

# Integrated Report on Performance and Value Chain Analysis of Selected Sectors within Manufacturing Industry

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# TABLE OF CONTENTS

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<b>Introduction and Summary of Analyzed Sectors.....</b>	<b>1</b>
Background: A Protracted Transformation .....	1
Key Competitive Advantages and Challenges .....	2
Sector Summaries.....	3
Recommendations .....	6
<b>Food and Drink Sector Performance and Value Chain Analysis with a focus on raspberries.....</b>	<b>13</b>
Summary of the Analysis of the Food and Drink Sector (F&D).....	14
Definition and Scope of the F&D Sector .....	17
Relevance and Structure of the F&D Sector .....	17
Performance and Competitiveness of the F&D Sector.....	21
Key Issues and Challenges .....	27
Fragmentation of the F&D Sector .....	29
Competitiveness Analysis by Sub-sectors.....	31
Meat Sub-sector.....	31
Milk Sub-sector .....	36
Fruit and Vegetable Sub-sector (F&V), with a focus on raspberries .....	40
Development Vision and Recommendations .....	53
a) Measures aimed at consolidating, or reducing the impact of fragmentation.....	55
b) Measures to increase and facilitate access to international markets.....	58
c) Measures aimed at improving internal operations and activities.....	60
d) Measures towards more intensive and targeted financial and non-financial state support....	61
e) Measures towards fruits and vegetables subsector, with a focus on raspberry .....	62
<b>Wood and Furniture Sector Performance and Value Chain Analysis with a focus on solid wood furniture .....</b>	<b>65</b>
Summary of the Analysis of the Wood and Furniture Sector (W&F).....	66
Definition and Scope of the W&F Sector.....	67
Importance of the W&F Sector and its Structure from the Value Chain Perspective .....	68
Sector Importance.....	68
Sector Structure .....	70
Sector Performance and Potential .....	74
Global Trends and Performance.....	74
Sector Performance in Serbia .....	74
Sector Potential in Serbia .....	76

In Focus: Wood Furniture .....	78
Global Market and Trends.....	79
Description of The Value Chain.....	79
Structure and Performance .....	83
Market Segmentation and Key Success Factors.....	90
Prospects for the W&F Sector and Potential Limitations.....	94
Recommendations .....	98
<b>Rubber and Plastics Sector Performance and Value Chain Analysis.....</b>	<b>103</b>
Summary of the Analysis of the Rubber and Plastics Sector (R&P).....	104
Definition and Scope of the R&P Sector.....	105
The Importance of the R&P Sector .....	106
Performance and Structure of the R&P Sector.....	107
Key Success Factors in the R&P Sector Value Chain.....	114
Description of the Value Chain of Plastic Products .....	114
Labor Force: Key Success Factor No. 1 .....	117
Cheap Energy: Key Success Factor No. 2.....	119
High Rate of Gross Operating Surplus Despite Lower Prices Per Unit — Another Indicator of Competitiveness .....	120
Segmentation of Domestic supply.....	122
Sector Perspective and Recommendations for Further Development .....	124
Targeted Support to the Development of SMEs.....	126
Improving Quality Infrastructure .....	127
Improving Operations and Production Operations .....	128
Increasing Availability and Quality of Labor Force.....	128
Improving Visibility and Cooperation among Companies.....	129
Encouraging the Creation of Functional Associations .....	130
Gradual Renovation and Modernization of the Machine Fleet .....	130
<b>Machines and Electrical Equipment Sector Performance and Value Chain Analysis.....</b>	<b>132</b>
Summary of the Analysis of the Machines and Electrical Equipment Sector (M&E) .....	133
Scope and Definition of the M&E Sector.....	134
Relevance, Structure and General Performance of the M&E Sector.....	136
Aspect of the Industrial Organization of the Sector .....	143
Export Performance and Competitiveness of the M&E Sector .....	144
Greenfield FDI .....	147
Autochthonous Domestic Companies .....	148
Privatized Companies .....	151

Analysis of the M&E Sector Competitiveness from the Value Chain Perspective .....	152
Value Chain Characteristics .....	152
Positioning Products and Companies Depending on Value Chain Characteristics .....	155
Critical Success Factors – Ownership Dependent .....	159
Perspective of the M&E Sector and Potential Limitations .....	169
Recommendations for the M&E Sector .....	171
<b>Overview on Performance and Recommendations for the Remaining Eight Sectors.....</b>	<b>177</b>
Fabricated Metal Products Sector.....	178
Textile Sector .....	184
Automotive Sector.....	190
Chemical Sector .....	194
Paper and Printing Sector .....	198
Computers, Electronic and Optical Products Sector .....	201
Leather and Leather Products Sector.....	202
Other Manufacturing Activities.....	204
<b>Annex 1 – Quality and statistical data sources.....</b>	<b>206</b>
<b>Annex 2 – Industrial policy framework measures for Serbia.....</b>	<b>211</b>

## Introduction and Summary of Analyzed Sectors

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The current study presents the performance of manufacturing in Serbia since the crisis of 2009, focused on competitiveness analysis of four manufacturing sectors selected by the Ministry of Economy: food and drinks (F&D), wood and furniture (W&F), rubber and plastics (R&P) and machines and equipment (M&E). The study is conducted within a broader project (“Competitiveness and Jobs”) implemented by the Government of Serbia and World Bank, whose aim is to mitigate and remove barriers for boosting competitiveness and employment.

The purpose of the study is to contribute to the improvement of business and investment environment - especially in selected sectors - in a way that implementation of activities proposed in the study leads to the promotion of development, competitiveness and employment, i.e. elimination or mitigation of the main identified barriers. Also, the purpose of the study is to inform the development of an industrial development strategy in line with the EU negotiating chapter 20 – Entrepreneurship and Industrial Policy, which is about accelerating the structural adjustment, encouraging the creation of business-friendly environment, fostering domestic and foreign investment, promoting small and medium enterprises (SMEs), as well as supporting entrepreneurship and innovation. Also, negotiating chapter 20 implies promoting better competitiveness analyses of specific sectors and sector-specific initiatives, such as high-level groups, forums related to policies, studies and panels of experts, as well as connectivity initiatives. Additionally, the creation and implementation of a policy in the field of entrepreneurship and industry requires appropriate administrative capacity at national, regional and local level, including effective consultation processes and mechanisms of cooperation, to which particular attention is paid in Annex 2 of this study.

Our findings confirm that these four sectors, as well as the fabricated metal products (FMP) sector which should be added to them, exhibit strong comparative advantages among manufacturing industries. However, to turn the observed advantages into sustained growth, two sets of policies are of critical importance. One is needed to address Serbia’s very fragmented economic structure in which MSMEs play a particularly important role. The other is needed to address the paradox that while highly skilled labor at very low wages is the key advantage in four out of the five sectors, its sparse availability is also the greatest obstacle to their faster growth. However, the conduct of proactive industrial policies will require substantial strengthening of relevant government institutions and changes in their manner of work. Limitating the analysis on the selected sectors has two main reasons: on one hand - resource constraints, but on the other hand - the need for the institutions to first get capable of implementing systematic proactive industrial policies which are targeted and adapted to specific sectors, which is a novelty for Serbian state administration.

### Background: A Protracted Transformation

To understand the somewhat muddled economic trends exhibited by manufacturing in Serbia, it is useful to distinguish **between the “traditional” and “new” economies, as since 2009 the two exhibit completely divergent trends**. By “traditional” we consider the economy comprised of previously state/socially owned companies, whether they are today privately owned or not. With the exception of a relatively few successfully privatized companies, it has

been declining and disappearing in the observed period, affecting the overall performance of those sectors, like M&E and W&F that started the period less transformed.<sup>1</sup> The new economy, however--consisting of greenfield FDIs and new domestically owned private companies that emerged truly *de novo*, or building on fragments of the disintegrating traditional economy--resumed strong export-led growth after 2009/2010. Privatized companies held by well-established international have behaved like FDIs in the new economy, while the performance of others has been in-between those of the new economy and imploding state-owned enterprises.

**Since 2009, export growth, almost entirely generated by the new economy, has been very strong considering the sluggish international environment, surprisingly diversified and broadly and evenly spread.** There is greater differentiation in growth rates by ownership type (17% for FDIs vs. 9% for domestic companies, i.e. MSMEs) than by activity sector (13% for both the average of the whole manufacturing industry and for the four selected sectors). About 70% of export growth in a large number of industries was accomplished by entering new markets and gaining market share. Even for micro enterprises, this growth was generally higher than the import growth rate of our main markets. The number of large exporters declined from 289 to 265, probably because of the decline and exit of traditional companies, but the number of markets with exports of more than EUR 1 million or more than EUR 10 million each approximately *doubled* over this period.

**The overall concentration of exports (if FIAT and Železara Smederevo are excluded) changed little in the post-crisis period,** despite considerable changes in structure, only with the exception of pneumatics and raspberries (exporting respectively 400 and 250 million), there are not as of yet areas of producer clustering and specialization. The number of industries with an RCA greater than 1 increased from 86 to 90, and at the level of 3-digit SITC aggregation, only the value of automobile exports surpasses EUR 1 billion and no other sector surpasses EUR 400 million.

**The foreign-owned and domestic MSME sectors appear to have largely had parallel developments,** with relatively little integration of Serbia's economy into the large FDI value chains. This issue, in particular, needs further study and a more detailed understanding if policies are to be fine-tuned.

## Key Competitive Advantages and Challenges

While generally the competitive advantages and disadvantages of the two kinds of enterprises comprising the new economy differ, they share the **fundamental factor of success--a favorable skill to labor costs ratio, the skills closely reflecting the existence of a "tradition" in the industry.** Old traditions of engineering/technical skills, especially in mechanical design and construction as well as metal processing, are key to the competitiveness of M&E and FMP industries, but also in good measure to the highly successful R&P sector. The F&D sector is based on an old agricultural tradition, with favorable natural resources playing a key role. The advantages in the W&F sector represent a combination of both skills (not unlike mechanical ones) and forest resources.

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<sup>1</sup> The distinction between companies by ownership type was made possible based on variables constructed by CEVES.

**The larger foreign owned companies are successful nearly across the board, emphasizing investments in larger-scale production. As to MSMEs, considering the limitations they usually encounter, they have found segments of competitive advantage in two kinds of circumstances.** One is where they could produce much cheaper products because of product/quality differentiation, usually also protected by transportation and market penetration costs (food and plastics). The other is where the availability of highly skilled labor at very low costs creates a strong competitive advantage, typically in technically more demanding industries when a high degree of customization/service content is needed.

**Labor costs tend to be lower in Serbia than in all NMS, but not by much, and possibly not lower than in Romania and Bulgaria.** Average productivity of the new economy is also lower than in competitor countries, but generally by less than labor costs. However, the competitiveness of labor decreases with the level of qualifications, so wage difference is greater for higher qualifications.

**A fundamental constraint, both for FDI and domestic companies, however, is that skilled labor is not plentiful,** and expansion of qualified employment as a rule has to be gradual, with investment in training. Low mobility contributes to low labor availability, but it also means that unemployed or underemployed skilled people continue to exist. Also, a constraint is the lack of highly skilled managers, experienced in integrated process management, as well as in corporate governance. While FDI's overcome this constraint by bringing expats or training local staff, this is an important limitation in the growth of domestic MSMEs. Furthermore, many aspects of the business environment that are beyond the scope of this study weigh on the competitiveness of businesses large or small.

**The usual constraints faced by MSMEs are exacerbated by the absence of large market intermediaries, and low trust,** emphasizing the effects of fragmentation, especially in F&D (and particularly fruits and vegetables—an area of otherwise greatest comparative advantage). As anywhere, MSMEs lack access to capital, and therefore, generally, the possibility of large-scale production. They are much more likely to lack access to global markets, especially where reputation and branding plays an important signaling role, and they are likely to lack not only the capital but also the knowledge necessary to build this access. They are also very likely to lack the knowledge (of technology but even more of process management and corporate governance) necessary to scale up production when/if the opportunity arises. Integration through association or large intermediaries, able to aggregate their products and penetrate global markets, would greatly alleviate these drawbacks. This would not only facilitate the presentation of Serbia's advantages, but also the conveyance of global market signals to the domestic economy. Fortunately, the proximity to core EU economies, as well as growing Serbian diaspora linkages, alleviates somewhat the challenge of individual global market integration.

## **Sector Summaries**

### *Food and Drinks*

F&D remains by far Serbia's largest export sector (1,665 million, 11.7% of the total) after transport vehicles and equipment. It has gained relatively less export market share than other industries (43%) both because of a higher starting base (with an RCA of 2,3) but also because



of true weaknesses compared to its potential. The fruit and vegetable subsectors by far the most competitive one (exporting a total of 430 million EUR, and including agriculture segment, more than 700 million), where Serbia is among the top European producers of raspberries, plums, quinces and paprikas, with an RCA of approximately 9. However, there is great scope for increasing competitiveness through diversification, increased commercialization and lengthening of all value chains. Although the sector is extremely low concentrated (HHI of only 62), exports are characterized by low diversification, with frozen raspberries comprising 17% of the sector total.

This largely domestically owned sector was privatized early, and the top three exporters (8% of sector exports) are all held by domestic capital, in the highly concentrated oils and fats subsector. There were only 15 well established international companies exporting more than 10 mil EUR in 2015, (a total of EUR 300 million). Foreign ownership tends to be regional, with international brands mostly in the drink subsector and mostly oriented to the domestic or regional market.

The competitiveness of the F&D sector largely rests on Serbia's highly favorable land and climatic conditions, and probably unsustainably cheap "labor on the margins"<sup>2</sup>. However, the fragmentation of land ownership, MSME processors and market intermediaries hamper the transition from a traditional subsistence-oriented to a modern, demand-driven, sector. Much of the land lies uncultivated (11%, o/w 9 pp south of Vojvodina), the yields per ha of cultivated land are low (37% lower than EU average for same portfolio of primary products) and the assortment of products is relatively low-value, and/or with low value added down the value chain.

### *Rubber and Plastics*

R&P (exports of 982 million) achieved the strongest competitive performance of all sectors, and has recently overtaken F&D for the position of highest RCA (2.73). More than 70% of its high exports growth (annual average of 13%) was accomplished by gaining market share on a wide array of global markets, partly because this is an sector where nearshoring from developed EU markets has been particularly pronounced. It is medium concentrated (HHI 713), mostly led by well-established foreign-owned companies dominant in exports (in total 72%) with the top three companies (44% of exports) comprised of well-known international brands (Michelin, Cooper Tires and Viscofan). The sector also has a vibrant MSME sector that has also been able to increase exports over the observed period substantially faster (15% annually) than the global growth of imports.

Serbia was by far the principal producer of rubber products in Yugoslavia, and today the sector's main comparative advantage lies in the low costs of the high-quality skills needed to produce and adjust often expensive (metal) tools that need to be changed every time a rubber/plastic product gets a new shape. Market opportunities for MSMEs in this sector have arisen in the plastics sector--the subsector of wrapping and packaging that often works closely with the local food sector, producing moderately large series, with possible quality diversification.

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<sup>2</sup>Particularly present in agriculture, especially in the production of fruits, but not limited to it. This refers to labor invested by households usually to produce fruit to complement other sources of income, as a secondary activity of many households, cultivating small land parcels that they own.

## *Machines and Electrical Equipment*

M&E is the only sector in focus with an RCA somewhat below 1 (0,95), but almost 82% of the fast growth (12,6% annual average) of its very diversified exports was accomplished by gaining market share, and it can be expected to remain sustained for a while, increasing the already significant export size (1.348 mil EUR). Moreover, the development of this sector can be expected to make a valuable contribution to manufacturing industry overall as it is the producer and consumer of the very skills that appear to comprise some of its main competitive advantages.

The M&E suffered strong structural change in the observed period, with the share of traditional economy in exports declining from 22% to 11%. The top 3 exporters (making up 32% of total exports) and 18 of the top 25 companies (creating 78% of total exports) are foreign-owned, mostly well-known international brands (eg. Gorenje, Siemens, Grundfos) producing household appliances, wind generators, and pumps, respectively. Still, exports of the domestic MSME sector are significant (EUR 335 million) and also growing strongly (10,7% for medium and 8,5 for small and micro companies). It is in this sector that the differentiation between the areas of strength of these two company types is most clearly seen with the highly diversified and diffuse domestic sector focusing on general purpose machines (refrigeration, lifting, pumps), when they require adaptation to customer needs and especially system integration, as well as on the production of sometimes very sophisticated specialized machines whose production requires a lot of engineering know-how and relatively little capital.

Industrial policy in this sector should be particularly directed to the attraction of selected investors—focusing on their potential for human resource productivity development—and in supporting them to cooperate with and integrate domestic suppliers. Also of key importance are programs for workforce skill development. Finally, more could be accomplished by systematic presentation of this sector on global markets.

## *Wood and Furniture*

The contribution of W&F to export growth is somewhat smaller than for the other three sectors (total exports of 335 million EUR), but this sector exhibited one of the highest export growth rates (13%), and has favorable characteristics from the point of view of the possible development and social effect. Moreover, the observed period has been marked by the near-exit of the large, loss-making state-owned company Simpo from Vranje. Out of the top three largest exporters (making up 16% of total exports), two are de novo domestic companies and one is Italian FDI. Out of the top 25 companies that account for 42% of exports, only 7 are foreign.

In comparative terms, Serbia is moderately rich in forests, but produces very little value from each hectare, although the relative contribution of furniture in it is among the highest (55%). Key to the success of the furniture sector is an adequate combination of quality-price-design. Having ample production skills and limited design and marketing and branding skills, as well as limited global markets access, Serbia has positioned itself in the low- to low-to -medium price segment. Half of its furniture exports are to the region, mostly of wood panel, and the reminder, mostly upholstered and solid wood furniture, are both towards eastern markets and advanced EU markets. Exports outside the region have all been growing strongly and have been well diversified, while export to the region were also growing strongly despite weak demand.

The principal obstacle to the sector's development is its fragmentation. This exacerbates the effects of an otherwise unpredictable allocation of primary wood, and also that trade intermediation on the domestic market is even thinner than in food and drinks sector. The main interventions ought to be the development of a transparent and predictable primary and sawn-wood market, as well as integration of producers both as buyers and when positioning on the global markets.

### *Other Sectors*

The FMP sector deserves inclusion among the sectors of first order of interest largely because it shares competitive strengths with M&E and the fact that these two sectors together can contribute to the competitiveness of the entire manufacturing. It itself has sizeable exports for a sector that is generally oriented to the domestic market, as well as a competitive performance exhibiting considerable market share gain on foreign markets and an RCA of 1,44. Domestic clothing sector also deserves more focus and further studies as it seems to exhibit a sound recovery power in the post-crisis period – although Serbia today is a relatively small exporter of textiles and clothing, its exports in the post-crisis period grew significantly faster than the import demand of key markets to which it exports, as well as faster than exports of its major European competitors. Growth was driven primarily by FDI (around 20 of them), but autochthonous small and medium companies also contributed.

If export growth is observed only between the endpoints of the observed period, it is as strong or even stronger for motor vehicles and the chemicals industry than for the selected sectors of focus. However, the increase in exports over the observed period for the motor vehicles industry peaked in 2013 with the coming of FIAT's 500L model, and has since declined. In the case of chemicals, longer term exports do not, in fact, show any trend – 2009 happened to be a very low-base year. These two industries heavily depend on single large companies (FIAT and Petrohemija), and their particular challenges need to be better understood. This merits investment into in-depth analyses engaging specific global expertise, well beyond the scope of the present study. The domestic apparel industry also deserves further study as it appears to exhibit remarkable resilience.

### **Recommendations**

A Policy Matrix at the end of this section summarizes general and sector-specific recommendations. The former ones are elaborated in detail in Annex 2 of each of the sector specific documents, while the latter are elaborated in their main body. Here we emphasize the key overall recommendations for a more proactive industrial policy to be implementable and effective.

- Government and quasi-government organizations supporting the private sector need to develop deep sector-specific expertise and a shared understanding of the technical and economic characteristics and needs of businesses in the targeted subsectors. This includes government support to MSMEs, which needs to be “verticalized”, i.e. adapted to sector-specific needs. A prior requirement for this is a substantial improvement of economic statistics in the public domain. Another is that a more systematic and deeper communication between the government and businesses sector be developed, as this deep knowledge can only be developed through a two-way transfer of information and

collaboration. This does not mean that all the necessary knowledge needs to be developed in-house, but only institutions that have accumulated knowledge, including of networks of individuals with world-class information, can be truly of help to industry.

- Second, fruitful industrial policy requires judgment calls that ultimately produce measures that give clear advantages to some, but not all market actors. This requires that Serbia's administrative system be adjusted to shift from strictly formal criteria observance, to making informed judgments based on well-defined criteria. This, in turn, requires the development of monitoring mechanisms that will involve and build public trust in the integrity of such decision-making.

Also, the paradigm of support to MSME sector and foreign direct investments should be reevaluated and potentially revised. Key issues are:

- Ten times more resources are spent on FDI attraction, yet their developmental effect in some cases may be quite limited, particularly as the structuring of incentives is likely to be biased towards attracting those with lesser developmental potential. To improve development effectiveness, the targeting and structuring of FDI attraction needs to be developed.
- Second, assistance to SMEs is insubstantial overall and fragmented, and therefore probably has only marginal effect. To make a difference, support to SMEs needs to be more substantial, integrate several aspects (advise, access to finance, organizational support) and go deeper.
- Supplier development programs are a way to improve both the development effectiveness of FDIs and promote and assist the development of SMEs.
- Finally, efforts to promote SME cooperation and clustering need to be anchored in incentives that bring lasting and palpable benefits to the companies in question—such as permanent reduction in material costs due to larger purchasing orders.
- Well-designed industrial policy in Serbia needs to pay attention to regional differences, particularly of employment/unemployment profiles. All aspects of regional development need to be studied.

## Policy Matrix – Priority measures

Short-term	Medium-term
<b>General Recommendations</b>	
<b>Institutional capacity and policy focus</b>	
<ul style="list-style-type: none"> <li>• Significantly improve the quality of statistical data and data availability from SORS (Statistical Office of the Republic of Serbia) and SBRA (Serbian Business Registers Agency).</li> <li>• Conduct comprehensive research on competitiveness and development potential of exchangeable services sector such as the creative industries, IT, tourism and Belgrade as a regional logistics center.</li> <li>• Reform administrative procedures to introduce more purposeful activities of competent institutions and their oversight.</li> <li>• Strengthen the Government's strategic planning and coordination system (Adopt the Planning Act)</li> </ul>	<ul style="list-style-type: none"> <li>• Establish / support a permanent independent institution for monitoring macroeconomic trends.</li> <li>• Develop programs for independent monitoring of industrial policy programs to boost public-private cooperation and develop confidence in policy quality.</li> <li>• Develop centers for the transfer of economic and technological knowledge and business-market analytics (<i>business intelligence</i>) in cooperation with the economic sector.</li> </ul>
<b>Knowledge and skills</b>	
<ul style="list-style-type: none"> <li>• Continue and expand systematic promotion of the development of secondary education curriculum in cooperation with the economic sector, strengthening the aspect of lifelong learning</li> <li>• Enhance the response of the Ministry of Education as well as cooperation between the ministries of economy and education in adapting the curriculum of secondary vocational schools to the needs of local economies.</li> <li>• Complete and adopt the national qualifications framework.</li> <li>• Legislate the compensation for public transportation for secondary school students.</li> <li>• Explore the main reasons behind the unavailability of certain secondary school profiles, according to administrative divisions.</li> </ul>	<ul style="list-style-type: none"> <li>• Support student and workforce mobility through subsidized inter-urban public transport and consider setting up youth accommodation facilities.</li> <li>• Introduce vouchers for the training of students and workers in specific skills, with a grading system for successfully completed training, as a condition for redeeming vouchers / reimbursement of funds invested in training.</li> <li>• Develop support programs for engaging experienced professional staff from Diaspora, especially in process management skills.</li> <li>• Develop modern academic programs: <ul style="list-style-type: none"> <li>- economic analysis of industrial sectors and organizations</li> <li>- economic justification / general applicability in technical / engineering schools.</li> </ul> </li> </ul>

## Policy Matrix – Priority measures

Short-term	Medium-term
<b>General Recommendations</b>	
<b>Support to companies, FDI and MSMEs</b>	
<ul style="list-style-type: none"> <li>• Explore best incentives for attracting FDI and how to recognize development impacts.</li> <li>• Intensify, consolidate and “verticalize” the support measures for SMEs development and export, especially within aRASprogram. Also, establish a comprehensive monitoring and evaluation of business support programs. This measure implies the following: <ul style="list-style-type: none"> <li>- Develop <i>sektoral</i> programs for quality improvement, marking, and traceability of products, along the entire chain.</li> <li>- Develop <i>sectoral</i> programs for the improvement and process management training. Place more emphasis on company trainings for communication with foreign buyers and develop support programs for the implementation and use of „e-procurement“.</li> <li>- Examine which areas in selected sectors would most benefit from investments in technology and equipment and pinpoint areas with the highest potential for development/externaleffects.</li> </ul> </li> <li>• Continue and intensify the promotion of companies in foreign markets.</li> <li>• Establish a program to research domestic market trends (using the "purchasing managers index" model) but for MSMEs, for priority sectors.</li> </ul>	<ul style="list-style-type: none"> <li>• Support investments in technology and equipment in areas with the greatest development effects. Provide training and support for installation and operation of the purchased machines or systems (IIS, CMM machines, tool reparation, and corporate governance).</li> <li>• Initiate complex policies for attracting SDIs, driven by developmental impacts. Re-route the incentives for creating jobs towards workforce development, i.e. investments in knowledge development and employee training.</li> <li>• Support and encourage the association and cooperation of SMEs by incorporating incentive measures with other industrial policy measures, such as support for group performances abroad.</li> <li>• Organize joint ventures of related companies on the market, through “umbrella” brands or some other form of cooperation, but only after reliable standards of quality control systems are in place etc.</li> </ul>

### Other measures directly within the competence of the state

- Examine in detail and propose a solution for inefficient disposal of public property and industrial sites trapped under unresolved property relations.
- Quality evaluation of public procurement and its practice.
- Further develop the quality infrastructure and make it fully available to the SMEs.
- Provide stable supply of electric power.
- Perform systematic and consistent inspection and supervision.

### Policy Matrix – Priority measures

Short-term	Medium-term
<b>Food and Drink</b>	
<ul style="list-style-type: none"> <li>• Establish an "administrative cold corridor" for a fresh fruit and vegetable segment i.e. reduce administrative procedures to a minimum, give priority to easily perishable fresh produce, and guarantee damage refund in the event of food spoilage due to long border wait times.</li> <li>• Develop cooperation programs with export and cooperative oriented globally integrated companies in the field of processing and trade.</li> <li>• Continue with consistent trade liberalization (do not introduce levies, remove administrative barriers).</li> <li>• Provide urgent funding through IPARD funds and make the application process fully transparent to all stakeholders.</li> <li>• Introduce new varieties to the market (fruits and vegetables), with stronger genetic potential and longer season, suitable for fresh consumption, and work on the development and promotion of indigenous varieties.</li> <li>• Restructure the state incentives system - higher allocations within the agricultural budget to support processing, the quality of primary products, and linking primary and processing sectors.</li> </ul>	<ul style="list-style-type: none"> <li>• Programs for consolidation and concentration of land ownership.</li> <li>• Establish a network of distribution points and wholesale markets.</li> <li>• Support the establishment of a functional and transparent purchase market, by means of a centralized and transparent system of continuous (ongoing) information, including world market trends, as well as through the aforementioned purchase / distribution points.</li> <li>• Improve the quality of primary production by subsidizing a gradual achievement of the GAP standard, establishing a reference laboratory and stricter control over product safety.</li> <li>• Promote and support higher organic production and non-GMO product labeling (particularly meat).</li> <li>• Become a member of the WTO.</li> </ul>

## Policy Matrix – Priority measures

Short-term	Medium-term
<b>Rubber and Plastics</b>	
<ul style="list-style-type: none"> <li>• Develop educational and support programs for the compliance of existing exporters with REACH standards.</li> <li>• Establish a database of domestic suppliers and exporters, according to specific products and standards, in order to develop, monitor and evaluate programs for improving the quality of production processes and products.</li> <li>• Perform a detailed analysis of capacities and product portfolios of domestic companies, and the needs of large globally integrated buyers, in order to determine the possibilities for developing direct support programs for import substitution.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop targeted support programs to link the existing FDIs and autochthonous companies - current import of plastic products is &gt; EUR 500 mil, and large FDIs account for 50% of those imports.</li> <li>• Support the establishment of functional associations, based on identified geographical groups of companies, to enable a joint procurement of raw materials, joint use of equipment and machinery, and joint ventures on foreign markets.</li> <li>• Support a gradual introduction of advanced and more productive machines (500-1000t), robots which can multiply productivity in certain segments of production, and 3D printers to create product prototypes.</li> </ul>
<b>Machines and Equipment</b>	
<ul style="list-style-type: none"> <li>• Promote the sector abroad, in particular the skills, knowledge and ability to produce customized products in a short time, given the trend of <i>nearshoring</i> in the most developed EU countries.</li> <li>• Establish a database of domestic suppliers and exporters, according to specific products and standards obtained, in order to develop, monitor and evaluate programs for improving the quality of production processes and products..</li> <li>• Pilot a vendor development program by selecting companies capable of becoming suppliers to globally integrated companies in a short time, and provide available direct support that will accelerate this transition.</li> <li>• Perform a detailed analysis of capacities and product portfolios of domestic companies, and the needs of large globally integrated buyers, in order to determine the possibilities for developing direct support programs for import substitution.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop a comprehensive supplier development program by learning from pilot projects.</li> <li>• Support cooperation between local suppliers and relevant globally integrated companies, especially in areas with potentials for import substitution.</li> <li>• Support stronger ties between economy and science, not only in terms of education of the needed personnel profiles, but also in research and innovations that the economic sector can put on the market.</li> <li>• Support the transition to more current production technologies and upgrade of machinery in line with the progress of advanced technologies and Industry 4.0 i.e machines, equipment and software that can upgrade productivity and product quality.</li> </ul>



## Policy Matrix – Priority measures

Short-term	Medium-term
<b>Wood and Furniture</b>	
<ul style="list-style-type: none"> <li>• Establish transparency of the wood raw material market by publishing information on beneficiaries, quantities and relevant criteria.</li> <li>• Explore options for a new sale model for wood raw materials from the state forests, which will increase procurement stability and predictability, encourage SMEs associations in procuring raw materials and potentially open the door for multi-year contracting for one fixed quantity of the total available wood raw material.</li> <li>• Establish and make public the available quantities of wood raw materials annually, along with future projections.</li> <li>• Subsidize the use of designs in enterprises with production potential in terms of capacity and production technology, which lack funds for proper product design necessary for market penetration.</li> <li>• Identify the reasons behind ineffectiveness of the existing clusters and associations within the W&amp;F industry, and find solutions and support measures for creating functional associations.</li> </ul>	<ul style="list-style-type: none"> <li>• Introduce a new sale model for wood raw material from state forests that will be based on market principles, while protecting woodworkers from rural areas.</li> <li>• Raise forest management to a higher level. As relates to state forests, primarily to improve road infrastructure and logging machinery, and in terms of private forests, primarily to improve afforestation, introduce certification, and raise awareness about sustainable forest management.</li> <li>• Establish a Design Center at the national level, which will be linked to all existing similar associations and initiatives at the local level.</li> <li>• Support functional associations, based on identified geographical groups of companies, aimed at joint ventures in the procurement of raw materials, use of equipment and machines, and foreign market operation.</li> </ul>

# Food and Drink Sector Performance and Value Chain Analysis

## with a focus on raspberries

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## Summary of the Analysis of the Food and Drink Sector (F&D)

- **Agriculture and the food and drink sector are traditionally rooted in the Serbian economy and have always been considered Serbia's most valuable resource.** The F&D sector still has massive economic (25% GVA of the processing industry), social (employs 20% of the processing industry) and demographic importance - more pronounced than in the EU countries. This position comes from widely known comparative advantages in agriculture, but also from efficient and faster privatization of its key processing facilities compared to other processing sectors..
- **As a self-sufficient country in food production, Serbia has been a net exporter of food for many years.** After the crisis, and the stagnation of a saturated but relatively poor domestic market, the F&D sector instinctively turned to foreign markets - today exports account for 25% of total turnover, and at the beginning of the crisis it accounted for 15% - and what is more important, the total growth of activities came from exports.
- **The performance seemed solid at first glance**— (export continued to grow (export was increased by 70% - EUR 680 million and net export by 45% - EUR 250 million), Serbia's market share in export markets was increased, and a high RCA indicator (2.3) points to strong comparative advantages of Serbia. Nevertheless, a comparison with key CIE competitors - Bulgaria, Romania, Hungary and Poland reveals that Serbia did not fully utilize the opportunity – the said countries achieved a significantly faster growth.
- **A deeper review of the structure of Serbian exports indicates that exports actually add very little value to the agricultural production, and that exports are not diversified.** Small added value is a consequence of short value chains - a significant amount of produced agricultural raw materials is still used for natural consumption (for milk 30%, for meat 40% -50%, even higher for certain fruit varieties), while a significant part of raw materials - especially cereals and oilseeds – is exported (exports of agricultural raw materials reached almost EUR 1 billion). The remaining raw materials which manage to find a way to the food industry are mostly only slightly processed - making frozen raspberry, sugar, soya and sunflower oil, and flour key export food products of Serbia. In addition to low added value, productivity too is relatively low across the entire chain – in terms of yields, Serbia's agricultural portfolio is on average 37% behind EU yields, while the processing segment is marked by low labor productivity, which is compensated through lower labor and energy costs (the added value/labor costs ratio in Serbia is 2, and one of the highest in Europe). However, in order to advance competitiveness, this productivity will need to grow faster than the certain and expected increase in wages.
- **The structure of the Serbian F&D sector, which is fragmented and dominated by domestic and regional capital, represents a key challenge and largely determines the described performance and characteristics.** The fragmented structure of the F&D industry (HHI only 62; top 25 exporters do not make up half of the exports) actually reveals an even more fragmented structure of agriculture (600k exporters, an average farm with 5-6 ha, often further divided by plots); this complex economic and political situation has prevented a significant inflow of foreign capital - there are only 15 foreign companies in Serbia that export over EUR 10 million, mostly to the regional market in the drink subsector. Serbian food companies are facing the challenges commonly

existing in fragmented economies, with prevailing domestic ownership, such as: access to capital, access to information, access to markets, value chain connectivity, and efficiency of internal organizational processes. Key measures should take into account the fragmented structure and target above that area.

