Diversity in Bulgarian foreign trade

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Abstract

The aim of the paper is to explore the changes in Bulgarian exports after 2007 by sectors and main trading partners and to generate hypotheses for its future development. The author applies different measures of diversity as predictors of economic resilience, whereas resilience is understood as the capacity of a system to recover its functions and structure after an internal or external shock. The analysis relies on the UN Comtrade database. This study can be regarded as an initial step towards the identification of options for policies supporting export development as an important component of economic growth and enhanced resistance and ability to adapt to exogenous shocks.

Key words: export, vulnerability, resilience, diversification, economic complexity

Introduction

Small open economies are highly exposed to exogenous shocks. Supply-side shocks may arise from the volatility of commodity prices in the global economy, while also changes in aggregate demand such as a capital investment boom, pre-election spending or changes in the growth rates of major trade partners are capable of creating disequilibrium in the economy. The proneness of a small open economy to exogenous shocks is defined as economic vulnerability. Vulnerability itself stems from a combination of inherent economic features of the country such as high degree of economic openness, export concentration and dependence on strategic imports.[1]

The ability to recover from or adjust to the negative impacts of external economic shocks is referred to as economic resilience. In general, resilience is understood as the capacity of a system to recover its functions and structure after an internal or external shock.[2] At its simplest, resilience implies the ability of a system to “bounce back” or restore to its pre-shock long term trend[3]. While the definition of resilience is not fixed, the reaction of the economy to a shock is usually described by its resistance to the external impact or the time to move back to the levels before the shock to its steady-state path of development.[4]

After the global financial crisis of 2007-2008 many governments focused on short term policy solutions to ameliorate the negative effects of the downturn on their economies. Since then it has become increasingly clear that the varying responses of the economies to the global crisis were dependent on policy decisions taken years and even decades in advance which have shaped the capacity of the economy to withstand and recover from an external shock. There is no universal recipe for fostering long term foundations for a resilient economy as there are no two shocks or recessions that repeat themselves and no two economies share exactly the same characteristics. However, among many features believed to strengthen resilience is diversity. Regional diversification of export has been emphasised as a strategy to build more resilient economic structures.[5] In retrospective, the fact that Asian countries weathered well the global financial crisis and its aftermath is partly attributed to their diversified external sectors and increasing regional integration, allowing for the emergence of comprehensive vertical supply chains whose participants produce a wide range of products and services.[6]

[1] Briguglio, L., Cordina, G., Farrugia, N., & Vella, S. Economic vulnerability and resilience: concepts and measurements. // Oxford Development Studies, 2009, 37(3), 229-247.

[2] Allenby, B., Fink, J. Toward Inherently Secure and Resilient Societies.// Science, 2005, 309(5737), 1034-1036. doi: 10.1126/science.1111534.

[3] ESPON. Territorial Observation No. 12: “Territorial Dynamics in Europe – Economic Crisis and the Resilience of Regions.”, September 2014

[4] The econometric approach to the measurement of resilience focuses on the impulse response functions modelled in the context of vector autoregression. See: Lütkepohl, H. Impulse response function. // The New Palgrave Dictionary of Economics. Vol. 4. Basingstoke, Hampshire: Palgrave Macmillan, 2008.

[5] Aiginger, K. Strengthening the Resilience of an Economy: Enlarging the Menu of Stabilisation Policy to Prevent Another Crisis. // Intereconomics, 2009, No. 5, 309-316.

[6] Zeti Akhtar Aziz. Asia’s Resilience. // Finance & Development, June 2014, 22-23.

Diverse economies appear more resilient over time as they are more adaptable to changing circumstances. Policies that avoid establishing a dependence on particular firms or market segments tend to support more resilient economies. The same is true for policies that promote a diversification of markets.[7] A wider interpretation links resilience to economic complexity, since higher complexity implies more diverse economic activities, sources of growth and flexible responses to shocks.[8] Economic complexity is expressed by the composition of a country's productive output and reflects the structures that emerge to hold and combine knowledge. The amount of knowledge that a country possesses is expressed in the diversity and ubiquity of the products that it makes.[9]

Based on these assumptions we hypothesise that the more diverse the export base, the more resilient the economy. The current paper reviews the diversity of Bulgarian exports as a precondition for building an economy able to withstand and recover from future shocks, since the inherent characteristics of the Bulgarian economy presuppose its vulnerability to exogenous shocks.

