

An Empirical Analysis on the Gross Value Added Growth: the Case of Bulgaria

[Silvia Trifonova]

Abstract— The key objective of the paper is to analyze the gross value added growth by economic sectors in Bulgaria before and after the global financial crisis. The global financial turmoil impacted all economic sectors in the country, hitting consumer and business confidence and eroding export opportunities and capital inflows. The study is focused on the structural imbalances of the gross value added (GVA) in Bulgaria. An econometric analysis is made on Bulgaria's GVA produced by economic sectors before and after the global financial crisis. Chow test is applied in order to test the presence of a structural break.

Keywords—Gross value added; Gross domestic product; Global financial crisis; Bulgaria; Chow test.

I. Introduction

The key objective of the paper is to analyze the dynamics of Bulgaria's GVA by economic sectors before and after the global financial and economic crisis. This financial turmoil impacted all economic sectors in the country, hitting consumer and business confidence and eroding export opportunities and capital inflows. The study is focused on the GVA dynamics in Bulgaria during the last years. With this regard, an analysis on the GVA's structural imbalances is made. In order to assess the impact of the global financial crisis on Bulgaria's GVA in the study is applied the Chow test. It tests the presence of a structural break. An econometric analysis on Bulgaria's GVA by economic sectors before and after the global financial crisis is made. The empirical study is based on the following two sub-periods: 1) Pre-crisis period 2002-2008; 2) Post-crisis period 2009-2013. Data bases of the National Statistical Institute (NSI) are used – seasonally adjusted data, 2010 base-year prices, 3-monthly basis. The paper concludes with summarizing the results from the study.

II. Structural imbalances of the gross value added in Bulgaria by economic sectors

The drop of added value is the most serious problem for the Bulgarian economy. This is a problem underpinning the emergence of numerous others (including the low income of the population and the low coverage of social costs) that the policy makers are trying to solve by means of economic policy, but without much success.

For each small open economy with low investment activity, such as Bulgaria, the drop of added value is the fully ordered process, as the main form of realization of its potential is foreign trade. Meanwhile, the lack of a basis for the development of modern production, stimulate the export of production in the early stages of the value chain. Raw materials and semi-manufactures are exported mainly from Bulgaria, in which the proportion of labor costs is much smaller than on the last stage of the chain, especially in the implementation of high-tech products. This is immediately reflected in the foreign trade balance of Bulgaria, as the volumes of exported and imported goods are highly unequal, which in turn leads to the accumulation of negative trade balance. From this imbalance occurs, and another serious problem associated with household income. This leads to a standstill in the purchasing power of the population and to the satisfaction of essential needs at the expense of increase in indebtedness. The cost of a large number of employees in industrial sectors, cannot be covered by the main source of revenue and they are forced to withdraw credit from local banks. In 2009, more than half of Bulgarian households experiencing a systemic shortage of means for existence, as the cost of providing the minimum subsistence figure and those – customer service credits are equal to their earnings, or even larger. Bulgarian households are cautious regarding their expenditure due to the existing uncertainty on the labor market related to the continuing drop in employment and increase in unemployment. In the conditions of the world crisis about 2/3 of Bulgarian households are finding it difficult to service their loans and this affects the financial system – many banks realize losses amid rising costs for supplies, and the quality of their portfolio is deteriorating.

Catalysts for value added exports are the processes of globalization, which lead to significant negatives in the economies exporting added value due to two main reasons. On the one hand, the lack of barriers to the free movement of goods and services leads to fast leveling of prices to markets in countries with substantially different levels of incomes of the population, i.e. the convergence of prices leads to a real impoverishment of households in the countries exporting added value. The problem with the export of value added stems from the unfavorable industrial structure of the Bulgarian economy and undermine its foundations, depriving its potential for development in the long term.

The structure of the Bulgarian production is inefficient in terms of volume and added value growth. The share of added value produced in industry, agriculture and construction is greater than the EU average. Like most small open economies, the Bulgarian economy is highly vulnerable to the effects of the regional and global factors, for the following reasons: a strong dependence on export earnings and foreign investment; weak competitiveness on international markets; the absence of

protection mechanisms; high energy intensity of production. The last feature is typical for the region of Central and Eastern Europe (CEE) and this lead to a deepening of the problems, as in the conditions of financial crisis, it is virtually impossible to allocate funds for the modernization of production. This is accompanied with a deterioration of the competitiveness of the CEE economies.