- **Key general recommendations at the F&D industry level are as follows:**
  - **Measures aimed at consolidation, or reducing the impact of fragmentation**
    - Develop a functional network of wholesale and retail markets
    - Resolve the issue of land availability and fragmentation
    - Attract and develop cooperation programs with export and co-operative oriented FDIs in processing and trade.
    - Joint appearance on the market, through an "umbrella" brand, which would guarantee top quality of products from Serbia.
  - **Measures aimed at increasing and facilitating access to international markets**
    - Joining the WTO
    - Further (de facto) trade liberalization
    - Specific measures in sub-sectors of meat (possibility of accessing EU market) and milk (improving quality and establishing a reference laboratory)
    - Develop "business intelligence" by improving statistics and establishing "export-import" information counters.
  - **Measures aimed at improving internal operations and activities**
    - Develop programs for improving the quality, marking and traceability of products, along the entire chain
    - A range of trainings aimed at raising awareness and turning companies from "product-driven" to "customer-driven" strategies
    - Special focus on organic production
  - **Measures aimed at intensive and targeted financial and non-financial state support**
    - Greater financial support and prioritization of activities under a RAS program
    - Urgent provision of funding through IPARD funds
    - Restructure of the state incentive system - higher allocations within the agricultural budget to support processing, the quality of primary products, and cooperation between the primary and processing sectors
    - Improve and upgrade operations of agricultural professional services
  - **Measures aimed at the fruits and vegetables sub-sector, with a focus on raspberries**
- **In the interest of producing more concrete findings and recommendations, the analysis was further focused on the fruits and vegetables sub-sector, which proved to be the most competitive sub-sector within the F&D sector. Meat and milk sub-sectors are also in play – as they are the "apex" of livestock production, and their**

performance and potentials are constantly in the public eye. However, a brief analysis of these two sub-sectors indicated that while Serbia has tradition and moderate potential - especially in the milk subsector - the priority of both sub-sectors in the medium term should be to preserve a dominant position in the domestic market through accelerated commercialization. Accelerated export growth, not accompanied by the growth in imports, is still not on the horizon. Given that most potential measures in both sub-sectors refer to the primary, agricultural segment, which is not in the scope of this analysis, the focus is placed on a far more competitive and more export-oriented sub-sector of fruits and vegetables.

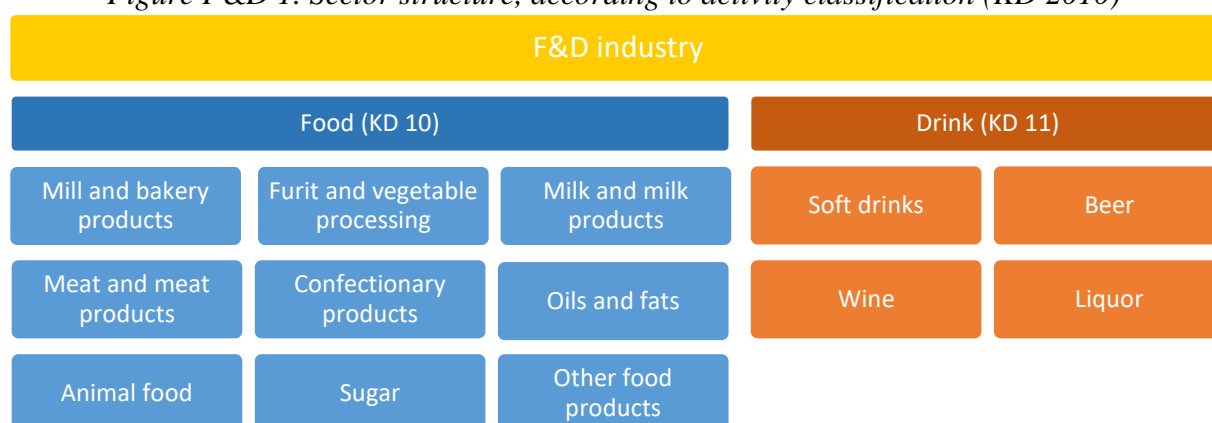
➤ **Analysis of the fruit and vegetable sub-sector has shown that all symptoms that are generally present in the F&D sector are even more present in that sub-sector.**

Although the growth of (net) exports was extremely dynamic and had greatly contributed to the F&D sector growth, the segment of the key export product – raspberries, is characterized by low added value and poor diversification, due to extremely fragmented export structure - about 200 exporters, of which 60 with exports over EUR 1 million, and no company had a dominant share. Despite being a dominant raspberry producer and exporter, Serbia's position could be strengthened by capturing new stages of added value within the established traditional chain (retail packages and deeper processing – e.g. freeze drying), by developing new chains - fresh raspberries, organic raspberries, jams and juices, and by diversification by including blueberries and strawberries.

## Definition and Scope of the F&D Sector

**The F&D sector entails activities that enable the transformation of agricultural raw materials into products intended for human consumption.** As presented in Table 1, in the context of this report, two groups of activities of the F&D sector were observed - production of food products (KD 10) and production of drink (KD 11). The entire sector is further subdivided into 13 sub-sectors, consistent in technology and inputs in production processes. As explained in more detail in Annex 1, the methodology used to define the sub-sector is based on the International Classification of Economic Activities (KD 2010), which is additionally adapted to the structure and characteristics of the Serbian F&D sector - certain sub-sectors which are significant in the context of Serbia, but not treated by KD 2010 as independent or as separate, as is the case with sugar; on the other hand, some sub-sectors were "merged", as is the case with mill and bakery products.

*Figure F&D 1. Sector structure, according to activity classification (KD 2010)*



## Relevance and Structure of the F&D Sector

Agriculture and the related F&D sector have always been considered as Serbia's most valuable resource and the greatest potential that can and must be used. **It is well known that one of the greatest traditional comparative advantages of Serbia lies in favorable climate conditions and rich and fertile land.** Already in the nineteenth century Serbia was a producer and exporter of agricultural and food products - especially cereals, meat and fruits.

There are still high expectations from the agricultural sector and the F&D sector, since the two still play an important role in the Serbian economy and society, mainly:

- *Economic - as in most other European countries, the F&D sector in Serbia is the largest and most important processing industry. In Serbia, it accounts for 25% of the GVA of the processing industry and 3.9% of the GDP of the entire economy (agriculture accounts for 10,4% of GDP).*
- *Social – F&D sector alone accounts for 20% of the employment in the processing industry, and together with agriculture it formally employs 120k, or over 600k in total (formally and informally), which is close to a quarter of the total number of employees according to the Labor Force Survey.*

- Demographic - agriculture and food industry, as the most common or major or additional sources of sustenance, have the strongest influence on balanced regional development, by providing motivation and conditions for living in rural areas.
- ... as well as a wider strategic and national significance - the concept of "food safety" is an indispensable goal of any sustainable development strategy and is defined by the FAO as a situation in which all people, at all times, have physical, social and economic access to sufficient and safe amounts of food that satisfy their nutritional needs and preferences in sustaining active and healthy lives.

**The significance of the F&D industry in Serbia is even more pronounced than in comparable European countries,** for all key parameters. We recognize two key reasons for the pronounced significance of the F&D industry:

- **It is naturally attached to agriculture, and the importance of agriculture in Serbia is also higher than in other comparable European countries.** The importance of agriculture in Serbia is high due to the above-mentioned comparative advantages in terms of natural and climate characteristics; it is a sector with strong tradition, which can provide rural and poor households with the relatively high income per unit of work. However, it should also be noted that high share of agriculture is also a sign of underdeveloped industry.
- **The F&D sector and agriculture are more resistant to external impacts and period of crisis,** which have been numerous in the past 20-30 years, worldwide and in Serbia. Food demand is the least elastic, so it is logical that the F&D sector was largely privatized and thus "preserved" during the 1990s and early 2000s. While many other large state-owned systems collapsed, and entire sectors along with them, the F&D sector had a significant foothold in domestic demand and available raw material base.

Two key characteristics of the Serbian F&D sector, which differ greatly from other characteristics of the Serbian economy, are the **fragmented structure and within it - domination of domestic and regional companies**, that is, a lack of significant presence of world-renowned foreign companies. According to SBRA, there are about 3,500 companies and about 9,000 entrepreneurs, and according to the SORS data, it contributes to Serbia's GDP with 3,9% and formally employs more than 100,000<sup>3</sup> people.

- Generally speaking, it is **the least concentrated sector in the processing industry** (HHI index below 100), in which the three largest companies account for only 11% of total business revenues, while the 25 largest companies generate 41% of operating revenues - despite some subsectors being heavily concentrated (oil, sugar and drink). However, most of the remaining segments - such as fruit and vegetable subsectors, meat, and mill and bakery - are significantly competitive in terms of the number of companies and their market.
- Apart from general fragmentation, **the F&D sector is also dominated by domestic and regional capital.** Although official data show that half of the revenue generated by the F&D sector is generated by foreign companies, the sector is largely controlled by domestic capital rooted in the traditional sector. Well-known world brands, which invested in Serbia, are mainly located in the drink sector, and are concentrated on the

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<sup>3</sup> The assumption is that each sole proprietorship, a form excluded from the structural business statistics, employs at least one person.

supply of domestic and / or regional markets. A more detailed review of the remaining foreign-owned companies suggests that most large companies are divided between “offshore” zones and regional capital, with management models and know-how very similar to domestic companies.

It is important to understand one of the key characteristics of the agriculture sector, which has largely determined the described structure of the F&D sector. Agriculture in Serbia is characterized by **a pronounced fragmentation, that is, by general fragmentation of land and insufficient accessibility.**

- It is a well-known fact that one of the largest obstacles to a serious increase in productivity of the agro-industrial complex is the fragmentation of the agricultural land in Serbia - about 6 hectares per farm which is less compared to majority of the European countries. The EU average is 16 hectares per farm and the only three countries that are comparable to Serbia by the size of average farms are Slovenia and Greece, which are slightly above, and Romania, which is below Serbia.
- We think that **the issue of availability of agricultural land** runs much deeper than what statistics of the average farm size show and that the fundamental problem concerns the development of agro-industrial facility complexes. Nevertheless, many reports and observations point to two more problems that further limit the availability of land fit for cultivation by its natural-geographical features: (a) small or large agricultural land is further divided into even smaller agricultural plots; (b) state-owned land is trapped under institutional burdens making its use sub-optimal - a dysfunctional approach by central and local authorities in land-use planning, land owned by dysfunctional companies (in particular, former agricultural enterprises) in bankruptcy, and land owned by large public companies – “Srbijašume” and “Srbijavoda” which are often inefficiently managed.

**The average land size, which is above 10 hectares per farm in Vojvodina and less than 5 hectares in other regions, does not adequately illustrate the actual regional contrast in land fragmentation and availability / use.** Namely, in Vojvodina, 83% of the total used agricultural area is owned by farms with over 10 ha of land, while farms with more than 50 ha account for 57% of the agricultural land in use. On the other hand, on territories of Southern, Eastern, and Western Serbia and Sumadija, 33% of the total cultivated agricultural land is owned by farms with over 10 ha, while farms with over 50 ha cover only 11% of the agricultural land.

**In Vojvodina, both the land-use and yields are significantly higher, with large commercial farms and modern facilities present.**

- **Certain crops can be exclusively cultivated in Vojvodina** due to natural characteristics and significantly larger farms, as is the case with industrial plants (sugar beet, rapeseed, soybeans, and sunflower). On the other hand, the fragmentation of land is the smallest obstacle for fruit crops, which are predominantly produced outside of Vojvodina, with the exception of apples. What is common to all plant crops is a significantly higher yield in Vojvodina than the rest of Serbia - on 40 observed plant crops, the yield in Vojvodina is higher by about 50% and only cucumber yields are higher in other regions.



Although official livestock farming data do not allow similar yield comparisons, the distribution of the number of livestock heads according to the farm size is significantly different - for example, in Vojvodina 63% of dairy cattle are in farms above 10 ha, while in other regions, excluding Belgrade, this figure is only 25 -30%. In terms of pig farming, the average number of livestock heads per farm is twice as large in Vojvodina (16: 8), but this does not illustrate the true relationship, since 50% of pigs in Vojvodina are in herds counting over 100 pigs, while in other regions 60 % are in herds counting less than 20. Therefore, it is reasonable to assume that productivity in the livestock farming sector is significantly different across regions, in favor of Vojvodina.

**The average productivity of Serbian agriculture and the F&D sector is significantly below the European average, but the described regional contrasts, as well as the domination of domestic and regional capital, produce variable productivity between sub-sectors, and between least and most productive companies.**

The productivity of the largest and most technologically advanced companies in Serbia is not far from that in the EU, especially when taking into account lower labor costs that have a double effect on added value - on the one hand, they directly reduce it because wage costs are lower; on the other, they indirectly decrease it because a company is able to offer a lower price, which also produces lower business revenues. The average productivity of the 50 largest companies in the food and drink industry sector in 2015 was EUR 30,000 per worker, with companies in concentrated sub-sectors reaching over EUR 70,000. On the other hand, labor productivity in the rest of the economy was below EUR 7,500 per worker.

Sectors such as sugar or oil, which are mostly located in Vojvodina due to the raw material base, are significantly more productive compared to other sectors due to simple purchase processes, stable relations between stakeholders, and the high concentration of processors..

**In relation to the fruit and vegetable sector**, most production is located south of Vojvodina, so there are many “scattered” small households involved. Due to product sensitivity connected with fruits and vegetables, this sector is fragmented and there are many actors involved at the purchase and processing stage.

Unlike cereals and oilseeds, and fruits and vegetables, livestock farming and meat and milk production are widespread throughout the country. Most of the highly productive companies from these two subsectors, such as Imlek, Somboled, Subotica, Matijević, Carnex, Neoplanta, Backa and others, are located in Vojvodina, while most of the traditional producers of milk and meat are located in the south. Therefore, although Serbia generally lags behind the EU, it is clear that this lag largely concerns producers located south of the Sava River.

The table below shows approximate participation of sub-sectors in key macro indicators of the F&D industry, based on the analysis of data from SBRA. Two things should be noted – first, the least concentrated sectors are at the very top in terms of size - especially concerning the number of employees and business income, and second, the most concentrated sectors led by the largest companies in the F&D industry are at the very bottom. In the F&D industry there is no correlation between the company size and the size of the subsector, as in most other processing sectors. However, as we move from “social” indicators to performance and profitability indicators, the participation of concentrated sectors increases - reflecting the size of companies in the sector and their productivity.

*Table F&D 1. Sector structure according to sub-sectors and key indicators*

2015. godina	# firmi	# zap	PP	VA	EBITDA
Učešće u ukupnom(%)					
<b>Prehrambeni sektor</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
Mlinski i pekarski proizvodi	36.8	32.2	17.3	19.4	14.7
Prerada voća i povrća	16.6	11.0	13.4	11.1	11.4
Meso i mesne prerađevine	11.3	16.2	12.4	10.4	8.5
Mleko i mlečni proizvodi	5.2	8.1	10.0	11.8	13.5
Hrana za životinje	5.0	5.0	9.0	5.8	6.6
Ostali prehrambeni proizvodi	11.7	7.7	8.2	8.3	7.0
Bezalkoholna pića	3.1	5.5	8.2	10.0	10.7
Ulja i masti	0.9	3.0	7.6	6.3	8.9
Proizvodnja piva	0.7	3.2	4.6	7.1	7.7
Proizvodnja šećera	0.3	1.4	4.3	4.1	5.2
Proizvodnja konditorskih proizvoda	2.7	4.2	2.9	3.4	3.5
Proizvodnja vina	2.7	1.3	1.0	1.0	0.9
Žestoka pića	2.9	1.1	0.9	1.3	1.5

Izvor: Kalkulacije autora na bazi podataka APR-a

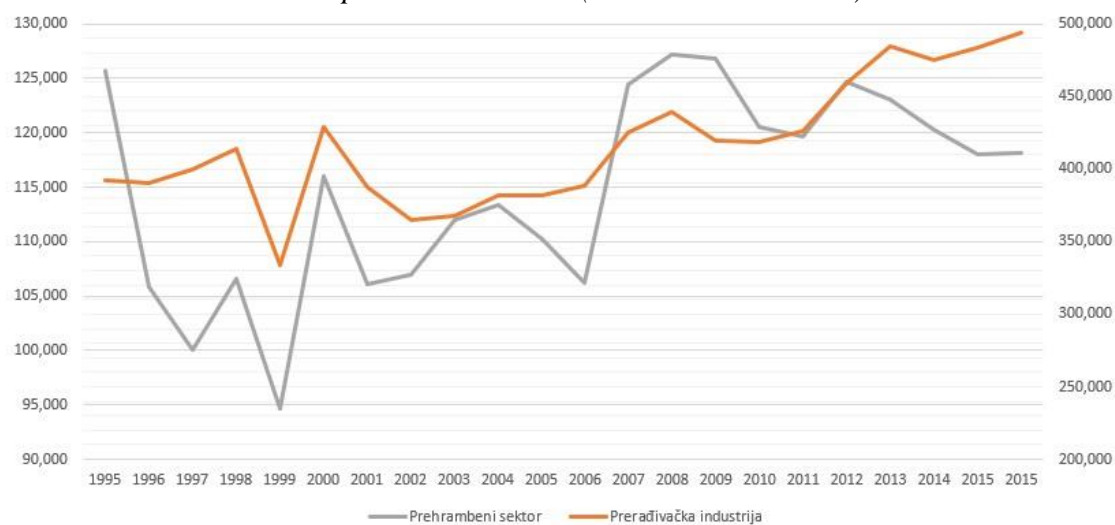
Source: calculations by the author based on data from SBRA

/2015 / #of companies, # of employees, PP, VA, EBITDA / total participation (%) / Food sector / milk and bakery products, fruit and vegetable processing, meat and meat products, milk and milk products, animal food, other food products soft drink, oils and fats, beer production, sugar production, confectionary products, wine production, spirits/

## Performance and Competitiveness of the F&D Sector

Although it is evident that in the past 10 years the F&D industry made a step forward in terms of competitiveness, the concrete effects in the post-crisis period cannot be easily determined. Given the questionable reliability of the official statistics regarding the growth of added value, but also the fact that we do not expect much change in the total consumption per capita in the observed period, and a much significant growth in sales in foreign markets by the F&D industry, sector performance is evaluated based on the analysis of export activity and export competitiveness. **Official data, as shown in Figure 2, indicate that the GVA of the F&D industry has been steadily declining and has not yet reached the pre-crisis level from 2008 - however, data reliability is a seriously questionable.**

*Figure F&D 2. GVA of the F&D industry (left axis) and processing industry (right axis), in the period 1995-2015 (in 2010 RSD million)*



Source: SORS

/ grey line – food sector / orange line –processing industry

- GVA data show that at the end of 2016, total real value of the sector was about 7% lower compared to 2008 and 2009.
- Such a poor performance cannot be fully justified by the prevailing circumstances in the domestic market and economy – since majority of other sectors recorded growth in the same period. The manufacturing industry, as shown in the figure above, is recording constant growth after the 2009 crisis. We do not see the reason as to why would the situation in Serbia be that much different from other examples in the European market - because the F&D industry in most comparable countries (Bulgaria, Romania, Poland) had managed to overcome crisis and achieve growth.
- As net exports increased constantly, in both value and quantity, the available amount of food on the domestic market was expected to decline in value - and consequently to bring a sharp decrease in relative prices to keep the quantity unchanged. Since this was not the case, it is simply not credible that food consumption per capita fell to such a high degree.
- Also, further suspicion of official data was brought up by the fact that 2012 was the only post-crisis year in which the F&D industry achieved activity growth of as much as 4.2%. In that year, due to a prolonged period of drought, the agricultural sector experienced a strong decline in activity of as much as 18%. Agricultural prices went up significantly in 2012, which would mean that firms operated with significantly lower profit margins (which was not the case, according to SBRA data) or that residents, contrary to their usual and rational behavior, decided to significantly intensify food shopping at higher prices, which is also unlikely.

**What is definitely clear is that the determinant of growth of the F&D industry in the post-crisis period is changing, both globally and in Serbia.** The focus in Serbia is shifting from “meeting the existential needs of the domestic market” to “perceiving the F&D industry as a prospective business with opportunities for conquering foreign markets”. This is also evident

by merely observing export revenues in companies that make up the F&D industry. In the post-crisis period, the share of exports in operating revenues increased significantly (from 14% to 24%), and the overall revenue growth was achieved in foreign markets - while domestic market sales stagnated. The motivation for the ongoing transformation lies both in urgency and in the observed opportunity:

- Food demand in one market is determined by the population size, per capita income, and consumer preferences. Given that the number of inhabitants in Serbia is steadily decreasing (in the post-crisis period, the number of inhabitants went down by 3.6%), that purchasing power is low and growing very slowly, and that this will cause slower transformation of preferences from traditional to luxury or very healthy products, it is clear that **stronger sales growth on the domestic market was not possible after 2009**. Quantity-wise, food consumption in Serbia is already at a sufficient or usual level for a European country, so the value of consumption could grow mainly as a result of purchase of more luxurious products - however, as mentioned before, this did not happen due to the recession. A logical option for most companies was to try to turn to foreign markets.
- Serbia is a country that is largely self-sufficient in terms of food needs, which is clear from the trade balance. Serbia is one of the ten largest agricultural and food net exporters in Europe and the only one among the countries of the former Yugoslavia that is not import dependent, that is, a country that generates a surplus of agricultural products and food. This position comes from a number of competitive advantages, such as good geopolitical position, arrangements for free access to EU markets and Russia, cheaper labor and energy, and good natural and climate conditions. These characteristics have enabled Serbia to easily **place food surplus at competitive prices on foreign markets - especially in terms of fruits and vegetables, cereals, oilseeds and sugar**.
- **The informal segment and natural production within the F&D industry are still very much important**. Due to the abundance of small farm holdings, traditional heritage and low purchasing power, primary agricultural products are produced, processed, and consumed in households. Some of these products are sold in green markets or in direct contact with other consumers in the informal market for further distribution and sale. The importance of the informal market is high in all sectors, and the easiest and most indicative way to present it is to use the example of milk and meat segment. As regards milk, natural consumption and the informal market together have a share of almost 50%, that is, of the total amount of raw milk, only every other liter is purchased by dairy farms. As regards meat, the estimate is similar - the number of animals slaughtered outside the slaughterhouse ranges between 40% and 60%, depending on the type of meat. Nevertheless, with rural population decreasing, the importance of the informal segment in the last years is declining.

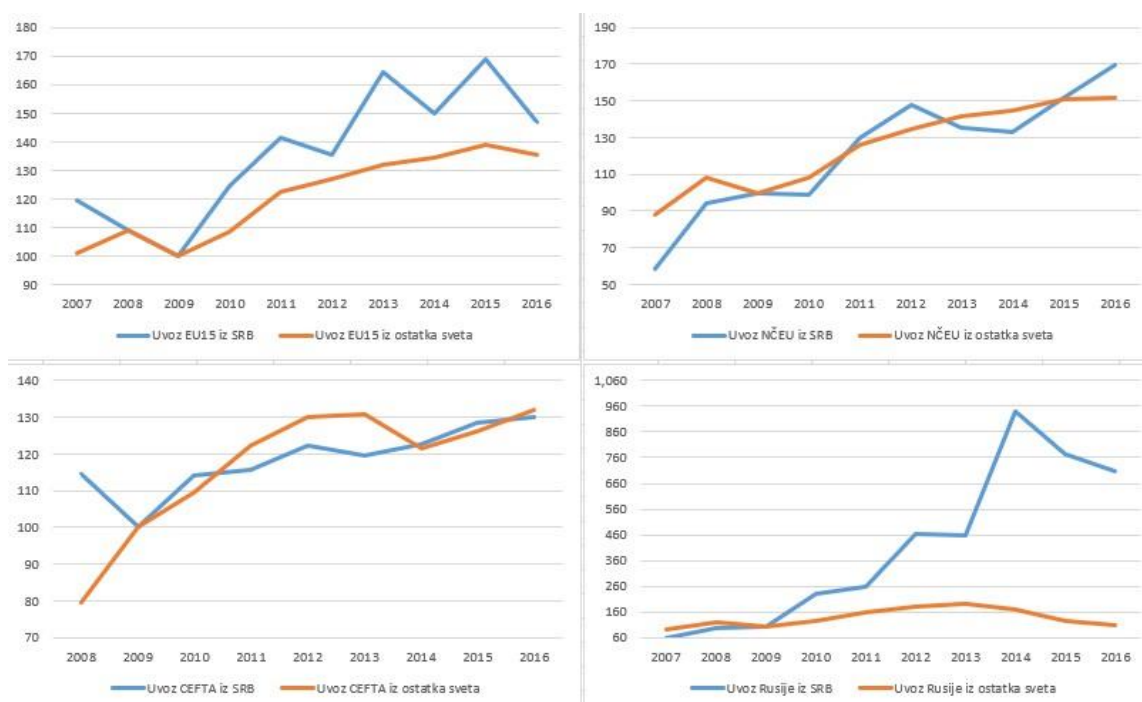
Foreign trade data, observed from three different sources (SORS, Customs, UNComtrade), clearly indicate that **the (net) export of the F&D industry has grown steadily in the post-crisis period, primarily due to orientation to increase market share**.

- Annual growth in exports of the F&D industry was on average 8%, and in most years it mainly revolved around that rate, with the exception of 2012 (drought). In the observed period, total exports were increased by 70%, or by about EUR 680 million, while net exports increased by 44%, or by about EUR 250 million. Data for 2017, as of end

September, indicate that the F&D industry continued with export growth at a similar pace.

- The EU and Russia markets and CEFTA make up 95% of total exports of food products from Serbia, so it was expected from the placement on these markets to determine almost the entire post-crisis export growth. Almost half of the total export growth was achieved on the EU market, which took over the primacy of CEFTA as the main export destination, while the rest of the growth was relatively equally distributed between the CEFTA and Russia markets.
- In all observed markets, with the exception of CEFTA, Serbia's export portfolio grew faster than import demand, thus increasing Serbia's market share. The figure below shows the growth of import demand in observed markets and growth of Serbian exports. It is noticeable that Serbia's growth has more pronounced acceleration and decelerations compared to general trends import demand - one of the reasons that will be discussed in the analysis is the insufficient diversification of exports, often based on the activities of one company, one market, or one type of product.

*Figure F&D 3. Serbian export relative to export demand at EU15, non-EU, Russia and CEFTA market in the period 2007-2015 (2009=100)*



Source: UN Comtrade

*/EU15 import from Serbia (orange)-EU15 import worldwide (blue) / Non-EU Import from Serbia- Non-EU import worldwide / CEFTA import from Serbia – CEFTA import worldwide / Russia import from Serbia – Russia import worldwide*

- Serbia has achieved solid growth on the EU market, faster than the import demand of that market, while on the CEFTA market it grew parallel to the growth in import demand.
  - Products that have determined growth on the EU market - raspberries, fodder and other products of the value chain of cereals and oilseeds, greatly reflect Serbia's opportunities on the EU market. These opportunities lie in luxury

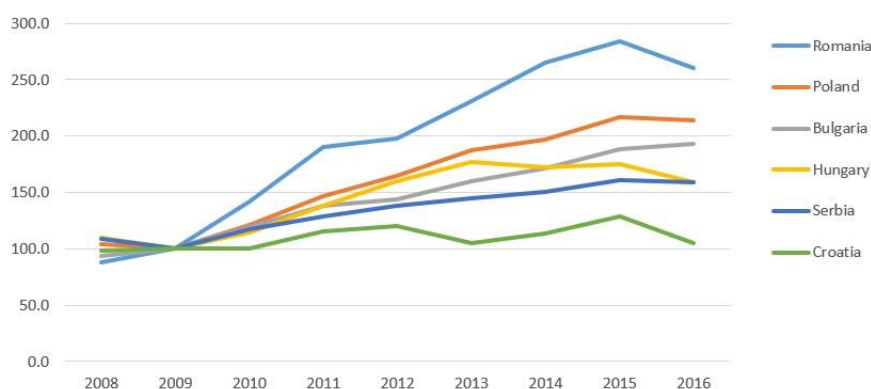
products - such as raspberries or usual products where Serbia has a distinct price advantage or advantage through some other characteristic, such as the “non-GMO” factor - these are primarily cereal- and oil-based products - fodder, soybean oil or other segments of the mill and confectionery industry.

- In the coming period, main activities on the European market will primarily entail differentiation and raising the level of product quality and safety. Intensive growth in demand for usual products cannot be expected in the European market; demand growth can be expected for luxury goods or goods where added value is significantly increased through processing or which are in demand due to some other characteristics that make them visually more attractive, healthier or more usable. Population growth in the EU will not significantly affect consumption growth, as it was only 2.5% in the past 10 years, or 0.26% per annum. Income is already at a high level, so it is more likely that the demand for traditional and usual goods will decrease, but it will grow for the aforementioned more luxurious goods.
- In the CEFTA market, growth was achieved primarily through products in which Serbia has an advantage over neighboring countries due to the economies of scale - sunflower oil, flour, sugar, soft drink, and animal feed. Exports of other products - primarily milk, meat, and fruits and vegetables - have mostly stagnated. Given that these countries have similar characteristics to Serbia, the growth of intra-industrial trade can be expected in the CEFTA market, so as to diversify consumption and / or make up for current shortages in certain products.
- The fastest growth was recorded in the Russian market - over 40% per annum. Still, the initial basis was low, and the sustainability of the achieved level and further growth is questionable.
  - Export to Russia grew faster even before the ban on exports from EU countries to Russia, and the ban certainly presented additional opportunities. Meat, milk, and fruits and vegetables were three key product groups which carried the growth in the Russian market. However, after exports to the Russian market peaked in 2014, they declined in 2015 and 2016, probably due to Russia’s strong push towards import substitution.
  - In addition to representing a market with great opportunities, due to its size and free trade arrangement, the Russian market also represents a type of risk for domestic companies: it requires serious adjustment to their standards and regulations, and carries a currency risk for the Serbian economy which is mainly euro-indexed. Logistics and transport also represent serious challenges for companies; we must bear in mind that on the day of joining the EU, Serbia will lose all trade privileges with Russia.
- Based on the “constant market share analysis” which included 116 food products exported by Serbia in the period 2009-2016, the conclusion is that food products from Serbia are relatively more represented in key markets compared to the beginning of the crisis - of total export growth (70%), almost half (35 pp) was achieved thanks to faster export growth than import market demand. Export growth was recorded in 70% of products (or in absolute value, 81 products). The analysis also indicates that higher export market share was recorded for more than half of the products. Taking into

account the growth in world demand for specific products, as well as the growth of Serbia's export markets, the analysis further indicates that almost half of the total growth was achieved by competitiveness, that is, the ability to increase placements faster than import demand.

- However, the analysis must give due consideration to the fact that the starting point for most products in most markets was low, that the starting period coincided with the beginning of the crisis and the use of benefits from international arrangements. **A more detailed analysis and observation of competition and the structure of placements indicates that the potential is moderately to significantly higher than the achieved growth.**
  - Serbia primarily won market share by growing faster than most developed EU countries, and did not take full advantage of the opportunity presented to new EU members, which are usually more cost-competitive and faster-growing.
  - The growth rate of Serbia's exports to the EU market was faster than the import demand of that market, but also significantly slower than the increase in food exports from Romania, Bulgaria, Hungary, Croatia and Poland, as shown in Figure 4. Namely, the export of these five countries on the EU market averaged about 12% annually.
- The reason behind slower growth and missed opportunities is not easy to explain, but we will show that most challenges arise from the specific structure of the Serbian economy – in terms of size and ownership.

*Figure F&D 4. Serbian export in relation to non-EU members, in the period 2008-2015.*



*Source: UN Comtrade*















## Key Issues and Challenges

Going deeper into the structure of exports according to products and exporters, **it is clear that the export of the F&D industry is not diversified and produces little added value to agricultural production.**

- **Export diversification is low**, observed from the aspect of product, market, and export companies.
  - Export of fruits and vegetables, together with two other product groups - (i) oils and fats, and (ii) mill products, accounts for more than 50% of exports of food products. Table 2 shows detailed export structure and trends, according to the sub-sectors observed.
  - **Fruit and vegetable products, particularly frozen raspberries, are absolutely the most important segment of Serbian food exports.** These products account for a third of exports and contributed to the increase in total post-crisis exports by as much as 40%. The significance of this sector for Serbian exports is also evident from fact that its RCA is close to 9, meaning that the product has nine times higher participation compared to other countries. Most exports of fruit and vegetable products actually concerns frozen raspberries, which is marketed in the developed EU countries and North America. The placement of this product on these markets accounts for almost 2/3 of exports of fruit and vegetable products, that is, almost one fifth of total exports of food products.
  - **Oils and fats exports are mostly tied to a few companies** (VictoriaOil, Diamond, and SojaProtein), with clearly defined export destinations - soybean oil is being marketed in more developed EU countries, and sunflower exclusively in the regional and some non-EU countries. Although the export of mill products is diversified by the number and participation of exporters, it is strongly focused on the CEFTA market, which accounts for 75% of exports of these products.
  - **Export of the remaining products is largely concentrated in terms of exporters - the three large exporters are mainly responsible for exports of whole groups of products, or markets - where products are largely tied to either the regional or Russian market.** As concerns sugar, the entire export is determined by activities of two companies (Sunoko and Hellenic). As for drink, several well-known brands (Coca Cola, Carlsberg...) mainly market products in neighboring countries, whereas meat and milk exports are entirely focused on the CEFTA market, with a short-term growth in the Russian market.



