

THE INNOVATION STRATEGY AND THE COMPETITIVE POSITIONS OF BULGARIAN ECONOMY

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Abstract: *As an EU member state, it has become an imperative for Bulgaria to fit in the economic structure of the European Union. In order to promote economic growth, the Union assigned member-states with the task to identify the advantages which will enable them to specialize in the production of goods and services with high added value. Specialization will thus enable member states to focus their effort on consolidating their comparative advantages by employing as an instrument the innovation paradigm. To respond to this challenge, Bulgaria designed its 'Innovation Strategy for Smart Specialization' in 2014. The aim of this research is to identify the extent to which the Strategy reflects the real opportunities for the national economy to increase the value added of its production by introducing innovations in specific technological areas stated in the document. The findings of the research indicate that the Innovation Strategy is not in compliance with the underlying logic of the European Commission or the OECD in terms of identifying the economic activities that have real potential as comparative advantages and core competences and where the fastest and most sustainable growth of value added could be expected through the adoption of innovations.*

Key words: *innovations; innovation strategy; smart specialization; national competitiveness; comparative advantages; core competences.*

JEL: M21, O31, O47, P52.

1. Introduction

The Innovation Strategy for Smart Specialisation 2014-2020 (ISSS) was adopted four years ago and the deadline for accomplishing its objectives is in two years' time. The Strategy is not an issue of common public interest and the data available about its current implementation are scarce. According to the website of the Council of Ministers¹, the Council for Smart Growth is the body in charge of the implementation of the ISSS; the review of annual reports on the implementation of the Strategy; changes to be proposed in priority technological areas of the Innovation Strategy, and the initiating of a set of activities to ensure the implementation of the Strategy. The website also lists the members of the Council for Smart Growth and describes the functions of the council, yet the only accessible documents refer to the establishment of the Council in 2015 and the appointment of its members in 2017. No data are accessible to the general public about the rules of procedure, the schedules of activities or the reports on the implementation of those activities. Therefore, the aim of this analysis of the ISSS contents is to provide an insight into the progress which Bulgaria has made so far in terms of producing hi-tech products and services in order to raise the national competitiveness through smart specialization (encouraging innovations) as planned in the flagship initiative Innovation Union of the Europe 2020 Strategy of the European Commission.

2. Increased Awareness about the Need to Innovate

The Directorate-General for Research and Innovation (2011) admits that although Europe has innovation potential, it is not exploited efficiently and therefore the European Union is lagging behind developed countries like the USA and Japan in terms of innovations. Yet, the Directorate does not specify on the details which designed innovation strategies should include but provides some general guidelines which state that: (1) encouraging research and innovations is a key tool for raising competitiveness and job creation; (2) employed policies and instruments need to be long-term and exploit already existing or newly identified strengths (smart specialisation); (3) innovation policies need to be in line with the concept of innovation as a product, process or organizational change; (4) public investments in research and innovations need to encourage private investments; (5) research funding need to be based on competition and the private sector will be able to exploit the results achieved with public funds, while a research work career should become attractive both in terms of tangible and intangible benefits so as to attract leading international researchers; (6) designed instruments and policies should ensure sufficient number of highly-skilled specialists in the field of science and analytical

¹ http://saveti.government.bg/web/cc_1501/1.

thinking; (7) partnership between research institutes, universities and business will be encouraged at all levels; (8) the necessary conditions should be provided to encourage private investment in research and development and innovations; (9) public support for research and innovations in business should be straightforward, easily accessible and highly efficient; (10) the public sector itself should inspire and disseminate innovations when delivering public services.

As a result of implementing these policies, the targets of Europe 2020 should be reached, namely: 75% of the population aged 20 to 64 to be in work; 3% of the EU's GDP to be invested in research and development in order to achieve target 20/20/20 on climate change and energy²; reduce the rate of early school-leavers below 10%; at least 40% of people aged 30- 34 having completed higher education; at least 20 million fewer people in – or at risk of – poverty. The specific targets which Bulgaria should reach by the year 2020 specify that: 76% of the population aged 20 to 64 should be in work; 1.5% of the GDP should be invested in research and development; reduce greenhouse gas house emissions by 20% compared to 1990 levels; the share of energy produced from renewable should be 16%; increase energy efficiency by 16.9%; reduce the rate of early school-leavers to 11%; have 36% of people aged 30-34 completed higher education; lower the number of people in risk of poverty by 260 000 people. Although different EU institutions have designed numerous documents related to the implementation of innovation policies, there is no universal template available which member states could use when designing their own investment strategies to maximize the efficiency of designed strategies.

The most systematic and clear guidelines to the contents of a similar strategy is the OECD Innovation Strategy 2010 (*The OECD Innovation Strategy...*, 2010), which aims to set the rules for dealing with low economic growth, increased unemployment rates and growing indebtedness of OECD countries by identifying and efficiently exploiting innovations as a source of raising national productivity and growth. The term 'strategy' was abandoned in 2015, when the OECD designed a new document, the Innovation Imperative, (*The Innovation Imperative...*, 2015) which was an upgraded version of the 2010 Investment Strategy. According to the OECD Innovation Strategy, innovations are the major factor behind growing labour productivity in developed countries as they create new jobs and are the most efficient method for achieving sustainable development while preserving the environmental equilibrium on the planet.

² Target 20/20/20 refers to the goal set by EU leaders in 2007 to reduce greenhouse gas house emissions by 20% compared to 1990 levels; to have 20% of produced energy come from renewables and to increase energy efficiency by 20%.

3. The Technology of Growth through Innovation

In both documents, the OECD presents the view of contemporary developed countries that ‘... Innovations are rarely created in isolation, since this is a highly interactive and multidisciplinary process which involves cooperation between a growing and diverse network of stakeholders, institutions and users...’ (*The OECD Innovation Strategy... 2010, p. 10*) and that the innovations which contribute to economic growth imply both the demand for goods and services with high value added and the supply of such products. In other words, according to the OECD, the innovation strategy and, above all, the Innovation Imperative do not merely imply ensuring funds for the research and development activity of companies, but aim at the overall improvement of the innovation system by identifying and overcoming existing weaknesses. The OECD strategy identifies the following components of the system: a) availability of skilled labour force; b) a business environment which encourages the introduction of new technologies; c) an efficient system for knowledge generation and dissemination; d) policies promoting innovations, entrepreneurship and active management; e) control upon the implementation of public policies designed to encourage innovations.

The process of transforming new ideas into innovations requires designing and putting into action a complex system of activities which involve organizational changes, training, design, tests, marketing, etc. Instead of conducting their own research and development activity, innovative companies nowadays increasingly create high value added by introducing technological and non-technological innovations and changes. Such companies use external knowledge acquired from their involvement in various partnerships and alliances or through the outsourcing of research and development activity. New technologies are bought and sold on emerging knowledge markets. This implies designing and implementing a public policy for that complex system for innovation generation and implementation. Such a public policy should encourage companies to enter new industries (branches) where their productivity may be higher compared to the less productive segments and branches they currently operate in. The policy should also ensure an environment in which companies will be able to upgrade their competitive advantages in different branches and establish chains for creating value through the introduction of cutting-edge technologies and entering more developed segments.

