economic activity and the weakening impact of short-term factors such as household and government consumption. After the crisis in 2009 the ratio between the consumption and the accumulation rates started to grow and after 2010 it remained above the average for the period. During the last four years its values approached the 2000 levels which was indicative of a stronger dependence of economic growth on consumption dynamics.

The relative share of the final component of the GDP expenditure structure – net exports, stands out with its increased instability with average value for the period of -2.6%. The dynamics of this relative share outlines two sub-periods

which are marked by the crisis in 2009 (Fig. 1). With the exception of 2000 and 2001 the first sub-period was characterized with negative and increasing in absolute terms values of the foreign trade balance. From 2006 until 2008 the foreign trade deficit as a percentage of GDP was expressed as two-digit numbers reaching the maximum of 14.3% in 2008. The economic crisis in Bulgaria in 2009 was closely associated with a strong decline in this deficit to 6.6% of GDP. Later, within the second sub-period the foreign trade balance demonstrated low positive, or low in absolute terms negative values, as a percentage of GDP and in 2014 it even equaled zero. The changes in the net exports during this sub-period did not outline any trend but underwent diverse changes.

The observed dynamics in the relative share of the foreign trade balance of GDP largely reflects the discussed changes in the relative share of investments. This can be observed in the correspondent behavior of the two components of the gross product during the bigger part of the period. During the majority of the years when the relative weight of investments in the GDP was below 20%, the net export was positive, whereas when the set limit was exceeded, it became negative. This dependence can clearly be observed when investments marked a considerable increase which corresponds with the considerable increase in the foreign trade deficit. For example, between 2005 and 2008 the share of investments in GDP increased from 26.9% to 34.9% and along with it the foreign trade deficit rose from 6.4% to 14.3%. As far as the connection between the net export and the personal consumption of households is concerned, it is significantly weaker and all the more that consumption changed relatively gradually. Some signs indicating the importance of this correlation were spotted at the end of the analysed period – in 2017 and 2019, when equal relative shares of investments in the GDP combined with positive and negative foreign trade balance respectively.

The internal structure of net export features net export in goods and net export in services which illustrate some specifics of the period as a whole. During all the years the net export in services was positive, while the net export in goods was negative and thus the correlation between their values predetermined the sign in front of the total net exports. Initially the two components of net exports were two-digit percentages of GDP, and this trend continued until 2009 for the net export of goods, whereas for the net export of services – until 2006. During these intervals the mean values of net export in goods and services were 14.5% and 12.7% respectively and the discrepancy in the duration of these intervals determined the highest values of the total deficit in foreign trade between 2006 and 2008. After that period the percentages in the gross product of the balances in the trade in goods and services became one-digit number and amounted to 6.3% and 6.8% on average. Unlike the period from 2003 until 2009 when the absolute value of the adverse balance of foreign trade in goods was higher than the value

of the balance of foreign trade in services, during half of the following years the correlation between them changed and the total foreign trade balance became favourable. Moreover, the dynamics in foreign trade in goods showed a striking similarity with the changes in the investment activity and this correlation was stronger than the one in the total net export.

The analyzed net export dynamics is related to changes in the openness of the economy, computed as a percentage to GDP of the sum of export and import in goods and services. From 2000 until 2003 the level of openness of the economy was just below 80% which is the most common threshold used to describe a given economy as open. From 2004 until 2007 the openness increased steadily and in 2007 it reached 117%. In 2008 it decreased moderately and then in 2009 declined fast – in the first year this was due to the more moderate increase in export and import relative to the GDP growth and in the second year it was due to their simultaneous decline. After 2010 the openness of the economy increased continuously at uneven rates and in 2018 it reached its maximum of 135.5%. The sharp increase in the openness for the period as a whole was the result of a nearly equal increase in export and import. It is indicative of the favorable opportunities for the economy to take advantage of foreign trade as well as for its increasing vulnerability to the emergence of adverse external shocks.