Methodology and data

The exploration of export diversity adheres to the World Bank framework for diagnostic analysis of trade competitiveness.[10] The trade outcomes analysis includes four principle factors on which a country's trade competitiveness is determined: 1) the level, growth and market share performance of existing exports; 2) diversification of products and markets; 3) the quality and sophistication of exports; and 4) the entry and survival of new exporters. The data for the analysis is sourced from the United Nations Comtrade database. Mostly mirror data, or data reported as imports from Bulgaria in the statistics of its trade partners, is used for the purposes of this research. Beyond the scope of the current paper remains the comparison between the official data for the Bulgarian export and the results from the use of mirror data. A significant part of the indices are calculated with the help of software applications, provided by the World Integrated Trade Solution (WITS),[11] a joint project of the World Bank in collaboration with the United Nations Conference on Trade and Development (UNCTAD), International Trade Centre (ITC), United Nations Statistical Division (UNSD) and the World Trade Organization (WTO). For sectoral composition and growth the classification of the Harmonised Commodity Description and Coding System (HS), 2002 edition, is employed at the highest level of aggregation or two-digit codes, while for the review at product level more detailed six-digit data is used.

Economic complexity as a country characteristic reflects the productive knowledge implied in a country's export structure.[12] It is calculated as the mathematical limit – or eigenvector – of a measure based on how many products a country exports, its diversity, and how many other exporters each product has or how ubiquitous the product is. The data used for estimating economic complexity is sourced from the UN Comtrade database and the calculated indices and visualised data are available from the Observatory of Economic Complexity[13] and the Atlas of Economic Complexity[14].

Measuring diversity

A major indicator characterising the role of foreign trade for a country's economy is *trade openness.* The trade-to-GDP ratio is one of the most often used measures of foreign trade openness and degree of integration in the world economy. The indicator measures the aggregate importance of exports and imports of goods and services for an economy. It provides an understanding of the

[7] ESPON, Ibid.
[8] Han, Y. and Goetz, S.J. Predicting the economic resilience of US counties from industry input-output accounts. NARDEP Working paper, April 2013. Available at: http://www.nardep.info/uploads/Predicting_the_Economic_Resilience_of_US_Counties_by_Han_and_Goetz_SRSA_2013B.pdf
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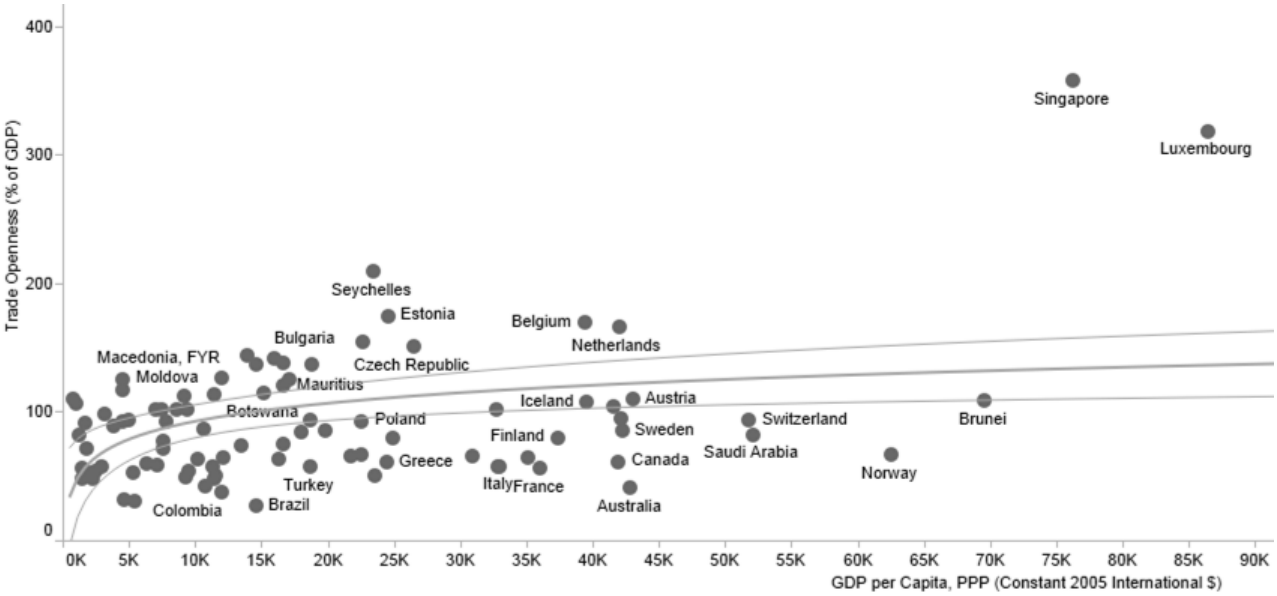
[10] Reis, J.G. and Farole, T. Trade competitiveness diagnostic toolkit. Washington DC: The World Bank, 2012.
[11] Available at: http://wits.worldbank.org/
[12] Hausmann, R., Hidalgo, C. et al., Ibid.
[13] http://atlas.media.mit.edu/
[14] http://www.atlas.cid.harvard.edu/