The global financial crisis hit the Bulgarian economy during the second half of 2008. Like a country with a currency board arrangement (CBA), in times of crisis fixed exchange regime are considered to be more fragile than other monetary regimes [1]. The CBA was introduced in Bulgaria in July 1997. Bulgarian lev (BGN) is fixed to the euro (BGN 1.95583 per 1 euro) and the Bulgarian National Bank (BNB) has no legislative powers to intervene on the financial markets. Money supply in the economy is limited to the changes in foreign reserves because of the legislative requirement to maintain 100% coverage of monetary base with the euro. The CBA's operation is considered as a key precondition for building up confidence, stabilizing the economy and stimulating structural reforms in Bulgaria [2].

During the crisis domestic demand was constrained by static incomes, growing unemployment, weaker foreign direct investment, and low lending rates [3]. On the other hand, weak domestic demand for durables and investment goods significantly cut imports. Declining export sales and revenues and increasing unemployment hit industries serving the domestic market. Low consumer demand during the crisis resulted in a drop in wholesale and retail trade; repair of motor vehicles and motorcycles, transportation and storage, accommodation and food service activities. Manufacturing was hit hardly as domestic sales dropped. The slump of value added in construction decelerated. The dynamics in the sector was determined by the lower output both of the building construction and the civil engineering [4]. This trend contributed to an intensification of real GDP decline. In 2009 real GDP dropped by 5.5%, and total GVA declined by 3.8%. Value added in manufacturing fell by 8.1% in 2009, contributing by 1.2 percentage points to the overall decline. Worsened export conditions and, even more, reduced domestic demand impacted the sector. Negative growth in industry was related to declines in construction (-7.2%) which utilizes the bulk of intermediate consumption products, and retail (-6.1%) in 2009. Reduced foreign trade was a key factor behind falls in transport and communications where value added dropped by 7% in 2009. GVA in financial sector was dropped to 52.7% in 2009 comparing with 54.3% in 2008. Owing to the deterioration in market conditions companies in most industries cut material and labor spending to protect the narrowing gross operating surplus in their gross output.

The effects of the global financial crisis in terms of Bulgaria's value added exports were the following: relatively weak changes in the structure of foreign trade; the amendments on the segments were on the order of 2-3 percentage points relative to the levels of 2007; they were mainly in the form of contraction of the proportion of the raw materials and energy resources (which is logical in a period of global recession), on account of the increase of the share of basic necessities (food and medicines).