The characteristics of the GDP expenditure structure for the period under consideration are largely related to its dynamics with two identified intervals – before and after 2009. (see Fig. 3). The formers stands out with high rates of economic growth, and in the second half – relatively stable ones. The mean annual rate for the period amounted to 5.9% and the maximum of 7.2% was reached in 2005. 2009 was the only year marked by negative rate of economic growth of -3.4% mostly due to the global financial and economic crisis. In the latter interval the real GDP rose by very slow or relatively modest rates which significantly lagged behind the levels reported prior to 2009. These rates illustrated inherent irregularity and initially they were insignificant, while between 2015 and 2019 they stabilized between 3.1% and 4%.
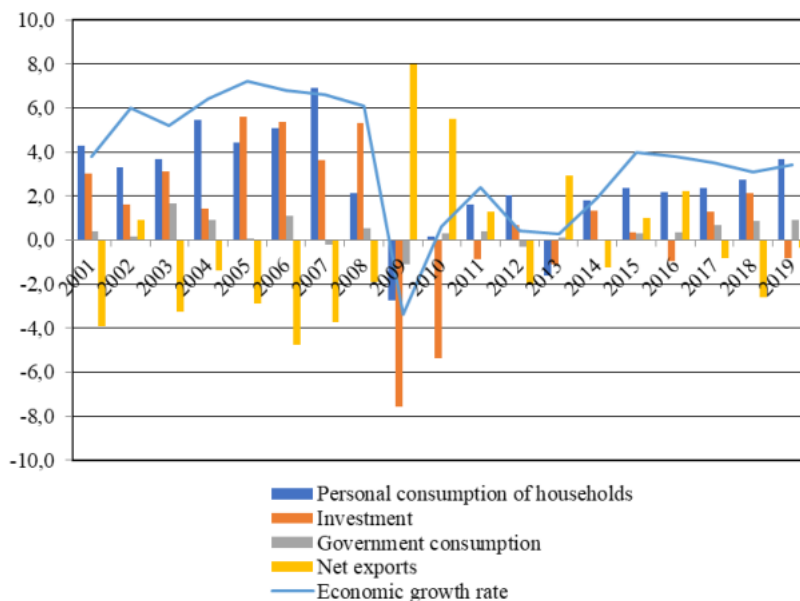
Source: NSI and own calculations

Figure 3: Economic growth rate (in %) and contributions of the expenditure components (in percentage points)

Major contribution to the reported rates of economic growth for most of the years included in the period was attributed to the personal consumption of households, which was due to its relatively highest weight of GDP. The increase in consumption during the first period contributed between 55.6% and 113.2% of the growth rate of the real gross output and its positive effect considerably exceeded the negative impact of the growing foreign trade deficit during the greater part of the interval. In years with highest rates of economic growth like 2005 – 2006 and 2008 the positive contribution of personal consumption of households lagged behind the investment rate – moderately by 1.2 and 0.3 percentage points and more perceptibly by 3.2 percentage points respectively. The economic crisis in 2009 was also affected by the decline in personal consumption of households, though its impact accounted for just 35.5% of the adverse impact of the decline in investments.

Personal consumption of households continued to play a leading role in growth during the greater part of the second time interval. The most substantial contribution was recorded in 2012 offsetting completely the strong adverse impact of the foreign trade deficit and in 2019 when it was combined with negative but weaker impact of investments and net export. Completely different situation was observed in 2013 when the impact of personal consumption was

adverse combined with a high positive contribution of the foreign trade balance. The comparatively weakest impact of personal consumption of households was reported in 2010 when it lagged considerably behind the positive impact of net export and the unfavorable impact of investments, as well as insignificantly behind the stimulating impact of government consumption. During the remaining years in the second time interval personal consumption of households remained a predominant factor and predetermined between 57.5% and 94.7% of real GDP growth.

The analyzed projection of the personal consumption of households on the growth rate of real GDP should not be evaluated one-sidedly. On the one hand, the data show that this is a short-term stimulating factor whose impact is achieved through aggregate demand. Furthermore, the increase in personal consumption does not usually result in considerable changes in the net export which designates lack of clearly profound crowding-out effect in terms of the increased consumption of imported goods. On the other hand, the economic growth theories define the long-run impact of personal consumption on the economic growth as negative due to the negative correlation with the amount of savings. Even if such an unfavorable effect does not occur in practice in case there is lack of direct relation between savings and investments, the impact on growth in the long run will be weaker than the predominant contribution to the current economic activity in terms of investments.