dependence of domestic producers on foreign demand and of domestic consumers and producers on overseas supplies. The link between trade openness and per capita income (Fig. 1) points out that Bulgaria has a relatively high trade-to-GDP ratio compared to countries with similar level of income.



Source: WITS-UNSD Comtrade, World Development Indicators

Figure 1. Trade openness and GDP per capita (PPP), 2013

This indicator fluctuates between 104 and 141 % for the period 2007–2013, being at its lowest during the recession year, 2009, while 2012 marks a recovery to the level of 2008 – 138%, followed by a further increase to 141% in 2013. Compared to neighbouring countries with economies of a similar size Bulgaria seems to be well integrated in the world economy (Table 1). At the same time the high level of trade openness hints at the exposure to potential shocks and increased vulnerability.

Table 1. Trade openness, 2008–2012

Country	*Trade to GDP, %*
Bulgaria	125,6
Greece	77,6
Romania	56,8
Serbia	86,5

Source: World Bank

The average level of trade in services as share of GDP is 24.5% for the period 2007–2012 compared to 106.3% merchandise trade for the same period. Although the economic crisis had a large impact on the merchandise trade which shrunk by nearly a third as share of GDP in 2009, this component of foreign trade was characterised by a more dynamic recovery by the end of the period (Table 2). The relative decline of trade in services lingers on until the end of the period, hinting at ongoing restructuring between the main trade sectors, predating the crisis.

Table 2. Trade composition, % of GDP

Trade in	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*
Merchandise	115.1	114.4	82.1	96.7	113.5	115.8
Services	28.4	26.8	24.5	22.4	21.9	22.8

Source: World Bank

The *total number of traded products* by a country at six-digit level of the HS gives a rough idea of the number of existing links between the country and its partners. For instance Bulgaria exported 2,317 products with value greater than 100,000 USD to 103 markets[15] in 2013. This marks an increase in the number of products from the previous 2012 when 2,250 products were exported to 113 markets. There has been a general trend towards gradual increase in the number of exported products since 2007 when they were 1,995, while the number of markets has not changed significantly. For comparison, the biggest exporting nations Germany and China reach over 140 markets with more than 4,500 products. Bulgaria demonstrates comparable export activity to its EU neighbours Greece and Romania.

Bulgarian imports comprised 3,234 products coming from 118 markets in 2013, while in 2012 the imported products with value over 100,000 USD were 3,161 deriving from 116 markets. There has been no clear trend regarding the number of imported products in recent years (e.g. 3,241 products in 2007), while the number of supplying markets reached a peak of 130 in 2007 followed by a decline until 2012.

The *share of the top five leading markets* in total exports (Germany, Turkey, Italy, Romania and Greece) was 44.7% in 2013. The share of the top five markets in Bulgarian exports has been hovering around 45% during the past decade; the only significant change has been the substitution of Belgium with Romania as a major trade partner since 2008 or after the accession of Bulgaria and Romania to the European Union.