The major principles of the policy which the OECD (*The OECD Innovation Strategy..., 2010*) sets in its strategy are:

1. Fostering innovation abilities through appropriate training and educational systems to disseminate the knowledge and skills required for generating innovations.
2. Creating favourable opportunities for innovations by promoting competition and entrepreneurial culture in addition to developing efficient

capital markets and providing instruments to fund emerging companies, especially those which create and assimilate innovations.

3. The creation and application of knowledge by establishing a modern and reliable knowledge-based infrastructure and the regulatory framework required to ensure the creation of new technologies and their assimilation.

4. Employing innovations to address global and social challenges.

5. Improved governance and measuring the effect of pro-innovative policies.

According to the authors of the strategy, these five principles of designing an innovation policy on the sphere of innovations also determine the set of indicators which should be employed to measure the success of an innovation policy.

In short, designing an efficient innovation policy does not imply focusing on supply by encouraging corporate research and development activity in general. Rather the main objective of such policies should be to introduce innovations which will make life better for individuals and society at large. In other words, a successful innovation policy is encourages consumer preferences for products with higher value. Designing the right policies to improve consumer demand and innovation-inducing policies render it possible to create a virtuous circle of innovations as the cooperation between consumers and producers in order to satisfy more fully demands result in more efficient exploitation of production factors; demand for hi-tech goods with high value added; the formation of new needs and further solvent demand. Such a system of policies, however, requires prioritizing of strategic decisions and rules to avoid substantial discrepancies (divergence) between the targets and strategies for the competitiveness of businesses and their products and services and the targets and assessments of national competitiveness. According to the data on competitiveness published annually in the Global report of the World Economic Forum (WEF), the low competitiveness of Bulgarian companies and their products is becoming a major issue which needs to be resolved in order to raise the overall efficiency and the standard of living in the country. Product and company competitiveness are essential to the national competitiveness in terms of improving the well-being of the population and ensuring the development of the country (*R. Georgiev, 2017*).

4. Priority Areas in the Innovation Strategy for Bulgaria

The innovation strategies of some EU countries are based on the OECD Strategy which was used when identifying the priority areas for smart specialization in those countries. This is not the case with the Innovation Strategy for Smart Specialisation designed for Bulgaria. An analysis of the ISSS for our country reveals several weaknesses in the assumed prerequisites

for designing the innovation strategy which hinder the attainment of the objectives set in the document:

1. Politicians and industries have been defined as the major stakeholders of smart specialization, whereas regional strategies are considered to be of limited importance (*ISSS, Version 2017, p. 9 and p. 31*)

2. The focus of smart specialization is not on improving consumer demand and encouraging appropriate demand, but on establishing various types of horizontal and geographical clusters, although there is no such immediate requirement. Both the innovation strategy designed by the OECD and the Innovation Union (*Innovation Union ... , 2011*) of the Directorate-General emphasise the importance of innovation clusters, more specifically, in the automobile and the IT sectors, and of clusters formed around highly-skilled work force, as well as clusters in the field of medical technologies.

We should note that the basic mechanisms which efficient market economies employ to minimize transaction costs and internalize external effects, such as the establishment of an efficient e-government, are also referred to as innovations.

In terms of the sectoral specialization in the medium and high-tech production of goods, the innovation strategy highlights pharmaceuticals, computer and communication equipment, machines and equipment and metal products, and in terms of services the focus is on the information technologies, telecommunications and information services. Those goods and services have been selected after analyzing the 'comparative competitive advantages or the production and export specialization of Bulgarian production sectors' (*Innovation Strategy ... , p. 23*) by employing the Balassa index for measuring the degree of specialization "(*Innovation Strategy ... , p. 23*). As a result, 85 product groups with competitive advantages were identified which accounted for 79.5% of Bulgarian exports in 2012 and 76% in 2011.

As a result of the scarce analytical evidence of the agglomeration of medium and high-tech production of goods and services, the Strategy concludes that the priorities of the smart specialization of the six regions in the country should be:

Table 1

Regional smart specialization according to the Innovation Strategy for Smart Specialisation in Bulgaria

North West Region	North Central Region	North East Region
Mechatronics and CleanTech	Mechatronics and CleanTech	Mechatronics and CleanTech
Industry for Healthy lifestyle and BioTech	Industry for Healthy lifestyle and BioTech	Industry for Healthy lifestyle and BioTech
New Technologies in the Creative and Recreative Industries	Informatics and ICT	New Technologies in the Creative and Recreative Industries

South West Region	South Central Region	South East Region
Informatics and ICT	Informatics and ICT	New Technologies in the Creative and Recreative Industries
New Technologies in the Creative and Recreative Industries	Mechatronics and CleanTech	Mechatronics and CleanTech
Industry for Healthy lifestyle and BioTech	Industry for Healthy lifestyle and BioTech	Industry for Healthy lifestyle and BioTech

Source: *Innovation Strategy for Smart Specialisation the Republic of Bulgaria 2014-2020*.

In order to convince the reader that there are prerequisites for such specialization, ISSS evaluates the potential areas for innovation development based on a deliberately created method including quantitative and qualitative indicators. However, the strategy does not specify the methodology of assessment, the source of output data or the criteria for analyzing achieved results. The ISSS only provides a table with the results from the assessment and the explanation that 21 economic activities have been selected which ‘... are considered to be a starting point for identifying technological areas for smart specialization. Their identification is based on establishing a cross-section between a group of economic activities and services and the areas of science in which the state and business R & D expenditure is concentrated (or should be concentrated – a remark made by the author)’ (*ISSS, version 2017, p. 68*). The identified technological areas for specialization are:

1. Mechatronics (mechanics, electronics, software, systems for control) and clean technologies (electromobility, fuel cells, hydrogen-based models and technologies).

2. Information and communication technologies – Applied informatics (software).

3. Biotechnologies (food products, perfumery and cosmetics, paper, cardboard, packaging).

4. Nanotechnologies (medicine, electronics, new products, textile and clothing industry, cosmetics).

5. Creative industries, including cultural (Motion picture, video and television programme production, sound recording and music publishing activities).