Government consumption during the greater part of the period had a minimal impact on GDP growth and this was observable during both time intervals. In 2007, 2009 and 2013 it had an adverse impact on growth which in the first and third year was weaker than the suppressing impact of net export and in the second one it was weaker than the negative impact of investments and personal consumption of households. An exception to this rule prior to 2019 were the years 2003 – 2004 and 2006 when the government consumption contributed between 14.2% and 32.7% of the GDP growth. In the second interval, in the years 2010 – 2011 and 2017 – 2019 it contributed between 50% and 20% of the reported economic growth rates.

The investments during the first time interval had a stimulating and strengthening in time impact on the growth rates of the real GDP, which was most noticeable in 2005 – 2006 and 2008. Their role was especially significant considering the effect of the multiplier mechanism and their impact on the economic activity both through the aggregate demand and through the long-run aggregate supply. At the same time it appears that the abrupt increase in the relative share of investments of GDP resulted in quite close in value rates of economic growth which is indicative of the decreasing productivity of the additional investments.

In 2009 the decline in investments became one of the most important reasons for the reported decrease in real GDP, followed by a decline in the personal

consumption of households and in the government consumption. In 2010 – 2011 and 2016 they limited growth but this effect was offset by the positive effect of the foreign trade balance and during the second and third year – of personal consumption. In 2019 investments once again functioned as a growth detainer just like net export whose role, however, was much weaker. There was some recovery of their stimulating impact in 2017 and 2018 when they accounted for 37.1% and 67.7% of the reported rates of economic growth in the context of a restraining influence on the part of the foreign trade balance. The outlined specifics of the dynamics, the contribution to the growth and internal structure of the investments during the second interval were determined as unfavorable not only in the short run, but also considering the accumulation of capital and the possibilities for achieving long-run economic growth.

The net export had a distinctive impact on the economic growth during the two separate periods. Until 2009 its impact was negative, with the exception of 2003 when it was positive, but much weaker than that of the personal consumption of households and the investments. Its negative growth reached the highest levels in 2001, 2003 and 2006 when it was commensurate with the contribution of the personal consumption of households. In 2004 and 2007 the depressing impact of the foreign trade balance was respectively equal to or stronger than the stimulating impact of investments, whereas in 2005 it lagged considerably behind the positive impact of the personal consumption and investments and in 2008 – of investments only. As long as the adverse foreign trade balance during that interval was dependent on the high investment activity, it should not be perceived as negative because of the multiplier effect of the investments and their projection on the long-run economic growth.

In 2009 the net export was the sole component of the GDP expenditure structure with positive, at that too high, contribution to economic growth. Its impact remained positive during half of the years in the second interval and it was strongest in 2010 and 2013. In the first year it exceeded the minimal adverse effect on the investments and outstripped considerably the aggregate effect of the personal consumption of households and the government consumption, whereas in the second year it offset fully the total unfavorable effect of both personal consumption and investments. 2016 was characterized with the parity leading role of net export and personal consumption along with the negative contribution of investments. Due to the reported compliance with investments, the growth in the favorable foreign trade balance can be interpreted in positive context if it was caused mostly by the increased external demand. The most distinct adverse impact of the foreign trade balance was recorded in 2012 and 2018 when it equaled the positive contribution of personal consumption and investments respectively.