Table F&D 2. F&D industry export by sub-sectors, in the period 2008-2015

	Izvoz (mil EUR)								Trend	Učešće u		RCA	Rast izvoza			
	2008	2009	2010	2011	2012	2013	2014	2015		X	ΔX	2015	EUR	%	CAGR	
<b>Prehrambeni sektor</b>	<b>1,014</b>	<b>934</b>	<b>1,073</b>	<b>1,187</b>	<b>1,265</b>	<b>1,311</b>	<b>1,381</b>	<b>1,482</b>		<b>100.0</b>	<b>100.0</b>	<b>2.2</b>	<b>548.4</b>	<b>58.7</b>	<b>8.0</b>	
Prerada voća i povrća	264	269	305	342	336	381	405	483		32.6	39.1	8.7	214.3	79.7	10.3	
Mlinski i pekarski proizvodi	150	119	135	149	153	163	159	164		11.1	8.1	2.8	44.5	37.3	5.4	
Ulja i masti	123	102	129	166	203	153	131	155		10.4	9.7	1.7	53.2	52.4	7.3	
Proizvodnja šećera	108	96	142	127	116	129	111	103		6.9	1.3	3.7	6.9	7.1	1.2	
Bezalkoholna pića	71	65	70	77	88	85	94	100		6.8	6.4	6.3	35.2	54.2	7.5	
Ostali prehrambeni proizvodi	50	53	55	60	71	89	101	99		6.7	8.4	1.4	45.8	86.5	10.9	
Meso i mesne prerađevine	66	51	47	46	55	58	118	98		6.6	8.6	0.5	47.1	93.1	11.6	
Mleko i mlečni proizvodi	46	45	45	55	67	63	80	79		5.3	6.2	1.5	33.7	74.2	9.7	
Hrana za životinje	16	15	21	30	40	51	51	67		4.5	9.5	3.5	52.1	346.8	28.3	
Proizvodnja piva	50	48	47	51	54	54	50	54		3.6	1.1	4.0	5.9	12.3	2.0	
Proizvodnja konditorskih proizvoda	54	54	59	57	54	55	52	51		3.4	-0.6	1.4	-3.1	-5.7	-1.0	
Proizvodnja vina	12	14	13	20	24	22	21	21		1.4	1.3	0.7	7.1	52.3	7.3	
Žestoka pića	5	4	4	5	5	7	8	9		0.6	1.0	0.4	5.6	149.5	16.5	

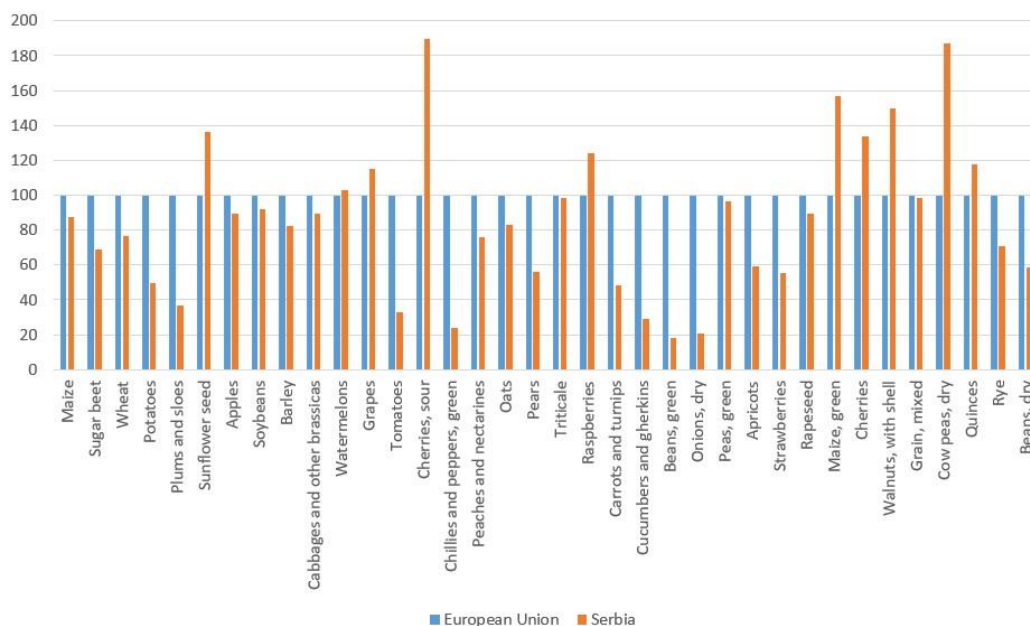
Source: UN Comtrade

Export (EUR mil.) / Trend / Participation / RCA / Export growth /fruit and vegetable processing/mill and bakery products/oils and fats/sugar production/soft drink/other food products/meat and meat products/milk and dairy products/animal foods/beer production / confectionary products / wine production / spirits.

- **The sector adds small added value to agricultural production, due to short value chains and low productivity.** The relationship between agriculture and the food industry both in terms of GVA and in terms of exports indicates that Serbia is among countries that add the least value to agricultural production. Two determinants that clearly affect a low added value are short value chains and low productivity in all chain product segments.
  - **Short value chains** are evident through:
    - **Significant placement of raw materials.** In 2016, Serbia exported almost EUR 1 billion of agricultural products. Cereals are predominant, namely corn, oilseeds and other industrial plants, and fruits and vegetables. Observed from the point of value chain, the placement of completely unprocessed raw materials is a sort of lost added value for the F&D industry. Corn is almost exclusively exported in raw form, while soybeans exports are also increasing - these raw materials could be used for the production of high-quality fodder - and given their non-GMO status, Serbia could brand and promote such products.
    - **Low product processing.** Products are often placed as raw or as finished already after primary processing, which relates to basic processing of agricultural products, such as grinding - obtaining flour, crushing - obtaining soybean meal, or freezing - placement of frozen fruits and vegetables. Luxury and expensive products have a small share in total placements - raspberries are exported in bulk, in packages of 5-10 kg and not in "retail" ready-made packaging. Although there are significant quantities of non-GMO soya, soybean cheese or milk products are negligible. Confectionery products are the most expensive export products in the F&D industry but record an unusually low share in exports.

- **Low productivity along the value chain**
  - **Agriculture in Serbia is generally characterized by relatively low yields per hectare or per capita.** By observing only 37 varieties where Serbia's production exceeds 10,000 tons, the conclusion is that EU yields are on average 60% higher than the average for a given variety in Serbia. If the deviation in yields is weighted by the structure of the Serbian primary production, placing importance on products that Serbia produces most, average deviation is somewhat milder at 37%. It is well known that yields in Serbia are lower due to the poor use of modern agro-mechanics and agro-technical measures, and that this is often compensated by lower labor, energy and land costs. The figure below shows yield deviations in Serbian agriculture relative to the EU28 - all EU yields are normalized to 100%, making it easier to see the percentage deviation.
  - **As with most other sub-sectors, food productivity is significantly lower than that of comparable countries.** Currently, this is offset by lower labor and energy costs, but a more dynamic growth in competitiveness requires stepping up productivity.

*Figure F&D 5. Average yield comparison between Serbia and EU28 (37 varieties)*



Source: FAO

## Fragmentation of the F&D Sector

Before discussing the possibilities and limitations in terms of finding solutions to these issues and raising added value, we will first consider the fragmented structure of the sector (**HHI only 62**). **This is a fundamental characteristic of a large part of the Serbian agribusiness sector, which has strongly influenced the current competitive position, and which must be taken into account when designing any corrective strategies.**

- **Four most important sub-sectors within the F&D industry - mill and bakery, fruit and vegetables, meat, and milk, which account for almost 70% of employment, over 50% of the added value, and almost 50% of exports, are extremely fragmented.** The total number of companies in these four sectors is close to 2,800, and concentration in the sub-sector is low, observed through the HHI index and participation of the largest companies. The milk sub-sector is an exception, because despite several hundred traditional dairies, the concentration is higher and “Imlek” company is the absolute leader (it makes up about 40% of the formal market). However, informal sector within the milk sub-sector is significant and absorbs almost a third of the total amount of milk produced.
- **This structure is largely determined by the structure of the agricultural sector and complex political and economic situation in the entire agricultural sector.**
  - **Visoka High fragmentation and a large number of companies reflect the structure of the agricultural sector, which is further fragmented - over 600,000 farms with an average farm size between 5 ha and 6 ha.** Serbian farmers operate in conditions of low marginal costs on small land parcels (raspberries are cultivated on land of average area of 0.2 ha and there are 80,000 registered producers), and harvesting is mainly performed directly by farmers and their families, along with several seasonal workers. This is possible because agricultural production is often considered as additional income, not a primary activity; a household earns significantly above the average salary or pension in Serbia, and with raspberries it is possible to reach EBITDA in the amount of EUR 1,200 - 1,500 on land area of 0.2 ha)
  - **Due to the complex political and economic situation in terms of land ownership, which had practically prevented the entry of foreign capital that would have probably accelerated land consolidation and development of large commercial farms, most capacities and facilities in the agricultural sector were privatized by domestic or regional capital.** Despite the fact that a relatively rapid inflow of domestic capital did initiate early transformation of the F&D industry and preservation of capacities, which have been collapsing in other sectors, this capital was extremely limited. These companies operate successfully thanks to comparative advantages in the primary sector, as well as low costs of electricity and labor (work), but are exposed to the same challenges as other emerging SMEs. Combined with limited access to foreign markets, limited capital has also contributed to slower growth and slower consolidation of the sub-sector.
  - **In the F&D industry, there are only a few well-known foreign companies, mainly in the spirits and soft drink sub-sector - Coca Cola, Carlsberg and Molson Coors, global leaders in their industries.** In other sub-sectors, globally known companies are Nestlé and Pepsi, as well as some companies that are recognizable in specific activities such as De Heus and Sanders (livestock feed) Crop S and Rauch (fruits and vegetables), Hellenic (sugar)... However, foreign companies operating in Serbia are mostly oriented towards supplying domestic and / or regional markets. The three largest exporters in the F&D industry are domestic companies, and only 15 foreign companies have exports above EUR 10 million and account for less than 20% of the F&D industry exports.

## Competitiveness Analysis by Sub-sectors

**The described structural characteristics influence the performance and operations in most F&D sub-sectors.** However, due to the described regional differences, the degree of fragmentation and domestic ownership, as well as the intensity of the impact of these characteristics differ between sectors, depending on technological processes and importance of the economies of scale for a single sub-sector. For example, in the sugar or oil sector, the fragmentation of primary production did not affect the processing, which is concentrated in only a couple of companies. On the other hand, the fragmentation and impact of domestic ownership are most pronounced in the fruit and vegetable sector, which nevertheless proved to be the most competitive F&D sub-sector.

In order to produce specific recommendations and solutions to increasing competitiveness, the focus must move from a diverse and widely defined F&D industry to a specific sub-sector and from there to a specific product or group of products.

- **For the purpose of this analysis we selected the fruits and vegetables sub-sector and product, specifically raspberries, as the most competitive, with serious potential for diversification and higher added value within the value chain.** A more detailed explanation as to why this subsector and product were selected is provided in the section dedicated to the analysis of the value chain of this sub-sector.
- But first we will give a brief analysis of the meat and milk sub-sectors, which were also considered for in-deep analysis and recommendations, since they are the “top of the pyramid” of agricultural and food production, and their performance and potentials are constantly under public scrutiny. A brief analysis of the two sub-sectors indicated that Serbia has tradition and moderate potential, especially in the milk sub-sector; however, two priorities for both sub-sectors in the medium-term are to preserve a dominant position in the domestic market and to accelerate sector transformation and commercialization. Rapid growth of net exports is still not expected. Given that most potential measures in both sub-sectors refer to the primary, agricultural segment, which is not in the focus of this report, the focus is placed on a far more competitive and more export-oriented sector of fruits and vegetables.
- The analysis of competitiveness of these three sub-sectors is followed by recommendations for improving the competitiveness of the F&D industry. All these recommendations also apply to fruits and vegetables, which were later supplemented with additional, sub-sector-specific.

### Meat Sub-sector

**The meat sub-sector will be thoroughly discussed for three reasons:** (i) it represents the top of the pyramid of livestock production and has potentials to create the highest added value and employment along the chain, and as such, it is often scrutinized by the public and decision-makers; (ii) it is important for understanding the milk and animal feed sub-sectors, whose value chains are integrated or at least closely related to the meat value chain; and (iii) the largest number of disputable public certificates is related specifically to the meat sub-sector, including the level of production, import dependence, and export potential.

**The global level of meat trade is relatively low, and a small number of countries that have managed to position themselves as relevant exporters achieve significant economies of scale, either by creating production niche, or by having large domestic market.**

- Of the total global consumption, about 86% comes from countries' own production. Countries trade more in key inputs for meat production - soybean and corn than meat itself. China is the largest consumer of meat and soybean and accounts for 30% of the world's total consumption of these two products; while it produces 97% of the meat consumed, it produces only 15% of soybeans. European Union is no exception in that respect; as a whole it is self-sufficient in meat production and imports from third countries are negligible. It is interesting, however, that the level of intra-trade within the European Union is relatively high, in the sense that the northern countries produce significantly more than they need and place this surplus on markets of southern countries, which are dependent on meat imports. That is in line with the fact that meat production has large economies of scale.
- There are only about 20 countries who have managed to position themselves as significant global net exporters of meat, covering meat shortages in the remaining 150 countries. These exporting countries can be classified into two groups, according to their characteristics: (i) countries that produce small surpluses per capita, but have a huge population, such as Brazil, Canada, Spain, Poland, the USA, Argentina, Germany and India (India has a surplus of only 1 kg per capita, which is enough to cover the entire meat demand of, for example, the Netherlands); (ii) countries that have relatively small population, but produce enormous quantities per capita, such as Denmark, New Zealand, Uruguay, Ireland, Belgium, Australia, the Netherlands, Paraguay, Belarus, Hungary and Austria.
- The primary goal of the first group of countries is to satisfy domestic consumption, while those in the second group are specialized, modern meat producers, which are all highly developed countries, with the exception of Paraguay and Uruguay where ideal climate conditions were coupled with strong public-private partnership and liberal land policy, and Belarus which is fully oriented towards the Russian market and which seized the window of opportunity created by the conflict between the EU and Russia. Common to both groups of these countries is that they achieve significant economies of scale, which determine their cost competitiveness at global level, because meat brings with very low margins, the lowest in the food industry.

**By European standards Serbia is a small and moderate meat producer, currently oriented primarily to meeting the needs of the domestic market, consequently yielding low and insufficiently diversified exports.**

- With production of about 70 kg per capita, Serbia is ahead of most of the surrounding countries and countries such as Greece and Italy, but behind Poland, Hungary and Austria, Germany, Spain and France, and significantly behind leading manufacturers - Ireland, the Netherlands, and Denmark, whose production per capita is much higher.
- In the post-crisis period, Serbia is constantly on the brim of self-sufficiency in terms of supplying own meat market – consumption level almost equals production. Serbia has an abundance of inputs for animal feed, tradition in meat production, and lower farming costs, but there are two more important factors that have helped maintain this balance -

relatively high levels of effective customs protection and the specific structure of domestic market and market channels, due to which a relatively small percentage of consumers buy meat through modern retail channels. Even in free-market trade, international competitors would probably find it difficult to reach most consumers.

- The achieved low level of export is directed mainly towards the CEFTA market, which for many years has been individually the most important and the only relatively stable market for Serbian meat exports, with an average share between 70 and 80 percent in Serbian exports. However, having in mind that Serbia is already a key player on the markets of Montenegro and FBiH, and that these markets are small and already dependent on imports, it is clear that placement growth which could significantly affect the performance of the Serbian meat subsector cannot be expected on the CEFTA market.
- When it comes to the huge Russian market, which is often considered as Serbia's great opportunity, it seems that with the current level of competitiveness barriers are very high. In fact, 2014 and 2015 were the only two years when more than just a "moderate growth of exports based on the CEFTA market" was achieved. Growth in the Russian market in those years came after the political and economic conflict between Russia and the EU; however, this growth has not proven to be unsustainable. Exports soon declined, under the pressure of strong import substitution and Belarus making the most of the window of opportunity. Russia imports from South American countries (70%) and Belarus (25%). Most of the remaining imports concern large countries, such as Kazakhstan, India, and Australia. Countries that can be considered Serbia's competitors (the non-EU and CEFTA countries) currently have insignificant exports in the amount of EUR 5-10 million. Before the sanctions were introduced, countries similar to Serbia, such as Hungary, Lithuania, Belgium or Austria, exported meat to Russia worth EUR 50-100 million annually.
- Due to the ban on the export of fresh and frozen meat from Serbia, the EU market remains irrelevant, and Serbia has not appeared in that market in the past three decades. The basic problem concerns the export of pork. Unless thermally treated, pork cannot be exported to the EU due to the plague vaccine, nor transported through the EU, which also creates problems with exports to Russia. The meat is transported to Montenegro, then shipped around Europe to Scandinavia, and the transported by road to Russia. It takes 40 days for meat shipments to reach Russia, but it would take only 40 minutes if shipped directly from Serbia.
- The lack of public promotion by companies and other stakeholders for the implementation of measures that would lead to the abolition of the ban on exports indicates that Serbian companies probably do not even see even a slight chance to appear in a demanding EU market, either because "the maps have already been drawn" or because it is clear that the appearance on this market requires investments and level of production that are currently unachievable. Another reason is that the domestic market is expected to show room for additional growth in sales - namely, it is expected to see further decline of the extremely important natural production and people turning to butchers and supermarkets to buy meat. Of the total meat production, only half comes from slaughterhouses, but despite still low share of meat obtained from slaughterhouses,

it has increased significantly over the past ten years. A high share of natural production is a chance to increase commercial production in the future.

Although the exploitation of export potential and the appearance in new markets is a common topic among the public and decision makers, **looking medium-term, it is not realistic to see the Serbian meat sub-sector go beyond safeguarding a dominant position in the domestic and regional markets, and possibly achieve less penetration in individual niches.**

- Despite being a small and poorly competitive meat exporter, unlike other countries in the region and the non-EU countries, Serbia is also a relatively small (net) importer. However, the net position is slightly deteriorating each year, by gradual liberalization of trade in line with the SAA, and gradual modernization of the sales channel and higher share of modern “retailers” in meat sale. Meat consumption in most of the new EU member states (with the exception of Hungary and Poland), CEFTA countries, and Greece and Italy, exceeds their production - and often the imports of these countries exceed their own production. In terms of market size, geopolitical position, and strategic orientation, Serbia is relatively similar to those countries, so it is evident that with further liberalization and market transformation comes a risk of significantly higher net imports.

**In order to preserve the acquired position, it is necessary to make a step forward in competitiveness, which means continuing transformation and commercialization of the value chain for meat production, through consolidation and modernization.** As already mentioned, like other agricultural and food industry sub-sectors, the meat sub-sector too is characterized by fragmentation, especially in primary production.

- The transformation process has begun, producing lower number of heads and meat on traditional farms, and their increase on commercial farms, and a clear growing distinction between modern and traditional producers. Despite popular belief, primary production in Serbia is not below the 2000 level. In absolute terms, it is at a similar level and in 2015 the production per capita was the highest since 1990. In the period of 2000-2015, the number of heads has declined, in all categories, along with the decrease in rural population. Despite the decrease in the number of heads the quantity of meat produced has remained the same, which means that commercial farms are becoming stronger; commercial farms operate with a smaller livestock fund, but genetically more favorable and better-fed, which affects the increase in the average weight of animals.
- Fragmentation is still high. We will take pork meat to illustrate fragmentation in the primary segment – beef meat segment is even more fragmented, but in poultry meat segment it is less pronounced. As much as 93% of the 350,000 pig farms have herds counting less than 20 pigs, and account for almost 50% of the total number of pigs. On the other hand, 229 farms, which make up less than 1% of the total number of farms, have herds with more than 400 pigs (on average about 3,500), and participate in the total number of pigs with over 20%. The first group is dominated by households south of the Sava River, while households from Vojvodina lead in the second group accounting for  $\frac{3}{4}$  of the mentioned 20%.
- Such high fragmentation in the primary segment, along with all previously discussed limitations, significantly influences the factors of competitiveness. Herds are smaller, the mortality rate is higher, breeding time is longer, the average weight of the animals

is lower, and the final purchase price, due to the lack of economies of scale and inadequate farm management, is higher than in most EU countries which are a competitive threat.

- In the processing segment, fragmentation is less pronounced but still present. There are over 300 companies in the market, and the top 25 account for 75% of the sales revenue. However, in order to achieve the necessary economies of scale, further consolidation of the processing segment is necessary - larger and more modern farms will have to continue increasing production, reducing unit costs and improve competitiveness. It is expected that smaller and unprofitable processing centers will be abolished. It is not solely the high production per capita that affects productivity, but also production concentration (for example, Denmark produces 300 kg of meat per capita through only 150 companies, while Serbia produces about 35 kg through more than 300 companies). In addition, it should be noted that according to the information, most Serbian companies operate with capacity utilization ranging between 50% and 70%, and the reason is insufficient quantity of available raw inputs as well as difficulties of adding additional production levels on the market.

**Serbia is competitive in the production of key inputs for meat production - corn, soybean, and sunflower, which is a good starting point.**

- The yields are at relatively high level thanks in particular to the favorable soil characteristics in Vojvodina. Serbia is lagging behind in corn yields, while soya and sunflower yields are higher than in Europe.
- The total quantities produced are relatively high, even for the European level. Serbia's production reaches 25% of European soybean production, 10% of corn production, and 5% of sunflower production.
- Serbia is price-competitive in the primary segment, and products have the potential to be differentiated using the non-GMO factor, and achieve higher prices in the global market. The lowest purchase prices of corn and soybean were recorded in Serbia compared to all other EU countries, while soya purchase price was at EU average.

**Bearing in mind that Serbia has certain competitive advantages, and that the meat sector is worth supporting, state policy measures and limited resources must be adapted to fully support the achievement of the desired level.**

- Serbia has a tradition in the production and export of meat; key inputs such as cereals and oilseeds are not only available in the domestic market but also show competitive performance; labor, electricity and land costs are lower than in the vast majority of comparable EU countries - so in the coming period it is crucial to support the promotion of genetic potential, facility modernization, and farm management of those primary producers that have the potential to be competitive. More funding from the agricultural budget should be used for improving productivity and product quality, and less for financing by the number of heads. Given that the total necessary investments along the chain are estimated at over EUR 500 million (IPARD strategy), it is necessary to release IPARD funds as soon as possible to support the overall transformation process. When establishing a vision and strategy, it is necessary to study in detail the examples of Hungary and Poland - after joining the EU these two countries have managed to remain



net exporters of meat, as well as Romania and Bulgaria, whose import dependence significantly increased.

- It is evident that Serbia must strive to join the WTO in order to improve the conditions for appearing in other markets, and also to signal its affiliation to the international market community. However, as long as the protection from import of GMO crops is in force, Serbia has the opportunity to position itself on potentially very profitable niches, whose growth in the future is undoubtedly related to the production of non-GMO meat. Given the existing structure and level of production, it is more likely that Serbia can shape itself as an exporter of niche products, rather than exporter of traditional products where price competitiveness is much more pronounced.
  - Bearing in mind that in Serbia corn and soybeans are not genetically modified, and that everything is indicating that this will not change, branding and certification of meat that is not fed by genetically modified foods could be a significant export possibility. The demand for genetically unmodified products is growing and Serbia is one of the few countries that produces and uses unmodified corn, soybeans, and meat.
  - In terms of beef meat Serbia has all the essentials to be competitive, but the trends are quite weak; both the number of heads and per capita production are in decline, and the EU market demand is weakening. Beef production in Serbia has a strong genetic base - Simmental breed for basic production and self-sufficient fodder production. Serbia also benefits from the fact that cattle breeding is not demanding in terms of technology, and does not require much hard work. It, however, requires space and land, which is also an opportunity for the areas that are slowly “dying”. Nevertheless, the Serbian production for export is so low that even 20% of the EU quota for baby beef exports is not met.

## **Milk Sub-sector**

**Milk market analysis is similar and closely related to meat market analysis.** The common characteristics of the two sub-sectors, already described in the analysis of the meat sub-sector, are as follows:

- Low global trade level - 85% of milk and dairy products come from domestic production.
- A small number of countries are exporters – surplus produced in 30 countries makes up for shortages in all other countries.
- Division by country, in terms of net exporters and importers, largely coincide. Just like in the meat sub-sector, the three largest producers producing the highest surplus per capita are Denmark, Ireland and New Zealand. Given that other participants take similar positions as in the meat sub-sector, it is reasonable to assume that the competitiveness of the two sub-sectors is often based on common factors and comparative advantages.
- However, unlike meat, the economies of scale are less influential in the milk sub-sector, and there is more room for smaller and possibly less specialized countries - the net exporters are joined by the Baltic countries and Luxembourg, while countries such as Canada, the United States, or Brazil are less important actors than in the meat sub-sector.

One of the reasons is that margins are somewhat higher than in the meat sub-sector, which nevertheless relieves the pressure of price competitiveness.

- It should be noted that EU is a significantly more important actor in the net placement of milk than meat, and that the milk sector is equally protected and supported as the meat sector, if not more.
  - On the supply side, the EU quotas have been abolished. They were introduced 30 years ago due to over-production (“milk lakes & butter mountains”) - and production has been growing slightly since then.
  - On the demand side, the consumption in the EU market is not expected to rise because it is at the upper limit – it has been decreasing slightly per capita in the last 10 years.
  - Therefore, the EU market is quite saturated and difficult to reach – even for quality products.
- Serbia is mostly self-sufficient in terms of milk production (as is the case with meat) - it produces a little over its needs.
- The primary sector is similarly if not more fragmented than the meat sector.
  - Cattle breeding takes place on 250,000 farms and in 2015 there were 430,000 - 95% of all herds have one to five cows.
- Even the milk industry is going through a kind of transformation, or turning to commercialization.
  - The number of dairy cows is in constant decline, so in the past 10 years the total reduction was 40%, from 607 to 430 thousand heads.
  - However, this decline did not affect the decline in milk production, which dropped by only 5.4%, and given the decrease in population, the per capita decrease was even lower, amounting to 1.2% or 2.57 liters annually.
  - Average milk yield per cow has increased by more than 35%, from 2,600 to 3,500 liters, which testifies to better breed composition, consolidation, and professionalization, that is, the fact that those who could not follow the inevitable market transformation fell out of the race.
  - In that respect, Serbia is only at the beginning of the road, as evident from the relatively low amount of milk that ends up in dairies
    - 65-70% of raw milk goes directly into industrial plants for the production of milk and dairy products, and 30% of the raw milk remains on farms (2% is lost in primary production).
    - About 60% of the total amount of milk remaining on farms is directly sold at local markets, stores or directly to locals, while the rest is used for personal consumption at family farms.
  - Therefore, as in the meat sub-sector, there is room for growth in the domestic market, along with further commercialization.

- Most recommendations concerning meat also apply to the value chain of milk - especially regarding the experiences and policies of other countries that were in a similar position as Serbia before joining the EU, reviewing the effectiveness of spending and state aid, and ensuring quick availability of IPARD funds.

**Key differences relative to the meat sub-sector in the context of Serbia are as follows:**

- **Raw milk production in Serbia is price-competitive compared to the surrounding and EU countries.** Milk production in the primary segment implies a less pronounced economies of scale, so the impact of management on a farm is less significant compared to the cost of raw materials for animal feeds and labor; this also creates a very low purchase price of milk in Serbia which is, despite high fragmentation of the primary segment, among the lowest in Europe. It is precisely the low price that staved off the impact caused by the abolition of production quotas in the EU market and the ban on exports to Russia by the EU, with or without the levies introduced occasionally.
- **The processing segment is less fragmented;** 4 to 5 dairies (Imlek, Mlekara Sabac, Subotica and Somboled), headed by Imlek (which according to characteristics does not lag behind the leading EU dairies) dominate the market and purchase 60-65% of the total quantity of purchased milk (14 largest dairies are responsible for 90% of the purchase).
- **Production by companies is relatively larger compared to the meat sub-sector, and the capacities are generally more updated.** In relation to the entire F&D industry, the milk sub-sector is relatively modernized, which is also reflected in the fact that its share grows as we move away from the social indicators - the number of companies and employees – towards the profit indicators. Although the sector accounts for only 5% of companies and 8% of employees, it is responsible for 10% of operating revenues, 12% of added value and even 14% of EBITDA. A relatively high labor productivity, operating income per employee, and EBITDA margins confirm a considerable degree of automation and professionalization in the sector. However, what is common for both meat and milk sub-sectors is that capacities are not fully utilized (60-80% of capacities).
- **A more competitive primary price and a more concentrated and modern processing sector have also enabled a somewhat better competitive position in milk exports.**
  - Serbia is a net exporter of dairy products. Net exports have been quite stable over the last ten years, and doubled the last two. Although the export of dairy products and milk from Serbia does not appear to be high in absolute terms - relatively observed it is not as low, as is the case with meat. The share of exports of dairy products in total exports is at a higher level than usual, and the RCA indicator in both 2009 and 2015 was significantly above 1.
  - Two most important export products are curd cheese and yoghurt; together with milk they account for the complete exports. Exports are not very diversified, nor usual – products most commonly traded on the world market are cheese and powdered milk, and yoghurt is the least traded product. In addition to milk, milk powder is the most important import product of Serbia since it is widely used in the confectionery industry, the production of which is not widespread in Serbia.

- Milk exports were significantly increased in in the last two years thanks to the growth achieved on the Russian market, and are slowly becoming dominant and, unlike meat exports, did not decline after the first couple of years (maintained at around EUR 25 mil). Before the crisis Serbia exported only to the CEFTA market, but it diversified its placements in the post-crisis period. Export to the CEFTA market is still the most significant and has remained more or less stable over the years (in the last 10 years the average is about EUR 45 mil). Exports to the EU market are still low, but they did record an increase from 0 to UR 10 million, which is a “positive” signal.

**Similar to the meat sub-sector, it is crucial to speed up commercialization of the primary segment in the coming period, in order to accelerate quality improvement processes and enable progress of the economies of scale.** According to SEEDEV, three groups of primary milk producers are clearly distinguished in Serbia - (i) producers who are generally out of formal flows, who keep only a couple of cows, do not have good genetic potential and produce relatively little milk; (ii) middle “actors” who are slowly adjusting to EU standards and regulations, but with a lot of work ahead of them, and who sell milk mainly to dairy farmers; (iii) large farms operating at levels required by the EU. We agree with SEEDEV that as long as Serbia protects the domestic market the process will run at a slow pace, on the other hand, on the day of joining the EU full liberalization will ensue, which will be a blow to those who have been protected for years. Therefore, it is desirable to gradually liberalize the market, which will result in reduction in a number of farms, primarily from the “middle” category, as well as in increased production by more commercially-oriented and sustainable farms that will jump at the chance.