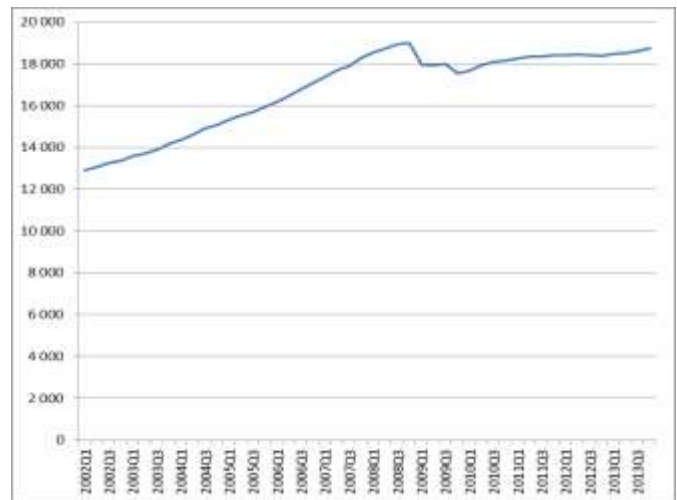


Figure 1. Bulgaria's GDP on a quarterly basis

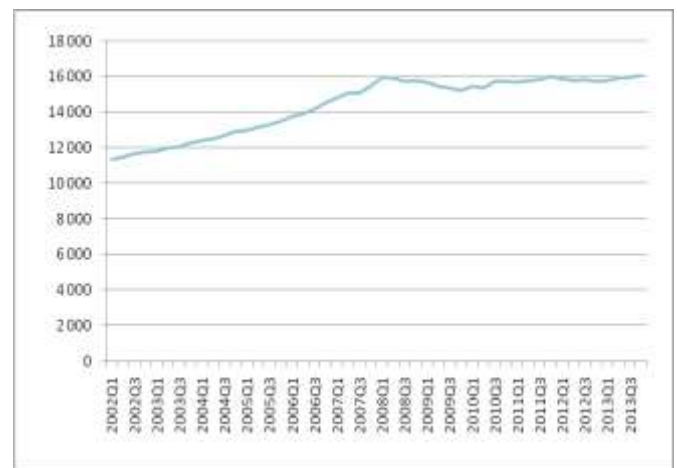


Figure 2. GVA produced by all economic sectors in Bulgaria on a quarterly basis

More than half of the Bulgarian export is composed of goods with low added value (raw materials and semi-finished products). The data indicate that this structure has greater inertia in terms of adverse economic developments and is relatively more resilient to the impact of the global crisis. The 2008 EU trade deficit grew by 21%, while the deficit of the 27 EU Member States - 25%. In the long term, however, such a low-efficient production structure prevents the increase of labor productivity. Indeed, bank lending in Bulgaria is scaled back, but even if it was reserved to the levels of before the crisis, it would hardly help the restructuring of production, as demonstrated its dynamism during the brief recovery since 2010. The low added value of local production determines the dynamics of household income which indicates the degree of economic convergence to the EU. In 2008, 41.9% of the population in Bulgaria was living in material deprivation, while for the EU this proportion was considerably smaller - 8.1%. As concerns the overall labor market in Bulgaria – during the crisis it remained poor. Weaker trading also hit the domestic labor market. Employment declined by 2.9% in 2008 and by 6.2% in 2009 as layoffs intensified (data from Labor Force Survey).

The global financial crisis affected the labor market with a delay, employers were in good financial health when it arrived and could afford to postpone layoffs pending a recovery. The initial shock hit exporters and took time to affect those serving the domestic market. The decline in employment was slower during the next years – by 3.4% (2010), 1.1% (2011), 2.9% (2012) and 0.0% (2013). During the crisis employment rate in the country fell mainly through staff cuts in manufacturing and in services. Unemployment continued rising during the period 2009-2013, reaching its peak - 12.9% at the end of 2013 according to the Labor Force Survey. Weaker labor demand and scarce new jobs continued to keep people of working age out of work. The number of unemployed persons aged 15 years and over and registered with the Employment Agency remained too high (more than 436,000) in December 2013.

III. Empirical analysis on Bulgaria's GVA by economic sectors before and after the crisis

This empirical analysis aims to reveal the impact of the global financial and economic crisis on the GVA by economic sectors in Bulgaria. The country's overall GDP is measured by the Production approach. The economic sectors and economic activity groupings are classified in 10 groups according to the National classification 2008 such as follows:

1. Agriculture, forestry and fishing;
2. Mining and quarrying; manufacturing; electricity, gas, steam and air conditioning supply; water supply; sewerage, waste management and remediation activities;
3. Construction;
4. Wholesale and retail trade; repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities;
5. Information and communication;
6. Financial and insurance activities;
7. Real estate activities;
8. Professional, scientific and technical activities; administrative and support service activities;
9. Public administration and defence; compulsory social security; education; human health and social work activities;
10. Arts, entertainment and recreation, repair of household goods and other services.

Two are reviewed periods in the analysis: (1) Before the global financial crisis (2002-2008); (2) After the crisis (2009-2013). On this basis, two econometric models are constructed for the two sub-periods. Chow test is applied in order to test the presence of a structural break in the country's GVA dynamics. Chow test does confirm the suggestion made in the graphical interpretation of Bulgaria's GVA (Fig. 2) that this indicator was developed in one way up to end-2008, but since 2009 – in another way. Chow test demonstrates that the **fourth**

quarter of 2008 can be seen as a breaking point when the upward trend of the country's GVA is broken.

Logically, the next step is to analyze both trends of development and to determine what the difference is exactly before 2008 and after that. This analysis is focused on the GVA generated by the tenth economic sectors. Tenth figures are presented in order to demonstrate the dynamics of GVA by each Bulgarian economic sector. With this view, a general measure of development is chosen which the average exponential growth of a certain variable is. The average exponential growth could be determined by using the following econometric model:

$$Y_t = \beta_0 + \beta_1 t + \varepsilon_t \quad (1)$$

where: Y_t are the investigated GVA, t is dummy variable expressing the time, and β_1 is the requested average growth.

The results from the tenth constructed econometric models for each economic sector could be seen at Table I, representing the average absolute growth of Bulgaria's GVA by economic sectors.