Convergence with the Eurozone

The dissimilarity and divergence indices of the GDP expenditure structure and its components relative to the Eurozone are computed on the basis of data in constant prices in base year 2015. As it can be seen in Figure 4. the dynamics in both aggregate indices disclose a pretty diverse picture for the intervals before and after 2009. The first interval was inconsistent starting with a decline in the deviations of around 50% of the dissimilarity index to a nearly full convergence by the divergence index. From 2003 until 2007 there was a growing discrepancy with the Eurozone which ran with some irregularity. In 2003 and 2004 it was relatively moderate and led to the recovery of the index to its 2000 levels. After that the dissimilarities increased dramatically with overwhelming changes in the divergence index. The dissimilarities observed between the values of the two aggregate indices were the result of their methodological peculiarities and of their higher susceptibility to the divergence index, in particular. It was noticeable in the higher absolute levels of this index relative to the dissimilarity index with stronger discrepancies in the analyzed structure and in lower levels – alongside stronger convergence.
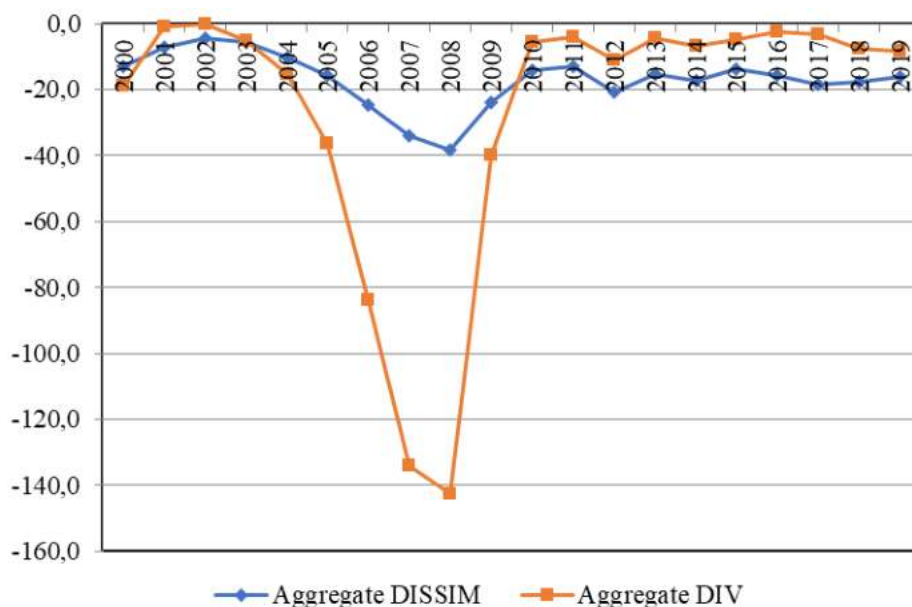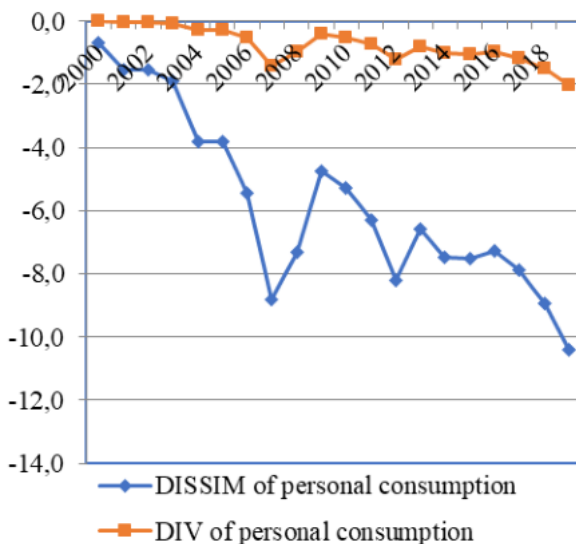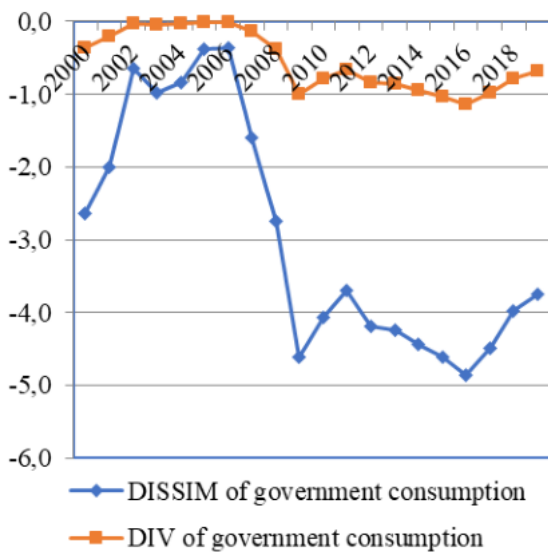

Source: Eurostat and own calculations

Figure 4: Aggregate dissimilarity and divergence indices

In 2009 and 2010 the discrepancies in the GDP expenditure structure in the Eurozone decreased and the two indices recovered to their levels from 2005 and 2004 respectively. From 2011 until 2019 they diverged with mean dissimilarity index value of -16.4 and of the divergence index of -5.8. The stronger convergence during the period and according to the two indices was observed in 2013 and 2015. The convergence by the dissimilarity index was evident in 2018 – 2019 although its highest value was in 2015 when the index reached -13.7. The difference in the divergence index in 2011 and 2016 narrowed and during the second year it reached the lowest absolute value of -2.4. Divergence in the GDP expenditure structure in the Eurozone by the two indices was reported in 2012, 2014 and 2017 and by the divergence index it was characteristic for 2018 and 2019. Despite that, the period as a whole featured a considerable strengthening of the convergence compared to previous years which can be perceived as a favorable characteristic of the economy in the context of business cycle synchronization. To what extent the discussed convergence was due to the individual GDP expenditure components and its correlation with the possibilities for economic growth can be determined by conducting some research into the convergence of personal consumption, government consumption, investments and net export individually.