6. Pharmacy.

7. Food industry technologies (bio products).

These seven technological areas are grouped in four thematic areas:

1. Mechatronics and clean technologies;

2. Information and communication technologies and informatics;

3. Industry for healthy lifestyle and bio technologies;

4. New technologies in the creative and recreative industries.

Clearly, specialization in the first area, Mechatronics and clean technologies, refers to the production of basic elements and components of mechatronic aggregates; mechanical engineering for the transport and energy sector; engineering; automated management of production; autonomous energy systems; robotics; design and construction of hi-tech products, including in the aero-space industry; bio-mechatronics; intelligent systems; clean technologies with focus on the transport and energy sector and no-pollution technologies. Specialization in the second area, Information and communication technologies and informatics, should be in terms of production, especially Fabless and new approaches for design and assembling; entertaining and educational games and firmware; big data, cloud and grid technologies; wireless communication; designing web-based applications; ICT-based services and systems for outsourcing. In the third area, Industry for healthy lifestyle and bio technologies, specialization refers to methods for clean production, preservation and processing and reaching the final consumer of specific Bulgarian products and elements; production of specialised food and drink (baby, children, 'astronaut'); production of instruments, equipment and consumables for medical and dental diagnostics and treatment; personal medicine, diagnostics and individual therapy; healing forms and substances; medical and healing tourism nano-technologies in medicine; bio-technologies serving the needs of healthy life and aging; sustainable use of sea and river resources; green economy. The fourth area, New technologies in the creative and recreative industries, refers to cultural and creative industries; computer and mobile applications and games; alternative and extreme tourism and sports; production of goods and products with direct application in these spheres.

5. Revealed Comparative Advantages of Bulgarian Economy by Commodity Groups

Thus defined, the priorities in the Innovation Strategy for Smart Specialisation in fact describe the whole structure of the high-tech activities of any developed economy. We will not comment on the validity and need of the policies and instruments envisaged to achieve smart specialization in the so-called thematic areas. The ISSS itself does not provide a methodology for analyzing the effectiveness of the applied strategy. It is therefore more logical to review Bulgaria's progress towards smart specialization, using as a reference point the guidelines which the Directorate-General for Research and Innovation prescribes in the Innovation Union Competitiveness Report (2011), namely that smart specialization is '... a dynamic and entrepreneurial process to identify and build comparative advantages in science and technology ...' (*Innovation Union...*, 2011, p. 440), which requires identifying the areas to which available (and, in general, scarce) resources should be allocated. We need to emphasize

that these are advantages in science and technology, which do not aim at promoting the development of the EU at large, but at accomplishing the objectives set by EU member states and the Community through the categories of long-term productivity growth.

Clearly, according to the European Commission, smart specialization should have an impact on a country's comparative advantages on international markets, i.e. it is important to analyse the objectives and outcomes of an innovation strategy in terms of changes in the comparative advantages at the level of goods (products). The thesis is sufficiently valid, although there are currently more sophisticated indicators of specialization in the production of complex high value-added goods such as the PRODY and EXPY indicators (Hausmann, Rodrik 2007), which are widely used by the OECD to assess smart specialization. An essential element of these indicators is the 'Revealed Comparative Advantage' index (RCA), we therefore believe that computing the RCA and the relative share of certain goods in the total volume of a country's export will have a cognitive value similar to that of the indicators. We used the United Nations *Comtrade* database³, to compile indexes of the Revealed Comparative Advantages⁴ of tradable commodities according to the Harmonised Commodity Description and Coding System⁵ (aggregated to the second digit), and indexes of the Revealed Comparative Advantages of tradable commodities according to the UNDP classification *EBOPS*, aggregated to the first digit. Our starting point was the principle that every tradable product which is competitive on the world market is inevitably competitive (productively effective) on the domestic market in the country of its origin. In order to gain an insight into Bulgaria's specialization compared to the overall specialization in the European Union, we compiled the same indexes for the EU27⁶, aggregate. The latest year for which there is data available in the *Comtrade* database is 2016, yet it is not complete because there are no data available about EU28 tradable commodities and about tradable services of both Bulgaria and the EU28. The years for which the computation is made are the first and last year of the previous programming period for the European Funds 2007-2013, as well as the latest year of the current programming period for which data are available. Relating the results from The Innovation Strategy for Smart Growth of Bulgaria to European funds is not an end in itself since according to ISSS (ISSS, version 2017, p. 113) the innovations in all thematic areas are to be funded from the operational programs of the European Union and national co-

³ <https://comtrade.un.org/>

⁴ The Balassa index - $RCA = \frac{E_{ip}}{\frac{\sum E_{ip}}{E_{wp}}}$ where E_{ip} is the export of commodity p by country I ; $\sum E_{ip}$ is the total export by country I ; E_{wp} is the export of commodity p by all countries in the world, and $\sum E_{wp}$ is the total export by all countries the world

⁵ i.e. the Nomenclature of the World Customs Organisation.

⁶ EU 28 excluding data about Bulgaria.

financing, limited to 'Activities leading to effective cooperation between academia and business'. Appendix 1 presents the relevant data.

These indexes indicate that:

1. In the period from 2007 to 2016, Bulgaria retained or increased its sustainable comparative advantages in the production of meat; animal products; spices; cereals; oil seeds; fruits; fruit preparations; sugar confectionery; preparations of cocoa, flour, starch; tobacco; inert construction materials; ores; fertilizers; essential oils; wood and coal; fibers; articles of apparel; footwear; ceramic products; glassware; copper; aluminum; lead; zinc; furniture; bedding; lamps; toys; games and sports requisites.

2. The share of the value of tradable goods in the production of which Bulgaria traditionally has comparative advantages in the value of the total export of the country is declining. That share accounted for 50% in 2007 and for 40% in 2016.

3. The revealed comparative advantages of our country in terms of tradable goods differ significantly from those of the EU in general. Bulgaria specializes in the production of goods with low-tech and medium-high technology of manufacture such as clothing, footwear, furniture, bedding and railway locomotives and parts thereof and signaling equipment, the EU specializes in more complex goods such as chemicals and chemical products; works of publishers; jewellery; tools; steam boilers; turbines; internal combustion engines; jet engines; hydraulic motors; pumps; compressors; furnaces; household appliances; machine yard equipment; agricultural machinery; electronic equipment; parts and components for machines, automobiles and vehicles; optical and measuring appliances; weapons; works of art.

4. The relative shares of most items with Revealed Comparative Advantages in Bulgaria's export outweigh the relative shares of the same items in the export of the EU. Those are mainly items whose production relates to available local resources and geographical location, as well as items manufactured by traditional industries: products of animal origin; cereals and articles thereof; tobacco and manufactured tobacco substitutes; mineral fuels and oils; bituminous substances; mineral waxes ores; fertilisers; wood and articles of wood; ceramic products; glass and glassware; copper; aluminum; lead; zinc; articles of apparel; footwear; furniture; toys.

5. We should note that the country has no Revealed comparative advantages in terms of items with complex hi-tech production in the technological areas Mechatronics, Nanotechnologies and Biotechnologies, such as the production of organic chemicals; paper and articles of paper or of paperboard; tools; electrical machinery; equipment and accessories; vehicles; aircraft and spacecraft; ships; measuring, checking, precision instruments and apparatus and the share of these items in the total volume of export is significantly below that of the EU in general. What is more, there is no upward trend in the Revealed comparative advantages of the country for such items and their relative share is a constant value. The only exception is the item of

electrical machinery and equipment for which the country has no Revealed comparative advantages, yet their relative share doubled during the researched period and equaled the share of the same item in total EU export.