**In terms of export, as in the meat sub-sector, niche products and potential branding of non-GMO products present good opportunity. One of the key priorities in this process is raising the quality level of milk, including inevitable establishment of a national reference laboratory and turning subsidies towards quality as well.**

## **Fruit and Vegetable Sub-sector (F&V), with a focus on raspberries**

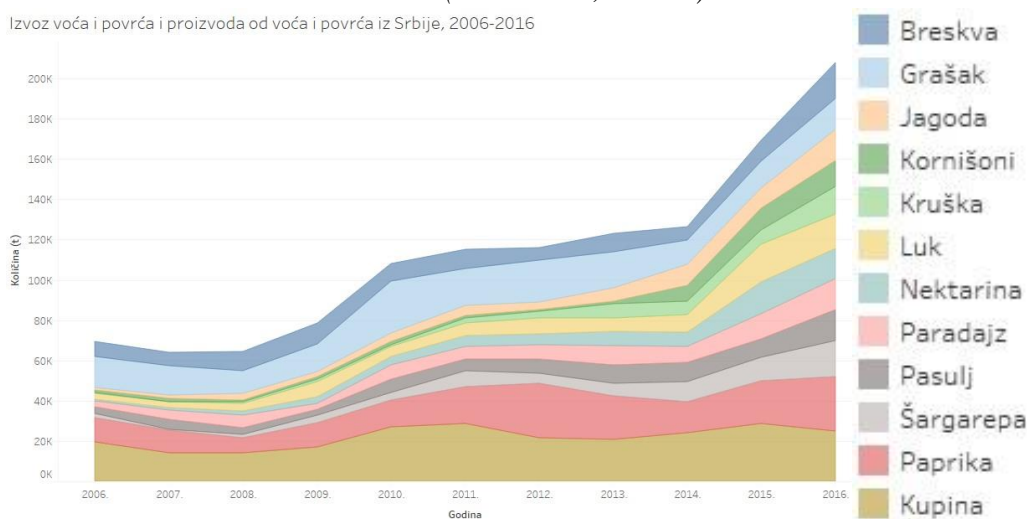
### *A Review of Characteristics and Performance of the Entire Sub-Sector*

**Fruit and vegetable sub-sector is the most competitive sub-sector of the F&D industry and one of the most competitive representatives of the Serbian economy in general.**

- **According to FAO statistics and estimates, nearly 3 million tons of fruits and vegetables are produced annually in Serbia, on close to 400,000 hectares.** The fruit segment is dominated by plums and apples; most of the plum yield is spent on farms in brandy production, without serious commercialization, unlike apples, with intensive production developed over time and primarily intended for exports, which have increased 10 times over the period of ten years. In the vegetables segment dominant varieties are potatoes, tomatoes, cabbage, and peppers, which account for 54% of the land under vegetables and 77% of the total vegetable production. Serbia has a significant share in the European, and even world market in the production of certain varieties. Serbia makes up more than a quarter of the European quince production (37%), raspberries (33%), cherries (29%), and plums (26%). As for vegetables, significant participation exists only in the production of cabbage and peppers - with both products close to 5% of European production.
- **Serbia is producing significant and growing surpluses of fruits and vegetables, which are relatively easily placed on the international market.** Taking into account the segment of fruits and vegetables that falls under agriculture and not necessarily under the manufacturing industry, and reveals the overall potential of this value chain - such as, for example, fresh apples, it is noticeable that the total export of fruits and vegetables is extremely high and fast growing. In 2016, exports exceeded EUR 700 million, reaching over 5% share, which is significantly higher than the average in the vast majority of other countries. This is also evident by an extremely high RCA indicator (9), which illustrates the extent of Serbia's comparative advantages in the production and marketing of exported fruits and vegetable. Net exports exceeded EUR 400 million and, if products which Serbia is not able to produce, such as tropical fruits and citrus fruits are omitted from this calculation, net exports reach the level of about EUR 580 million, which clearly indicates the level of surpluses realized in Serbia.
- **During the crisis period Serbia has increased its exports significantly, and the market share analysis indicates that growth was achieved primarily through competitiveness.** In the post-crisis period, fruits and vegetables exports grew by 13% annually, that is, total exports were more than doubled. The analysis of the constant market share of 27 product groups, as well as all export markets, shows that over 70% of the growth was achieved thanks to the increase in market share, which shows that Serbia increased its exports in respective markets with its product portfolio faster in relation to import demand of these markets.
- **Fruit products are a dominant category and account for more than 80% of exports. Raspberries and apples are the two most important export varieties, making up more than half of total exports of fruits and vegetables.** Although these two have shaped the growth of exports, it is important to note that exports of the majority of other varieties have also increased dynamically, as shown in Figure 6 below. Serbia is a net

exporter of all the crops that households are able to produce (excluding citrus fruits), except for tomatoes and cucumbers due to increased net deficit in the last three years. Three more products should be mentioned, both for their current relative significance and for their growth potentials and competitiveness - plums, cherries and peppers. For example, Serbia exports only 5% of produced plums, due to insufficient purchase process. Export of products made from these three varieties reached almost EUR 100 million euros in 2016, making Serbia an important producer at the EU level, with indigenous species that can be improved and processed as niche products or products with protected geographical origin.

*Figure F&D 6. Fruits and vegetables export growth, excluding raspberries and apples (2006-2016, in tons)*



Source: UN Comtrade

*Export of fruits and vegetables and fruit and vegetable products from Serbia, 2006-2016  
/peach, green peas, strawberry, pickles, pears, onion, nectarine, tomatoe, beans, carrot,  
peppers, blackberry/*

- **The Russian Federation is the most important export destination, followed by Germany** and other developed EU countries.
  - **Russia is the primary destination for most fruit crops (except for raspberries)** - apples, apricots, peaches, strawberries, plums, cherries... Raspberries are exported to more developed European countries - Germany, France and Belgium, while the large and unsaturated North American market is becoming increasingly more attractive to Serbian exporters.
  - **As far as vegetables are concerned, exports are much more diversified.** Most of the exports are directed towards the CEFTA market and surrounding countries, primarily due to perishable property of these products. However, certain varieties, such as peppers, mushrooms and cucumbers, are increasingly exported to Germany, Italy, and Austria. **Despite encouraging market signals in the fruits and vegetables sector - net exports are high and in constant increase - a deeper review of the structure suggests that Serbia does not use all the available potential.** Key characteristics of the value chain of fruit and vegetables in Serbia are low added value through processing and low

diversification of exports, despite a relatively high agricultural production. As previously explained, this does not concern the fruit and vegetable industry only, but represents a general problem of the entire Serbian food industry, which is particularly pronounced in the fruits and vegetables segment. Serbia is one of the countries with the lowest relation between exports of food products and agricultural raw products (below 2), because it exports a relatively high percentage of raw products or products with added value. Taking raspberry products as an example, the share of the purchase price in the price of the exported processed final product can be up to 70-80%.

### *Focus on Value Chain of Raspberry Products*

Since there are differences between key actors and rivals, their relations, export products, export markets, depending on the type of fruits and vegetables, for the purpose of deeper analysis of the structure and competitiveness, raspberries are taken as representative of a wider value chain of fruits and vegetables. **Raspberry was selected for several reasons:**

- Raspberry is the only product within the fruit and vegetable sub-sector that has a truly strategic export (> EUR 250 million) and social significance (> 80,000 farms). All other varieties are either too small to be independently analyzed or, as is the case with apples, they belong to the agricultural sector, which is not the primary focus of this analysis.
- In addition to its significant importance, the value chain of raspberry has a number of observed shortcomings – such as gaps in quality and safety standards, market-logistic organization, and potential joint performance, which are largely a consequence of fragmentation, producing lower added value and diversification within the sector.
- Given that described problems are to a certain extent also representative of the fruit and vegetable sub-sector, and even the entire F&D industry, the know-how of problem solving can be a representative way to increase competitiveness of other prospective varieties.
- It is possible to improve (or at least sustain) the compromised competitiveness of the entire traditional chain, but it is also possible to develop new “modern” chains – related to deeper processing, fresh segment, retail-ready segment and organic production.
- Raspberries can be considered a luxury product for developed countries (high prices for richer consumers), for which there is a constant increase in demand due to the attractiveness of berries (taste, smell, color, aroma, high levels of antioxidants ...).
- Profitable species - the relationship between the cost of growing, the labor required during the year and the selling price is favorable, especially when taking into account the standard of living in Serbia.

## *General Characteristics of the Raspberry Production in Serbia*

*Figure F&V 7. Raspberry production centers in Serbia*

- **Raspberry has a long tradition of production in Serbia, which dates back to the 70's of the 20th century**, when the center of production was in the Valjevo region. Today, the center is relocated to Western Serbia, where around 80,000 farms grow raspberries, while other farms are located in Arilje and Ivanjica, with recent tendencies of expanding to other parts.
- The total production varies from one year to another, but constantly increasing, reaching 100,000 tons in 2015 and 2016. One of the key challenges in analyzing the value chain of raspberries is the insufficient reliability of available statistics - starting with total production. Namely, as shown in the figure below, it is evident that official statistical data underestimate the production of raspberries in the last years and do not follow the expansion of primary production, which is noticeable when observing the export of raspberries, as well as field data obtained by Cold storage operators (UH). It is clear that in the long run cumulative exports cannot be significantly higher than production, in a situation where there are no significant imports and stocks. Nevertheless, in the last 5 years, the cumulative export was around 395k, and the official production was 329k tons, showing a difference of about 20%. Export and UH data are more consistent, since production is higher than export (cca 5-10%), which is approximately the same amount used in domestic consumption. Without timely and accurate data on the production and purchase of raspberries, it is not possible to create an adequate policy or establish strategic framework for further development. Information on whether the production is declining or growing and how much is also important for understanding whether the processing capacities are of adequate size, whether Serbia's market share is growing, its competitive position, and whether the yield in primary production is on the rise etc. - which should determine further actions in the field of improving sector competitiveness.

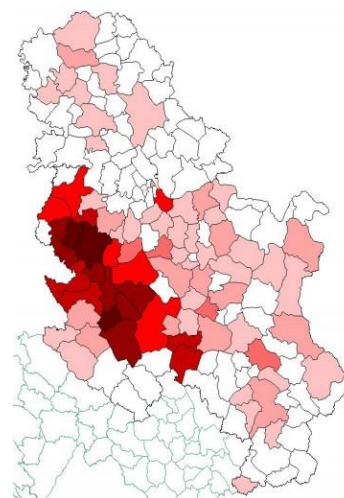
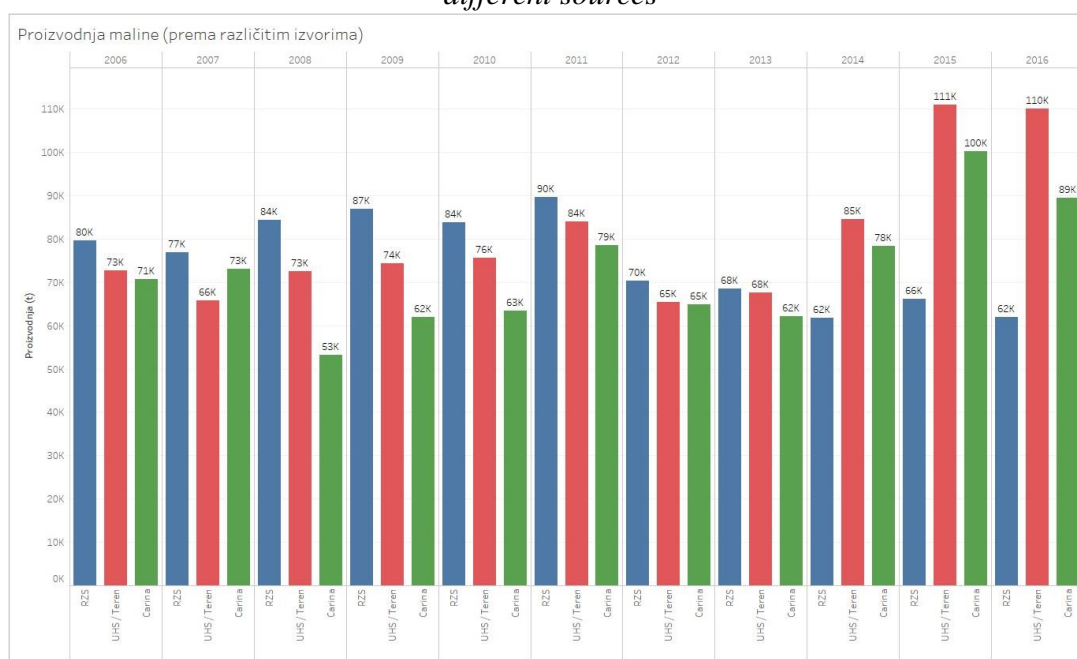




Figure F&D 8. Raspberry production and export by volume and years in tons, according to different sources

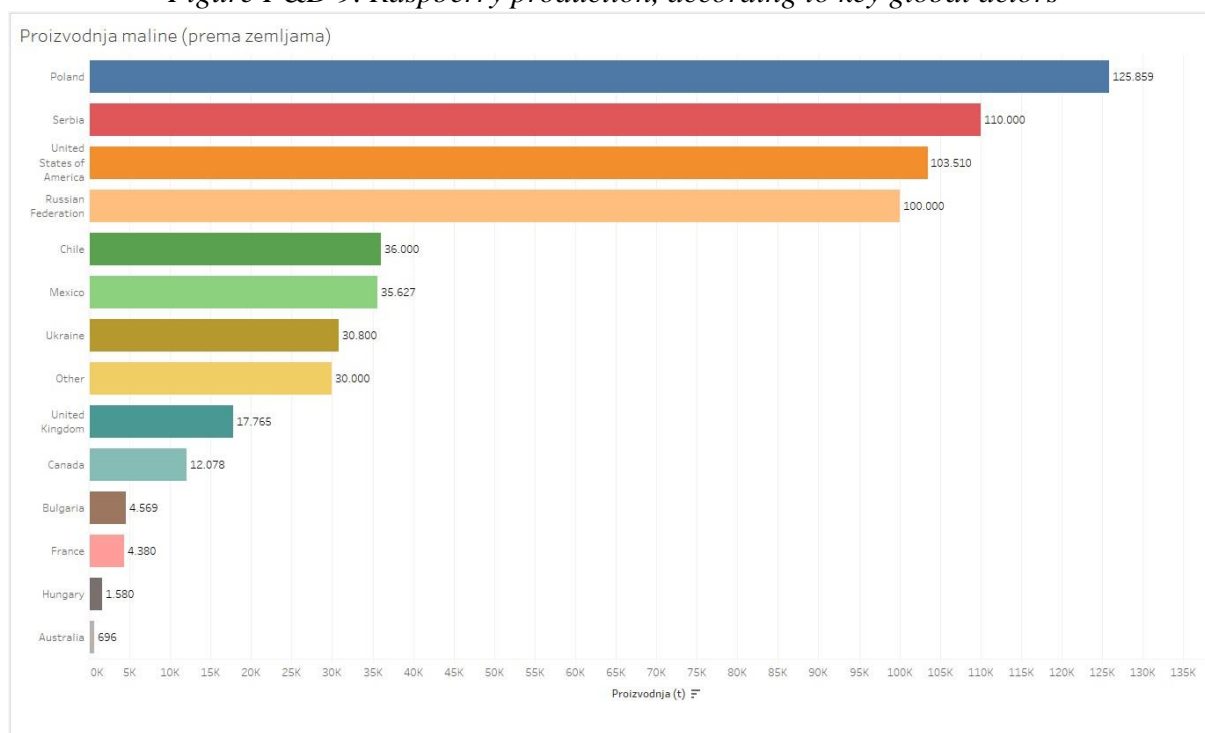


Source: UN Comtrade, SORS, UH

- **Serbia is one of the global leaders in the production of frozen raspberries - and almost all the production is placed on the markets of developed countries.**
  - **Serbia and Poland are key producers of raspberries (35-40% of global production),** fully export-oriented. America and Russia are also important producers due to their size (30-35%) – but also large raspberry consumers who are not export oriented, and represent net importers. Chile and Mexico (10-15%) are predominantly oriented towards North America, but thanks to good organization they supply more distant countries (Australia, China, New Zealand...). Figure 9 shows the global distribution of production.
  - **Highly developed countries import raspberries (EU, US, Australia, with Germany in the forefront),** as shown in Figure 10. They account for 95% of global raspberry imports (USD 1,060 billion of USD 1,120 billion). Only about 60 million USD of imports comes from other countries (Asia, Africa, South America, Russia ...).
  - **Serbia is a key exporter specialized in frozen raspberries, Willamette cultivar, marketed in developed countries of the European Union and North America.** This traditional value chain has been established and developed for decades, and its performance, advantages and disadvantages can be observed in detail. Other chains of raspberries (fresh, dried, juices and jams) have not been developed. There are few market actors in these chains, and there are no representative examples to mention, but there are examples of successful practices that should be supported and multiplied, provided adequate basis. Therefore, this analysis discusses the competitive position primarily on the example of traditional chain of frozen raspberries, since other chains are not possible to analyze in detail. However, the recommendations also include

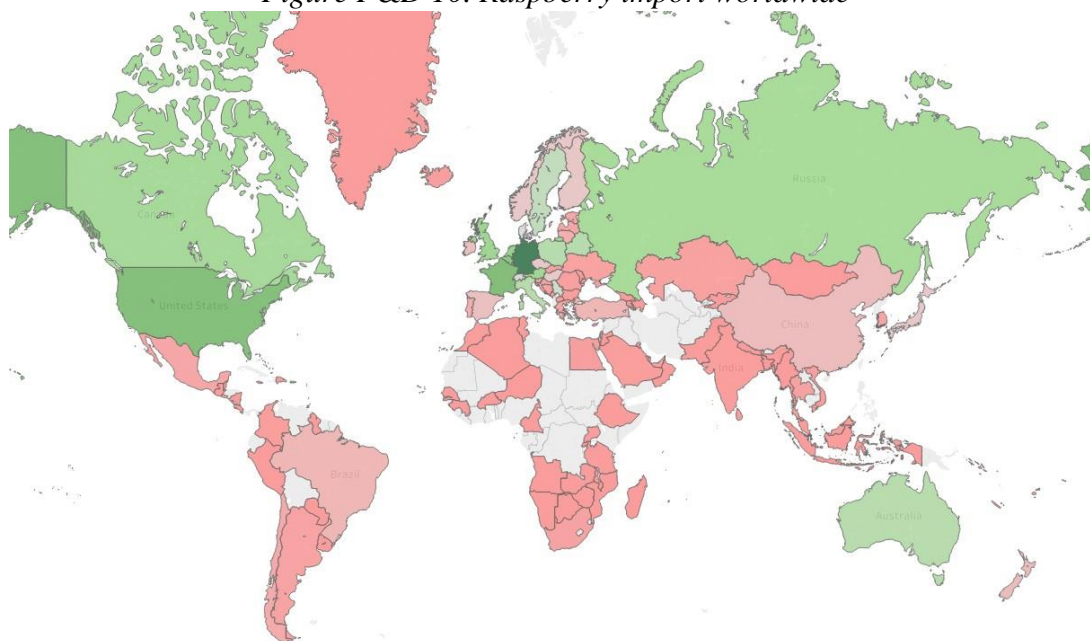
segments that are significant for other chains that are still not sufficiently developed, and it is necessary to work on their development.

*Figure F&D 9. Raspberry production, according to key global actors*



Source: UN Comtrade

*Figure F&D 10. Raspberry import worldwide*



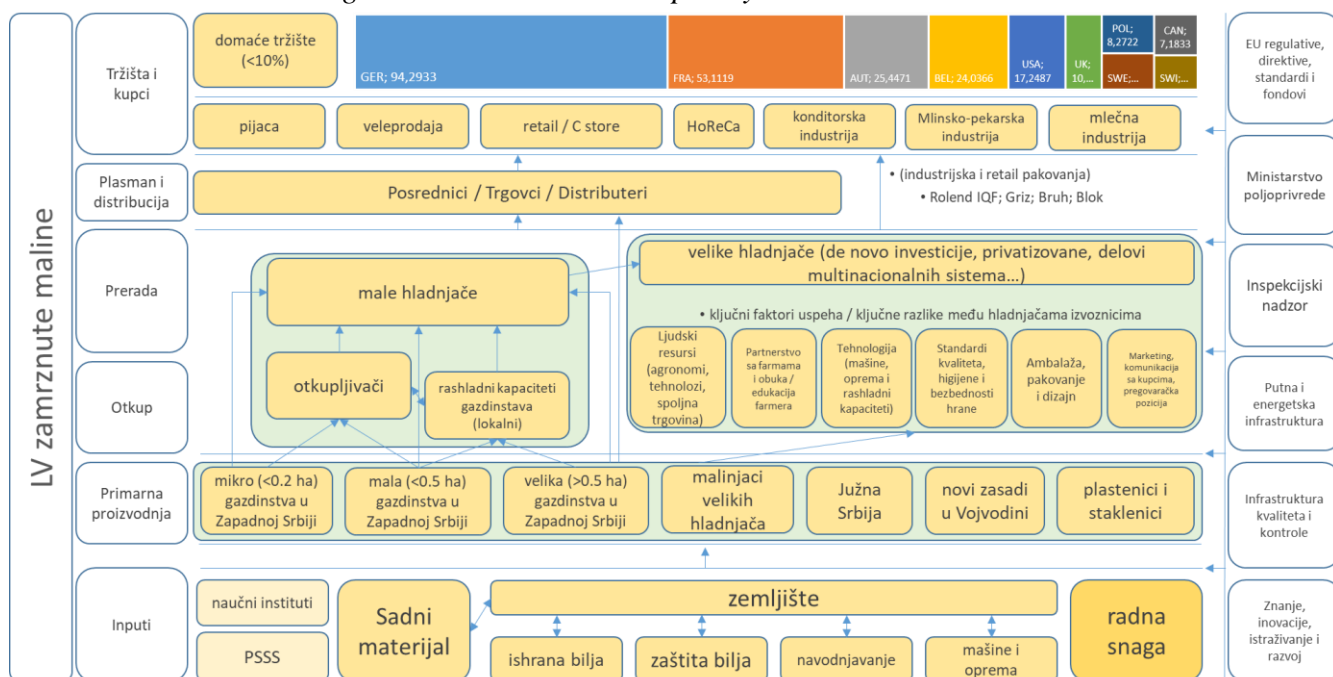
**GREEN** marks the countries with import exceeding USD 5 million

The greener the country, the higher the export; the redder the country the lower the export.

## Frozen Raspberry Production Value Chain

**Frozen raspberry value chain is extremely complex, primarily due to numerous actors involved** – in the primary production phase, as well as in buying, processing and placement stages

Figure F&D 11. Frozen raspberry value chain



/frozen raspberry value chain / markets and buyers / placement and distribution / processing / buying / primary production / inputs // domestic market (10%), green market, wholesale, retail / C store / HoReCa / confectionary sector / mill and bakery sector / milk sector / Intermediaries / Traders / Distributors / (industrial and retail packaging) / small refrigeration facilities / buyers / farm refrigeration capacities (local) / large refrigeration facilities (de novo investments, privatized, parts of multinational systems) / key success factors / key differences between refrigeration facilities (exporters) / human resources (agronomists, technologists, foreign trade) / partnership with farms and training / education of farmers / technology (machinery, equipment and refrigeration capacities) / quality standards, hygiene standards, and food safety / packaging and design / marketing, communication with clients, negotiation position / micro (0.2 ha) farms in Western Serbia / small (0.5ha) farms in Western Serbia / large (0.5ha) farms in Serbia / raspberry fields of large refrigeration facilities / Southern Serbia / new plantations in Vojvodina / greenhouses / Scientific institutes / PSSS / Planting material / Land / plant nutrition / plant protection / irrigation / machines and equipment / labor / EU regulations and directives, standards and funds / Ministry of Agriculture / Inspection / Road and energy infrastructure / Knowledge, innovations, research and development

- **The entire chain starts from the input phase, which, according to information provided by key stakeholders, is one of the key bottlenecks.** Serbian farms and companies are primarily oriented towards imports of inputs, which makes them relatively more expensive than in other countries. Serbia has no significant producers of fertilizers or plant protection products; newer cultivars, with stronger genetic potential, must also be imported because there are no modern nurseries in Serbia; farms

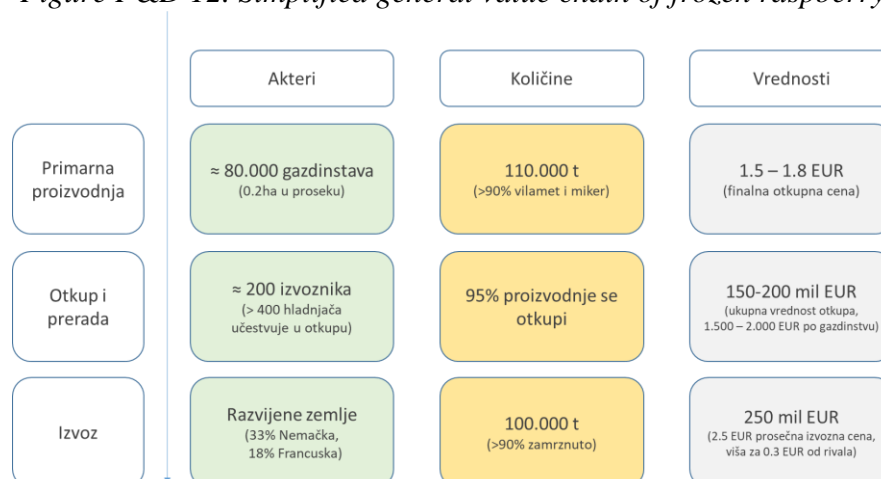
lack knowledge in terms of choice, scope and method of using inputs; state support services are poorly functioning; irrigation systems, greenhouses or foils, and safety nets are not used in 99% of households. Serbian producers rely primarily on the traditional way of production and one of the key challenges is to turn their focus on education and modern cultivation technologies.

- **As mentioned before, Serbia is one of the most important raspberry producers in the world, with a highly fragmented structure of the primary production.** About 80,000 farms are involved in the production of raspberries, which are cultivated on plantations of average size of about 20 ares. Although it seems as a significant constraint right from the start, it should be kept in mind that small plantations allow for easier management of old farms or households for whom this is not the primary activity, especially since raspberries require a lot of field work. Key cultivars are Willamette (about 95% of total production) and Meeker - characterized by flavor and color, and which are highly valued in the context of industrial production and less in the context of fresh use. Raspberry picking lasts only 6 weeks, which creates difficulties as it concerns placement of very large quantities in a very short time period. Average yields range between 5 and 6 tons - although yields on modern and larger farms that use adequate and available nutrition and protection measures reach up to 15-20 tons. According to FAO, Serbia significantly lags behind yields of non-mass producing countries such as Spain, US or the Netherlands, which have turned to newer and more genetically potent cultivars. Serbia is, however, ahead of direct competitors such as Poland or Bulgaria.
- **Over 95% of production is purchased by a large number of cold storage operators.** Over 400 cold storage operators are involved in the purchase process - from micro operators, with capacities of a few dozens of tons, and who act exclusively as intermediaries, to the largest ones, with a capacity of more than a thousand tons, which produce and market final products. According to the data of the Union of cold storage operators, it is estimated that a maximum of 15% - 20% of cold storage facilities have HACCP certificate. Modern cold storage facilities (with more than 2,000 ton capacity), which meet HACCP, BRC and other key standards, account for around 30% -40% of total final purchase. These companies (such as Sirogojno, Zadrugar, Agropartner, Master Frigo, and Crop S and Mondi Lamex, which are foreign owned) have in some way affected the accelerated development and transformation of the sector. During the 1990s, the sector was run by state-owned cold storage facilities and the sales were mostly directed to domestic intermediaries. Modern companies today have direct contacts with foreign customers, as well as clearly defined product quality categories.
- **There are many cold storage operators who export to foreign markets directly, without domestic intermediaries.** Like primary production and processing, exports too are extremely fragmented, in terms of number of companies. Nearly 200 companies have exported raspberries to foreign markets, and among them there is a large number of very small cold storage operators. About 60 companies exported over EUR 1 million, and these account for 90% of raspberry exports. None of the companies had export share above 10%, and domestic companies are dominant among the largest exporters. Considering the global importance and advantage that Serbia has in relation to the production and export of raspberries, it is not difficult for the existing companies to

market their products. The most common scenario cited by companies is that “buyers find them”.

- **Most companies sell their products as frozen, in large packages (10 – 20 kg) to large foreign intermediaries.** Intermediaries are in charge of communication and negotiation with final customers, as well as for the packaging and delivery of final products. A small number of domestic companies (up to 10, not more than 10% of exports) have expanded their cooperation with intermediaries, so they independently pack products into safe retail packages. Several companies (about 5, not more than 5% of exports) are selling shelf-ready products to supermarkets. These are mostly companies that are: part of major multinational systems (Crop S & Partners, Mondi Lamex...), domestic companies that meet all the necessary quantitative requirements (> 10.000t), standards requirement (basic + BRC, GFIS, IFS...), technological requirements (laser sorting and processing ...) and packing requirement (compartment organizers (boxes), PE / PP ZIP bags ...) (Sirogojno Company, Agro Partner ...). A few companies have modern technology for a different kind of raspberry processing (Van Drunen, Sirogojno) – freeze-drying adds the highest value to frozen raspberries. Fresh raspberries are also exported from Serbia during the picking season – but this should not be confused with consumption. Fresh raspberries exported from Serbia are exported in storage tanks, with a relatively low unit value.
- **Sales on the domestic market are negligible and almost the entire placement of frozen raspberries is realized on the international market.** Germany and France are two key export markets, which account for over 50% of the total placement. They are followed by the Netherlands and Belgium, which mainly add value to Serbian raspberry through additional processing or packaging, and place it on other markets. In recent years, Serbia has increased its exports to the US and Canadian markets, at which it did participate in the first post-crisis years. The average export price of frozen raspberries in 2015 amounted to EUR 2.5, - 10% more for Rolend (first class raspberry), and 10-20% less for frozen raspberry mash. On average, the price was higher than competitors' by about 10%, which somewhat confirms the fact that Serbian raspberry is to some extent differentiated and significantly more suitable for industrial processing, due to its characteristics in terms of taste, color and aroma.
- **The figure below shows simplified general chain value, according to stage, actors, volumes and values - relevant in the purchase and placement in the 2015/2016 season.**

Figure F&D 12. Simplified general value chain of frozen raspberry



/ actors , quantities, values / primary technology, purchase and processing, export / 80.000 farms (0.2 ha average), 200 exporters (400 cold storage facilities participating in the purchase), developed countries (33% Germany, 19% France) / 110,000 t (90% Willamette and Meeker), 95% of the production is purchased, 100,000 t (90% frozen) / EUR 1,5 – 1,8 (final purchase price), EUR 150 – 200 million (total value of purchase, EUR 1,500 – 2,000 per farm), EUR 250 million (EUR 2,5 average export value, higher by EUR 0,3 than other competitors).

### Serbia's Competitive Position

- **Due to a number of comparative advantages, Serbia has managed to position itself as a key supplier of EU raspberry markets.** The key comparative advantages of Serbia are:
  - Two American cultivars (Willamette and Meeker), with 20 years of applied innovations in cultivation technology; ideal yields on Serbian soil
  - The tradition and experience of older households/farms, which require seasonal or marginal work to achieve relatively high profits for Serbian conditions
  - A network of hundreds of cold storage facilities, who are well familiar with the complex terrain and operate in conditions of lower labor and electricity costs, with state incentives for cold storage installations
  - The proximity of key markets (developed EU countries) and free trade agreements
- **However, there is a steady supply growth and a growing competitive pressure on the market. Serbia has maintained market share relative to 2009, but in the last 2-3 years there is a slight stagnation and decline.**
  - Poland is at a similar level of production, but the export of frozen raspberries is lower - the cultivar is less attractive, cheaper, but yields double crops, and appear later on the market (Poland forms the price after Serbia). Ukraine is also in the race, with the possibility to primarily affect Poland's position.

- Chile is reducing production, but Mexico is taking over – greenhouse production and supplying the USA with fresh raspberries.
- Bosnia's production is on the rise (it is expected to reach about 20% of Serbian production in 2018), with characteristics similar to Serbian. The same observation applies to a few other countries in the region, primarily Kosovo and Bulgaria.
- **Serbia is already lagging behind certain competitors in terms of innovation and diversification in the value chain of raspberries:**
  - **Poland is working hard on placement diversification, development of autochthonous varieties, and investments in reducing the risk of adverse climate conditions.** In the past 15 years, raspberry plantations have been doubled in Poland (from 14,000 to 28,000 ha). The focus is on placement of frozen raspberries (accounting for about 50% of total placement), Polka and Polani varieties, with relatively low yields (4-5 t / ha). Over a 100 cold storage facilities serve the entire territory of Poland, with the largest capacity density in the southeastern part of the country. Poland has also developed processing capacities (> 30 companies), so juices and jams participate in total exports with 20-30%. Poland also sells fresh raspberries on the international market (13-18%). The Polish domestic market absorbs about 8-13% of the total raspberry production. Exports are mainly focused on markets to which Serbia exports (Germany, France, and Belgium). Poland is working hard on the development of autochthonous varieties (homogeneous - Przehyba, Sokolica ..., and double crops cultivars - Polka, Polana, Popiel, Polesia ...; and fresh raspberries for consumption - Poemat, Polonez...). Although the climatic conditions and the quality of the land in Poland are not favorable compared to Serbia (Polka and Polana have a higher brix level in Vojvodina), Poland is steadily increasing the area under raspberries by means of irrigation systems.
  - **As a relatively new player in the global raspberry market, Mexico is investing heavily in modern plantations and a joint appearance in foreign markets.** The annual export of berries and soft fruits exceeds \$ 1.5 billion (400,000 t) - primarily to the US and Canada. Strawberries and blackberries are dominant, but in the last 15 years significant growth in raspberries has been recorded (from 1,000 to 40,000 t, mostly produced in the state of Jalisco). The focus is on fresh raspberries, mostly cultivated under greenhouses and foils (> 80%), with high yields (15-20 t/ha), manually picked, and packaged in the field. Production also takes place during autumn and winter months, when the United States and Canada do not have their own production. Production is likely to continue to grow, due to the rapid return of invested funds, high profits, competitive quality and low costs, and the potential for further diversification of placements. "Aneberries" is an association of the most important producers and exporters of berries, established in 2010. It is a proactive organization whose primary goal is to join producers and processors in improving product quality and safety, cooperation with state institutions, and penetration in new markets.