The gap between the relative share of personal consumption of households of GDP in Bulgaria for the entire period and the Eurozone grew (see Fig. 5.a). This trend was more noticeable in the dissimilarity index which in 2019 amounted to -10.4, while in 2000 it was -0.7. The divergence index stood at zero prior to 2003 and then changed within a narrower range and in 2019 it reached the minimum of -2. Both indices illustrated an accelerated divergence in 2018 and 2019 which in relative terms was higher for the divergence index despite its lower absolute values. Some gap narrowing occurred in 2008 – 2009 and 2013 when there was a partial, though insignificant contribution to the dynamics of the aggregate dissimilarity index and just a symbolic effect on the aggregate divergence index.

a)

b)

Source: Eurostat and own calculations

Figure 5: Convergence of relative shares of personal consumption of households and government consumption

The pattern observed in the dissimilarity and divergence indices for government consumption exhibits some similarity with their pattern for personal consumption of households (see Fig. 5.b). It refers to the divergence trend itself rather than to the specific index values and their changes in time. According to the dissimilarity index in 2001 – 2002 the relative share of government consumption of GDP in Bulgaria converged with the Eurozone and after one single interruption in 2003 the trend continued in 2004 – 2005. Between 2007 and 2009 the index started to go up dramatically as an absolute value, and then it fluctuated around the mean value of – 4.6. During the last three years of the period, unlike the changes in personal consumption, a relatively gradual reduction in the differences was reported which made the index increase (go down by absolute value) – from -4.9 to -3.7. For the entire period the divergence index changed within the 0 to -1 range which is a sign of absolute or very high similarity with the contribution of government consumption to GDP in the Eurozone, although the trend is toward gradual divergence.

The dynamics in the dissimilarity and divergence indices of investments from 2005 until 2010 followed a V-shaped curve (see Fig. 6.a). The dissimilarity index curve is situated a bit lower and its lowest point of -11.8 was reached in 2008 when the minimum of the divergence index of -6 was reported. The increase in the gap with the Eurozone from 2005 until 2008 occurred at a high rate and was closely related to the sharp increase in the investment activity and the ensuing high rates of economic growth. The decline in the relative share of investments in the Bulgarian GDP caused by the economic crisis during 2009 – 2010 led to reducing the dissimilarities at accelerated rates. Until 2004 inclusive, and after 2010 the values of the divergence index were zero or close to zero and this indicated the existence of full or very high investment convergence during the two time intervals. According to the dissimilarity index there were discrepancies with the Eurozone during these two periods where during the first one they were descending, whereas during the second period they remained within the -0.1 and -2.2 range. The derived characteristics of convergence in investments affected the aggregated indices stronger but were not capable of determining their levels and changes.

a)