6. In terms of services, Revealed comparative advantages are sustainable in the spheres of transport, communications, information, personal, cultural and recreational services. Interestingly, not only are these RCA common to the entire EU, but the share of these items in the total export of services is nearly the same for Bulgaria and the EU. This is probably due to the EU Principle of free movement of people, goods and ideas.

7. The item 'Travel' traditionally has RCA for Bulgaria, accounting for nearly half of all export revenue. Unfortunately, there is a downward trend in the value of the index, and the relative share of the item in total exports is decreasing which indicates that this RCA is about to be lost.

8. After reviewing the differences in the structure of relative shares, we can conclude that there is certain potential (RCA are increasing, yet the average EU level of the relative share of the item in total exports has not been reached yet) for the development of activities in the items 'Royalties', 'Insurance Services' and 'Other Business Services'.

6. Relating the Comparative Advantages of Bulgarian Companies and Economy to Their Competitive Positions and Core Competences

A major requirement to the strategic competitiveness of economic entities is relating their competitive advantages to their resource potential and the funds which allow them to gain and develop their competitive position. Resource opportunities ultimately refer to the core corporate competences identified by the fathers of strategic management theory, G. Hamel and C. K. Prahalad as: a) collective knowledge and skills (multi-functional and at multiple levels); b) complex multi-component technologies, including habits and experience (hard и soft); c) the ability to distribute created end products, key products and royalties beyond traditional business and geographic boundaries (*G. Hamel and C. K. Prahalad, 1996, p. 121*). The potential of resource allocation (absorption) and the development of competitive positions is an element of core competences. The total potential (potential energy) of an entity or industry is in fact the result of the whole range of diverse circumstances which, on the basis of strategic decisions, are governed by actions appropriate in each situation towards achieving high and sustainable efficiency (*R. Georgiev, 2017*).

What conclusions do these facts about the comparative advantages of our country lead to, if our starting point is the view of core competences and strategic competition established by the Theory of Competition? In the first place, Bulgaria obviously continues to specialize in commodities produced by

low- and medium-high tech industries or in commodities with non-price competition (e.g. Travel). As a result of this specialization, our economy is inconsistent with the specialization of the European Union. We should point out that many of the areas in which our country has RCA are not a priority according to the ISSS, while for those identified as priorities there is no evidence of effective investment in the development of core competences and improved comparative advantages.

It is noteworthy that there has been significant growth in the export of computer and information technologies as a share of the total export of our country, yet this was the case during the previous programming period, from 2007 to 2013. The export share of these services seems to have stopped growing after reaching the export share of such services for EU in general. This does not mean that the country does not have the potential to develop in this area. Rather, it implies that the export share of these products should be comparable to the relative export share of the EU at least in the short run. In other words, the increase in the revenues from the sale of computer and information services abroad is likely to be proportional to the increase in the total export revenue of the country in the coming years.

As for the recommendation given by the authors of the ISSS to develop **mechatronics**, we cannot but note the lack of specialization both in the production of machines and machine parts and components, and in the automation and production of electronic components and details. In terms of clean technologies, and the priority declared by the authors of the strategy to produce electric cars, fuel cells and hydrogen technologies, there has been an increased activity in the export of electrical machines, equipment and appliances although no RCA have been identified so far. Such an increase in the export of electrical machines, equipment and appliances might be due to the increased inflow of foreign direct investment (FDI) in the field of automotive electrical components and it might also be the result of designing the ISSS, yet the question why the effect of the specialization strategy is so limited remains.

The thematic area **Industry for healthy lifestyle and bio technologies** is defined rather loosely as it included various technologies employed in agriculture, food processing, medicine, medical tourism, nanotechnologies, biotechnologies, sustainable exploitation of resources and green economy. This makes it difficult to analyse the impact on employing the ISSS in the area. Nevertheless, judging by the items for which Bulgaria has Revealed Comparative Advantages and a higher relative share of export than the relative share of the same items in the EU export, (e.g. Meat and edible meat offal; Milk and Dairy produce; Coffee, tea, and spices; Cereals; Oil seeds and oleaginous fruits; Animal or vegetable fats and oils; Sugars and sugar confectionery; Cocoa and cocoa preparations; Preparations of vegetables, fruit, nuts or other parts of plants; Tobacco), then clearly, Bulgaria has comparative advantages in the production of a number of foods and food products. On the other hand, there are a number of items for which the EU at general has Revealed Comparative Advantages in contrast to our country (e.g. Lac and resins;

Miscellaneous edible preparations; Beverages and spirits; Organic chemicals; Pharmaceutical products; Soap and organic surface-active agents; Raw hides; Articles of leather; Paper and paperboard; Wool and yarn; Other vegetable textile fibres; Ropes and cables and articles thereof). This indicates that Bulgarian economy is still far from exploiting efficiently the available resources and that introducing innovations in these areas would significantly raise productivity.

The last thematic area, **New technologies in the creative and re-creative industries**, is still an abstract one since any technology since any technology is creative by default. According to the ISSS, this group involves cultural and creative industries; computer and mobile applications and games; alternative and extreme tourism and sports; production of goods and products with direct application in these spheres. Judging by the data available about the Revealed Comparative Advantages of services and the indirect indicators for tradable goods, for items such as Photographic and cinematographic instruments and apparatus; Articles of publishers, the press or the rest of the graphics industry and drawings; Articles of precious or semiprecious stones and Works of art, we should note that while the EU has Revealed Comparative Advantages in 'creative' technologies, Bulgaria has certain advantages only in terms of tourism (journeys), information services (Computer and information services) and in Personal, cultural and recreational services. Yet, the three Revealed Comparative Advantages which were identified over the previous programme period are not convincing evidence of an innovation strategy being implemented in our country in the area of creative and re-creative technologies. We assume that the three items with identified RCA belong to industries that create medium to high added value, and therefore tend to approach them as potential for smart specialization, yet they are far from being sufficient for the thematic area 'New Technologies in Creative and Re-creative Industries'.

In short, the results achieved so far indicate that it is hardly surprising that Bulgaria's innovation strategy does not serve as a starting point for defining the efficiency priorities in the smart specialization of the country in the coming years. In our opinion, the strategy has been designed without taking into account the specific features of the economic and production structure which was already established and can therefore hardly be approached as an integral element of the growth model.

The authors of the strategy have neglected the fact that production can only be upgraded provided that it is accompanied by an increase in the core competences of companies and the industries a country specializes in and improved well-being of the population. In other words, the goods whose export rich countries specialize in are in general more sophisticated, while those which poor countries specialize in are not, and therefore have lower added value. Or '... Rich (poor) countries export products which are also exported by other rich (poor) countries ...' (*Hausmann et al. 2005, p. 10*). The innovation strategy should therefore respond more adequately to the existing specialization and further develop existing competencies. Promoting innovations in the food

processing and light industry in order to benefit more effectively from existing comparative advantages in animal breeding and plant growing by upgrading food products and consumer goods based on existing organic raw materials is more likely to produce a substantial impact on smart specialization than the funding of projects in the sphere of robotics, for example, in which our economy has no significant established traditions or cultivated core competences. No innovation strategy could serve as the first step in raising the efficiency and promoting economic growth unless clear priorities are set for the different stages of its medium- and long-run implementation.