The *concentration of imports* from the largest five partners is in the range of 46-51% during 2009–2013. The top three suppliers are firmly Russia, Germany and Italy, while Romania, Greece and Turkey have been changing their ranking during the five-year period. Major vulnerability of the Bulgarian economy stems from the very high dependency on supply of fuels from the Russian Federation. While Russia is the biggest importer in the country with a share of 16 to 21% of total imports, 93-94% of its imports in 2010–2013 constitute fuels corresponding to roughly three quarters of the total Bulgarian foreign supply of fuels.

For a more formal estimate of export concentration the *Hirschman-Herfindahl Index* (HH index) is used. Values close to zero point at high diversification, while exports destined to only one market (or concentrated on one product) will produce value of one. The HH market concentration index for Bulgaria is 0.0545 for 2012, compared to 0.0559 for 2005, which confirms the lack of strongly dominant market destinations. There is also no discernible trend before and after the EU membership.

The *share of the top five products* in the country’s exports, defined at HS six-digit level, forms about a quarter of Bulgaria’s exports. When mirror data is applied, the share of the top five products is 21% for 2012 (Table 3), while when employing data from the national statistics the result is 26.9% of total exports. Irrespective of the data set leading positions occupy oil products, cathodes and unrefined copper, durum wheat and sunflower seeds. As sunflower seeds and medicaments have very close trade values they exchange their ranks at fifth and sixth place, depending on the data set. Ranked seventh with 1.5% of total exports value (or 1.9% according to national statistics) is electrical energy. It is worth noting that leading export products originate from sectors with a small number of large enterprises, the only exception being to some extent the production and export of grains and essential oils. The high degree of concentration in fuels is confirmed by the HH product index: 0.68. The small number of products within product groups leads to high values of the index for footwear (0.20), and hides and skins (0.14). Significant values are observed within vegetables (0.15), metals (0.17) and minerals (0.24). Lower concentration is observed for stone and glass products (0.13) and chemicals (0.11), while for all other product groups the index is under 0.1 for the year 2012.

[15] Most probably the number of markets is underestimated and will be revised upwards after additional data from reporting countries is added to the UN Comtrade data base. The official Bulgarian trade statistics registers export to over 190 countries without considering a value threshold.

Table 3. Leading export products, share of total exports and compound annual growth rate (CAGR) for 2010–2012

HS Code	*Product Description*	*Trade value in 1000 USD, 2012*	*Share, %*	*CAGR, 2010-12, %*
740311	Cathodes and sections of cathodes	1 193 096.194	5.70	-5.2
271011	Light oils and preparations	1 069 566.239	5.11	23.8
271019	Other petroleum oils	1 009 328.199	4.82	28.1
740200	Unrefined copper; copper anodes for electrolytic refining	662 717.677	3.16	35.7
100190	Durum wheat	459 662.410	2.19	29.4
120600	Sunflower seeds	448 442.539	2.14	9.1
300490	Medicaments	441 310.529	2.11	18.3
271600	Electrical energy	319 467.901	1.53	3.9
720449	Waste and scrap of tinned iron or steel	312 729.450	1.49	-1.2
711299	Waste and scrap of precious metal	280 309.178	1.34	104.5