b)
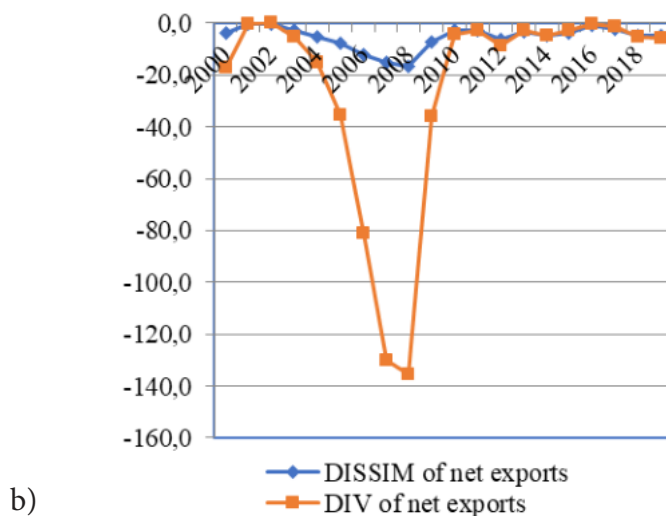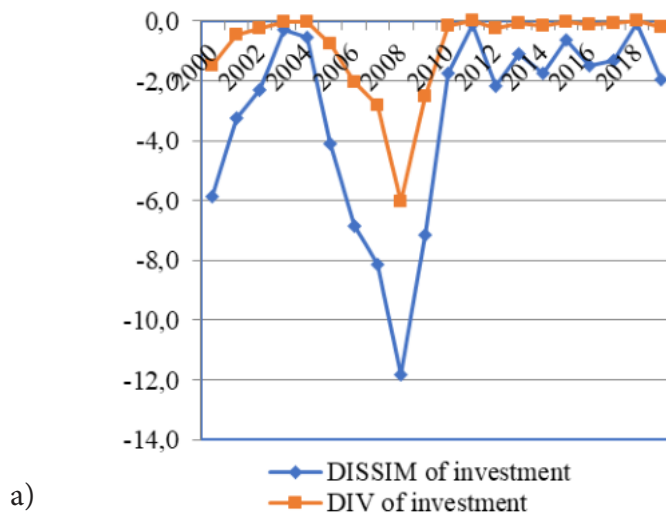
Source: Eurostat and own calculations

Figure 6: Convergence of relative shares of investment and net exports

The levels of the aggregate dissimilarity and divergence indices were mostly determined by the large fluctuations in the net exports (see Fig. 6.b). They also caused higher instability of its divergence index relative to the dissimilarity index which was not typical of any of the remaining components of the expenditure structure of GDP. In the period 2005 – 2008 this index reached high two-digit

and three-digit values with minimum value of -135.2 in 2008. These extreme values were the result of the dramatic increase in the foreign trade deficit during the same time period. What is more, the trajectory of the divergence index of the net export was quite similar to that of investments and this could be explained with the existing close correlation between their deviations. Certain peculiarities were observed in 2000, in 2003 – 2004 and after 2009 when the net export demonstrated considerable discrepancies with the Eurozone at the backdrop of the strong similarity in investments. These discrepancies were larger in 2000 and 2004, characterized with divergence indices of -16.9 and -15 respectively. From 2010 the deviations in the net export were considerably smaller but marked some increase in the end of the period. As far as the dissimilarity index is concerned, it showed smaller deviations and the minimum of -16.4 was recorded in 2008. The situation changed in the interval from 2010 until 2019 when its values became commensurate with those of the divergence index.

Conclusion

The empirical analysis of the Bulgarian GDP expenditure structure and its impact on the economic growth reveals the main contribution of personal consumption of the households during the greater part of the period under consideration, which is a short-run factor operating on the aggregate demand side. The impact of the other short-run factor – government consumption was usually positive and weaker, but marked a certain increase at the end of the period. During most of the years with high economic growth the investments whose changes were closely related to fluctuations in the net export were the determining growth factor. Before the crisis in 2009 the net export had an adverse impact on the dynamics of economic activity, while during the crisis and after it its impact was diverse and corresponded to the increase in the openness of the economy. The investments in the post-crisis period played the role of the most important growth deterrent and their unfavorable impact will be realized in the long-run time period. This was due to the decapitalization of the economy and the decreasing ratio between the consumption rate and the accumulation rate, as well as the unfavorable internal structure of investments.

The period with high economic growth was characterized with a considerable increase in the deviations of the structural characteristics of GDP in the Eurozone and later there was a process of stronger structural convergence. This was evidenced by the changes in the two convergence gauges in the expenditure structure of the gross output and the divergence index showed higher absolute levels of structural similarity. The closest convergence and similarity during the past years was observed in the relative share of investments, followed by government and personal consumption of households. This strong convergence

of investments, however, can be interpreted in two ways. On the one hand, it contributed to the business cycle synchronization, to the stronger resistance of the Bulgarian economy to the external shocks and to the efficiency of the future common monetary policy. On the other hand, however, it limited the possibility for the achievement of higher economic growth and thus – for the achievement of higher real convergence with the Eurozone. This illustrates that in Bulgaria the stronger convergence in the GDP expenditure structure was in conflict with the real convergence and the analysis of the importance, the conditions and the prerequisites for this conflict will be the object of future research.

Notes

[1] In this respect the current study differs from most of the existing analyzes of the GDP expenditure structure in Bulgaria, in which the relative shares of the components are calculated in current prices.