We arrived at the conclusions above judging from the level of competitiveness of Bulgarian economy confirmed by the Annual Competitiveness Report of World Economic Forum (www.weforum.com). *At this stage, the competitiveness of Bulgarian economy depends on investment.* Its overall specifics relate to the ability of the economy to absorb and apply foreign technologies and methods borrowed from leading European and world companies and introduce its own improvements to them. According to the criteria set by the Economic Forum and the requirements in the OECD Strategy, investments made by the State and European funds naturally have a key role to the development labour-intensive industries with standardized products, with significant economies of scale, which are simple to service and have multiple sources of technologies that are easily transferred and absorbed. These are relatively mature branches and industries which manufacture end products and basic (key) components for foreign markets. Balanced investment is also required to establish strategic opportunities for developing unique core competencies of companies in the long term and for upgrading the competition, i.e. the factors which will dominate the *innovation-driven stage* that is typical of developed and more affluent countries. At that stage, the drive to constantly innovate the economy, the skills to introduce such innovations and the symptoms which govern their direction will predominantly come from the private sector and innovative universities, smart units and avant-garde, smart, specialized infrastructures.

At present, in our country, the funding of scientific research and innovations which are directly related to the ISSS thematic areas focuses on grant award procedures through Operational Programme Science and Education for Smart Growth (OP SESG) for developing Centres of Competence and Centres of Excellence. The investments which will be made in the two types of centres by the year 2020 are: BGN 118 million in Mechatronics and clean technologies; BGN 57 million in Information and communication technologies and informatics; BGN 118 million in Industry for healthy lifestyle and bio technologies; BGN 57 million in new technologies in the creative and recreative industries. Funding can also be obtained from other sources. Eligible target groups include scientists, PhD students and students at universities and scientific institutes, as well as entrepreneurs from the business. Expectations and opportunities also relate to the announced competitions for grants to be awarded to beneficiaries from the EU Research Programme Horizon 2020; Operational Programme Innovation and Competitiveness (OPIC), the National

Science Funds and the National Innovation Fund. Currently, there are no data available about the targeted absorption of the investments planned for the specific priority areas for smart specialization.

7. Conclusion

For economic science, efficiency and time are the core values that should be the focus of attention when comparing different models and policies for the development of a country. The analysis we have conducted confirms that the issue of turning the public resources allocated to smart specialization from a subsidy instrument into an instrument for strategic regulation and goal setting is fundamental to national policies on competitiveness and efficiency. In terms of the general framework and the requirements set for investment from EU Funds and the State into priority ISSS areas, two major issues can be identified: *on the one hand*, the issue of the involvement of entrepreneurs and companies outside the groups of research and innovation organizations into the process of establishing various fields of competition for core competences and, *on the other hand*, the issue of the lack of a transparent and results-based system for assessing and funding research activities in the highly fragmented group of universities, higher schools and institutes in the country.

It is clear that in order to achieve smart specialization it is necessary to establish institutes and to develop systematic mechanisms to promote both the improvement of consumer demand and the creation of high value added in industry, scientific research and higher education, with clearly formulated specific objectives in terms of enhancing the competitiveness and the efficiency of the Bulgarian economy. This has not been done so far. The short time before the deadline for implementing the ISSS and its multiple shortcomings leave little room for hope that the Strategy will be helpful in accomplishing the objectives set in the Europe 2020 strategy.

The specific recommendations made in terms of smart specialization focus on aligning the priority areas with the specific structure and features of Bulgarian economy. Our country definitely has sufficient resources which can be transformed into a number of goods and services for which there is solvent demand on both domestic and international markets. A good example is the fact that Bulgaria has traditionally produced live animals, cereals, oilseeds, wood, wool, metal ores, etc., yet the industries that add value through the processing of these resources have not been developing and therefore the country is merely a net exporter of these resources. A similar practice cannot be observed in the structure of the EU economy. Many of the resources which are available in our country cannot not only be used as the raw materials for producing a wide variety of consumer goods and services in industries such as food processing, clothing and apparel, and production of leather goods but can also be used to boost activities in marketing, transport, chemical, mechanical

engineering, industrial construction, R & D, etc., especially if accompanied by the development of adequate medium- and long-term (strategic) competences of the human capital.

In general, identifying and supporting weak or missing links in similar production chains with available abundant resources at their beginning are more likely to effectively boost innovation activity than is employing administrative measures in order to restructure the economy through the establishment and funding of agglomerates and activities in which the country has not specialized or has no identified 'business genes' or competitive positions. Hence, the most logical step in determining the potential of the economy for smart specialization is not designing a method for identifying innovative industries according to some ambiguous indicators, but employing a method for identifying the potential users of innovations which will combine the analysis of existing production chains in the country in terms of available technologies for improving the production efficiency and will help identify the solvent demand for the products of these industries and cultivate consumer preferences on the domestic and the foreign markets.

Bulgaria has the unique advantage to be located close to and to have unlimited access to markets with rich and numerous consumers, in addition to being rich in natural resources. Furthermore, the country can benefit from abundant labour and capital and access to modern technologies due to the free movement of people, capital and ideas within the EU. Such opportunities are rarely available to countries seeking for an incentive to their economic growth, so that should be the starting point of any truly smart strategy. Unfortunately, the experience we have had with the ISSS so far proves that such opportunities are not always efficiently taken advantage of.

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Appendix No. 1 RCA of tradable goods and relative shares of each item in the total volume of export