- **Chile is a traditionally significant player in the raspberry market, with significant investments in the quality and availability of statistics and information, as well as product quality through the establishment of a traceability system.** However, under the pressure of Mexico, the role of Chile has been decreasing in recent years. This case should be further studied as it can be significant from the Serbia's perspective, because Chile is similar to Serbia in terms of structure and chain links. There are 13,000 farmers in the primary segment, who work 9,000 hectares, and raw raspberries are further placed to 450 buyers, 350 collection centers, 100 cold storage facilities, and 5-10 deep processors. The average farm size is 0.7 ha, with average yield of 4-5 t / ha, and manual picking is dominant (98%). The main cultures are Heritage (80%) and Meeker (15%). The harvest season is from December to April, and frozen raspberries make up 80-85% of exports, with main export markets being the US and Canada. Raspberry is the only fruit in Chile with a national traceability system (from farm to export, SAG regulation 3410/2002). In the last 5 years, production and exports have been declining - Mexico is more competitive, with higher yields, and provides raspberries for most of the year. The main challenges facing Chile are yield improvements, lack of labor, and cooperation between stakeholders.
- In order to further improve or at least preserve the existing competitive position, Serbia should aim at higher levels of added value and diversification. **Serbia's opportunity is in further extending of the existing traditional value chains and developing new ones within the raspberry segment.**
  - Further strengthening and extending the traditional value chain of frozen raspberries means **improving the functionality of the existing raspberry market, and scaling new stages of added value**, by moving to "retail-ready" packaging and new processing technologies, such as freeze-drying.
    - **Conquering new added value stages primarily relates to the packaging of raspberries in "retail-ready" packages.** The dominant form of sale of frozen raspberries is in packages of 10-20 kg, and is targeted for foreign intermediaries and packers who receive raspberries in "bulks" and sort and package them in "retail" packages, and sent them to supermarkets. Some cold storage operators (exporters) have managed to bypass the intermediaries and add about 20% to the selling price through smaller packaging. However, the share of such exports in the total export of frozen raspberries is still low and does not exceed 10 to 15%. In the process of conquering new stages of added value it is imperative to increase the relative share of high quality raspberries, meeting the necessary standards, but also joint appearance, which would to some extent solve the problem of fragmentation and low bargaining power, that is, visibility and influence.
    - **Higher added value could also be possible through new types of raspberry processing, such as freeze-drying.** Van Drunen, an American FDI, is currently the only company to export significant



quantities of freeze-dried fruit. Total exports in 2015 reached 200 tons, or EUR 6 million, with an average unit price of EUR 30 per kilogram.

- Developing new value chains concerns **intensive production and distribution of fresh raspberries, thermal processing, and organic raspberries.**
  - **In order for Serbia to start producing and exporting fresh raspberries, innovations in the field of assortment, cultivation technology and logistics are necessary.** Serbia is currently exporting negligible quantities of fresh raspberries, which are sold primarily in the domestic market, in small quantities, in the amount not exceeding 2-4% of the total production. The level of competition in the fresh raspberries segment is similar to that of frozen raspberries - apart for Poland, the main players include Spain, the United Kingdom and France, with superior varieties, but limited quantities and prices that Serbia would probably be able match successfully. The price of fresh raspberries per kilogram in export reaches 200 to 400 percent of frozen raspberries, exported in larger packaging. However, switching to fresh raspberry production also requires significant investments - introduction of new varieties, larger fruits more suitable for consumption, longer shelf life, installation of irrigation systems, greenhouse production in order to prolong the seasonal availability, and improved yields and quality.
  - **In the case of products with added value resulting from thermal processing, the key activities include dissemination of necessary market information, learning production techniques, and promotion and branding of final products.** Despite being one of the world's largest raspberry producers, Serbia's production and export of jams, juices, concentrates, purees, or other culinary supplements or raspberry products are almost non-existent. Since such types of production are not present, it would be beneficial to organize pilot projects with more advanced and motivated companies that could provide information on potential buyers and demand, technical training, as well as assistance in product promotion and placement.
  - **Organic production can be viewed as an opportunity for the fragmented primary production, which does not possess sufficient adequate resources for the procurement of inputs and technological investments.** The demand for organic berry products is still higher than the offer, and prices realized are about 20% higher compared to the frozen segment. There is a small number of export oriented producers of organic raspberries in Serbia. One successful exporting company is "Midi organic", which cooperates with more than 600 group-certified households, and focuses its entire placement to the Netherlands. The company is not specialized in raspberries only, and its portfolio includes strawberry, blackberry, prunes and other products. According to company representatives, there is a significant potential for expanding

and multiplying their success story – due to the world market demand, and characteristics and competitiveness of domestic primary production.

## Development Vision and Recommendations

**In this chapter, we will deal with a vision of development and recommendations related to immediate measures necessary to eliminate the main perceived obstacles to further growth and competitiveness of the F&D industry and fruits and vegetables sub-sectors, with a focus on raspberries.** Recommendations can be divided into three groups:

- Some of the problems observed are generally **common to all the sectors analyzed in the study package** - they derive from the fact that SMEs are predominant in the Serbian economy. On the other hand, implementation of these measures entails specific preparatory steps and capacity building of state institutions for the implementation of proactive industrial policy measures presented here. Umbrella recommendations, common to all sectors, primarily concern: the administration's capacity to be more flexible and pro-active, workforce development, the necessary shift in the way FDIs are attracted, providing better support resources for SMEs, as well as other measures which must be in the state's focus, such as further development of quality infrastructure and services of EPS. These common aspects are described in more detail in Annex 2, Industrial Policy Framework for Serbia, and are referred to below as needed.
- Some of the problems observed are to a large extent **common to all sub-sectors within the F&D industry**, and concern the need to reduce the impact of fragmentation, access to international markets, improvement of internal operations and activities and more targeted and more intensive state support, either financial or non-financial.
- Some of the problems identified are specific to the fruits and vegetables sub-sector, i.e. raspberries, and recommendations for overcoming these problems will be given for two key value chains – the existing traditional value chain of frozen as well as fresh produce segment, which should be developed in the following period.

**The general objective of the F&D industry, as well as fruit and vegetable sub-sectors, should be higher added value and diversification of placements in the coming period, which should result in improved competitiveness.** Policies that must be taken into account should include key features of domestic supply: fragmented structure and mainly domestic and regional ownership of companies, as well as characteristics of product demand: the export market can propel growth, unlike saturated domestic market with low purchasing power. Consumers in the EU market, which is a key export market for Serbia, are increasingly concerned about health, ecology, food safety, and are turning increasingly to local products. Consequently, the control and quality standards, as well as product labeling and branding, are becoming increasingly imperative, and demand is shifting towards more luxurious products - which is the segment in which Serbia can improve growth through diversification of placements by including higher levels of processing (juices, jams) or fresh fruit and vegetables, soy products, designer confectionery products, traditional meat and milk products, such as sauerkraut or goat cheese, or through the branding of non-GMO animal feed and livestock products. In most mass products, characterized by fragmentation and domestic capital, Serbian companies cannot achieve adequate economies of scale and price competitiveness, nor can they significantly improve their current position (sugar, oil).

**Therefore, when defining policies it is necessary to focus on those segments mostly affected by fragmentation and the dominant influence of domestic and regional capital** and which can be considered as weaknesses of the value chain. The fragmentation and lack of foreign companies have the greatest impact on: access to capital, access to information, access to markets, connectivity through value chain, and the efficiency of internal organizational processes. This further affects: (i) **lower productivity**, since smaller companies do not have sufficient and / or favorable access to capital, knowledge and technology; (ii) **lower quality and insufficient product supply**, since less is invested in achieving the required standards, capacities are limited and slower, and the level of cooperation among companies is generally low; and (iii) **difficult access to markets** because the visibility and negotiating power of companies are lower, and access to information and contacts is very limited

Key areas that are currently preventing increase and require measures to be taken refer to:

**a. Measures aimed at consolidating, or reducing the impact of fragmentation.**

- i. Developing a functional network of wholesale markets and retail markets.
- ii. Solving the problem of land availability and fragmentation.
- iii. Carefully attract and develop cooperation programs with export and cooperation-oriented FDIs in processing and trade.
- iv. A joint appearance on the market, through an “umbrella” brand, which would guarantee top quality products from Serbia.

**b. Measures to increase and facilitate access to international markets.**

- i. Joining the WTO.
- ii. Further (de facto) trade liberalization.
- iii. Specific measures for the meat sub-sector (possibility of accessing the EU market) and milk sub-sector (quality improvement and establishment of a reference laboratory).
- iv. Developing an “administrative cold corridor” for the fresh segment (more elaborated in recommendations for fruits and vegetables).
- v. Development of “business intelligence” through the improvement of statistics and establishment of “export-import” information counters.

**c. Measures aimed at improving internal operations and activities**

- i. Developing programs for improving the quality, marking and traceability of products along the entire chain.
- ii. A range of trainings aimed at raising awareness and changing companies’ orientation from product-driven to customer-driven strategy.
- iii. A special focus on organic production.

**d. Measures towards more intensive and targeted financial and non-financial state support**

- i. Consolidation of financial support and prioritization of activities under a RAS program.
- ii. Urgent provision of funding through IPARD funds.
- iii. Restructuring the state incentive system - higher allocations within the agricultural budget to support processing, the quality of primary products, and linking the primary and processing sectors.

- iv. Improving and changing the mode of operations of agricultural services.
- e. **Mere usmerene ka podsektoru voća i povrća, sa fokusom na malinu.**

a) **Measures aimed at consolidating, or reducing the impact of fragmentation.**

- As already described, sector fragmentation is one of the biggest challenges in the process of raising competitiveness and extending the value chain. The impact of fragmentation on the SME sector and general aspects for overcoming this problem are elaborated in more detail in Annex 2, and aspects that are critical to the F&D industry are given below.

*Developing a functional network of wholesale markets and retail markets*

- Serbia is not exploiting its full potential in food exports, because due to short and unregulated value chains it is exporting “fragmented” quantities and adds little value to its products. A key structural feature, which largely produces such placement, is the high fragmentation of the processing sector, which reveals an even more fragmented structure of the agricultural sector. In most cases, fragmentation creates a series of barriers to companies - difficult access to capital, markets, and information, insufficient investment and inadequate operations at the company level, and insufficient and inconsistent level of product safety and quality. Consolidation of agriculture and food industries, as well as building stronger links between these two segments, requires a path towards increasing competitiveness and placement of food products from Serbia. The most reliable solution to the problem of fragmentation is the **establishment of a functional wholesale market, which would provide adequate storage capacities and consolidation of the supply itself, and allow direct “merging” of supply and demand.** This would provide sufficient quantities for existing (and new) processing operators, who could improve the packaging, design, product quality and safety, and place sufficient quantities on the market.

*Solving the problem of land availability and fragmentation*

- **As already noted at the very beginning, land fragmentation is one of the biggest obstacles to a more serious increase in productivity. However, the problem of availability of agricultural land runs even deeper,** since small and large land estates are further split into even less agricultural plots, while state-owned land is trapped by institutional burdens leading to its suboptimal use. A deeper research of the problem goes beyond the scope of this study, but the question arises – if we exclude from the total arable land in Serbia small and unused plots owned by citizens who have long moved abroad or who live in larger cities and view these plots as part of their family tradition, if we exclude fragments of fragmented land, which cannot be economically used due to fragmentation, and if we exclude state-owned land that is managed uneconomically - how much land remains on which Serbia's economy can actually count on?
- **Direct solution to this problem, i.e. the implementation of land policy measures that would lead to land consolidation will not produce results quickly - the problem**

**must be solved through agro-industrial and national economic policies.** Therefore, our strong recommendation is that it is necessary to work in two directions. On the one hand, agro-industrial policies have to be adapted to the expectation that much of the growth will have to be based on varieties for which land fragmentation is not an obstacle. The choice of such varieties and activities will be dictated solely by the market. On the other hand, it is necessary to consider what national economic policies, such as land taxation and limitation of the right of ownership which prevents property development, could gradually influence the ownership structure and land division in a way that is sufficiently acceptable. The specific formulation of such policies also requires specific research. Our recommendation is to immediately initiate a deeper research into measures that can lower the costs and stimulate market functioning at the level of purchase and commercialization of primary production, so as to prevent the inevitable production inefficiency in small-sized land plots from spreading, as well inefficiency of their commercialization.

Carefully attract and develop cooperation programs with export and cooperation-oriented FDIs in processing and trade

- **Attraction of renowned processing companies and supermarket chains, which would significantly help with the export of food and drink from Serbia and placement of Serbian products on the international market, is of particular importance for the fragmented economy.** SEEDEV findings indicate that compared to the surrounding counter there are fewer reputable trading companies operating in Serbia. Of the 20 largest trading companies, only two are operating in Serbia - German Metro AG and Ahold Delhaize. Participation of trade FDIs in total FDIs is below 10%, which is far less than in comparable countries in similar phases of transition. Foreign investments in processing capacities and trade also influence changes in the procurement system, and promote construction of distribution centers and direct contracting between suppliers and producers. Most of the products would be able to end up in supermarkets, and this would create pressure and stimulation for complying with quality standards.
- **The potential arrival of FDI in processing and trade should be accompanied by smart development policy of the domestic food and drink sector through the implementation of a cooperation program between domestic companies and FDI.** The domestic market should be prepared for the arrival of such investors - it should respond in short-term with adequate supply, both in terms of quantity and quality, because otherwise it may produce a negative effect. If domestic firms are not ready and able to become part of the value chain, the FDI arrival could even increase imports, instead of recovering the trade balance. Therefore, investments must be targeted and directed towards cooperation with the domestic sector, which should be the first to receive expert assistance.
  - **According to information obtained from key stakeholders, producers and food suppliers in Serbia have problems meeting the requirements of large supermarkets.** Most small businesses are still “product-driven” - trying to sell what they produce, not what is demanded or required. The first obstacle is related to the new necessary standards: “IFS” (International Featured Standards,

defined by GFIS - Global Food Safety Initiative) and “BRC” (British Retail Council, a food safety standard used in over 90 countries worldwide). Another obstacle is related to the outdated product range - the use of traditional seeds that do not meet the requirements of modern consumers (for example, different potato and tomato varieties). The third obstacle concerns the processing and packaging of products that are not adapted to the needs of the market - lack of washed potatoes, products in packages of different sizes – 100 g packs in the form of snacks or family packages (not bulk), products “to go” or products “ready for use”.

- **By filling the gap between the demands of retail chains and processors’ capabilities - through the improvement of capacities of domestic enterprises - domestic companies would become more competitive in international markets because meeting the standards of first-class retail chains is also the first step in meeting the requirements of internationalization.** Large retail chains organize programs and activities to promote the inclusion of domestic suppliers in their supply chains, through contracted production, so producers have a guaranteed placement of their products. However, this is not enough, because due to the lack of investments and know-how, small businesses are still not able to adapt and transform. Large international retail chains do not have the incentive to invest in small business systems and their development. Therefore, systematic support is necessary, especially from the state, so that small businesses can adapt to global trends and requirements.
- It is obvious that the partnership with large retail chains in Serbia could be very important for improving the competitiveness. **A pilot project with 2 to 3 retail chains (which make up 60% of market share in the retail sector) as partners, could be developed to raise awareness of selected companies (e.g. exporters who do not meet quality standards) and raise the quality of their products.** This would significantly affect their operations and prepare them for the international market. One of the key problems for companies is that they do not want to risk without a guarantee that their product will be offered in supermarkets, while supermarkets do not have the incentive to give such guarantees. The state could overcome this gap.

*A joint appearance on the market, through an “umbrella” brand, which would guarantee top quality products from Serbia.*

- Under conditions of fragmented structure and limited access to knowledge capital and markets, companies from Serbia, and especially smaller ones, are unable to present and brand their products adequately. Gathering around a common brand, which can refer to the top quality standard in the field of fruits or vegetables, or non-GMO foods from Serbia, meat and milk products and animal feed, would bring greater visibility and bargaining power for companies, standardization of the quality of export products, and reduced transaction costs for companies. Similar to the cooperation with retailers, companies, especially smaller ones, should not be expected to willingly take the risk of a significant investment in branding. According to companies, that would mean leaving the comfort zone because it involves a completely new market segment which is totally

unfamiliar to them, and they do not have the knowledge, information contacts... It would also mean that they would become competitors to the companies they cooperated with and sold their own products as a raw material. Therefore, as in the case of cooperation in the retail segment, only the state could fill the gap that exists between the current level of knowledge and capabilities of domestic enterprises and the level needed to take advantage of the transition to higher price segments.

## b) Measures to increase and facilitate access to international markets

### *Joining the World Trade Organization (WTO)*

- **Joining the WTO is inevitable and must be finalized as soon as possible because it will have a positive impact on (net) exports of food and drink.** Membership in the WTO implies creating a stable and predictable regulatory and economic framework, which is a prerequisite for stimulating investment and increasing competitiveness. All EU member states, as well as the EU itself, are WTO members, with a total of 164 members. Membership in the WTO is also an obligation arising from chapter 30 in pre-accession negotiations with the EU on economic relations with foreign countries.

### *Further trade liberalization*

- **It is necessary to re-examine the need to protect certain segments of the domestic market, because it is demotivating in terms of competitiveness.** This especially concerns the meat segment, which is permanently protected, and the milk segment (last year levies were introduced). The main concern is that in case of further liberalization of trade there will be an excessive increase in imports of agricultural and food products. However, Serbia already performs most of its trade exchange within the framework of the free trade agreement, so any eventual increase in imports would not be of major importance and would impact a small number of sectors. After joining the WTO and intensifying trade liberalization, Lithuania saw a ninefold increase in exports after ten years; Latvia's exports were increased sixfold, and exports of many other countries were increased fourfold or more. Therefore, WTO membership produces more efficient allocation of resources and puts focus on competitiveness - it is certain that underdeveloped and uncompetitive producers will not be able to compete with cheaper and better quality products from abroad, but the net result is as a rule positive and affects the increase in overall competitiveness and moves towards a more optimal production structure. Also, producers gain access to more accessible machinery and other inputs that are crucial in food processing.

### *Sector-specific measures – meat exports to EU*

- **Trade and administrative barriers in terms of placement and transport of fresh or frozen pork to or via the EU market should be removed as soon as possible.** Due to the plague vaccine, which is only used in Serbia, pork cannot be exported to the EU nor transported through the EU to Russia - unless thermally treated. The meat is transported to Montenegro, and then from there it circulates around the entire Europe to

Scandinavia, from where it is transported by road to Russia. It takes 40 days for the meat to reach Russia, and if the meat was transported directly from Serbia to Russia, it would take about 40 hours. The long way that the meat must pass creates a risk that the meat will not arrive in a predetermined condition and at a predetermined temperature to Russia. If the customer is dissatisfied, the meat is returned to Serbia in the same way (40 days), which creates high costs for companies. Another general problem with the export are sluggish operations of competent institutions when it comes to aligning veterinary certificates with export market certificates. To transport goods to a foreign market companies hire distributors, and goods are delivered to central warehouses mainly through their own logistics network. Companies involved in the production of meat and meat products often resort to vertical integration in advance, which means opening their own sales facilities. The previous is the result of the problem of collecting receivables from large stores. By rounding off the process, companies are trying to control the collection.

#### *Sector-specific measures – testing and improving milk quality*

- The quality and safety of milk will be in the focus of development of the milk supply chain. After joining the EU, farms will have to produce milk according to EU standards (for example, maximum permitted number of bacteria). Currently, the quality of Serbian milk is well below these standards. Milk and dairy farms often get milk with a high number of bacteria, which affects milk quality. The quality of milk must also be tested for each cow every month; laboratories do not have the capacity to carry out these tests. The establishment of an accredited National Reference Laboratory is a prerequisite for a fair policy of Government support aimed at improving the quality and safety of milk, which would lead to the improvement of the international competitiveness of that sector.

#### *Developing „business intelligence“*

- **Some of the key market information is missing, both for decision-makers and for the companies.** Official data is not completely reliable, even in terms of basic macro data. For example, official statistics often underestimate production levels. This is the case with raspberry, where the official data show that in the last five years the annual production amounted to 330 thousand tons, while the export in the same period was 400 thousand tons - similar to the unofficial field data. As there are no official data on storage and processing capacities, it is questionable how decision-makers can design their interventions and subsidies, unless they know what to support - primary production or processing facilities.
- **Support for the development of “export-import” counters,** in which companies could collect contact and other information on the most important customers and intermediaries in key markets, information on food safety requirements, required quantity and quality, as well as data on key production standards. Most companies stated that they obtain information about market conditions through their customers. If buyers are the key source of information for most businesses, it is clear that it is difficult for businesses to be proactive in the market, to increase their bargaining power, and to diversify their customer portfolio.



c) **Measures aimed at improving internal operations and activities**

- **Quality infrastructure across the entire chain is one of the key challenges and conditions for a more intensive placement of products on the foreign market, and in particular the EU market.** Improving product quality must be accompanied by adequate evidence, that is, the standards applicable on the markets to which companies export, and which are the most stringent in the case of the EU market.
  - **Support to companies in gradual achievement of the basic standards is essential.** Most of the basic standards are defined by the WTO and they are “conditio sine qua non” for product placement. Today, standards like Global Gap or HACCP are considered as initial standards, and not standards that must be achieved. However, most companies in Serbia do not even meet these basic standards.
  - **Education related to the existence, significance and choice of additional and voluntary standards and support in their achievement is also an important element for raising competitiveness.** Additional standards are set by the market itself or even by companies. These additional, mostly private standards are becoming more and more important, in line with the growing consumer preferences. These are standards that buyers-intermediaries or traders expect from local companies, and whose absence is either disincentive to cooperation or it significantly reduces the export price. Another trend that is growing more and more important are voluntary standards, the fulfillment of which manufacturers label with various labels in order to convince customers of the quality, originality, and safety of their products. Such standards may be accompanied by a geographical indication or organic production certificate. These standards add value and differentiate the product, which is of particular importance in terms of niche, or more luxurious products.
  - **The following activities should be carried out in support of quality infrastructure:**
    - Establish a database of domestic companies and standards they possess and regularly bring them in line with the standards applicable to the activities these companies perform.
    - Learn the examples of best practices in the sector and understand and disseminate their experience to understand at which point a company should obtain a standard, how to do it, and what the benefits are.
    - Raise awareness of the importance of quality (PR campaigns, guides, workshops, and seminars).
    - Establish quality hubs, which would represent knowledge centers related to quality standards and which would provide help to companies.
    - Conduct a cost / benefit analysis and establish the necessary and cost-effective testing laboratories
    - Train domestic consultants for evaluation (foreign consultants are significantly more expensive)

- Subsidize the achievement of necessary standards based on the defined priorities (the “stick and carrot” system during the improvement process within the company - achieving standards is expensive due to expensive training and the use of specialized laboratories).

d) **Measures towards more intensive and targeted financial and non-financial state support**

- **Government support to the processing sector is very limited and should be increased and prioritized.** This issue is elaborated in more detail in Annex 2, in the segment dealing with the support to the SME sector, and below we present the aspects that are critical for the F&D industry.
  - **The Ministry of Agriculture supports processing companies through subsidies, but the total amount spent for this purpose in 2016 was around EUR 720,000 which is 0.4% of total subsidies in the agriculture sector.** In addition, these resources have covered three large sectors - fruit and vegetables, meat processing and milk processing. Subsidies are intended for investments in machinery and equipment and can cover up to 50% of the total investment. Subsidies only apply to investments in new machinery and equipment and include drying, freezing, cleaning and sorting machines, laboratory machines, packing machines... The maximum annual subsidy per company is up to EUR 40,000. Since total costs were low, it is clear that the average subsidy was well below the maximum limit. In 2017, subsidies for investments in manufacturing equipment are planned in the amount of EUR 1.4 million.
  - **The support of the Ministry of Economy is higher in terms of value and broader in terms of activities it encompasses, but it is neither prioritized nor targeted.** The Ministry of Economy supports companies through its development agency (RAS). RAS supports companies through grants for purchasing new machines and equipment, creating new jobs, exporting to foreign markets, innovation and achieving higher quality standards. Although all these activities present significant obstacles for domestic companies, there are no specific programs focused on the food and drink sector. The total amount of grant support was around EUR 10 million, with an additional EUR 5 million that were placed through subsidized loans. Companies from the F&D industry have the same starting position as tens of thousands of other companies from other sectors. It is not possible to assess how beneficial RAS programs were for the companies, since evaluation programs have not been established. In addition, after the transformation and integration of NARR and SIEPA into the RAS, support for the processes of internationalization and export promotion has taken a back seat.
- **IPARD funds are still not available to businesses, and these funds are intended exactly for investments in processing capacities.** Since government support is below sectoral needs, it is important to allow funding through IPARD funds as soon as possible. Total resources projected by the IPARD component of investment in technology and equipment used in processing and marketing of agricultural products

amount to about EUR 83 million (EU participation 63 million and the state 20 million). In addition to the availability of resources, it is also important to effectively disseminate key information and effective training for potential users, and key information, clear demarcations and qualifications, as well as training, should be available on-line.

e) **Measures towards fruits and vegetables subsector, with a focus on raspberry**

- **Key activities to be taken and key barriers that must be removed are presented by two key groups - traditional frozen and fresh consumer chains.** The recommendations presented for these two chains mostly relate to recommendations regarding the development of the remaining, currently less significant chains.

*Scaling higher added value in the established value chain of frozen raspberry*

- **Improving the quality of primary production.** Problems in primary production are visible through a range of activities - starting from seedlings, through the quantity and type of fertilizers and plant protection products, hygienic conditions during operation, irrigation, and finding the workforce for harvesting. Together these problems produce relatively low and variable yields, which later aggravate the stability of the supply of processed products, as well as product quality. Serbia is the only exporter of raspberries where every tenth truck is checked against norovirus, which is primarily caused by the use of non-genuine and certified seedlings, inadequate plant protection products, and insufficient hygiene of workers themselves who are in direct contact with raspberries. It is necessary to develop an incentive system for improving the quality and safety of primary products, which implies the **establishment of production of high-genetic potential planting material, reference laboratories, subsidies for the gradual achievement of GAP standards, and the improvement of the functioning and financing of professional services.** Also, more rigorous controls and sanctions are necessary for those who do not comply with the regulations; this requires the establishment of transparent database of stakeholders (including farms, buyers, cold storage facilities) and changes in inspection operations.
- **Supporting the establishment of a functional and transparent purchase market.** Market price formation of raw fruits is a prerequisite for long-term competitiveness in circumstances when the final product is intended for export and when it is exposed to an increasing competition. If the raw material price is formed outside the market it will either influence a long-term sustainability of the primary producers (if it is lower than the market) or the insufficient export consistency of final products (if higher than the market price). The solution is not to have the state form the price, especially when it comes to “luxury” export products, for which there is adequate demand and many flexible market participants, but to provide the infrastructure for establishing an efficient

market, primarily by **supporting integration of supply and increasing negotiating power of primary producers** (combining households, building local cold storage capacities, cold chains, machine circles...), and through **dissemination of key market information** (production, demand, competition, prices and quality requirements in the global and national markets). According to information provided by companies, **unfair competition** is a problem that significantly disrupts market functioning. People who have been operating in the sector for many years estimate that the number of unregistered cold storage facilities i.e. facilities that do not settle their obligations towards the state (payment of taxes and contributions), reaches up to 30-40% of the total number of cold storage facilities operating on the Serbian market.

- **Supporting investments in technology and equipment** along the entire value chain, from mechanization, irrigation (only 2-3% of the area under raspberries uses irrigation) and foils in primary production, to transportation vehicles and refrigeration capacities during purchase, and modernization of equipment (IQF freezing, laser sorting by color / shape...) in the processing capacities. IPARD funds can provide significant support for the necessary investments, and it is imperative to make these assets available as soon as possible. Prioritization of state support is also necessary i.e. examine the need to stimulate both the primary production and the construction of cold storage facilities at the same time, provided neither of these are a bottleneck in terms of capacity, and to allocate additional funds for the procurement of equipment.
- **Designing an “umbrella” brand and joint appearance of exporters in foreign markets.** The joint appearance and development of an “umbrella brand” would increase the visibility and negotiating power of the companies, and increase the possibility of direct cooperation with the retail sector through consolidation of the supply and quality guarantee (potentially setting up top quality standard). A common umbrella brand would require companies to work on: achieving traceability of production and adopting HACCP, BRC, AIB, Halal, and Kosher standards; improving marketing knowledge and skills, through education about customer characteristics, markets and consumer preferences; greater visibility through joint appearance at fairs, such as SIAL, Anuga or Fancy Food; education in the field of packaging and product design, creating a common strategic plans and establishing a truly functional association related to the created brand.

### *Developing the value chain of fresh raspberries*

- **Introducing new varieties, with stronger genetic potential, longer season, and suitable for fresh consumption.** The first step would be to implement a systematic and informative campaign on the benefits of switching to the production and placement of fresh raspberries, which should be followed by a pilot project with selected motivated and

advanced companies throughout the chain, such as Green Hit in the field of plant nutrition and protection, or processing companies such as ITN AllFresco or Pamin. If the initiative is successful, it is necessary to work on attracting foreign companies engaged in the development and distribution of new varieties, as well as on supporting a small number of local companies in the same business activity.

- **Improving knowledge, technology, and marketing and management skills in the field of production and distribution of fresh raspberries,** since it concerns the production of a brand new product on the Serbian market. This includes a range of activities - creating educational materials, visits to greenhouses in Spain, the Netherlands or Italy, bringing foreign experts to run workshops and field work with producers and professional services, supporting the construction of irrigation systems and greenhouses and participation in fairs such as Fruit Logistica, Fresh Moscow, Eurofruit-FRESH, or Middle East Congress. In any case, the entire activity would require very intensive work and trainings with producers, which would require foreign consulting assistance.
- **Developing a distribution chain** is a particular challenge and a key success factor for products that are sensitive in terms of delivery times and expiration dates. This activity initially requires identifying and supporting the development of all logistics companies that have the capacities to deliver fresh produce to foreign markets by air and road. Currently there are but a few export-oriented distributors who have expertise in this segment.
- **Establish an “administrative cold corridor” for fresh raspberries, and other fruits and vegetables,** which would include minimizing administrative procedures, enabling priority passage for perishable fresh products, and providing damage refund insurance in case of food spoilage due to long waiting periods at the border. Such measure would greatly reduce one of the key risks in the placement of fresh products, the one over which the state has control – long waiting periods at borders, causing serious damage. Later, other incentives could be added to support other operations of such corridors (supporting the association of exporters, attracting larger intermediaries, etc.). The use of such corridor should start with vegetables producers, whose products must also be kept in specific, but often less demanding conditions for delivery on the market.

# Wood and Furniture Sector Performance and Value Chain Analysis

## with a focus on solid wood furniture

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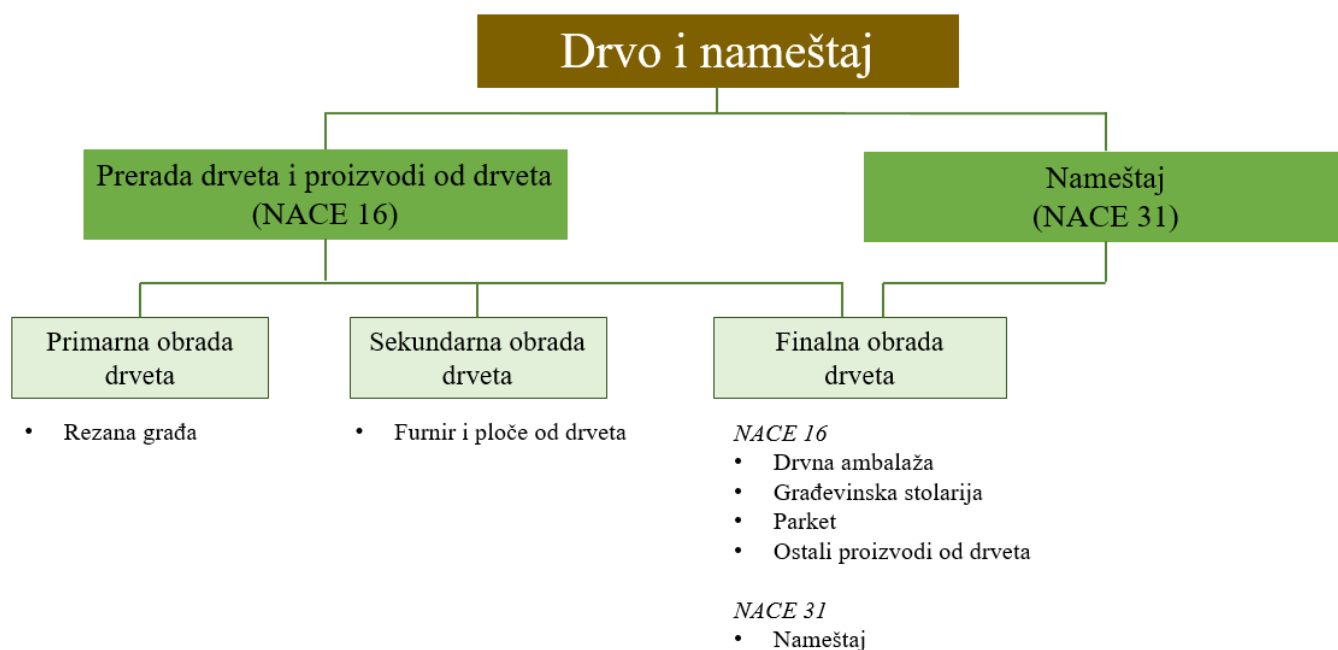
## Summary of the Analysis of the Wood and Furniture Sector (W&F)

- The Serbian wood processing and furniture production sector is very diversified - by the type of end products, by the geographical distribution of companies across the country, and by export markets. In the post-crisis period this sector is showing international competitiveness, by starting low and going through multiple restructuring: a slow reorientation from domestic to foreign markets, the collapse of (the remnants) of the former state sector whose performance was ill-based, gradually extending the value chain. All of this is taking place amidst the unpredictability and non-transparency of the wood market, with wood being the main input in all segments of the said sector.
- However, the key to sustainable international competitiveness, which is currently based on low labor costs in relation to product quality, is the ability to provide faster labor productivity growth, a relatively rapid growth of wages and labor (which are growing faster than the processing industry average). This can be achieved through training of the existing and additional staff, raising knowledge and improving production technology, and greater investments in design and marketing - especially in the segment of wood furniture which accounts for 40% of the sector.
- Due to higher added value and potentials to significantly increase the added value, special focus in this analysis was put on wood furniture. Based on a sample of 165 companies (which account for 90% of furniture exports), it was determined that all wood furniture types are almost equally presented – upholstered, particle board and solid wood furniture, with particle wood furniture producers having the largest share. The main difference between these types of producers is their market positioning – particle board furniture is mainly exported to the region and under own brand, and solid wood furniture is exported to developed countries, but often under another brand, and upholstered furniture is almost equally exported to developed countries and countries in the region, but this depends on ownership (domestic firms export to the region, and SDI to developed countries). However, what is common for all producers, i.e. for the entire Serbian wood furniture sector, is the fact that it is mainly sold in the lower-mid price segment. Also, it is interesting that almost all producers make complete furniture products, i.e. there are few who produce parts of furniture, which indicates a low division of labor in the sector.
- In terms of future perspective of wood furniture manufacturers, successful market positioning and niching will determine whether current pronounced diversification (by the type of furniture and export markets), and low division of labor (specialization) will present an obstacle to the competitiveness.