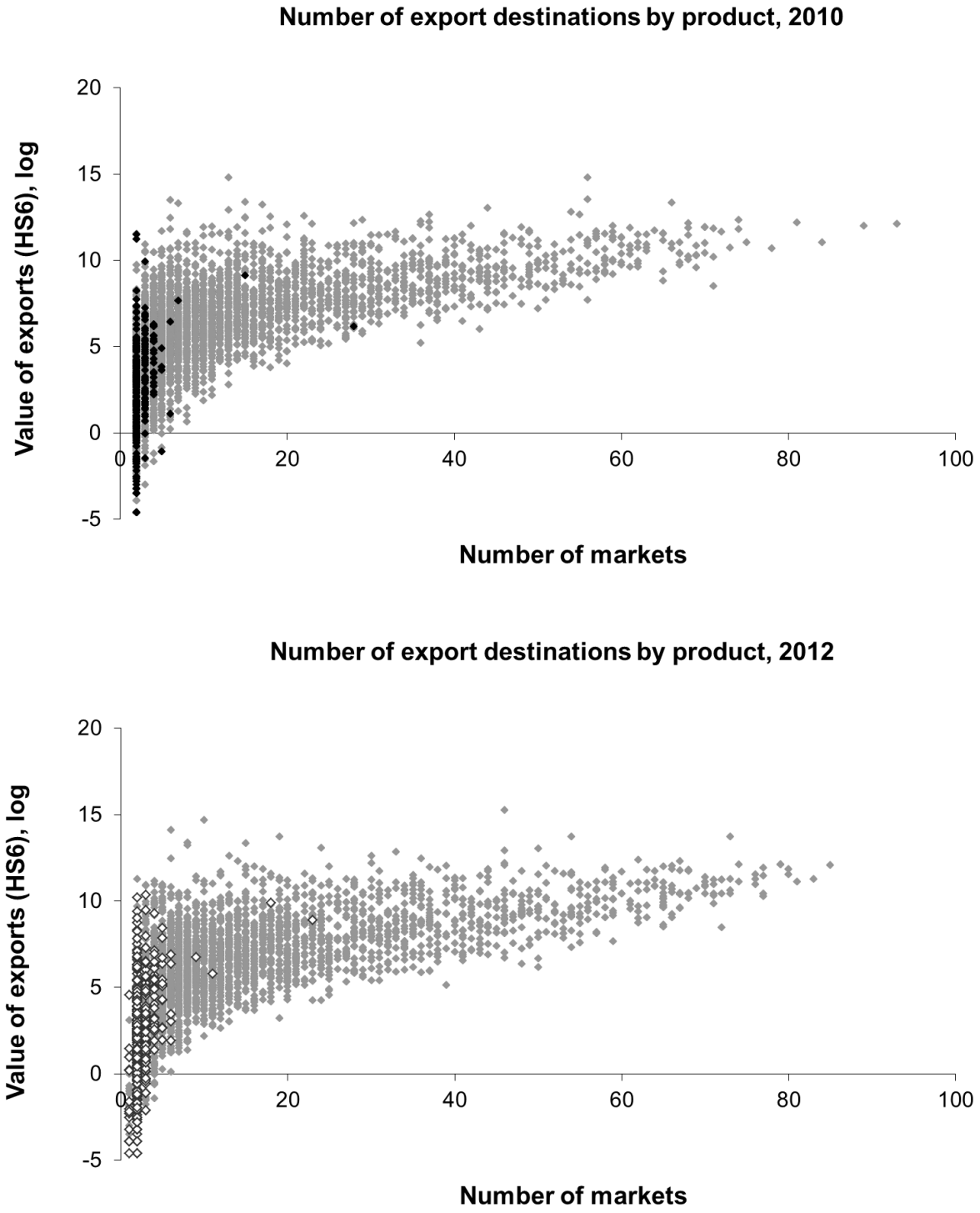
Source: WITS–UNSD Comtrade

How successful are the efforts in exporting a country’s individual products and how many markets do they reach? An answer to this question offers the *Index of Export Market Penetration* (IEMP).[16] This index looks at a country’s total number of exports and the number of markets that each of those products reaches. Then the number of countries in the rest of the world that import each of the products (which the country of interest exports) is counted. Pairing products and countries this way, the maximum potential number of export relationships that a country can establish, given its export portfolio at present, is established. The actual number of export relationships is then divided by the potential number to assess how much export opportunities a country is exploiting. No country exports its products to all the countries that import them. Actually, Germany, one of the world’s most successful exporting nations, exploits only around 50% of its potential and this can serve as a best case benchmark. Bulgaria improved its index of export market penetration from 6.81% in 2005 to 8.24% in 2013 with a gradual increase over the years. For comparison Romania’s IEMP for 2013 is 9.40% and that of Greece – 8.37%.

An alternative approach for visualising the access of individual products to export markets is presented in Figure 2. Products exported both in 2010 and 2012 are plotted in grey, in total 3,655 positions. Products that have disappeared from the export list at the end of the period are marked in black on panel a); new products or “discoveries” for 2012 are depicted in white on panel b). The newly exported products in 2012 are 354, while those that that were withdrawn after 2010 are 324. This represents the general growth trend in the number of products but the information is also interesting in tracing newly introduced products that are able to reach a significant number of markets from the outset.