TABLE I: AVERAGE ABSOLUTE INCREASE IN GDP AND GVA BY ECONOMIC SECTORS IN BULGARIA ON A QUARTERLY BASIS

| Average absolute increase in GDP and GVA by economic sectors in Bulgaria on a quarterly basis (2010 base-year prices) | | | |
|---|-----------|-----------|-------------------|
| Period | 2002-2008 | 2009-2013 | Total (2002-2013) |
| GDP | 239,37 | 47,34 | 124,88 |
| Production Approach | | | |
| Agriculture, forestry and fishing | -7,79 | -6,59 | -7,82 |
| Mining and quarrying; manufacturing; electricity, gas, steam and air conditioning supply; water supply; sewerage, waste management and remediation activities | 44,82 | 22,36 | 23,84 |
| Construction | 24,22 | -16,50 | 8,75 |
| Wholesale and retail trade; repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities | 44,13 | 28,40 | 26,32 |
| Information and communication | 14,83 | 1,19 | 14,69 |
| Financial and insurance activities | 33,69 | -1,47 | 24,37 |
| Real estate activities | -0,08 | 5,55 | -0,66 |
| Professional, scientific and technical activities; administrative and support service activities | 13,78 | 1,09 | 7,99 |
| Public administration and defence; compulsory social security; education; human health and social work activities | 7,22 | -1,47 | 1,91 |
| Arts, entertainment and recreation, repair of household goods and other services | 7,79 | -3,04 | 6,32 |

The results obtained from the econometric analysis demonstrate four distinguished trends in the GVA, produced by economic sectors:

1. Trend of sustainable average decrease in GVA before and after the crisis.

This trend is observed only in sector „Agriculture, forestry and fishing” in Bulgaria. During the pre-crisis period 2002-2008 the GVA produced by this sector declined every year by average BGN 7,79 mil, followed by a decrease of BGN 6,59 mil after the crisis 2009-2012. Therefore, no serious impact of the crisis is observed on this sector. The GVA's decline was BGN 7,82 mil on a quarterly basis for the whole period 2002-2013. This means that on an annual basis the GVA decline in sector „Agriculture, forestry and fishing” was around BGN 31 mil for the whole reviewed period. This sustainable downward trend reveals the reducing contribution of agriculture to the economic development in Bulgaria. This sector is not a driver of the economic growth, but back slows down the GDP growth. At the same time, the number of employed in the sector remained almost unchanged or decreased by a much slower pace. This means that in the agricultural sector there is no increase of the production efficiency. The production is very extensive, which in much greater degree than in developed countries depends on the natural and climatic conditions. Therefore, the lack of serious progress in agriculture can be considered to be due to the existing serious structural problems, and the fact that during the last years the attention was focused on the preparation of the sector for the EU requirements.

2. Trend of sustainable average increase of GVA before and after the crisis, but the growth rate is much lower after the crisis.

This trend is observed in the following four economic sectors in Bulgaria:

1) Sector „Mining and quarrying; manufacturing; electricity, gas, steam and air conditioning supply; water supply; sewerage, waste management and remediation activities”. Up to end-2008 the GVA produced by this sector increased by 44,82 BGN mil quarterly. This means that on an annual basis its growth was around BGN 180 mil. Since 2009 the average growth in GVA by this sector in Bulgaria was only BGN 22,36 mil quarterly. There was a decline by 2 times of this indicator. In fact, the yearly growth of GVA by this sector during the period 2009-2013 was very low – around BGN 90 mil.

2) Sector „Wholesale and retail trade; repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities”. During the pre-crisis period the GVA produced by this sector increased by BGN 44,13 mil quarterly. Its growth on an annual basis was around BGN 176 mil. During the second period the average growth in GVA by this sector was only BGN 28,40 mil quarterly. On an annual basis this growth was around BGN 113 mil. In fact, a decline by around 2 times of this indicator is observed. Worsened export conditions and, even more, reduced domestic demand impacted hardly this sector.

3) Sector „Information and communication”. Up to the end of 2008 GVA by this sector raised by 14,83 BGN mil quarterly. This means that on an annual basis its growth was around BGN 59 mil. Since 2009 the average growth in GVA

by this sector in Bulgaria was only BGN 1,19 mil quarterly or 4,76 annually. There is a huge decline by more than 12 times of this indicator. Reduced foreign trade was a key factor behind falls in transport and communications during the crisis.

4) Sector „Professional, scientific and technical activities; administrative and support service activities”. During the pre-crisis period GVA produced by this sector increased by BGN 13,78 mil quarterly. Its growth on an annual basis was around BGN 55 mil. During the second period the average growth in GVA by this sector was only BGN 1,09 mil quarterly. On an annual basis this growth was too low – BGN 4,36 mil. As a result, sharp contraction by more than 12 times of this indicator is also observed.

The conclusion made from the econometric assessment of the GVA produced by the above-mentioned four economic sectors in Bulgaria is that its upward trend was strongly hampered by the global financial and economic crisis.