## Definition and Scope of the W&F Sector

The subject of this analysis is *Wood processing and wood products* (Area 16, KD 2010) and *Furniture production* (Area 31, KD 2010), given in more detail in Figure 1. Since furniture production is considered the highest degree of wood processing these two sectors are often analyzed together, so for the most part in the analysis these will be observed as one whole, under short name W&F (wood and furniture). Even though the *Furniture production* sector also entails furniture made of metal and other materials which are not wood, these will be included in this analysis to provide consistency and comparability with other countries. However, in the second part of the analysis, a special focus will be on wood furniture only, as it is the most significant segment of the *Furniture production* sector, and as a segment most directly related to *Wood processing and wood products* (hereinafter: *wood processing*), and which has the ability to create the highest added value to wood raw materials. From a forest to the final piece of furniture, wood is subjected to different stages of processing and added value, and these are: logs, panel boards and furniture elements.

Figure W&F 1. W&F sector scheme, three stages of wood processing and seven groups of products



/ Wood and Furniture / Wood processing and wood products / Furniture / Primary wood processing / Secondary wood processing / Final wood processing / Sawn lumber / Veneer and wood panels / Wood packaging / Joinery / Parquet / Other wood products / Furniture



## Importance of the W&F Sector and its Structure from the Value Chain Perspective

The W&F sector is relevant for the economy of Serbia due to a significant workforce in the industry, favorable socio-economic characteristics and positive foreign trade balance. Even though it currently generates a relatively low added value per employee, this paper argues that this industry has significant potential to increase added value, as well as employment.

### Sector Importance

With 22,161 employees, W&F is the fifth largest sector, but only 13<sup>th</sup> in terms of added value (out of total 22 sectors in the Processing Industry PI<sup>4</sup>) and participates with 0.7%<sup>5</sup> in Serbia's GDP. Still, despite not being one of the largest sectors in terms of added value, W&F sector is **significant for Serbian economy because it creates foreign trade surplus** – with net export over 214 million EUR this sector ranks 4<sup>th</sup> in the PI. Table 1 shows the size and significance of the sector.

Table W&F 1. Size and relevance of W&F sector (2015)

	Value added		Export	
	mil EUR	%PI	mil EUR	%PI
<b>W&amp;F sector</b>	<b>222</b>	<b>4,3</b>	<b>359</b>	<b>3,3</b>
of which: Wood processing	123	2,3	183	1,7
Oof which: Furniture production	100	1,9	308	2,8

Source: SORS

In addition to its significance for foreign trade balance of the country, W&F sector is **important to Serbia for other reasons** as well, primarily due to *domestic* raw material base and high potential for entrepreneurship development, employment growth and balanced regional development. Serbia has significant quantities of good quality wood raw materials (30% of total land area), which are diversified by type (beech, oak, poplar, ash, pine, fir...) and geographically (all areas of the country have certain quantities of wood raw materials). Despite the fact that most of this raw material is processed into products with higher added value, there is a potential for creating significantly higher added value, which is relatively easy to achieve. There are low entry barriers in most W&F sub-sectors, and achieving higher price segments is possible even with moderate quality raw materials and higher wages (primarily including design and marketing). In addition, the W&F sector is labor-intensive and can be established in different parts of the country, which is important from the social and regional aspect. As concerns the already mentioned low entry barriers, this means that potential for employment growth and development of less developed regions is not only large, but relatively easy to attain / utilize.

<sup>4</sup> There are actually 23 sectors in the PI (Processing Industry, but since W&F entails two sectors, the total observed number of sectors is 22.

<sup>5</sup> This is the official data generated by the statistics (NSO), covering the companies registered in W&F industry only. It is therefore estimated that the W&F sector contribution to Serbia's GDP is higher.

In order to better understand the significance of the W&F sector for an economy such as Serbian, it is useful to compare the significance of the sector in other European countries. The significance of the sector varies from country to country and is largely in line with the country's forestation. For example, the value created by the W&F sector ranges from just 0.3% in Ireland (with forested 11% of the territory) to as much as 27% in Latvia (forestation 54%). The largest deviation is present in Slovenia and Finland, with 63% and 68% of the forested area, but with W&F sector creating only 4.8% and 5.9% of the value added in PI. Certainly, participation in PI also depends on the strength of other sectors, including the size of the Furniture sector that does not rely solely on wood raw materials, so it is reasonable to compare Serbia with countries which are also comparable by various other characteristics. Table 2 shows the size of the W&F sector in BiH, Croatia, Hungary, Romania, Bulgaria, Slovakia, Czech Republic and Poland, as well as Italy and Germany, the largest suppliers of EU markets. The table clearly shows that this sector holds most significance for economies of Bosnia and Herzegovina, Poland, Croatia and Romania, while in Serbia its importance is similar to that in Slovakia and the Czech Republic (viewed by the share of sector added value as compared to PI added value).

The Serbian W&F sector creates the lowest added value in relation to the forested area. While Italy and Germany are taking the lead, as expected, it is interesting that other countries (which are more comparable to Serbia) create significantly higher value-added per unit of wood raw material. The primary reason for this is the volume of wood raw material harvested and transformed to logs (as will be seen later), besides the ability of other countries to create higher value-added in later stages of wood processing and production of final products. What is also interesting is that most countries that are compared to Serbia have less of forest per capita (except Croatia, Bulgaria, and Bosnia and Herzegovina), and some of them have relatively more employees in the W&F sector (Poland, Slovakia, and Romania).

*Table W&F 2. Sector performance and significance – Serbia and relevant countries (2015)*

	forest area per capita	W&F value added per ha of forest area	# employees in W&F / # employees in Manufacturing	W&F value added in Manufacturin g value added	Furniture value added / Wood processing value added
	ha	EUR/ha	%	%	ratio
Germany	0,14	1.197	3,9	2,6	1,1
Italy	0,18	827	6,6	4,3	1,6
Poland	0,25	488	11,9	7,4	1,3
Czech Republic	0,25	468	6,4	3,5	0,5
Slovakia	0,36	253	8,4	3,8	0,7
Hungary	0,22	190	5,0	1,9	0,9
Romania	0,35	159	10,0	7,2	0,8
Croatia	0,59	147	10,3	7,4	0,6
Bosnia and Herzegovi	0,80	75	15,2	11,2	0,6
Bulgaria	0,54	67	7,2	4,1	1,4
Serbia	0,45	47	6,8	3,6	1,2

*Source: Eurostat*

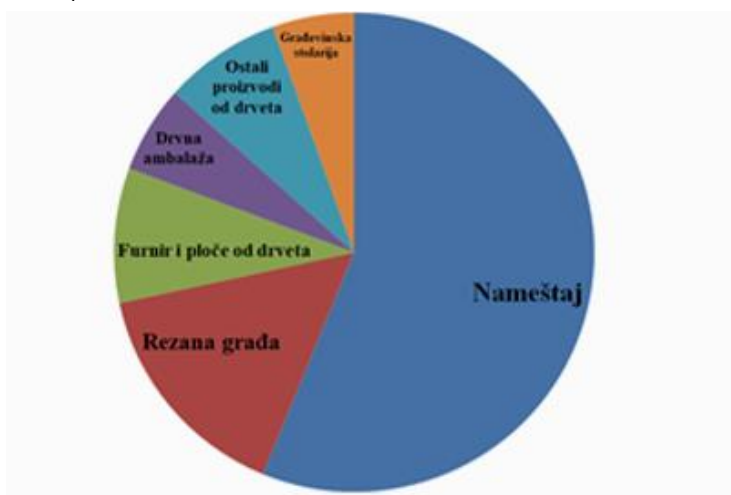
Even the countries with smaller *absolute* area under forests compared to Serbia (Czech Republic, Slovakia, Hungary and BiH) create significantly higher value-added in W&F sector. In doing so, they create most of the value-added in wood processing not furniture production

(which can also be made of other materials), which suggests a single conclusion that they better valorize their forests and wood raw materials. A reason for this could be higher quality and better structure of wood raw materials, as well as higher productivity and sector density (in terms of the number of companies). On the other hand, given that furniture industry requires a higher degree of product finalization, this structure is generally considered to be more favorable, especially since the EU28 average is such that Wood processing creates only 1% of added value and Furniture production 4%.

## Sector Structure

**The W&F sector in Serbia is very diversified - by the type of products, by the geographical distribution of companies across the country, and by export markets.** This is shown in Table 3, which shows indicators to illustrate the sector's diversity, as well as in Figure 3 which shows geographical distribution of the sector in Serbia. Circles of different sizes represent company sizes according to business revenues. Also, to facilitate visualization of the sector according to the degree of processing, the values are given on the chain value (Figure 4). Sector's diversification according to groups is evident from the participation of all seven product groups in the added value segment. Only parquet flooring segment is insignificant, while all other product groups have a relatively even share (6-9%), with the exception of cut materials and furniture, which participate in the added value of the sector by 15% and 56% respectively (Figure 2).

Figure W&F 2. Value Added shares within the W&F



*Furniture (blue), Sawnwood (red), Veneer and boards (green), Packaging (violet), Other wooden products (light blue), Building joinery (orange)*

On the other hand, sector's diversification by production companies is evident through the HHI index which is less than 1.000 in almost each product group, and export market diversification by export markets is evident by the number of markets to which each group exports, where no product group is related to one export market more than 25%, with the exception of parquet flooring whose export is negligible and construction joinery since its export is tied to Russia (44%).

*Table W&F 3. Diversification of W&F sector - by product groups, companies, and export markets(based on data generated by the Serbian BRA – only the companies registered for the production of W&F\*)*

	Number of companies	Number of employees	Average number of employees per company	Revenues		Added value		Export		Number of export markets	Participation and name of the largest market	HHI
	#	#	#	EUR	%	EUR	%	EUR	%	#	%	
W&F	2.155	22.196	10	815.492.128	100,0	169.400.246	100,0	278.436.970	100,0	67	14 (Italy)	137
Sawn wood	541	3.565	7	129.499.134	15,9	26.150.665	15,4	49.863.988	17,9	33	16 (Italy)	685
Veneer and panels of wood	26	1.193	46	67.243.964	8,2	15.368.972	9,1	28.018.096	10,1	22	20 (Italy)	4.100
Parquet	7	8	1	386.142	0,0	69.360	0,0	89.083	0,0	13	30 (Slovakia)	3.887
Building joinery	358	1.648	5	59.908.061	7,3	9.301.731	5,5	14.736.894	5,3	37	44 (Russia)	280
Wood packaging	178	1.309	7	58.748.782	7,2	10.033.752	5,9	18.969.491	6,8	38	16 (Hungary)	611
Other wood products	316	1.916	6	57.287.084	7,0	13.334.545	7,9	16.117.925	5,8	39	23 (Italy)	219
Furniture	732	12.557	17	442.418.962	54,3	95.141.221	56,2	150.641.493	54,1	47	11 (Romania)	341

Source: Serbian Business Register Agency and Customs of RS

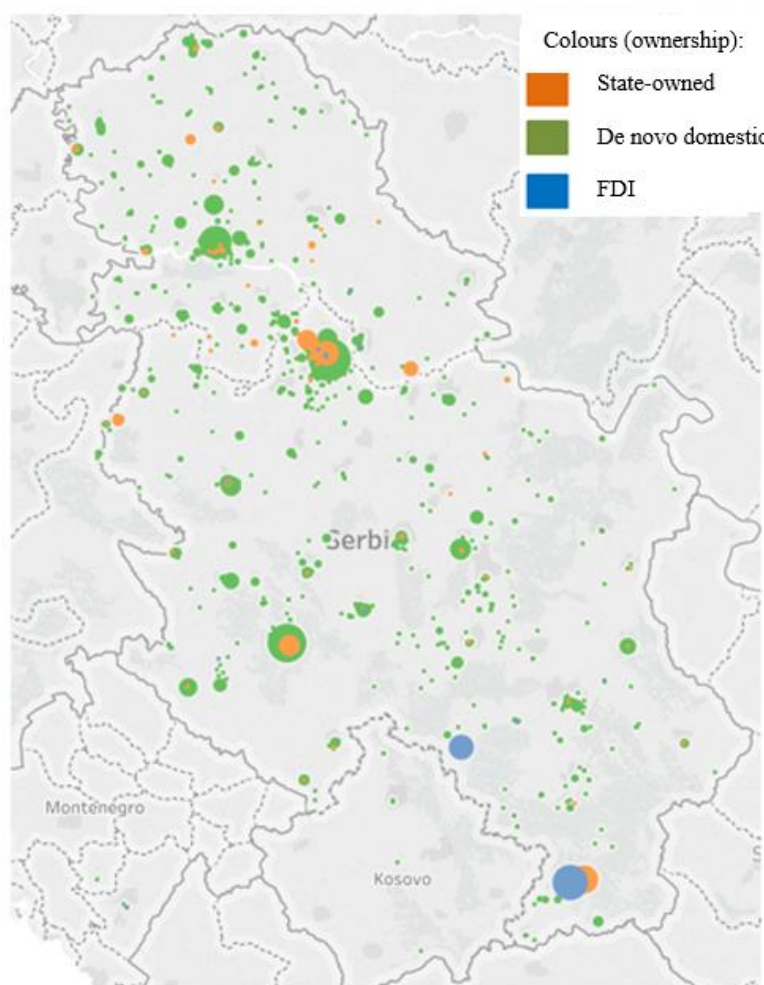
\* It makes no sense to include all companies that produce or sell W&F products, because we can reasonably assume that in case of companies that are not registered for the production of W&F, only part of their activity is based on W&F production, and often a very small part.

*Table W&F 4. Structure of the W&F sector by the size of company*

	Number of companies	Number of companies	Employment	Revenues	Added value	Export
	#	Share (%)				
<b>W&amp;F total</b>	<b>2.155</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Micro</b>	<b>1.753</b>	<b>81</b>	<b>17</b>	<b>17</b>	<b>9</b>	<b>10</b>
Non-exporters	1.368	63	10	9	4	/
Exporters	385	18	7	8	5	10
<b>Small</b>	<b>320</b>	<b>15</b>	<b>30</b>	<b>29</b>	<b>28</b>	<b>26</b>
Non-exporters	84	4	7	5	5	/
Exporters	236	11	23	24	23	26
<b>Medium</b>	<b>75</b>	<b>3</b>	<b>30</b>	<b>36</b>	<b>39</b>	<b>41</b>
Non-exporters	7	0	2	1	1	/
Exporters	68	3	28	35	37	41
<b>Large</b>	<b>7</b>	<b>0</b>	<b>23</b>	<b>18</b>	<b>24</b>	<b>24</b>
Exporters	7	0	23	18	24	24

Source: SBRA

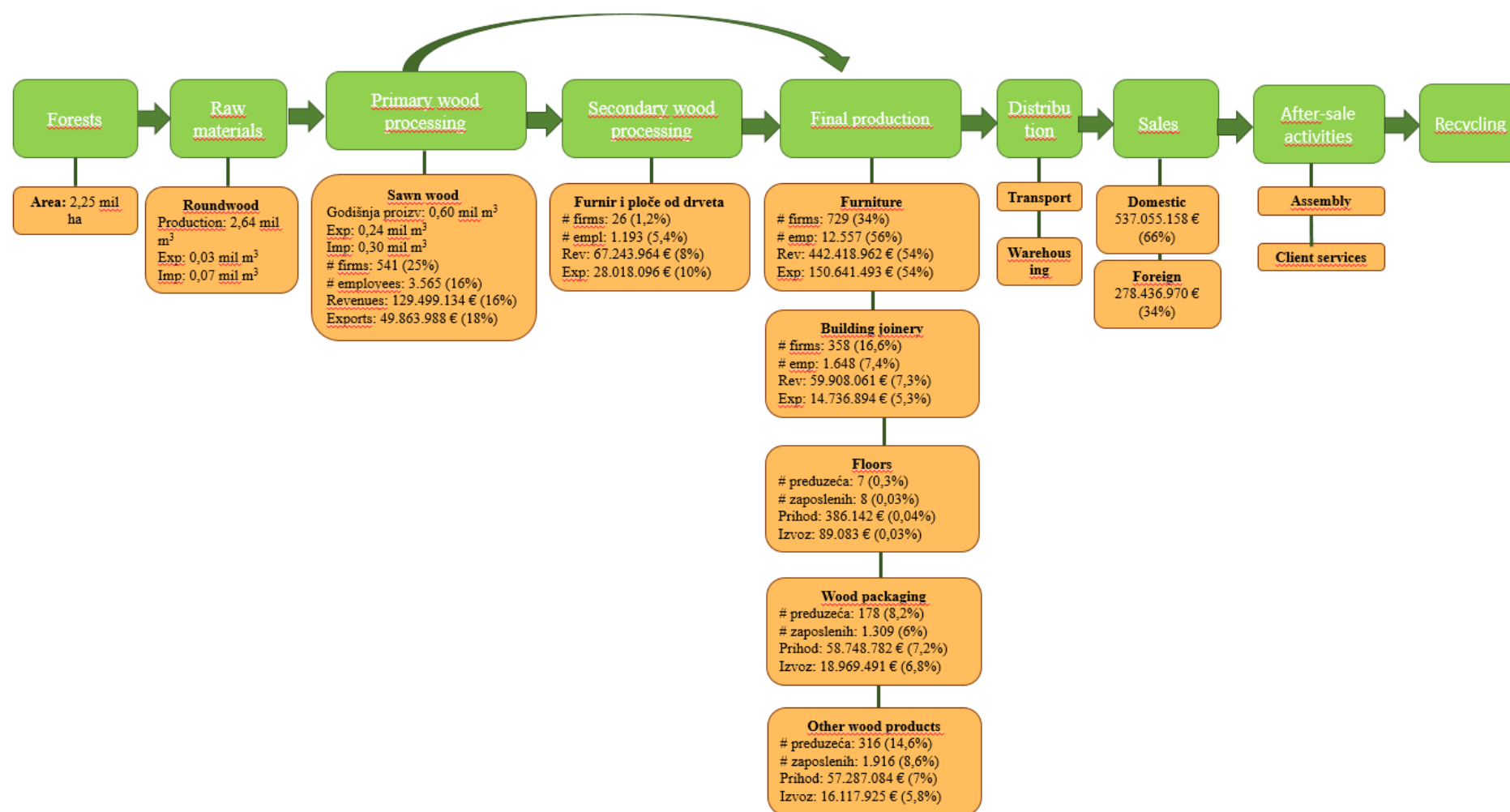
Figure W&F 3. Geographical distribution of the W&F sector



Source: Serbian Business Registers Agency

However, despite the high diversification of the sector which indicates its stability (in the sense that there is no high dependence on the success of one or several companies, export markets or products), this sector is still **highly dependent on domestic economic developments**. Namely, all segments of the sector are predominantly locally oriented - on average, 65% of revenues are realized in the domestic market. Naturally, foreign market exports are predominantly performed by larger companies. Namely, out of 2,155 companies in the sector, 696 are exporters (exports > 0 in 2015), but even though they account for less than 1/3 of the sector, they create more than 70% of the sector's revenue and employment (Table 4). The W&F sector is a sector of micro and small companies, which, as a rule, have a harder time penetrating foreign markets. These are companies that do not have the capacity to produce large quantities required by foreign markets (in order to be cost-effective) because of the size of production as well as transport. It is particularly difficult for these companies to become producers for foreign companies that want to outsource their production, as these companies are mostly large producers who need large-capacity partners.

Figure W&F 4. Value chain of the W&F sector



Source: SBRA

## Sector Performance and Potential

### Global Trends and Performance

In recent years, wood and wood processing industries have been attracting global attention. On the one hand, **global demand for wood as a natural material is growing**(particularly in the construction sector<sup>6</sup>), and on the other hand there is a problem of **global decrease of forest area**. As far as demand is concerned, although a number of new materials with superior characteristics are being marketed, with the increase of ecological awareness and health consciousness, the market is turning toward traditional, natural materials. Wood is becoming an increasingly generally popular material (wood packaging for foodstuffs or wood as constructive material in building construction) and in households (wood furniture). Although these trends are particularly pronounced in developed countries, growth in demand in less developed countries is also noticeable given the urbanization process. However, there is a growing problem with the provision of wood raw material to satisfy this demand, despite the fact that wood is *a renewable and recyclable raw material*. The problem of reduction of global forest area is faced by a large number of countries worldwide, especially those less developed that did not practice sustainable forestation. It is estimated that in the period between 1990 and 2015 the world forest area was reduced by 129 million hectares<sup>7</sup>, which is equal to the surface of the South African Republic (i.e. 15 times the surface of Serbia). In this regard, certain countries have been tightening forest cutting standards and put export restrictions on wood raw material.

Despite the growing demand for products from natural materials such as wood, in terms of cycles, demand is currently below the pre-crisis level. Namely, the W&F sector is a fairly procyclical sector, and is slower to recover from crises compared to less cyclical sectors. The **sector's procyclical character** is established by the fact that wood raw materials are most used in construction and furniture production - two sectors which are extremely sensitive to economic and financial developments. In that respect, in the post-crisis period the W&F sector seeks recovery focused primarily on markets that have not been significantly affected by the crisis - emerging markets. These markets recorded strong economic performance growth in the last decade, especially in the purchasing power of population and urbanization. In the past few years China has overtaken Canada as the world's largest lumber producer and the United States as the world's largest consumer. The largest growth in demand for wood raw material in China was driven by growth in the construction sector, but also by demand growth for furniture in line with rising of the middle class in this country.

### Sector Performance in Serbia

In addition to being a procyclic, responding quickly and in strongly to a crisis, the W&F sector was also hit by the crisis in Serbia due to its **large dependency on the domestic market**, which was hit harder compared to the markets of developed EU countries. Export was mostly directed to the regional countries who were also strongly affected by the crisis. For these reasons, the

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<sup>6</sup> The wood from the trees: The use of lumber in construction, *Renewable and Sustainable Energy Reviews* (2017; p. 333-359)

<sup>7</sup> Food and Agriculture Organization of the United Nations (2016), *Global Forest Resources Assessment 2015*



M&F production sector has slowed down - from a pre-crisis growth rate of 25% per annum to 2% in the period 2009-2015.

Learning from experience, after the crisis the sector took a turn towards export, primarily to developed EU countries. In the post-crisis period export growth is significantly faster than the overall growth of activity, and over two-thirds of the growth of exports is achieved by taking over competitors' market (the so-called competition effect), which indicates a significant improvement of the competitive position in foreign markets.

Observed according to product groups by complexity (a value chain in Table 5), we see that all **segments of the W&F sector are going international in the post-crisis period**. The largest internationalization of Veneer and Wood panels is, but the reason for this are direct investments (SDI) in this subsector. However, the acceleration of export recorded in wood packaging, other wood products, and furniture, was the result created by domestic companies. Also, most of the export growth in furniture segment was achieved by taking over competitors' markets. The segment with the slowest growth in export is, as expected, construction joinery, as it is the most procyclical sub-sector, whose recovery is now expected. Also, prior to crisis this subsector relied mostly on export to Montenegro and Russia - two countries strongly affected by the crisis in previous years. However, what is problematic is the fact that it is the only sub-sector that had lost market share to foreign competitors.

*Table W&F 5. Export performance and competitiveness of the W&F sector (2009/10 - 2014/15)*

	Sawn wood	Veneer and panels of wood	Wood packaging and other wood products	Building joinery and floors	Furniture *	W&F TOTAL
Exports, EUR million (2015)	45,7	42,0	61,4	46,8	179,1	375,0
Participation in total exports DiN,% (2015)	12,2	11,2	16,4	12,5	47,8	100,0
% of Serbian export growth	78,5	162,8	94,8	17,5	88,0	75,7
% of world imports growth	52,1	44,1	47,1	36,1	37,2	42,3
Contribution to the growth of total sector exports	11,2	16,2	18,4	4,7	31,0	81,4
Contribution to the effect of competitiveness on	76,9	85,0	54,2	-20,0	85,6	71,1

*Source: UN Comtrade*

*\*motor vehicle seats and mattresses are excluded, because these products cannot be compared to the rest of furniture industry due to their physical properties and production technology.*

A more detailed analysis of the performance of companies registered for the activities belonging to the W&F sector provide the answer as to why some subsectors are more successful internationally than others. In Table 6<sup>8</sup> we see that all sub-sectors are increasing the value added (VA) in the post-crisis period faster than the number of employees (which means they are increasing productivity), excluding the construction joinery. Construction joinery is a sub-sector that creates the lowest added value per employee, and this sector is the slowest growing in the post-crisis period. On the other hand, producers of veneer and wood panels and parquet flooring create the highest added value per employee and realize the fastest growth in revenue in the observed period. Still, their performance is largely created by the SDI. If we observe exclusively domestic companies, wood packaging producers have the best performance - they create the highest added value per employee and have the highest EBITDA margins and the fastest revenue growth. On the other hand, furniture producers create high added value per

<sup>8</sup> Data in Table 6 differ from the data in Table 5, because of the different point of view. Table 6 shows the company point of view, while Table 5 shows the product point of view (regardless of the registration activities of companies exporting these products).



employee and have high export orientation but, due to the aforementioned procyclic nature, they record a very modest increase in business income in the post-war period.

*Table W&F 6. Performance indicators along the value chain in the W&F sector*

		Primary wood processing	Secondary wood processing	Final wood processing				
		Sawn wood	Veneer and panels of wood	Parquet	Building joinery	Wood packaging	Other wood products	Furniture
static indicators (2015)	VA / employment	885,6	1.555,4	1.046,8	681,4	925,4	840,2	914,8
	VA / Revenues	20,2	22,9	18,0	15,5	17,1	23,3	21,5
	Exports / Revenues	38,5	41,7	23,1	24,6	32,3	28,1	34,0
	EBITDA margin	8,1	12,0	9,2	2,3	7,4	4,6	5,0
dynamic indicators (2015-2016)	CAGR revenues	1,6	16,8	16,8	-6,5	6,3	2,6	2,0
	CAGR employment	-7,7	3,9	-13,4	-8,5	1,0	0,4	-3,4
	CAGR VA	3,9	31,7	0,6	-10,2	7,5	4,7	0,6
	CAGR exports	11,7	23,9	0,0	5,8	12,4	21,1	9,3

*Source: Serbian Business Registers Agency*

## Sector Potential in Serbia

Although the previous analysis suggests that the value chain of the W&F sector in Serbia is well-rounded - from raw material to end-customer - and that the sector's performance is moving in a positive direction, there is significant potential for its improvement along the entire chain. **The biggest potential for adding a higher value to wood available in Serbia lies at the very start of the W&F chain (in forests) and at the very end of its chain (in furniture).**

As far as forests are concerned, in addition to the possibility of extending the raw material base through the increase of the forest area and a change in attitude towards the existing forest area, the greatest potential lies in improving the access to forests and enabling their *better use*. A proof lies in the comparison between Serbia and relevant European countries<sup>9</sup> (Table 7). It is evident that Serbia has the smallest coefficient of valorization of its forests (transformation of a forest area to logs). Although the reason for this partially lies in the structure of forests in Serbia (by variety and quality) – 50% of forests are privately owned, which implies great fragmentation, low level of afforestation, and often inadequate cuts), another fact is that there is no proper access to raw materials (forest roads and machinery) and that loggers are often inadequately trained to extract the highest value from the forest (especially in private forests).

<sup>9</sup>The comparison was performed with countries which are similar to Serbia in terms of economic characteristics or forest potential, and with countries which represent "indicators" when it comes to furniture sector in Europe (Italy and Denmark)

Table W&F 7. Transformation of wood raw materials into final products in the W&F sector – Serbia and selected countries (2014, for comparison)\*

	Country and forests area		Roundwood		Sawnwood				Wood processing and production of wood products (NACE 16)		Furniture production (NACE 31)	
	country area (km2)	area under forests (km2)	Production (m3)	Production per forest area (m3 / km2)	Production (m3)	Production per 1m3 of roundwood	Import (% of production)	Export (% of production)	Production (mil EUR)	per unit of available sawnwood (mil EUR / m3)	Production (mil EUR)	per unit of produced cut material (mil EUR / m3)
Italy	302.073	111.100	5.759	0,05	1.430	0,25	328	22	12.993	9,09	20.101	14,06
Poland	312.679	94.350	40.862	0,43	4.725	0,12	17	15	7.687	1,63	8.251	1,75
Romania	238.391	69.510	15.330	0,22	6.019	0,39	1	62	2.945	0,49	1.785	0,30
Portugal	92.226	49.072	11.152	0,23	1.035	0,09	14	67	2.681	2,59	1.400	1,35
Austria	83.879	40.220	17.089	0,42	8.460	0,50	21	59	7.454	0,88	2.845	0,34
Bulgaria	110.370	38.450	5.570	0,14	838	0,15	4	48	440	0,53	458	0,55
Serbia	88.000	32.280	2.636	0,08	600	0,23	50	40	269	0,45	256	0,43
Czech Republic	78.868	26.674	15.476	0,58	3.861	0,25	19	85	3.043	0,79	1.250	0,32
Croatia	56.594	24.910	5.926	0,24	1.294	0,22	23	116	677	0,52	334	0,26
Lithuania	65.286	22.840	7.351	0,32	1.345	0,18	38	55	1.070	0,80	1.377	1,02
Slovakia	49.035	19.400	9.168	0,47	1.750	0,19	18	47	1.150	0,66	805	0,46
Slovenia	20.273	12.710	5.099	0,40	700	0,14	127	150	646	0,92	351	0,50
Denmark	42.924	6.570	3.180	0,48	358	0,11	572	82	1.471	4,11	1.744	4,88

Source: Eurostat and NSO

\*Available sawnwood is counted as: total-produced sawnwood + imported sawnwood - exported sawnwood

Moving furthermore down the value chain, there is room for more efficient use of raw materials, meaning adding more value and losing less value not only in primary wood processing (conversion from logs to cut materials) but in all subsequent stages of processing. Specifically, *efficient use* of raw materials implies greater utilization through less waste generation at all processing stages, which reduces the loss of value along the value chain, and *effective utilization* means directing wood raw materials to those parts of the chain where they add the highest value.

### Sale of raw wood material and lumber (focus: market organization of sawmills)

The structure of the sawmill market is a complex issue that needs to be further explored. In Serbia, technicalwood is processed in 1,008 sawmills. Despite theextremely fragmented sawmill industry(over 50% of sawmills process less than 1,000 m3 of technical roundwood per year, and only a small number of them process over 10,000 m3), its total processing capacity exceeds the available annual quantities of wood raw material<sup>10</sup>. Some sawmills get wood raw material from private forests, while othersget their supplies from state forests. Sales organization and allocation of wood raw materialfrom state forests (which account for 50% of total area under forests) is done according to certain criteria, at prices formed by the public enterprises in charge for managing forests. Buyers of this wood raw materials are sawmills, the same asmanufacturers of highadded value products that also have facilities for primary wood processing(mostlythe large furniture manufacturers). Some of these manufacturers claimthat the sawmills sometimes export unprocessed wood raw material; whereas, if that raw material was allocated to them, they would process it into products with higher added value. Likewise, saccording to some small furniture manufacturers who do not have own primary wood processing capacity, sawmills sometimes export lumber to international buyers because their interest is to receive advance payment and higher purchases at once<sup>11</sup>.Therefore, apart from regulating the system of allocation and

<sup>10</sup> Action Plan for supporting export of the high added value products of the Serbian wood industry, United Nations Office for Project Services UNOPS (2016)

<sup>11</sup> Source: interviews (formally conducted within the project and additional interviews by phone).

procurement of wood raw material from state forests, and encouraging small producers of final products to buy lumber from sawmills (these measures are given in more detail in the Recommendations section), an in-depth analysis of the sawmill market needs to be conducted in order to potentially provide a market mechanism for preserving social effects of small sawmills in rural areas, and providing incentives to be able to add value and increase the efficiency in the use of wood resources in the country.

Finally, there is a great potential for *deepening* the chain (in terms of increasing value added) in all its parts, primarily through non-production activities such as design and marketing. The biggest potential for this has been the production of furniture because furniture is a specific product category that can relatively easily add value to the same types of products, namely through design and marketing (and then branding). In the following chapter we put special focus on the analysis of the furniture industry.

## **In Focus: Wood Furniture**

### ***Why furniture?***

Furniture production is the most important sector, both economically and socially within a wider W&F sector. From an *economic point of view*, furniture production is not only a sub-sector that adds the highest value and which in the post-crisis period has an international competitive advantage, but also a sector with great potential to relatively easily increase value added and improve international position by repositioning the price-quality-design axis. It is this relationship which makes furniture production a sub-sector with the potential to diversify and successfully act in foreign markets, even with the increase of labor costs in Serbia. Barriers to entry are low, so the potential for creating new businesses and developing entrepreneurship is high. On the other hand, furniture production is also the most significant sector within the W&F from the *social aspect*. It is a labor-intensive sub-sector employing over half of the entire W&F employees (over 12,500 people), mostly involving domestic private micro, small and medium-sized businesses, most of them family-owned. Another important component of the social aspect is that furniture production is a multidisciplinary activity that employs and connects people from different professions, such as designers, engineers, artisans and ecologists.