For the long term success of exports and build-up of resilience important is not only the diversification of markets and products but also the level of technology, employed in the manufacture of export-oriented products. The degree of innovation and sophistication is supposed to increase competitiveness and create buffers against external shocks. For the purposes of trade analysis products are grouped in five classes according to the degree of complexity of the technologies they employ. While the assignment of products to specific categories is not uncontroversial, analysing how a country’s export basket has changed over a span of years may give insight into the pattern of its economic development. The groups are:

[16] Brenton, P. and Newfarmer. R. Watching more than the Discovery Channel to diversify exports. // Newfarmer, R., Shaw, W. and Walkenhorst, P. (eds.) Breaking into new markets: emerging lessons for export diversification, Washington, DC: World Bank, 2009, 111-126.

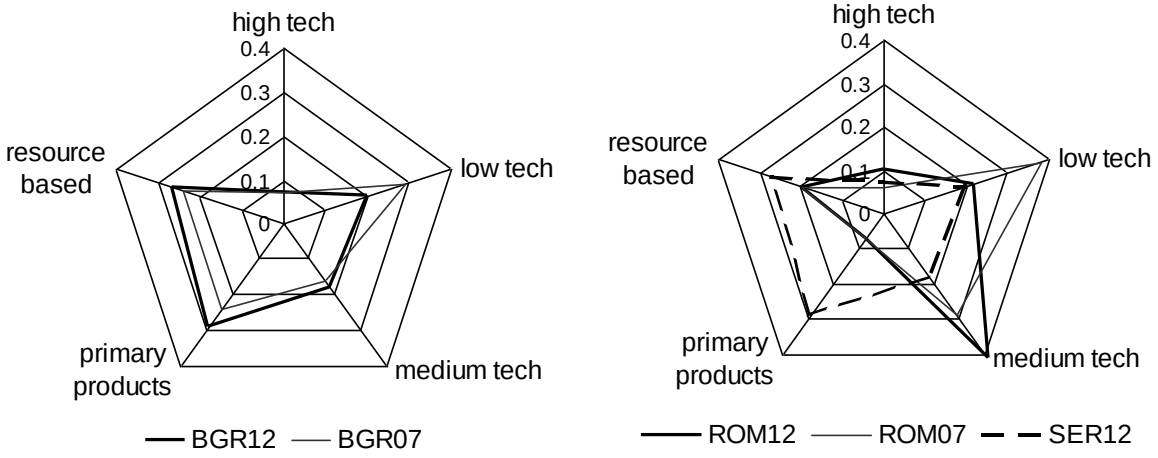


Source: Computed from data in WITS–UNSD Comtrade

Figure 2. Market reach of Bulgarian exports: a) 2010; b) 2012

- primary products – agricultural products, coal, crude oil, natural gas;
- resource based – ore concentrates, oil products, cement, stones and glass
- low tech – textile and clothing, shoes, furniture, toys;
- medium tech – car parts, paints, chemicals, fertilisers, pipes, motors, pumps, switches, industrial machines, ships;
- high tech – electrical machines, computers, telecommunication equipment, pharmaceutical

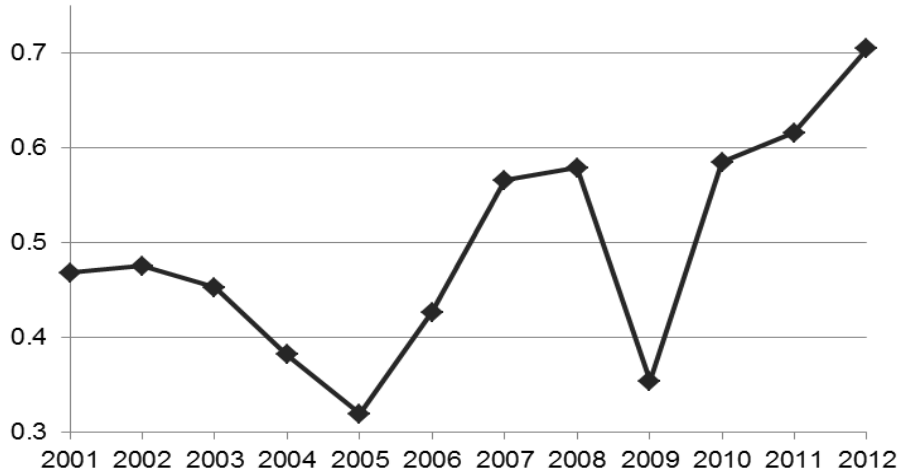
products, products for the aviation and space industry.[17]