Item No	Description in the Harmonised System	Revealed comparative advantage						Weight in total trade							
		Bulgaria				EU 27		Bulgaria				EU 27			
		2007	2013	2015	2016	2007	2013	2015	2007	2013	2015	2016	2007	2013	2015
1	Live animals	1.50	0.71	0.82	1.34	0.69	0.89	1.06	0.17%	0.08%	0.10%	0.17%	0.08%	0.08%	0.13%
2	Meat and edible meat offal	1.56	0.96	0.93	1.06	0.49	0.70	0.65	0.90%	0.64%	0.65%	0.76%	0.28%	0.29%	0.46%
3	Fish and crustaceans, molluscs and other aquatic invertebrates	0.20	0.20	0.18	0.17	0.35	0.36	0.33	0.10%	0.11%	0.11%	0.12%	0.17%	0.17%	0.20%
4	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included	1.24	1.57	1.73	1.57	1.08	1.12	1.18	0.56%	0.79%	0.81%	0.71%	0.49%	0.48%	0.55%
5	Products of animal origin, not elsewhere specified or included	0.52	0.41	0.48	0.52	0.86	0.91	0.95	0.02%	0.02%	0.03%	0.03%	0.04%	0.04%	0.05%
6	Live plants, cut flowers and ornamental foliage	0.16	0.27	0.25	0.35	1.06	1.01	0.99	0.02%	0.03%	0.03%	0.04%	0.13%	0.13%	0.11%
7	Edible vegetables and certain roots and tubers	1.01	0.76	0.76	0.83	0.45	0.50	0.39	0.33%	0.26%	0.31%	0.36%	0.14%	0.14%	0.16%
8	Edible fruit and nuts; peel of citrus fruit or melons	0.75	0.78	0.71	0.63	0.40	0.44	0.31	0.33%	0.40%	0.44%	0.43%	0.18%	0.17%	0.19%
9	Coffee, tea, mate and spices	0.69	1.14	1.31	1.38	0.42	0.41	0.36	0.13%	0.26%	0.37%	0.40%	0.08%	0.08%	0.10%
10	Cereals	1.52	8.07	5.87	7.35	0.42	0.63	0.74	0.81%	5.35%	3.78%	4.26%	0.22%	0.14%	0.47%
11	Products of the milling industry; malt; starches; inulin; wheat gluten	0.93	2.83	1.80	1.62	1.55	1.32	1.36	0.09%	0.29%	0.20%	0.18%	0.14%	0.14%	0.15%
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit;	3.77	6.37	4.45	5.06	0.34	0.21	0.23	1.19%	3.42%	2.37%	2.82%	0.11%	0.06%	0.13%

	industrial or medicinal plants; straw and fodder														
13	Lac; gums, resins and other vegetable saps and extracts	0.12	0.12	0.28	0.22	2.24	1.14	1.52	0.00%	0.01%	0.01%	0.01%	0.06%	0.06%	0.06%
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included.	0.17	0.54	0.69	0.48	0.71	0.18	0.13	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	0.63	1.79	2.04	2.03	0.47	0.53	0.54	0.28%	0.93%	1.06%	1.07%	0.21%	0.20%	0.28%
16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	0.28	0.60	0.83	1.02	0.34	0.36	0.31	0.07%	0.16%	0.22%	0.29%	0.08%	0.08%	0.08%
17	Sugars and sugar confectionery	1.37	1.65	1.42	1.30	0.58	0.43	0.52	0.30%	0.44%	0.35%	0.36%	0.13%	0.12%	0.13%
18	Cocoa and cocoa preparations	0.57	1.54	2.41	2.47	0.92	1.05	0.98	0.11%	0.36%	0.65%	0.66%	0.19%	0.18%	0.27%
19	Preparations of cereals, flour, starch or milk; pastrycooks' products	2.30	2.22	2.37	2.16	1.19	1.43	1.48	0.65%	0.77%	0.92%	0.91%	0.34%	0.33%	0.58%
20	Preparations of vegetables, fruit, nuts or other parts of plants	1.64	1.40	1.48	1.41	0.70	0.76	0.75	0.54%	0.45%	0.52%	0.53%	0.23%	0.23%	0.26%
21	Miscellaneous edible preparations	0.56	0.72	0.85	0.84	1.45	1.26	1.12	0.16%	0.24%	0.32%	0.35%	0.41%	0.41%	0.43%
22	Beverages, spirits and vinegar	1.39	0.94	0.81	0.77	2.34	2.40	2.35	0.83%	0.57%	0.52%	0.52%	1.39%	1.40%	1.51%
23	Residues and waste from the food industries; prepared animal fodder	1.09	2.01	2.06	1.87	0.53	0.52	0.56	0.32%	0.86%	0.91%	0.81%	0.16%	0.15%	0.24%
24	Tobacco and manufactured tobacco substitutes	4.53	7.22	5.95	5.30	1.19	1.32	1.26	0.99%	1.72%	1.45%	1.33%	0.26%	0.24%	0.31%

25	Salt; sulphur; earths and stone; plastering materials, lime and cement	1.95	1.55	1.70	1.89	0.79	0.90	0.87	0.47%	0.36%	0.43%	0.44%	0.19%	0.19%	0.22%
26	Ores, slag and ash	1.68	2.02	2.26	2.24	0.15	0.10	0.13	1.45%	2.51%	2.07%	2.16%	0.13%	0.11%	0.12%
27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes	1.13	0.93	1.07	1.06	0.44	0.46	0.61	14.71%	14.73%	10.62%	9.22%	5.68%	5.62%	6.08%
28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes	1.87	1.44	1.67	1.66	1.41	0.91	1.01	1.31%	0.94%	1.10%	1.00%	0.99%	0.99%	0.66%
29	Organic chemicals	0.64	0.13	0.16	0.13	1.48	1.22	1.41	1.60%	0.32%	0.36%	0.29%	3.71%	3.75%	3.18%
30	Pharmaceutical products	0.55	1.15	1.14	0.99	2.15	2.36	2.47	1.40%	3.01%	3.48%	3.16%	5.43%	5.43%	7.59%
31	Fertilisers	2.29	2.25	2.65	3.02	0.85	0.66	0.60	0.68%	0.77%	1.02%	0.93%	0.25%	0.25%	0.23%
32	Tanning or dyeing extracts; tannins and their derivatives; dyes, pigments and other colouring matter; paints and varnishes; putty and other mastics; inks	0.24	0.25	0.28	0.22	1.58	1.51	1.41	0.11%	0.11%	0.13%	0.10%	0.75%	0.75%	0.64%
33	Essential oils and resinoids; perfumery, cosmetic or toilet preparations	0.99	1.24	1.43	1.45	2.08	2.04	1.97	0.56%	0.75%	0.97%	1.08%	1.18%	1.18%	1.35%
34	Soap, organic surface-active agents, washing preparations, lubricating preparations, artificial waxes, prepared waxes, polishing or scouring preparations, candles and similar articles, modelling pastes, „dental waxes“ and dental preparations with a basis of plaster	0.52	0.86	0.82	0.85	1.26	1.29	1.23	0.15%	0.26%	0.27%	0.29%	0.37%	0.37%	0.41%