### ***Why *wood* furniture?***

Wood furniture accounts for 75% of the export value of the furniture<sup>12</sup>, sector while the rest includes metal furniture and furniture from other materials. Although wood furniture sub-sector is representative of the furniture sector, it is not representative of the entire W&F sector, since it generates a significantly higher value than other W&F sectors. However, it does have a number of representative aspects: the same primary market (wood raw material market), low barriers to entry (relatively easy to acquire knowledge and low initial capital), a large number of small, scattered companies, and finally, small series that if enlarged could significantly boost productivity and increase earnings. Not being representative is a reason to place more attention in finding a way to raise the productivity of the entire sector. Approximately 76% of wood

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<sup>12</sup>Here, we observe the export of HS 94 group products that are considered to be furniture (automobile seats and prefabricated buildings are excluded).

furniture exports are made by companies registered for the production of furniture, while the rest of the export involves trading companies or a company that is registered for some other production activity, rather than production of furniture.

The analysis will now focus only on wood furniture, which will include not only solid wood furniture but also upholstered and panel furniture. On the one hand, it is difficult to divide furniture producers into subgroups (due to aggregation of statistical data, and because some producers produce more than one type of furniture), while on the other hand it makes sense to include panel and upholstered furniture, as it mostly contain wood as the basic raw material. Panels used in panel furniture are mostly made of wood, and frames for upholstered furniture are also mostly made of wood. Given that other types of materials are used in the production of these types of furniture, the wood furniture sub-sector is also important because other sectors such as metal, textile, or rubber and plastic can also be included in the value chain.

Since there are no statistics on the production of furniture by *type* of furniture, we made a sample of 165 companies with different types of production, based on Internet research. When analyzing a sector based on products (export data), we also observed the HS classification of following product groups: 940360, 940350, 940161, 940390, 940340, 940330, 940169, 940159, 940151, 940381, 940389, 940140<sup>13</sup>.

## Global Market and Trends

Technological and market characteristics (high level of product differentiation, high production technology range and relatively high transport costs) make furniture production **widespread throughout the world** - every country in the world has its own furniture production. Moreover, furniture production is mostly locally oriented due to low revenue accumulation or due to specific characteristics of furniture (not suitable for transport). In this respect, about 65% of the global furniture production is sold in the country of production, and only 35% is exported. Export, however, is mainly directed to the nearby countries. **The largest part of the furniture trade takes place within economic integrations** - for example, in the EU, 85% of furniture needs are met from the markets of countries within the EU, while only 15% is imported from non-EU countries. However, not all regions are "self-sufficient" at this point: when it comes to the NAFTA region (USA, Canada, Mexico), only 28% of the furniture trade takes place between these three countries, while in Asia and the Pacific these percentages are as high as 41%.

## Description of The Value Chain

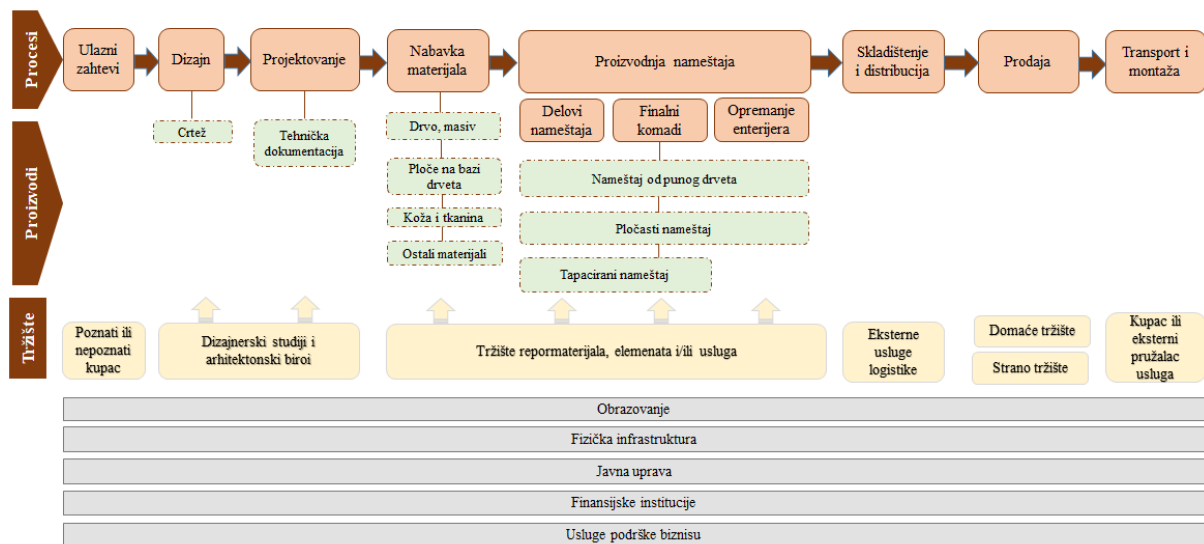
Creating value in furniture production starts by recognizing customer needs and ends with the sale of finished products. The value chain shown in Chart 4 consists of three main parts -

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<sup>13</sup>940330 – Furniture; wooden, for office use; 940340 – Furniture; wooden, for kitchen use; 940350 – Furniture; wooden, for bedroom use; 940360 – Furniture; wooden, other than office, kitchen or bedroom use; 940381 - Furniture; of bamboo or rattan; 940389 – Furniture of cane, osier or similar materials (excl. of bamboo, rattan); 940390 – Furniture parts; 940140 - Seats other than garden seats or camping equipment, convertible into beds; 940151 - Seats of bamboo or rattan; 940159 – Seats; of cane, osier or of similar materials, other than bamboo and rattan; 940161 – Seats; with wooden frames, upholstered (excluding medical, surgical, dental, veterinary or barber furniture); 940169 – Seats; with wooden frames, not upholstered (excluding medical, surgical, dental, veterinary or barber furniture).

**upstream, production, and downstream.** Upstream and downstream activities relate to service activities, while only the central part of the chain is production. The chain is based on input requests (coming from the client or from the market), conceptual design, product design and technology design for the production, through the procurement of necessary materials, the production process itself (which usually includes production of elements and their assembly) to storage, sales, transportation and installation (*Figure 5*).

*Figure W&F 5. Value chain of wood furniture*



Given that the value chain begins and ends with customers, **the appearance of the entire chain depends largely on whether production is aimed at a known or unknown customer** (market). Also, a known customer can be the end consumer (a consumer for whom custom furniture is produced) or a contracting company (a company which outsources production to another company).

- In the case of a known customer, the value added to the upstream and downstream parts of the chain is lower, as investments in market research, product design and development, storage, distribution and marketing are lower or completely absent.
- In the case of production for unknown customer (i.e. market), the first step towards maximizing value for the producer is to identify customer preferences and create products that will satisfy their taste and needs. The main role in this part of the chain is market research and design, but part of the value is created by product versatility, so as to make it functional and lasting. On the other hand, production for the market implies high investments in downstream activities - both in storage, transport and distribution, as well as in marketing activities. In terms of advertising, branding and selection of sales channels often brings most value for producers who independently sell their products on the market, i.e. under own brand. Adding value to such producers could be presented as a "Curve", where the highest added value is created in the beginning and end of the chain, and the lowest at the central (production) part.

How much difference can design, producer's image, and distribution channel make in terms of price (in higher price segments, price ranges are greater), is shown in *Figure 6*.

Figure W&F 6. Price segments – large differences in prices for similar products

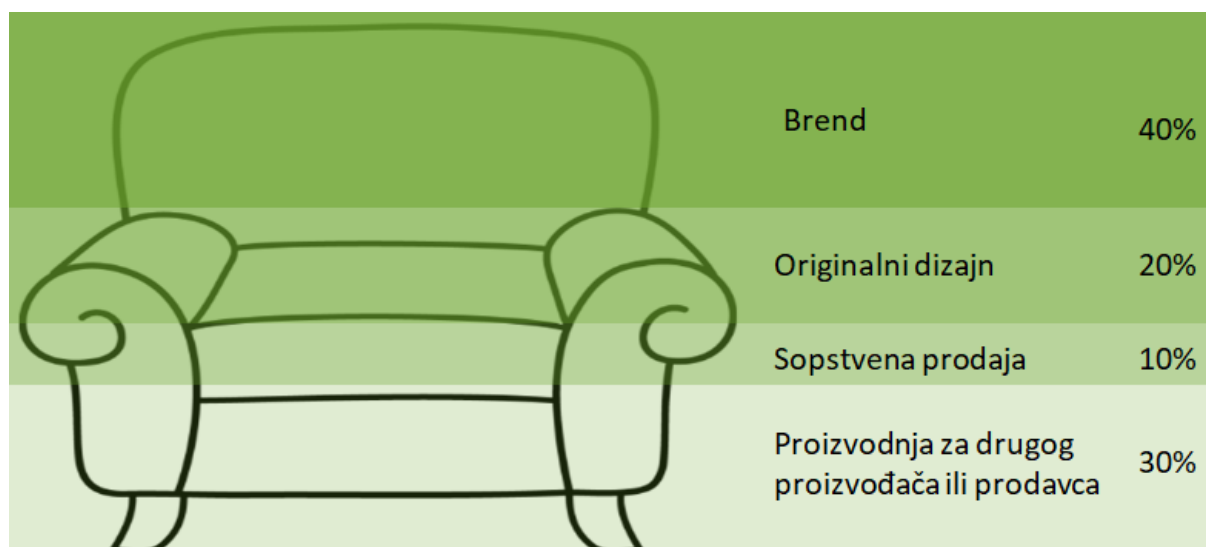


Source: Internet search

In the Serbian furniture sector, **upstream and downstream activities are not sufficiently developed**, while developed EU countries place main focus of these activities. The reasons why Serbian furniture producers do not invest enough in upstream and downstream activities are the lack of financial resources and the lack of awareness about the importance of design and marketing. Even if they do pay attention to these activities, Serbian companies are more likely to decide to carry them out "on their own", regardless of the quality they provide. Company owners rarely decide to let things done by others, no matter how specialized other companies are, such as design studios or marketing agencies. On the other hand, producers from countries which are known in the world of furniture (e.g. Italy and Denmark) invest heavily in upstream and downstream activities, which in turn contribute to the "branding" of these countries and positioning on the global scene as furniture manufacturing countries.

Although most of furniture products placed on domestic market are advertised under own brand, **a significant share of the export is realized by working for others' brands**. This is especially the case with the production of solid wood furniture where some of the largest exporters are producers for foreign brands (Gir and Kolarević companies). These producers create most of their value in production, and almost completely ignore values added by upstream and downstream activities. This means that they fail to achieve an average of 30-70% of product sales price abroad, since price of a piece of furniture of a known brand is formed as follows: production costs can participate with about 30%, own sales 10%, design 20% and a brand with 40% (Figure 7). Furniture production worldwide is distributed so that the upstream and downstream parts of the chain are located "close to the customer", since these activities require two-way communication with the customer (market), because their effectiveness produces the added value. On the other hand, product chains do not have to be close to the customer, and they are often located in countries where production know-how is available at relatively lower costs.

Figure W&F 7. Sale price structure of a piece of known furniture brand



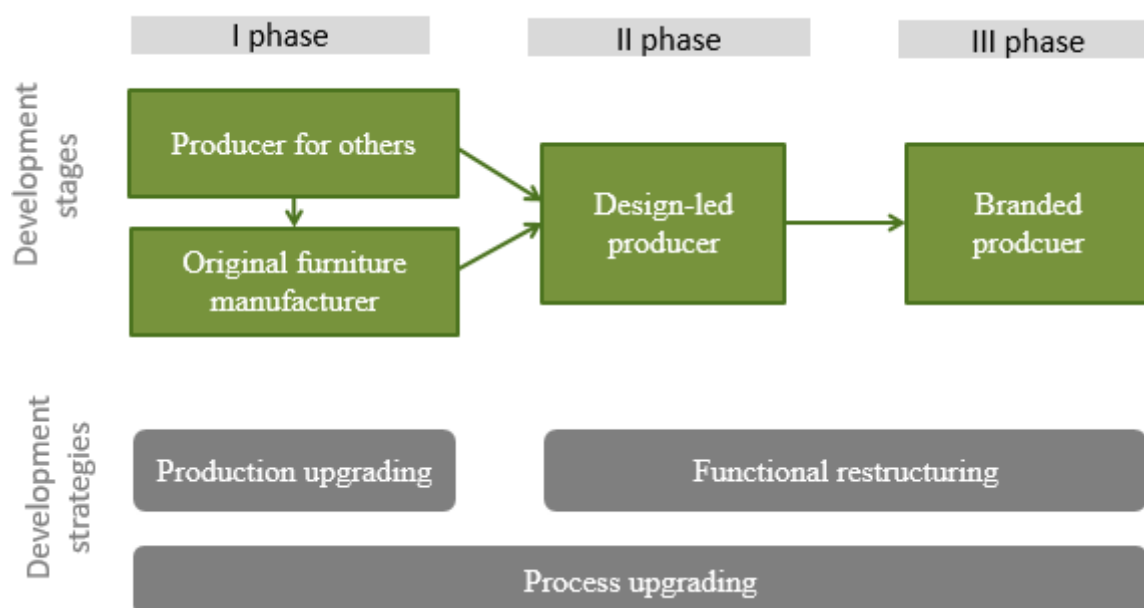
Brand/Original Design/Own Sales/Production for Other Manufacturer or Seller

Furniture sector development can be defined as a process with three phases<sup>14</sup> (Figure 7) and our analysis indicates that the **Serbian furniture sector is at the brink of the second phase**. The development path shown in Figure 8 is a somewhat simplified illustration of the value chain. Furniture manufacturers in Serbia have “conquered” *production*, whether they are producing under their own or a third-party brand, but few of them can be considered *design-led* manufacturers (so-called original design manufacturers), while almost none can be considered *brand name* manufacturers (so-called original brand manufacturers), recognized on the international market, as is the case with the Bosnian brands Artisan and Gazzda. Of course, certain manufacturers from Serbia are selling their products on most developed foreign markets under their own brand (e.g. Jela jagodina and Lotus Divani, while one of the interviewed manufacturers even has a brand showroom abroad -Kolarević), but they cannot be considered brand-name manufacturers who have conquered the third phase of the development path. In addition, even though production can be considered “conquered” at the global sector level, many manufacturers still have a lot of room for improvement in production itself, by increasing the productivity of their work force and their machine fleet. To move on to later phases of development, a functional restructuring is necessary, primarily in terms of increasing the share of design and marketing in the creation of value. This functional restructuring can unfold internally, in companies, but also at the sector level, by providing external support to companies or by providing these services as outsourced. Finally, regardless of the development phase, companies must continually improve their processes in order for their development to progress to higher stages. This is especially important if moving from entrepreneur to corporate form, or in case of a larger increase of sales.

<sup>14</sup> The Global Wood Furniture Value Chain: What Prospects for Upgrading by Developing Countries (2003), United Nations Industrial Development Organization



Figure W&F 8. Corporate development path - phases of development and development strategies



## Structure and Performance

In Serbia, like elsewhere in the world, furniture production in Serbia is a predominantly **locally oriented sector**. Exports of wood furniture accounts for 34% of the Serbia's total wood furniture production (as seen above, the global average is 35%). Namely, out of the 25 top furniture exporters (as mentioned earlier), 15 are among the 25 largest companies (in terms of the amounts of operating revenues). This information indicates that many of the significant number of largest producers generate most of their revenue in the domestic market. Specifically, the average share of exports as part of revenues of 25 largest producers is 38.6%, while the average share of exports as part of revenues of 25 largest exporters of furniture is 53.6%.

Wood furniture sector is **quite diversified**. Products with diverse functions are represented (for kitchens, bedrooms, dining rooms, living rooms, offices etc), they are being exported to 58 markets (of which 99% is fairly evenly distributed among the 25 largest markets) and there are no dominant players (the largest exporter, Forma Ideale, has an export share of 16%). Moreover, the sector is comprised of a large number of small and micro companies, unrelated and fairly independent. Still, despite the diversification and disintegration, there is certain grouping, which is related to the small size of the companies in this sector.

**Export is mostly driven by larger companies** (as indicated by the fact that only 38% of the companies in this sector are exporters and that these create as much as 89% of revenues and 87% of jobs in the sector), **half of products are exported to the region** (while in BH and Croatia this is about 20-25%) **and the dominant products are complete items of furniture**, i.e. few companies specialise in producing parts. The fact that it is the larger companies that create the majority of the export comes from the fact that, due to its physical properties and its



relatively low price, furniture is a type of product for which the transport can only pay off in quantities only larger companies can produce (especially in the lower price segment). As for the strong ties to the region, they are mostly created by the producers of particle board furniture (which is not as developed in the countries in the region), as well as by the companies that used to be state-owned and that are traditionally oriented towards the region (e.g. Simpo). As for parts production, there is an interesting finding that, in the export of Serbian wood furniture, parts take up only 9% while they have a 15% share in the export from BH and 24% in the export from Italy. In absolute terms (measured in kg), Italy's export of ready-to-assemble furniture in parts equals China's export of the same furniture, even though China's total exports of furniture is severaltimes higher. Experts in W&F<sup>15</sup> believe that the specialisation of small Italian producers and production of parts for larger systems were among the key factors in the development and success of the Italian furniture sector. In Serbia, on the other hand, almost a half of the exported components are produced by foreign companies, only three of them at that, with only one of these three specializing in part production. Among the domestic companies, there is only one significant exporter of parts specializing in the production of components for a foreign partner. There are several reasons for such low specialisation and the fact that the majority of manufacturers produce final products. First, in order to be able to make a living from parts production, serious production capacities and high production capacity are needed, which means modern technology, good management, economy of scales etc. Domestic producers are small and, for the most part, financially limited, so they don't have the capacities needed for such significant investments. Secondly, specialisation in parts production requires committed cooperation and strong ties between different producers, both on the national and on the international market. On the national market, this means that there must be a relationship of trust, both between manufacturers and between manufacturers and institutions, which is generally often lacking. There is a prevalent culture of avoiding payments and performance guarantees for contracts are low. The decision to become dependent on one or several other producers on the domestic market (compared to sale to a large number of final buyers) is a fairly risky strategy. On the other hand, networking with foreign buyers requires contacts abroad and the ability to identify potential clients, but also production capacities that can meet the needs of foreign clients which usually exceed those of domestic clients. In addition, one has to be ready to depend on the foreign client (usually one, exactly because of the capacities). Finally, specialisation in part production means greater focus on quality, greater investment into quality assurance and proof thereof, as well as adherence to stricter quality regulations as the buyer, in this case, is an informed byer (furniture manufacturer) and not an uninformed buyer such as the buyer of final furniture (e.g. households).

**The sole supplier of IKEA from Serbia is a foreign -owned company manufacturing products with low added value**

Aiming to include producers from the countries of South-East Europe, which are competitive with their price, in their value chain, IKEA established its procurement centre for this part of Europe in Belgrade about 10 years ago. However, even with multiple attempts to include products from Serbia into its chain, it has failed to do so. There were several companies that attempted producing for IKEA, but at present, there is only one manufacturer in Serbia producing for IKEA – a Bosnian-owned company producing rolling pins, chopping boards

<sup>15</sup> Committee for Forestry, Wood Processing, Furniture Industry and paper, Serbian Chamber of Commerce

and furniture elements. The main reason why IKEA failed in finding Serbian suppliers, in the words of our main interlocutor<sup>16</sup>, was the fact that the suppliers that could potentially have the capacity to produce for IKEA (which are few, bearing in mind the capital and capacities needed to supply the largest global player in furniture industry) didn't want to work for IKEA, knowing that this would make them almost exclusively dependent on IKEA and maintain their margin at a very low level. They failed to see that working for IKEA would get them world-leading know-how and efficiency and that in future, they could use these skills to develop their own lines, which would then allow them to secure larger margins for themselves than the competition can (naturally, if they managed to set aside capacities to develop a segment that is not tied to IKEA). Such is the case with a company from Bosnia and Herzegovina – MS&Wood.

MS&Wood manufactures solid wood chairs and is located in Fojnica (BH). The furniture factory was built in 2013 and prior to this, the company was in metal-processing business. That year, the company owner decided he wanted to work for IKEA and learn from it. He invested 2.5 m EUR into the factory, immediately signing a contract with IKEA worth 1.5 m EUR<sup>17</sup> for the production of wooden chairs for the markets of Europe and USA. However, he managed to negotiate in such a way that allowed him not to use all of his capacities for IKEA, so that now, after only four years, MS&Wood has its own furniture line that is sold at a much higher price, with the same maximum efficiency achieved in the production destined for IKEA. Today, the company employs over 200 staff and has the capacity to produce 500,000 chairs and 100,000 tables per year, with the aim of having their capacity exceed 1,000,000 pieces of furniture in 2020.

When it comes to the post-crisis performance (period: 2009-2015), wood furniture sector is getting **gradually internationalized after the crisis**. Namely, observing only the export created by companies registered as furniture manufacturers, which were originally privately-owned (272 of such *exporters* in 2015, out of 713 originally private *producers*), export has been growing by 18% per year, in the post-crisis period. The reason only the companies registered as furniture manufacturers (NACE31) are considered is the fact that this is the sector that is the subject of this analysis, but also the fact that wood furniture export from Serbia is mostly (78%) driven by these companies<sup>18</sup>. By comparison, metal furniture export is almost completely driven by trading companies or companies registered for the production of metal products, with only 15% created by companies registered as furniture manufacturers. On the other hand, we are only looking into originally privately-owned companies, as companies that used to be state-owned are not yet adapted to market-driven operations and they cloud the performance of the sector (the most prominent among these - Simpo - has been decreasing its export by 26% per year in the post-crisis period); Figure 9 shows the transformation of the entire furniture sector, as it is impossible to segregate the companies producing wood furniture in the database of companies).

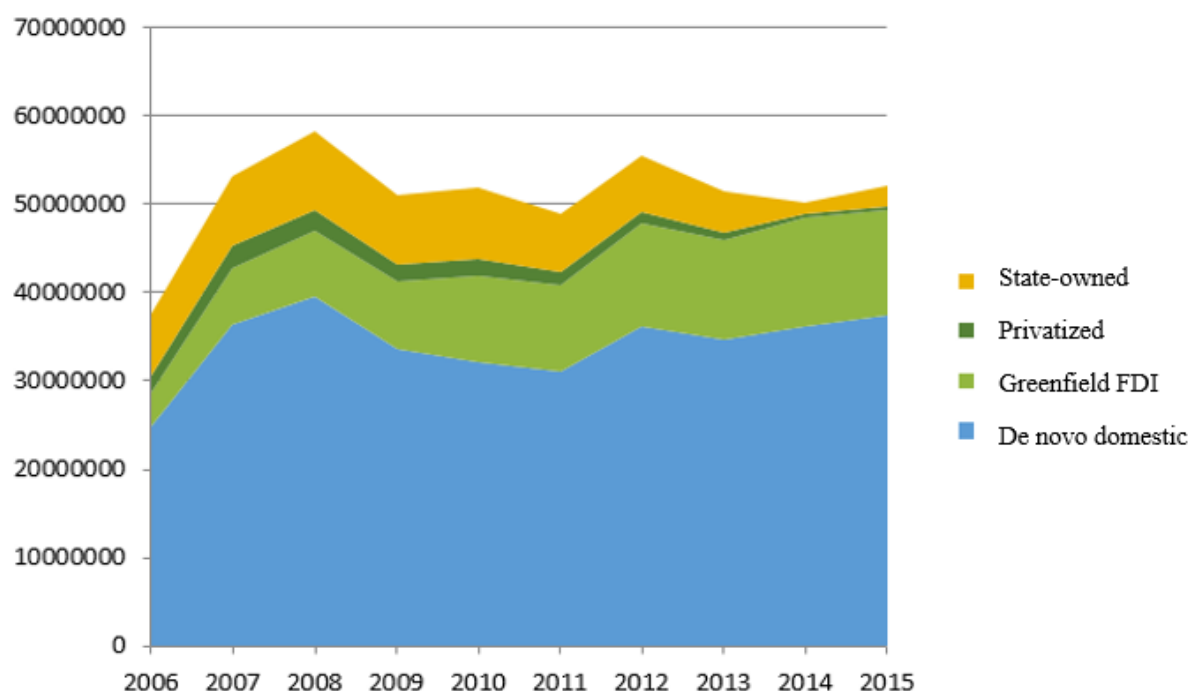
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<sup>16</sup> Senior ekspert Svetske banke.

<sup>17</sup> [www.seenews.com](http://www.seenews.com)

<sup>18</sup> These companies are responsible for the 82% growth of wood furniture export in the post-crisis period.

Figure W&F 9. Sector transformation – Operating revenues (000RSD, constant prices 2015)



#### SIMPO – once the brightest star in the sector, today a „mixed“ performance

Simpo used to be the main and almost sole true representative of the furniture sector in Serbia. However, its revenues today amount to a mere 29% of the revenues generated in 2009 and the number of employees is lowered by 54% compared to that year. Export activities have particularly been decreased<sup>19</sup>, which is partly the consequence of the fact that the markets Simpo exported to were dominantly the markets of the region and Russia, which have all been falling in recent years. The largest drop for Simpo was in 2014, but it has been slowly recovering since. In 2017, Simpo presented 31 new items of furniture and they are conquering some new European markets. In addition, despite the fall in the post-crisis period, Simpo is still one of the largest suppliers on the domestic market. They are known for their upholstered furniture, but also their mattresses which won them recognition among domestic buyers, despite the presence of companies specialising solely in mattresses. On the other hand, Simpo's particle-board furniture segment and upholstery segment are not performing as well, as their equipment in this segment is obsolete and insufficiently productive.

Although the links with the region are still strong (50% of export goes to eight neighbouring countries), there is a **trend of gradually increasing the orientation towards the developed EU countries**. Table 8 shows wood furniture export to 25 of the largest export markets<sup>20</sup>, absorbing 99% of the export from this furniture category. In the post-crisis period, export to non-neighbouring EU countries (developed EU countries) has increased almost five-fold compared to the increase of export to neighbouring countries, thus contributing to the overall

<sup>19</sup> Simpo's export in 2015 is 82% lower than in 2015 and 84% lower than in 2008.

<sup>20</sup> Of the 25 largest export markets, 8 are neighboring countries (ranked by export value: Romania, Montenegro, BH, Croatia, Macedonia, Slovenia, Bulgaria, Hungary), 14 are developed EU countries excluding neighboring countries (by export value, Belgium, Germany, Italy, France, Switzerland, Austria, UK, Greece, Denmark, Czech Republic, the Netherlands, Norway, Lithuania, Sweden); and 3 are remote countries (Russia, Kazakhstan and USA).

furniture export growth with 47%, compared to the export to neighbouring countries which contributed 23%. Such a structure of performance is due to certain FDIs (primarily, Diva Divani, Mobilturi, and Ergomade) and new privately owned domestic companies (primarily, Enterijer Janković, Gir, and Kolarević), which strongly increased their export to the most developed EU countries, but also due to the collapse of Simpo, whose export was mostly linked to the region (BH, Macedonia, Montenegro...). Still, in both groups of countries, Serbian furniture producers have increased their export, even though the neighbouring countries *decreased* their total furniture import and developed EU countries increased it only slightly. Namely, Serbian furniture producers have increased their export by increasing the export market share (the so-called competitiveness effect<sup>21</sup>). The main competitors on the markets of neighbouring countries are: Poland, Italy, Slovenia, BH, Germany and China (Serbia is 2nd-3rd largest supplier on these markets), while the main competitors on the markets of developed EU countries are Germany, Italy, Poland, China and France (on average, Serbia is ranked as the 20th supplier in these markets - e.g., in Belgium in Italy it is ranked as 11th and 17th, while in Germany and France it is ranked as 28th and 32nd)..

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<sup>21</sup>Constant market share analysis or trade share analysis is an intuitive and simple method of analysing the competitiveness of the overall export of a country, or groups or subgroups of products within this overall export. The method assumes that the product is competitive on a market if its share on that market is increasing, and vice versa if it is decreasing. The product's competitiveness effect on that market is calculated as the difference between the export achieved and the export that would be achieved if the share of the product's export in the overall import of that product into the observed country remained the same. Overall competitiveness effect in the export of a certain product is calculated as the sum of competitiveness effects on all markets that product is exported to and can be either positive or negative. It is obvious that this sum does not only depend on the export growth rate, but also on the market structure – whether it is being exported to faster- or slower-growing markets. High competitiveness effect rates should be interpreted with care, being that, as a rule, they will be higher in those places where the baseline is lower. In addition, if the export product's manufacturing has moved, “conquering market share” pertains to the country receiving the investment, but not to the product that could be taking up the same market share throughout this time.

Table W&F 8. Wood furniture export - 25 largest export markets by groups

	Total (Worldwide)	Neighboring countries (8 countries)	EU (14 countries)	Russia and Kazakhstan	USA
	135,511.375 EUR				
Serbian export (2015/14) -- share	100.0	49.4	42.1	6.7	0.2
% of Serbian export growth (2015/14 - 2010/09)	83.2	33.7	154.4	431.7	788.5
Contribution to the growth of total Serbian export compared to 2010/09	83	23	47	10	0
Serbian competitiveness effect (2015/14 - 2010/09) -- share	100.0	31.0	54.8	11.9	0.3
Export growth thanks to CE	92.9	105.2	90.4	91.6	93.2
% of overall import growth of the target country (2015/14 - 2010/09)	20.1	-12.7	3.7	28.2	33.2

To better understand which companies drive the growth of the wood furniture sector and which are penetrating foreign markets and *why*, we took a sample of companies which we classified, based on our Internet research, by type of furniture (particle board, upholstered and solid wood furniture). This classification cannot be made using statistical data and it is important for the understanding of this sector, as different types of furniture have not only different production technology, but also show different market segmentation, i.e. have a different price-quality-design ratio. The sampling was performed by selecting, among all active originally privately owned companies registered for furniture production (713<sup>22</sup> of them), 300 companies that meet one of the following criteria: their export accounts for more than 50% of their revenues (90 companies); companies with a smaller share of export in their revenues but with significant revenues or value added (120); but also companies which are not as significant, but have increased their revenues in the post-crisis period (90). However, out of the 300 companies, 117 do not have a website, or the website is not functional (which reflects the level of investment of these companies into marketing activities, even if these are successful companies considering the selection criteria), while for some companies that did have a website it was found that they trade or produce other types of furniture in addition to the wood furniture, and there were some that also produced other products regardless of being registered as furniture producers. Thus, the final sample comprised 165 companies, of which 125 were exporters and 40 were not. Even though the sample comprises 23% of the companies in the sector (165 out of 713), they account for the majority of the sector's activity - 82% of revenues and 90% of export. The companies in the sample were classified into three groups, according to their dominant type of production: particle board furniture (80 companies), solid wood furniture (46 companies) and upholstered furniture (39 companies).

The sample showed that **all three types of production are very well represented in Serbia**. Still, the majority of companies produce particle-board furniture (80 out of 165), which is in line with the anecdotal information that Serbia is the leader in the production of particleboard furniture in the region. These companies create the highest revenues, employment and export in the sector, even though their export share is the lowest. Producers of particleboard furniture place only 28% of their production on foreign markets, due to the physical properties of this type of furniture (large size, made to order), but also a lower price which cannot tolerate long transport. On the other hand, upholstered furniture is equally distributed on domestic and foreign markets, while the solid wood furniture is dominantly exported (65%), as was expected. This is furniture of the higher price range, which attracts more buyers abroad than on the domestic market.

<sup>22</sup>Only one company is registered for construction, but is essentially a solid wood furniture producer and a significant player in this segment, so it was added to the group.

Regardless of technology and the price point, all three types of producers have enjoyed an intense export growth in the post-crisis period. Average annual export growth rate in all three types exceeded 20%. The largest export growth (but also largest revenue and employment growth) was in the upholstered furniture segment, but the majority of this growth can be attributed to a large FDI - Italian company Diva Divani. On the other hand, the particleboard and solid wood furniture segments have based almost their entire export growth on internationalisation of domestic companies which, following the crisis, tried to compensate for the low domestic market activity by turning to the foreign markets.

A detailed analysis of export performances shows that export growth **was diverse, not just by type of production, but also by type of product, companies and export markets**. As for the products, the largest contributors to the growth were dining and living room furniture, bedroom furniture, upholstered wooden seats, furniture parts and kitchen furniture. Companies with the largest contribution to export were the domestic companies (Forma Ideale, Gir, Enterijer Janković, Matis, Rimako, Jela Jagodina), but a few FDIs after 2009 are also responsible for a significant part of the growth; these are: Diva Divani (Italy), Mobilturi (Italy) and Ergomade (Denmark). As for the markets, export grew in almost all significant export markets, mostly based on taking the market over from competitors. The ten most significant export markets, responsible for growth in export following the crisis, are: Romania, Belgium, Austria, the Netherlands, Germany, France, Italy, Russia, United Kingdom and Switzerland. In the post-crisis period, Serbia increased its wood furniture export to these countries by 16% annually (i.e. 27%, if only originally privately-owned companies are observed), while these countries increased their import by only 3.5% per year. The only country that had a similar level of export to these markets in 2009 (about 29 million EUR) and managed to increase its export faster than Serbia was Belarus, which increased its export by as much as 37% per year. Other countries that had a similar presence at the aforementioned markets in 2009 accelerated their export at a slower rate than Serbia (Bulgaria and Ukraine by 13% per year, Estonia and Latvia by 11% each), or even reduced it (Finland by 10% per year, Russia by 12%). Of the former Yugoslav countries, the largest direct competitors of Serbia on the aforementioned markets are BH, Croatia and Slovenia. The export of these countries to the aforementioned 10 EU countries in 2009 was several times higher than Serbia's, but in the post-crisis period, the growth of their export was not as fast, i.e. it decreased. BH increased its export by 10% and Slovenia by 0.7%, while Croatia decreased its export by 3.3% (Table 9). When it comes to products, the export of Serbian furniture producers to the 10 observed EU markets accelerated the most in the segment of bedroom furniture and kitchen furniture (over 33% per year), with the growth in the former category being attributed exclusively to the domestic companies (Matis, Rimako, Jela Jagodina), while the growth in the latter was predominantly due to an Italian FDI (Mobilturi). Living and dining room furniture also marked above-average export growth, mostly in the particleboard category (Forma Ideale, mostly exporting to Romania), but also in the solid wood segment (GIR and Enterijer Janković, exporting to developed countries). Import in the 10 most significant EU markets grew the most in these three product categories, which means that Serbian producers chose well which categories of furniture to export to these markets.