Source: Computed from data in WITS–UNSD Comtrade

Figure 3. Technological content of Bulgaria’s export in 2007 and 2012, share of total exports a) Bulgaria; b) Romania and Serbia (only 2012)

The aggregated data on Figure 3a show clearly the structural change of Bulgarian exports towards resource based and agricultural products after the country’s accession to the EU. The low tech product group shrinks, while the export of medium tech products, such as car parts, paints, machines demonstrates moderate growth. These observations confirm the concerns that the first years of EU membership are characterised by deteriorating quality features of exports.[18] A trend towards exporting more raw materials and agricultural products is forming and Bulgarian firms are not able to supply sufficient volume of competitive products with higher value added on at the European and international markets.



Source: Computed from data in Observatory of Economic Complexity

Figure 4. Economic complexity index for Bulgaria, 2001-2012

[17] Lall, S. The technological structure and performance of developing country manufactured exports, 1985–98. Oxford Development Studies, 2000, 28 (3), 337–369.

[18] See: Хаджиниколов, Д. Някои проблеми при адаптирането на България към общата търговска политика на ЕС. Научни трудове на УНСС, Т. I, 2010, 125-154.; Лозанов, О. Определящи тенденции в развитието и структурата на стокообмена на България в рамките на Европейския съюз. Членството на България в Европейския съюз: четири години по-късно. Изд. комплекс – УНСС, 2013, 41-49.

This development is in stark contrast with Romania's reorientation from exporting low tech products to medium tech ones in the period after the country's accession to the EU. In 2012 this group forms 41% of Romanian exports (Figure 4b). The Bulgarian export basket has nearly the same characteristics as the Serbian on regarding the technological content.

The *Economic Complexity Index* (ECI) indicates simultaneously how diversified and complex a country's export basket is. It carries information about how many products a country exports (diversity) and how many other exporters each product has (ubiquity). The values for Bulgaria are represented on Figure 4. They range from 0.32 to 0.71 corresponding to a rank of 35 to 46 from a sample of about 130 economies over the period.

There seems to be present a trend for growing economic complexity starting in 2005, only briefly interrupted by the recession in 2009. This fits well with the previous observations of increasing product diversity and moderate improvement in quality and sophistication of exported products. The ECI can be used as an integrative measure capturing both the extensive and quality margin of foreign trade.

Conclusion

The review of Bulgarian foreign trade development after the country's accession to the European Union leads us to some important observations:

- The Bulgarian economy is vulnerable to exogenous shocks through its inherent features, such as trade openness and dependence on strategic imports.
- Bulgarian exporters manage to find new markets, including outside the EU, under conditions of suppressed business climate in many European trade partners.
- There is no over-concentration in regards to export markets or products. Nevertheless, the top five export products form around a quarter of the total value of exports.
- Problematic is the technological content of the export basket, which is primarily focused on raw materials, resource based and low tech products. This trend seems to deepen with the EU membership and may become a hurdle for sustainable economic growth and increased resilience in the face of future shocks.

The quality related issues and the level of technological sophistication of Bulgarian exports raise serious questions about the appropriateness of the conducted economic policy during the last decade. The focus on products requiring low degrees of productive knowledge pushes Bulgarian exports towards price competition with developing economies and away from the leading advanced economies in the EU. It is possible that this process is further stimulated by EU policies, such as substantial subsidies in the agricultural sector.

The weaknesses of Bulgarian exports are not typical only for individual sectors and cannot be overcome through sectoral strategies. The search for short term solutions will send more probably false signals to the economic agents, locking resources in vulnerable industries, and creating preconditions for future destabilisation. Diversity acts as a stabiliser for the economy in turbulent times. Still the resilience of the Bulgarian economy has to be strengthened by increased market efficiency, good governance and stable institutions that can unlock a development towards increased productive knowledge transforming into a bigger number of unique export products.

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