35	Albuminoidal substances; modified starches; glues; enzymes	0.91	1.80	1.90	1.71	1.68	1.60	1.67	0.13%	0.27%	0.32%	0.28%	0.24%	0.24%	0.28%
36	Explosives; pyrotechnic products; matches; pyrophoric alloys; certain combustible preparations	0.96	0.85	0.62	0.51	1.51	1.18	1.31	0.02%	0.02%	0.02%	0.01%	0.03%	0.03%	0.04%
37	Photographic or cinematographic goods	2.82	0.14	0.07	0.07	1.01	1.03	0.86	0.42%	0.01%	0.01%	0.01%	0.15%	0.16%	0.08%
38	Miscellaneous chemical products	0.12	0.26	0.45	1.22	1.43	1.36	1.34	0.11%	0.26%	0.47%	1.34%	1.32%	1.32%	1.40%
39	Plastics and articles thereof	0.70	0.78	0.85	0.82	0.93	0.88	0.85	2.29%	2.49%	2.88%	2.84%	3.06%	3.06%	2.87%
40	Rubber and articles thereof	0.68	0.71	0.98	1.07	0.77	0.79	0.82	0.69%	0.79%	1.01%	1.12%	0.79%	0.79%	0.85%
41	Raw hides and skins (other than furskins) and leather	0.65	0.55	0.63	0.57	1.03	1.13	1.07	0.15%	0.10%	0.11%	0.09%	0.24%	0.24%	0.19%
42	Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (other than silk-worm gut)	0.91	0.48	0.54	0.54	1.22	1.32	1.21	0.30%	0.19%	0.25%	0.25%	0.40%	0.40%	0.55%
43	Furskins and artificial fur; manufactures thereof	0.37	0.12	0.07	0.23	2.15	2.49	2.21	0.02%	0.01%	0.00%	0.01%	0.10%	0.10%	0.15%
44	Wood and articles of wood; wood charcoal	1.67	1.84	1.86	1.52	0.81	0.96	0.86	1.50%	1.23%	1.37%	1.21%	0.73%	0.73%	0.63%
45	Cork and articles of cork	0.21	0.23	0.22	0.28	2.41	2.74	2.73	0.00%	0.00%	0.00%	0.00%	0.03%	0.04%	0.03%
46	Manufactures of straw, of esparto or of other plaiting materials; basketware and wickerwork	0.11	0.09	0.10	0.06	0.13	0.16	0.13	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
47	Pulp of wood or of other fibrous cellulosic material; recovered (waste and scrap) paper or paperboard	0.57	1.04	0.94	0.93	0.72	0.78	0.73	0.16%	0.25%	0.25%	0.25%	0.20%	0.19%	0.19%

48	Paper and paperboard; articles of paper pulp, of paper or of paperboard	0.59	0.87	0.97	0.99	1.28	1.24	1.13	0.73%	0.80%	0.94%	0.98%	1.56%	1.57%	1.09%
49	Printed books, newspapers, pictures and other products of the printing industry; manuscripts, typescripts and plans	0.31	0.41	0.67	0.63	1.39	1.35	1.40	0.10%	0.10%	0.16%	0.15%	0.46%	0.46%	0.33%
50	Silk	0.53	0.49	0.52	0.62	0.74	0.76	0.71	0.01%	0.01%	0.01%	0.01%	0.02%	0.02%	0.01%
51	Wool, fine or coarse animal hair; horsehair yarn and woven fabric	7.36	5.40	6.06	5.62	1.13	1.04	1.03	0.81%	0.42%	0.49%	0.45%	0.12%	0.13%	0.08%
52	Cotton	0.64	0.35	0.46	0.49	0.61	0.38	0.36	0.23%	0.13%	0.15%	0.16%	0.22%	0.22%	0.12%
53	Other vegetable textile fibres; paper yarn and woven fabrics of paper yarn	1.01	0.43	0.38	0.34	1.37	1.17	1.19	0.03%	0.01%	0.01%	0.01%	0.04%	0.04%	0.03%
54	Man-made filaments	1.08	0.58	0.59	0.85	0.68	0.49	0.49	0.34%	0.16%	0.17%	0.24%	0.21%	0.22%	0.14%
55	Man-made staple fibres	2.83	1.99	1.93	2.05	0.89	0.73	0.68	0.68%	0.44%	0.47%	0.48%	0.21%	0.21%	0.16%
56	Wadding, felt and nonwovens; special yarns; twine, cordage, ropes and cables and articles thereof	0.47	0.88	1.07	1.25	1.22	1.13	1.07	0.06%	0.11%	0.16%	0.19%	0.16%	0.16%	0.16%
57	Carpets and other textile floor coverings	0.63	0.68	0.81	0.69	0.83	0.69	0.62	0.06%	0.06%	0.07%	0.06%	0.08%	0.08%	0.06%
58	Special woven fabrics; tufted textile fabrics; lace; tapestries; trimmings; embroidery	0.26	0.41	0.54	0.60	0.72	0.67	0.58	0.03%	0.03%	0.04%	0.05%	0.07%	0.07%	0.04%
59	Impregnated, coated, covered or laminated textile fabrics; textile articles of a kind suitable for industrial use	0.07	0.10	0.17	0.17	1.12	0.94	0.89	0.01%	0.01%	0.03%	0.03%	0.16%	0.16%	0.13%
60	Knitted or crocheted fabrics	2.03	0.60	0.61	0.57	0.55	0.45	0.38	0.36%	0.11%	0.12%	0.12%	0.10%	0.10%	0.08%

61	Articles of apparel and clothing accessories, knitted or crocheted	3.63	2.26	1.95	2.21	0.30	0.32	0.30	4.58%	2.76%	2.64%	2.81%	0.37%	0.38%	0.40%
62	Articles of apparel and clothing accessories, not knitted or crocheted	5.04	3.18	2.61	2.87	0.64	0.68	0.57	6.28%	3.46%	3.51%	3.63%	0.80%	0.81%	0.76%
63	Other made up textile articles; sets; worn clothing and worn textile articles; rags	1.25	1.15	0.92	0.96	0.53	0.52	0.47	0.37%	0.38%	0.35%	0.36%	0.16%	0.16%	0.18%
64	Footwear, gaiters and the like; parts of such articles	2.19	1.29	1.11	1.04	0.70	0.66	0.55	1.33%	0.89%	0.92%	0.86%	0.43%	0.43%	0.45%
65	Headgear and parts thereof	0.40	0.34	0.29	0.31	0.61	0.54	0.46	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
66	Umbrellas, sun umbrellas, walking-sticks, seat-sticks, whips, riding-crops and parts thereof	1.23	0.68	0.52	0.53	0.24	0.20	0.17	0.02%	0.01%	0.01%	0.01%	0.00%	0.00%	0.00%
67	Prepared feathers and down and articles made of feathers or of down; artificial flowers; articles of human hair	0.00	0.22	0.10	0.14	0.18	0.11	0.07	0.00%	0.01%	0.01%	0.01%	0.00%	0.00%	0.00%
68	Articles of stone, plaster, cement, asbestos, mica or similar materials	0.75	0.96	1.00	1.19	1.27	1.28	1.11	0.21%	0.25%	0.31%	0.37%	0.36%	0.36%	0.34%
69	Ceramic products	2.19	2.39	1.94	2.15	1.69	1.40	1.07	0.62%	0.64%	0.68%	0.68%	0.48%	0.48%	0.37%
70	Glass and glassware	3.11	2.91	3.62	3.68	1.15	0.90	0.84	1.36%	1.15%	1.52%	1.62%	0.50%	0.50%	0.35%
71	Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal and articles thereof; imitation, jewellery; coin	0.25	0.09	0.07	0.07	1.25	1.34	1.14	0.53%	0.41%	0.25%	0.29%	2.69%	2.70%	4.32%
72	Iron and steel	2.42	1.38	0.89	0.91	0.75	0.84	0.73	7.50%	2.78%	1.77%	1.70%	2.31%	2.36%	1.46%