[2] The data about the mean values and the internal structure of each of the expenditure components of GDP as well as the following data about the correlation between the consumption rate and the accumulation rate and the openness of the economy are computed by the author based on information provided by the NSI.

[3] Net investments are calculated as the difference between the gross fixed capital formation by expenditure structure of GDP and the fixed capital consumption by its income structure.

[4] The data about the two structures of gross fixed capital formation are in current prices due to lack of information about the real values by components.

References

Величков, Н., (2020), Конвергенция в разходните компоненти на БВП на България към Еврозоната, Бизнес посоки, брой 1, с. 54 – 65. (Velichkov, N., 2020, Konvergentsia v razkhodnite komponenti na BVP na Bulgaria kum Evrozonata, Biznes posoki, broy 1, s. 54 – 65).

Ралева, Ст. (2007), Конвергенция или дивергенция в структурата на БДС на България спрямо Еврозоната, Шеста научна конференция на младите научни работници "България в Европейската икономика", София, УИ "Стопанство", с. 62 – 68. (Raleva, St. 2007, Konvergentsia ili divergentsia v strukturata na BDS na Bulgaria kam Evrozonata, Shesta nauchna konferentsia za mladi nauchni rabotnitsi "Bulgaria v Evropeiskta ikonomika", Sofia, Universitetsko Izdatelstvo "Stopanstvo", s. 62 – 68).

Ралева, Ст. (2013), Инфлация и икономически растеж: теория, методология, емпирика, София, Издателски комплекс на УНСС. (Raleva, St. 2013, Inflatziya i ikonomicheski rastezh: teoria, metodologia, empiria, Sofia, Izdatelski kompleks na UNSS).

Ралева, Ст. (2019), Структурни характеристики на икономическия растеж в България, Научни трудове на УНСС, София, Издателски комплекс на УНСС, Том 5, с. 65 – 79. (Raleva, St. 2019, Strukturni harakteristiki na ikonomicheskia rastezh v Bulgaria, Nauchni trudove na UNSS, Sofia, Izdatelski kompleks na UNSS, Tom 5, s. 65 – 79).

Ралева, Ст. (2020), Разходна структура на БВП в България: особености и конвергенция към Еврозоната, Икономически предизвикателства: държавата и пазарът, Пета научна конференция на катедра "Икономикс", София, Издателски комплекс на УНСС, с. 110 – 123. (Raleva, St. 2020, Razhodna struktura na BVP v Bulgaria: osobenosti i konvergentsiya kam Evrozonata, Ikonomicheski predizvikatelstva: darzhavata i pazarat, Peta nauchna konferentsia na katedra "Ikonomiks", Sofia, Izdatelski kompleks na UNSS, s. 110 – 123).

Статев, Ст., Ралева, Ст. (2006а), Конвергенция на разходната структура на БВП на България и Чехия към Еврозоната, Народностопански архив, Книга 3, с. 11 – 16. (Stattev, St., Raleva, St. 2006a, Konvergentsia v rashodnata struktura na BVP na Bulgaria i Chehia kam Evrozonata, Narodnostopanski Archiv, Kniga 3, s. 11 – 16).

Buiter, W., Grafe, C. (2002), Anchor, float, or abandon ship: exchange rate regimes for accession countries, EBRD Working Paper.

Darvas, Z., Szapary, G. (2004), Business cycle synchronization in the enlarged EU: co movements in the new and old members, Magyar Nemzeti Bank Working Paper, 1.

Krugman, P. (1991a), Geography and Trade, MIT Press.

Krugman, P. (1991b), Increasing Returns and Economic Geography, Journal of Political Economy, vol. 99, pp. 183 – 199.

MPC Task Force of the ECB. (2004), Sectoral specialization in the EU: a macroeconomic perspective, European Central Bank Occasional Paper, 19.

Stattev. St., Raleva, St. (2006b), The Bulgarian GDP structures convergence to EU, South-Eastern European Journal of Economics, Vol. 4(2), pp. 193 – 207.

Van de Coeving, C. (2003), Structural convergence and monetary integration in Europe, MEB Series, №20.

Von Hagen, J., Traistaru, J. (2005), Macroeconomic Adjustment in the New EU Member States, ZEI Working Paper, B 01.

Wacziarg, R. (2004), Structural convergence, CDDRL Working Papers, 8.