3. Trend of increase of GVA before the crisis and of its strong decline after the crisis.

This trend is observed in the following 4 economic sectors in Bulgaria:

1) Sector „Construction”. This sector was hit most hardly by the crisis with GVA contracting by BGN 16,50 mil average on a quarterly basis during the period 2009-2013. Huge contrast is observed in comparison with the first pre-crisis period when GVA produced by construction sector rose by BGN 24,22 mil quarterly. This trend was similar to many other EU countries experiencing negative construction growth due to the worsened business climate. The key difficulties encountered by the construction industry were the tightened credit conditions, the low demand and low investment levels and the lack of confidence in future prospects. Leading segments in the building sector would be road construction due to the large-scale infrastructural projects financed through the EU Programmes. The number and significance of the so-called green projects is increasing, and Bulgaria is a partner in many international activities [5].

2) Sector „Financial and insurance activities”. During the first pre-crisis period the GVA produced by this sector increased by BGN 33,69 mil quarterly. Its growth on an annual basis was around BGN 135 mil. During the second period the average growth in GVA by this sector was negative - by BGN 1,47 mil quarterly. On an annual basis its decline was around BGN 6 mil during the post-crisis period. The global financial crisis directly affected the financial and insurance sector in Bulgaria. Since the beginning of the crisis the credit demand has been declining, and the loan portfolio quality was worsened while the price of borrowing was remained relatively high. The restricted bank lending was due to the increased risk and the conservative credit policy of banks while no financial support is provided by the central bank to the banks in a currency board arrangement. This led to excess liquidity for some banks and expansion of non-bank financial institutions in provision of loans to the real sector. In the conditions of a financial crisis such institutions try to replace the banks in their role of lenders, extending loans at

less strict conditions, but at a significantly higher interest burden [6].

3) Sector „Public administration and defence; compulsory social security; education; human health and social work activities”. During the pre-crisis period the GVA produced by this sector increased by BGN 7,22 mil quarterly. Its growth on an annual basis was around BGN 29 mil. During the second period the GVA produced by this sector declined by BGN 1,47 mil on a quarterly basis. On an annual basis its decline was around BGN 6 mil during the post-crisis period.

4) Sector „Arts, entertainment and recreation, repair of household goods and other services”. Up to end of 2008 the GVA produced by this sector increased by 7,79 BGN mil quarterly. This means that on an annual basis its growth was around BGN 31 mil. This upward trend was reversed during the time of the crisis. Since 2009 the GVA by this sector has been declining by BGN 3,04 mil quarterly. On an annual basis its decline was around BGN 12 mil during the post-crisis period.

4. Trend of decrease of GVA before the crisis and of its low increase during the crisis.

This trend has been observed only in the real estate sector in Bulgaria. During the pre-crisis period the GVA produced by real estate activities declined by BGN 0,08 mil quarterly. This means that on an annual basis its decline was less than BGN 0,4 mil. Since 2009 this downward trend has been reversed. An average growth in the GVA produced by this sector was observed during the post-crisis period - by BGN 5,55 mil quarterly. There was an increase by BGN 22,2 mil of this indicator on an annual basis. Following the domestic economy recovery, real estate sector started to expand in 2010 and this trend was retained in the next years.

iv. Conclusion

The problem of added value's drop from Bulgarian economy is underpinning the emergence of numerous others (like the low income and the low coverage of social costs) that the policy makers currently are trying to solve by means of economic policy, but without much success. The structure of Bulgarian production is inefficient in terms of volume and added value growth. Bulgarian economy is highly vulnerable to the regional and global factors due to its strong dependence on export earnings and foreign investment, weak competitiveness on international markets, the absence of protection mechanisms, and the high degree of energy intensity of production. The impact of the global financial crisis in terms of Bulgaria's value added exports was associated mainly with relatively weak changes in the structure of foreign trade, and a contraction of the proportion of the raw materials and energy resources on account of the increase of the share of basic necessities.

The econometric analysis on Bulgaria's GVA by economic sectors demonstrates that construction was hit most hardly by the global financial crisis. The GVA produced by this sector was declined by BGN 16,50 mil average on a quarterly basis during the period 2009-2013. This was the strongest decrease

in GVA produced by an economic sector in Bulgaria. Besides construction, financial and insurance activities were also strongly affected by the crisis. As regards the sectors “Information and communication”, „Mining and quarrying, manufacturing, electricity, gas, etc.”, “Wholesale and retail trade, transportation etc.” and „Professional, scientific and technical activities, etc.”, the upward trend of the produced GVA before the crisis was negatively reversed during the post-crisis period. The only sector experiencing a sustainable average decrease in GVA before and after the crisis was „Agriculture, forestry and fishing” due to its serious structural problems.

Acknowledgment

S. Trifonova thanks to Prof. Dr. Nikolay Nenovsky, University of Picardie Jules Verne, CRIISEA, Amiens, France for his valuable support and collaboration.

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