73	Articles of iron or steel	1.03	0.99	1.06	1.23	1.26	1.25	1.10	1.94%	1.63%	1.84%	2.03%	2.37%	2.38%	1.90%
74	Copper and articles thereof	9.21	12.02	11.76	9.27	0.56	0.64	0.61	10.02%	10.17%	8.88%	6.45%	0.61%	0.54%	0.46%
75	Nickel and articles thereof	0.00	0.28	0.02	0.01	1.55	0.73	0.76	0.00%	0.04%	0.00%	0.00%	0.52%	0.52%	0.11%
76	Aluminium and articles thereof	1.61	1.42	1.43	1.33	0.65	0.68	0.62	1.84%	1.21%	1.42%	1.33%	0.74%	0.74%	0.62%
78	Lead and articles thereof	19.13	14.90	15.57	13.76	0.20	0.49	0.48	0.98%	0.58%	0.62%	0.59%	0.01%	0.01%	0.02%
79	Zinc and articles thereof	11.13	7.42	7.10	7.09	0.53	0.76	0.61	1.79%	0.52%	0.62%	0.62%	0.08%	0.10%	0.05%
80	Tin and articles thereof	0.00	0.03	0.04	0.02	0.36	0.20	0.29	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%	0.01%
81	Other base metals; cermets; articles thereof	0.49	0.45	0.44	0.44	1.07	1.07	1.09	0.06%	0.04%	0.04%	0.04%	0.14%	0.14%	0.10%
82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal	0.51	0.40	0.40	0.38	1.34	1.25	1.11	0.18%	0.14%	0.15%	0.15%	0.47%	0.48%	0.42%
83	Miscellaneous articles of base metal	0.68	0.86	1.05	1.23	1.13	1.15	0.96	0.25%	0.29%	0.42%	0.49%	0.42%	0.42%	0.38%
84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	0.57	0.65	0.67	0.66	1.46	1.58	1.42	7.49%	7.24%	7.93%	7.98%	19.28%	19.36%	16.84%
85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	0.42	0.64	0.69	0.66	0.78	0.66	0.57	5.54%	7.87%	9.74%	9.70%	10.33%	10.32%	8.07%
86	Railway or tramway locomotives, rolling-stock and parts thereat railway or tramway track fixtures and fittings and parts thereof; mechanical (including electro-mechanical) traffic signalling equipment of all kinds	2.02	1.65	1.45	1.48	1.09	1.37	1.04	0.48%	0.33%	0.34%	0.31%	0.26%	0.26%	0.24%

87	Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof	0.08	0.32	0.34	0.35	1.12	1.49	1.36	0.74%	2.35%	2.76%	2.99%	9.75%	9.78%	11.08%
88	Aircraft, spacecraft, and parts thereof	0.07	0.07	0.02	0.01	2.19	2.21	1.92	0.09%	0.12%	0.04%	0.03%	2.96%	2.98%	3.94%
89	Ships, boats and floating structures	0.88	0.02	0.04	0.08	1.66	0.99	1.24	0.68%	0.02%	0.03%	0.07%	1.28%	1.30%	0.99%
90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; parts and accessories thereof	0.45	0.32	0.33	0.36	1.40	1.46	1.41	1.30%	0.98%	1.11%	1.22%	4.08%	4.10%	4.68%
91	Clocks and watches and parts thereof	0.04	0.21	0.20	0.20	0.64	0.74	0.71	0.01%	0.06%	0.07%	0.06%	0.15%	0.15%	0.24%
92	Musical instruments; parts and accessories of such articles	0.27	0.26	0.35	0.36	0.93	0.89	0.84	0.01%	0.01%	0.01%	0.01%	0.04%	0.04%	0.03%
93	Arms and ammunition; parts and accessories thereof	0.00	0.00	0.00	0.00	0.00	1.85	2.89	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.29%
94	Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; lamps and lighting fittings, not elsewhere specified or included; illuminated signs, illuminated nameplates and the like; prefabricated buildings	1.43	1.48	1.57	1.67	1.03	0.96	0.82	1.70%	1.80%	2.31%	2.48%	1.23%	1.23%	1.20%
95	Toys, games and sports requisites; parts and accessories thereof	0.64	1.30	1.57	1.72	0.46	0.52	0.44	0.40%	0.61%	0.90%	1.04%	0.28%	0.28%	0.25%
96	Miscellaneous manufactured articles	0.44	0.76	0.64	0.56	0.96	0.90	0.79	0.08%	0.19%	0.19%	0.18%	0.17%	0.17%	0.23%
97	Works of art, collectors' pieces and antiques	0.03	0.04	0.04	2.89	2.38	2.70	2.70	0.00%	0.01%	0.01%	0.01%	0.36%	0.37%	0.48%
99	Reserved for special uses by Contracting Parties	0.35	1.03	1.43	0.63	0.49	0.66	0.66	0.99%	1.09%	2.54%	3.72%	1.38%	1.38%	1.64%

Appendix No. 2: Identified Comparative Advantages of tradable services and relative shares of each item in total volume of export

	Revealed Comparative Advantages						Weight in the total trade in services					
	Bulgaria			EU 25			Bulgaria			EU 25		
	2007	2013	2015	2007	2013	2015	2007	2013	2015	2007	2013	2015
Transport	1.03	1.08	1.22	1.08	1.01	0.98	23.22%	22.25%	22.82%	24.50%	20.85%	18.36%
Trips	2.31	2.00	1.65	0.63	0.60	0.57	54.50%	51.65%	41.96%	14.89%	15.41%	14.38%
Communications	1.10	0.55	1.09	0.87	1.56	1.52	2.51%	0.96%	1.69%	2.00%	2.72%	2.33%
Construction works	1.56	0.23	0.20	1.26	0.90	0.83	4.01%	0.50%	0.40%	3.24%	1.93%	1.70%
Insurance services	0.33	0.67	1.00	1.28	1.38	1.20	0.74%	2.17%	2.76%	2.88%	4.45%	3.32%
Financial services	0.06	0.23	0.24	1.19	2.08	1.86	0.50%	0.99%	1.17%	10.69%	9.07%	8.98%
Computer and Information services	0.37	1.29	1.25	1.07	1.37	1.41	1.80%	9.41%	9.90%	5.16%	9.99%	11.12%
Copyright and royalties	0.03	0.06	0.09	0.92	0.90	1.07	0.16%	0.36%	0.66%	5.40%	5.85%	7.78%
Other types of business services	0.46	0.38	0.63	1.18	1.06	1.11	11.29%	9.83%	17.18%	28.63%	27.30%	30.05%
Personal, cultural and recreational services	1.57	1.78	1.62	1.23	1.15	1.15	1.21%	1.79%	1.41%	0.95%	1.16%	1.00%
Services provided by the government	0.02	0.06	0.04	0.88	0.82	0.68	0.04%	0.09%	0.05%	1.67%	1.28%	0.97%



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