Table W&F 9. Exports of selected countries into the Top 10<sup>23</sup> EU markets that were most significant for the growth of exports of the Serbian W&F sector (EUR)

	2009	2015	CAGR 15/09
Belarus	28.926.030	191.730.099	37,1
Macedonia	1.565.816	9.330.167	34,6
Serbia	28.671.344	71.597.022	16,5
Bulgaria	39.304.318	82.105.159	13,1
Ukraine	49.850.821	103.591.511	13,0
Portugal	118.896.954	241.993.876	12,6
Estonia	36.667.011	70.873.166	11,6
Latvia	35.332.955	66.820.460	11,2
Should	64.598.980	116.495.782	10,3
Czech Republic	169.746.574	272.096.577	8,2
USA	37.215.470	59.371.530	8,1
Lithuania	216.252.362	336.508.433	7,6
Romania	459.042.562	684.288.195	6,9
Slovakia	298.907.376	331.675.632	1,7
Slovenia	118.993.532	124.251.879	0,7
Croatia	55.113.440	44.939.176	-3,3
Finland	26.423.238	17.137.058	-7,0
Russia	39.359.368	23.072.236	-8,5

Source: UN Comtrade

## Market Segmentation and Key Success Factors

Despite the diversification of export, it is clear that the Serbian furniture industry is mainly positioned on the market segment: **“low price - good quality - undeveloped design”**. However, there is a certain grouping, depending on the production type (Figure 10):

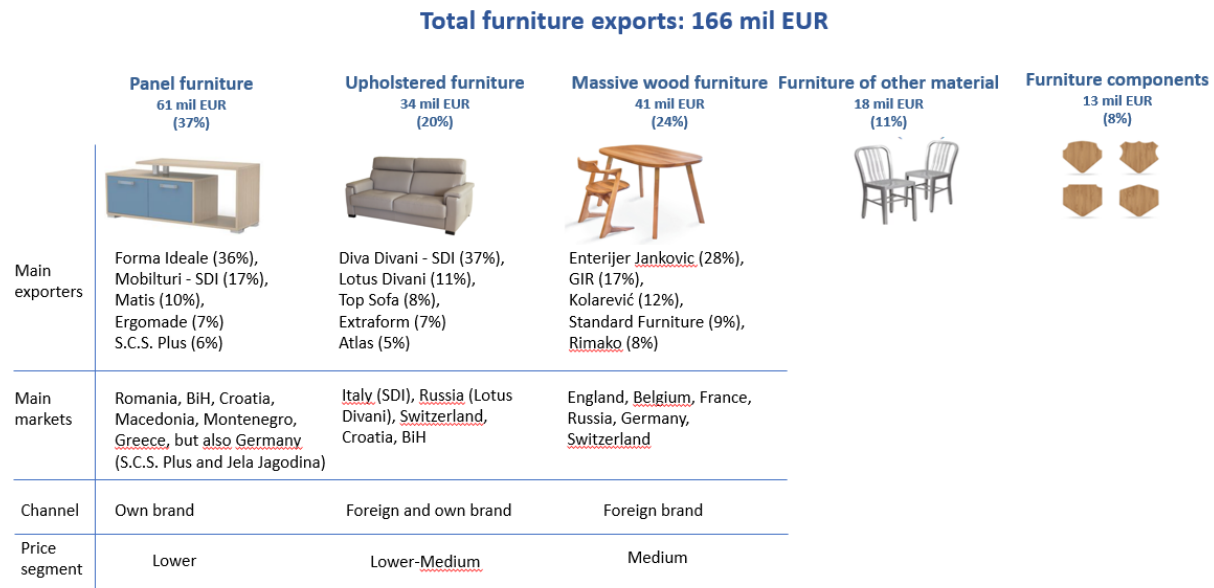
- Particleboard furniture is mostly exported to the region and is at a lower price range, but under the producer's own brand

<sup>23</sup>Romania, Belgium, Austria, the Netherlands, Germany, France, Italy, Russia, the United Kingdom and Switzerland

<sup>12</sup> The state-owned companies have been initially excluded for Serbia because they are not accommodated to the market assumptions of business and therefore blur the comparison of the sector with other countries.

- Upholstered furniture is almost equally exported to the region and to the developed countries, but it depends on the exporter (export to the developed countries is mostly attributable to the FDIs)
- Solid wood furniture is exported to the developed countries, in the medium price range, but mostly through third party brands.

Figure W&F 10. Market segmentation by type of furniture



Source: SORS and interviews

**Key factor in the positioning of the Serbian furniture industry is, without a doubt, the low labour costs** that allow Serbian furniture, with its solid quality (based on the inherited know-how) and a „not-so-original“ design, to position itself predominantly in the lower, or lower-middle price segment. Reasons:

- *Low labour costs compared to European countries, including the new member countries.*
- *Experience and tradition in manufacture (high know-how), but also lack of experience in design and management (especially in terms of marketing and branding).* This, again, is partially a consequence of heritage (in the former state-owned sector, these skills were not developed) and partially due to the fact that these skills could not be acquired in Serbia, in recent history.
- *Serbia's poor reputation among buyers shopping for products in the higher price range.*

Since the furniture production sector is labour-intensive (labour costs take up 26%), labour price plays a major role in competitiveness. Table 10 shows that the price of labour in Serbia, among the potential competitors, is low (higher only than Bulgaria's). However, productivity is also low. Still, bearing in mind that the productivity is not that much lower than in other countries, compared to the differences in labour price, the value-added to cost-per-worker ratio is still relatively favourable.



However, even with this fact, furniture manufacturers in Serbia emphasize that they often can't compete in price with manufacturers from Poland, Romania, Lithuania etc. First, although the labour price in Serbia is lower, the problem is that productivity is significantly lower, too. Dominant reasons for this lie in the **limitations decreasing production productivity**:

- Limited labour distribution, i.e. lack of specialisation: production of every part in relatively small series leads to decreased productivity and quality of work in every activity.
- Obsolete machines; non-optimal use of resources;
- Inadequate process and business management.

*Table 10. Labour costs, productivity and competitiveness of the furniture sector in Serbia and selected countries*

	Number of companies	Number of employees	Number of employees per company	Expenditure s per employee (EUR)	Added value per employee (EUR)	Value added / Expenditure (per employee)
Bulgaria	2.132	21.938	10	3.282	5.985	1,82
Poland	14.802	161.187	11	8.593	14.765	1,72
Romania	3.347	61.504	18	5.154	8.292	1,61
Czech Republic	6.783	25.972	4	8.836	14.211	1,61
Lithuania	1.869	27.112	15	8.616	13.415	1,56
Serbia*	739	9.822	13	5.875	8.952	1,52
Croatia	949	9.721	10	8.384	12.221	1,46
Italy	18.130	136.185	8	26.977	38.767	1,44
Hungary	2.456	16.627	7	7.428	10.615	1,43
Slovenia	1.114	4.380	4	14.795	20.982	1,42
Denmark	473	10.804	23	42.817	59.978	1,40
Portugal	4.489	28.873	6	11.218	15.624	1,39
Bosnia and Herzegovina	411	9.819	24	4.960	6.732	1,36
Germany	11.053	142.679	13	36.152	47.880	1,32
Slovakia	1.327	14.904	11	11.044	12.191	1,10
France	9.224	49.994	5	39.135	42.671	1,09

*Source: SBS (SORS and Eurostat)*

There are three **key obstacles to further development and competitiveness of the sector**:

- **Unpredictability and unreliability of the raw wood market in Serbia.** The problem is that the current system of sale of raw wood by state-owned forests is entirely non-transparent. There is no disclosure of the quantities sold, buyers sold to, or the logic used to allocate raw wood to different buyers. In addition, the current system for the sale of raw materials is very unpredictable for companies. Some years the manufacturers get the quantities they ask for, some years not (sometimes not even in comparable proportions), which is a surprise to them, which they cannot properly understand as they don't know who did get the raw materials. In this way, their performance is jeopardized, but also, this fosters a broader mistrust in the raw materials market and other players in the sector.
- **The fact that the sector is comprised of small companies** is another major issue, both because it enhances the effects of the absence of specialisation and because it **increases**

**the costs of materials procurement** (fabric, fibre boards, lumber...). Namely, raw material costs make up 70% and the SMEs, if they don't unite their procurements, cannot ensure the same rebates that are common among their European competitors. In the raw wood segment, this issue has already been mentioned and we return to it in our recommendations, but this is also an issue that is the source of a significant burden on the procurement expenditures of upholstered furniture manufacturers (material costs make up as much as 77%).

- **An almost complete absence of companies specialized in development of the retail function on the domestic market, not even to mention foreign markets.** This means that there are no visible market mediators to support and accelerate the development of manufacturers towards a design-led and brand-led phase. In other words, there is no one who would focus on **the development of skills of knowing your buyer and developing the market**. This is a serious limitation in the further development of this industry, so it can be expected that without narrowly focused interventions, their ascent to the higher phases of development (design-led and brand-led) will still be a spontaneous process.

This analysis leads us to the conclusion that Serbian manufacturers are more competitive on the regional market, or in the lower price range of the EU markets with lower payment abilities, which can tolerate minimal investments into the design and market development, while in more developed markets, which emphasize design and finishing and require investments into branding, they are competitive only if they supply brands that come from the said countries. Still, the future lies in conquering the global market, so it is necessary to ensure the conditions for conquering downstream activities.

What is characteristic of this value chain is the **very low level of development of downstream activities**. This is not surprising, since the furniture manufacturers in Serbia are now only at the beginning of the second development stage shown in Figure 7 (design-led manufacturer). This is understandable since they are, as a rule, SMEs with short histories, that have been established predominantly on the basis of production skills, which are different from the skills needed in the downstream parts of the chain. For instance, integrated approach requires not only furniture-making skills, but also skills of analysing the market prior to entering it (both in terms of demand and in terms of the already existing supply) and the skills of selecting the proper ratio of price-quality-design bearing in mind the *distribution channel*<sup>24</sup>.

On the other hand, those who do know how to select the right ratio may have problems to achieve it, in part due to very limited access to capital for SMEs – a significant amount of investment is needed for market development, design and branding, and in part due to the lack of experienced or at least successful designers and/or marketing experts who could help them move up on the price ladder and reach exclusive retail chains (such as Williams Sonoma) or local showrooms (concept stores).

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<sup>24</sup> For example, to sell in local showrooms, you need to select a price-quality-design ratio that is in line with the particular showroom concept and other producers presented in it.

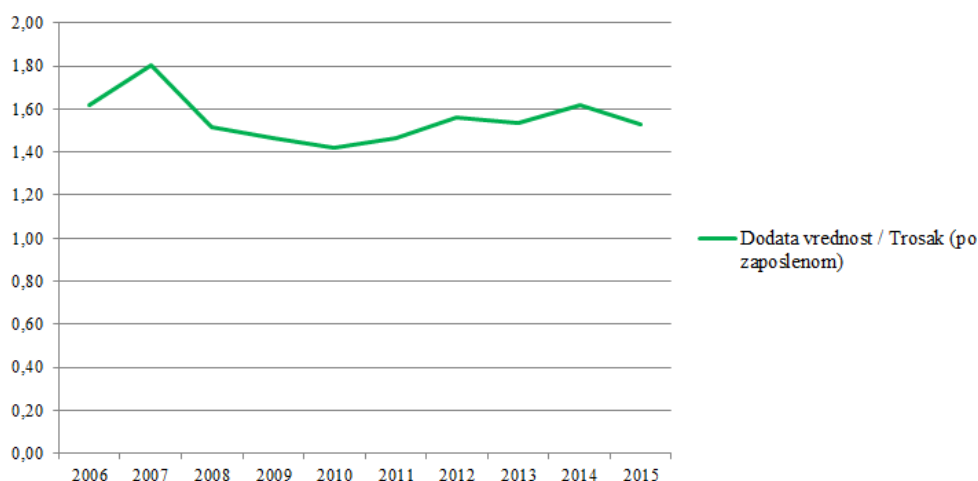
Another open question is how the positioning will proceed in the markets of the countries in the region. This is affected, in part, by the fact that proximity brings down transportation costs; but the dominant factor is that buyer taste/demand (design, price segment, finishing) that the Serbian manufacturers address has already been „conquered“ in the past. The question is, how will this segment of demand develop in line with consumer income growth in these countries.

## Prospects for the W&F Sector and Potential Limitations

Being that, as we have seen, Serbia is building its current competitiveness on the European market thanks to low labour costs and know-how/tradition in production, and that the productivity and development of upstream and downstream activities (design, marketing, distribution channels) are lagging behind European countries, it is necessary to form a view of the direction in which the Serbian furniture sector and the European market are headed, in order to assess its prospects on this market.

On the side of the Serbian furniture sector, the situation is such that the sector is now seeing an increase in labour price in the post-crisis period, but it is also seeing an even faster productivity growth, meaning that the sector is increasing its competitiveness (Figure 11).

*Figure W&F 11. Value-added to expenditure-per-employee ratio (2006-2015)*



Source: SORS

On the side of the European market, there are the following two important trends – import of wooden furniture to EU28 has been growing very slowly, while China is expected to withdraw from the European market. Namely, import of wooden furniture to EU 28 has been growing by 2.8% per year, which is much slower than the import of metal furniture segment (8.5%) and segment of furniture from other materials (7.5%). This means that it is getting more difficult to penetrate the European market with wood furniture. At that, the only type of wooden furniture that has seen a significant increase in demand (almost 8%) are upholstered items (sofas and armchairs), which is a segment in which Serbia has no significant domestic producers penetrating the EU market, excluding two FDIs. Domestic upholstered furniture manufacturers cannot compete, in terms of expenditures, with China, Poland or other countries that have larger manufacturers who can get lower input prices. This is a special competitive edge in the upholstered furniture segment, as raw materials in this segment take up 77% of the overall input

costs, which is the highest relative share among different types of furniture. In addition, the design and finishing that Serbian upholstered furniture manufacturers offer are not well matched to the needs of the buyers in the developed EU countries. On the other hand, what should be a favourable circumstance is the fact that China is expected to withdraw from the European market, as it is turning to meeting its domestic demand, and also bearing in mind the growth of labour costs that has discouraged European brands from moving their production to this remote country. China is currently present in all segments, but a significant withdrawal can be expected in the lower price segments and outsourced operations.

With regards to the aforementioned trends, regarding the Serbian and European sector - the Serbian furniture sector may take two main directions:

1. **Increasing the scale of production with increasing specialisation and more significant investment into capital.** This option would contribute to a higher productivity in the sector and improving the position with regards to the competition in terms of productivity and efficiency, such as Poland and Lithuania. This strategy could lead to an increase in market share on those markets in which Serbian manufacturers are already present under their own brands, as well as on developed markets in which Serbian manufacturers would be selling their furniture under someone else's brand, since this strategy implies the improvement of production capacities and production competitiveness, regardless of the investments in upstream and downstream activities. This would be those segments that China is now retiring from and where there is now a greater space for the entry of South-East European companies. To be prepared for significant efforts into conquering the European market with products with competitive prices, domestic furniture manufacturers would primarily have to invest into the improvement of their machine fleet and in management professionalisation, in order to increase their production capacities, productivity and efficiency. Bearing in mind the current size of the majority of companies in the Serbian furniture sector, there is little room for economies of scale; thus, competitiveness in the procurement of inputs or in the placement of final products would require either expansion of the companies or several smaller companies joining forces. In addition, if association and cooperation among companies were to be easier to achieve (which would require greater trust among the companies and higher security of contract enforcement), companies would be more likely to specialize in the production of certain components which, in turn, would lead to a greater productivity at the level of the entire sector.
2. **Finding niches and greater focus on design and marketing.** This strategy would allow Serbian producers conquering higher price segments and/or achieving a stronger presence at the more demanding markets such as Belgium, Italy, Denmark, the Netherlands, under *own brands*. Even with the labour costs increasing faster than productivity, competitiveness at these markets could be achieved with higher investments into downstream and upstream activities. By adapting design to the taste of buyers from developed countries and/or buyers in higher price segments, as well as through increased investments into marketing, distribution and branding, domestic manufacturers could increase their market shares on the aforementioned markets even with their existing production capacities. For small series or individual production,

lower production process productivity would be annulled by the lower labour costs, especially bearing in mind that labour costs in the upstream and downstream parts of the chain are even lower in Serbia than the labour price in the production part of the chain.

Unrelated to the option that any individual producer chooses, the **three key limitations** that may stand in the way of a stronger penetration on the European market are:

- a) Raw wood
- b) Know-how and human resources
- c) Capital

Issues in acquiring the **raw wood** which the furniture producers (and producers of other wood products) currently face suggest that this input may represent one of the significant problems faced when attempting a stronger European market penetration. Producers emphasize that the biggest issue with raw wood acquisition is unpredictability, which prevents production planning. On one hand, furniture producers claim that it is becoming increasingly difficult to acquire raw wood from abroad, being that certain countries (especially those from the region, from which the majority of the material is imported, such as BH and Croatia) are limiting their export of raw wood. On the other hand, acquisition of the raw material on the domestic market is unpredictable in terms of quantity, price and quality alike. Whether acquired from state-owned or privately-owned forests, manufacturers are often unsure whether they will be able to procure the raw material of adequate quality, in the required amount, at a competitive price. First, they often have to procure raw materials in several iterations or from several sources, increasing transaction costs and decreasing their competitiveness in terms of *price*. Second, discrepancies in *quality* can have an impact on the credibility among buyers and on delays in delivery, if new procurements of raw materials are necessary. At that, wood coming from privately-owned forests does not come with a certificate of sustainable forest management (FSC or PEFC) which is increasingly being demanded by the developed European countries. Finally, issues in procuring the necessary *quantity* of the raw material can potentially be the largest obstacle to a more significant European market penetration, since that would take a more significant quantity of raw wood (especially if option no. 1 is chosen) and bearing in mind the frequency of the problem of supply unpredictability (especially when it comes to procurement from state-owned forests). Namely, even though there are criteria for distribution of raw materials originating from state-owned forests among buyers, they are not enforced, leading to the raw material often ending up in the hands of those who do not produce a high value out of it (e.g. saw mills that export it in the form of raw planks), even if there is a demand by those that would be able to give it a higher value added and are prepared to pay more for it. At that, the price is determined as a monopoly, instead of being formulated based on production costs and having the proposed price subject to consent from the Forestry Directorate.

**Know-how and human resources**, as the second most important input, in addition to the raw wood, can represent a major issue not just in the short-term, but also in the long-term. The issue cannot be resolved as quickly as the issue with raw wood, as it takes time to build the necessary workforce (through schooling and practice) and accumulate the adequate know-how. There is already a lack of professional staff with secondary education (craftsmen), so it is practically impossible to achieve a significant increase in production in the short-term. The issue of the lack of craftsmen (especially upholsterers and carpenters) is the issue that producers emphasize

as the key obstacle to growth. Also, there is an issue with the lack of practical skills in those fresh out of secondary school, their induction takes significant amount of time and resources. On the other hand, there is an issue with the highly qualified labour as well, but the issue is rather quality than quantity. Even though there is sufficient interest among the youth for education in the fields of design, engineering, marketing and management, these profiles are not getting the appropriate education and have no chance of getting the practical experience which would be in line with the experience that can be gained in developed European countries. With regards to that, in order to conquer the market of these countries (especially if choosing option no 2), the lack of *experienced* designers, engineers and marketing and management experts (especially art and brand managers, but also production managers) could represent a major problem. The greatest issue with designers is the lack of knowledge in production and calculation of costs, leading them to produce “unrealistic” designer solutions that are either physically unfeasible or come at a non-competitive cost.

Another problem in trying to penetrate European markets can also come from the insufficient contact of Serbian companies with world trends, meaning that their design solutions are often dated. As for engineers, the largest issue is the lack of knowledge and experience in organising operations and managing processes, especially in large systems. W&F sector, like most of other sectors in Serbia, has been affected by the general lack of entrepreneurial, management and marketing skills. To establish new companies that would fill niches already existent in the European demand, first and foremost, we need entrepreneurs who wish to initiate the cooperation between designer, manager, marketing and artisan skills. The sooner we build these skills, the sooner we support entrepreneurs with the initiative to unite these profiles of professionals, the greater the share in value we can get at the European market, as the highly qualified professional labour (designers and engineers) is currently relatively cheaper in Serbia than the craftsmen labour.

Finally, significant **capital** is also needed for a more significant European market penetration. Being that furniture, as a low-profit sector, cannot tolerate higher transport costs, export usually requires larger quantities and greater productivity. Therefore, capital is needed, first and foremost, for capital investments, i.e. investments into machine fleet and production technology upgrades (especially for option 1). However, significant funds are also required to provide sufficient turnover funds, to hire highly skilled professionals (in management, marketing, design...) and to meet the required quantities - e.g. there are domestic companies that managed to exhibit at foreign fairs, but failed to produce and deliver the orders that they would receive after these fairs. Example from BH shows that capital and financial support are important - as BH has several recognizable furniture brands at the moment (while Serbia has none). Naturally, other factors played into the BH success, such as copious and high quality raw wood, tradition and know-how in furniture production and entrepreneurial spirit, but what was equally important was the fact that significant international support and subsidies were granted to this country, without which individual entrepreneurial initiatives would not have been able to grow into brands.

## Recommendations

### ➤ **A set of measures for ensuring quality and stability in the procurement of wood raw materials**

As wood raw material represents the most significant input for the entire W&F sector, which can be processed into different products with manifold higher value added, it is necessary to provide predictability in terms of price, quality and quantity. Three measures are crucial here:

- *Increase of transparency, predictability and credibility of the procurement system of raw wood from state-owned forests.*
  - First and most importantly, it is necessary to establish market transparency on the raw woodmarket *by publicly disclosing information on which companies got the raw materials, in which quantities and according to which criteria.* This would allow companies to better understand their competition and draw conclusions on their relative positions on the raw materials market; on the other hand, state-owned forests would be under the public eye and would have to meet the established criteria for raw material allocation. This measure would thus help increase the predictability of raw wood procurement, which is important for companies so that they can plan their operation.
  - Secondly, *available quantities of raw wood should be identified and publicly disclosed at an annual level.* This is another measure contributing to the transparency and predictability of the raw wood procurement system, as well as to the sustainability of raw materials procurement. Public disclosure of the quantities available in several upcoming years would allow companies to plan their production and procurement and it would allow state-owned forests to plan their operation.
  - Third, *an option of negotiating for several years in advance needs to be introduced, but only for a predetermined, fixed part of the totally available raw wood.* Only a certain quantity of the totally available raw wood would be sold through this kind of sale every year (e.g. 25%), so that the remainder would be available for new sales. At that, domestic and foreign manufacturers should be treated equally. This measure would contribute to raw material supply predictability and allow manufacturers to plan their production in medium term.
  - Finally, it would be preferable if the *entire existing model of selling raw wood was to be reconsidered*, but this would take additional research, to ensure that the design of the new model suits all stakeholders. Namely, from the view point of meeting industrial policy objectives, it would be optimal to know the price of the wood materials in the domestic market, if they are offered for transparent and carefully designed tendering, and then to additionally encourage an increase in adding value in the country through specific incentives. In this way, stability and transparency of wood production and use would be separated from other needs and objectives. The new system would mean the sale of raw wood in line with market principles, by tender or auction. Sale by market principles would allow for the „detection“ of the true price of raw wood which would provide a clear view of how that raw material can be valued in the country, which is something that the current concept of price determination does not allow.

- *Encouraging registration, certification and forestation of private forests.* Procurement of wood raw material from private forests is often inefficient, not only because of fragmentation of these forests (small private holdings), but also because of their invisibility. Producers are often not aware that there are private forests in their vicinity, so they get raw materials from forests on distant locations. It is therefore necessary to encourage the registration of private forests and their location on the map. In addition, it is necessary to provide support programs to private forest owners to certify forests, as European countries are increasingly setting up sustainable forest exploitation certificate as a minimum requirement for imports of wood products. For private forests PEFC certification is recommended, since it is adapted to smaller forests in relation to FSC certification. Finally, private forest owners need to be encouraged to perform forestation (i.e. to provide them with adequate support for afforestation) because they often have no motive to cultivate their forests which will be cut down 1-2 generations down the line. It is necessary to raise awareness of the importance of afforestation and benefits for future generations, but also to provide afforestation programs with financial and/or professional assistance by the state.

➤ **A set of measures to increase productivity and competitiveness of the sector's manufacturers**

Key obstacles for the improvement of competitiveness among the W&F sector manufacturers are limitations to increasing productivity (e.g. for investments into new equipment) and small size of companies preventing economy of scale and/or greater negotiating power towards upstream and downstream partners (i.e. negotiating better terms of procurement or sale). In addition, a high level of mistrust and thus lack of association between the stakeholders in the sector lead to a low distribution of labour (and thus low specialisation), which additionally decreases productivity at the sector level. With regards to that, we propose the following types of support:

- *Support for procurement of equipment and modernisation of production capacities in technological terms.* Since the low technological level is one of the main reasons for a lower productivity of Serbian manufacturers, and the main reason for the low levels of technology lies in the lack of financial capacities, companies need to be provided with financial support for the procurement of new or modernisation of the existing equipment. The Republic of Serbia already provides such support (through SDA and Development Fund programmes), but the funds allocated for this support are small and distributed among a large number of companies, so their effect at the sector level is not quite visible. In addition, equipment procurement support programmes implemented by the SDA are limited to small companies, which means that these are smaller investments that represent major steps for these companies, but not necessarily the sector. However, it must be kept in mind that providing larger support to a smaller number of companies could mean an increased risk of incorrect selection. It is therefore important to ensure that the competitions are completely credible so it is our recommendation to include international institutions in the process of their design and implementation, at least at the beginning.
- *Support to cooperation and association of companies in the sector.* Since the small size of the companies in this sector represents another reason for their lower productivity and competitiveness, mutual cooperation of companies should be encouraged. Joint



procurement of inputs, sharing machines that are not used to their full capacity or joint participation on the market are just some of the examples that could significantly improve the competitiveness of the sector's companies. Such association would be especially useful for smaller companies as it would allow them to achieve the benefits of the economy of scale, but it would also be significant for larger companies, especially when they approach developed markets, in which these companies are actually small by global standards. In addition, there is a significant potential that can be put to good use by including smaller companies in the value chains of the larger companies, as this allows larger companies to focus on their „core“ activities and allows smaller companies to learn from larger companies and increase their productivity. The efforts invested thus far in encouraging corporate association in the sector resulted in the establishment of several clusters (of which the most renowned is the Cluster of Woodworkers under the auspices of the Serbian Development Agency), but none of them achieved significant results. Initiative for association has to come from companies themselves and the administration can use appropriate measures to encourage such initiatives. Since incentives achieve the largest effects in areas where there is already a strong interest but the mechanisms or means of realisation are lacking, we would like to emphasize the three most important potential types of incentives:

- Encouraging association in the *procurement of wood raw material*. Bearing in mind the small size of companies, furniture manufacturers mostly fail to procure inputs at competitive prices. It is therefore necessary to design programs for incentivizing joint input procurement, whether from import or on the domestic market. The greatest contribution could come from a measure supporting association of small manufacturers when procuring lumber from saw mills. Since the interest of saw mills is to be paid in advance and to sell large quantities of lumber at once (due to transaction costs), they often sell their lumber to foreign buyers with larger capacity, both for advance payments and for procuring larger quantities. So, we propose that the administration design a measure to ensure support to furniture manufacturers for advance payment of lumber to saw mills. When it comes to smaller manufacturers, their association should be a pre-condition, which would further support this concept and, at the same time, ensure a certain level of mutual responsibility among companies that join forces in a joint contract. We propose that a credible international institution should be involved in the design of the negotiation model, such as USAID, IFC or EBRD.
- Support to association of manufacturers *in placing their goods on the market*. This type of support is significant both in terms of placing their products on domestic and on foreign markets, since costs of sale and distribution are high for small manufacturers and could be significantly lowered through association/clustering.
- As any cooperation has to be based on trust, the administration could incentivise association of companies by increasing security and enforcement *of contractual relations that the manufacturers enter*. Specifically, the administration, in addition to reinforcing the capacities of its institutions, could consider the option of being a majority guarantor during the conclusion of the first contract on cooperation of two

companies. For instance, if the supplier company supplies products of insufficient quality, the administration would bear the majority of that expenditure, as to not let the purchasing company suffer damage, while, at the same time, not penalizing the supplier company since it was its first time at attempting cooperation. Of course, the next time the administration would not support this same company, but they would certainly be left with the financial capacity to try to establish cooperation again, after having learned their lesson from their first attempt. Still, a thorough analysis is needed for the design of such a measure and serious monitoring is required for its implementation, since measures like these are easily corruptible.

➤ **A set of measures for design promotion**

Given the added value that a design can bring to a piece of furniture, as well as the design's effect on the recognition and branding of the entire country's furniture sector, it is necessary to raise awareness of the importance of design and to broaden the understanding of the value it can add. Companies need to be trained on the need for continuous improvement of design and adaptation to trends in order to raise the "culture of design" at the sectoral level. This would also have an indirect effect on domestic buyers, who would, if they saw the design is being raised to a higher level in the entire sector, start to appreciate design, create a sense of aesthetics and finally pay for the visual identity. In this regard, it is possible to take two measures - the first (nonfinancial) being key for the sector as a whole, and the other (financial) is a "transitional" measure that only applies to a limited number of producers..

- *Establishing a national design center.* This could serve not only to raise awareness of the importance of design but also to provide design solutions to companies which cannot afford to engage designers. This center should be connected with all existing design initiatives and centers around the country (fairs, associations, hubs, etc.). It would be possible to establish center branches on local and regional levels with larger presence of producers of furniture and similar products. The center would engage students and / or newly graduated students on a volunteer basis, and expert teams would organize company visits and training on the significance of design, and spread design awareness at the national level. Also, the centers would provide support to producers who have design issues, and these producers would learn to recognize the mistakes they make and next time be more willing to engage designers. This would contribute to higher awareness about the need to invest in design, and facilitate higher employment rate of designers. This could also motivate students and / or newly graduated students to work at such centers on a volunteer basis. Even without a employment potential within these companies, this type of work could provide the students with necessary professional practice (closely related to production and market), which they currently lack in the formal education system. Therefore, creating a Design Center (with branches) would increase the competitiveness of domestic W&F products and enable young designers to gain experience and create potentials for future employment in the field. It is also necessary to consider a roof approach to strengthen – production cooperation. This requires encouraging the cooperation between designers and producers as well as mutual cooperation in defining recognizable design of the Serbian furniture sector
- *Subsidizing design use.* This financial measure should be first applied to companies with production potentials in terms of capacity and production technology, but which cannot

afford a design which would allow them a more penetrating market appearance. A one-time subsidizing investment in design would help these companies improve their performance and rise their capacities and be able to afford own designers in future. At the level of the entire sector, this measure would yield higher awareness on the importance of design and the value it brings, thus raising the readiness to engage professionals for design works, rather than copying design solutions from others.

➤ **Increased workforce availability and quality**

On one hand, the necessary profiles are not passing through the educational system in sufficient numbers and re-qualification from other profiles is difficult as the system lacks flexibility. The problem of the lack of adequate staff is especially emphasized now that the older generations of experienced staff from the traditional system are retiring. On the other hand, even in the case of those profiles that are being schooled in sufficient numbers (or, even in excess numbers, considering the needs of the economy) – e.g. managers and designers, the quality or experience are insufficient. This is because the educational system is not generating professionals of sufficient quality, nor do these professionals have a lot of opportunities to get the necessary experience in practice. If the supply of the labour market does not come to meet the needs of the economy, and the younger generations which should be the pillars of this sector in the future don't get the necessary qualifications, knowledge and skills, the Serbian W&F sector will risk losing one of its most important competitive advantages. Detailed recommendations with regards to workforce are presented in Annex 3, Item 3, since workforce issues haunt other sectors, too. Below we present the problems with availability and quality of workforce which, for a large part – but not completely – pertain to the wood and wood furniture sector, which the companies themselves emphasized as obstacles for their growth.

- In highly educated staff, the greatest limitation is the shortage of *experienced* designers, and there is also an issue of finding experienced engineers and CNC programmers. In addition, designers lack knowledge of production and calculation of costs.
- In terms of skilled workers, the greatest shortage is among carpenters and upholsterers. There is a gap between the older generation, now retiring, and the younger ones which lack practical training.
- In terms of non-qualified workers (NQW), the greatest limitation is mobility. Namely, in some areas, due to engaging in or links to other family activities (primarily agricultural), workers often have a high reservation price. On the other hand, in other areas of Serbia, the reservation price is lower and unemployment higher, but there is no mobility of the workforce, although it would be good, from an economic standpoint, to invest efforts into having the unemployed workforce from one area of the country be the response to a shortage of work force in another area in the country.

# Rubber and Plastics Sector Performance and Value Chain Analysis

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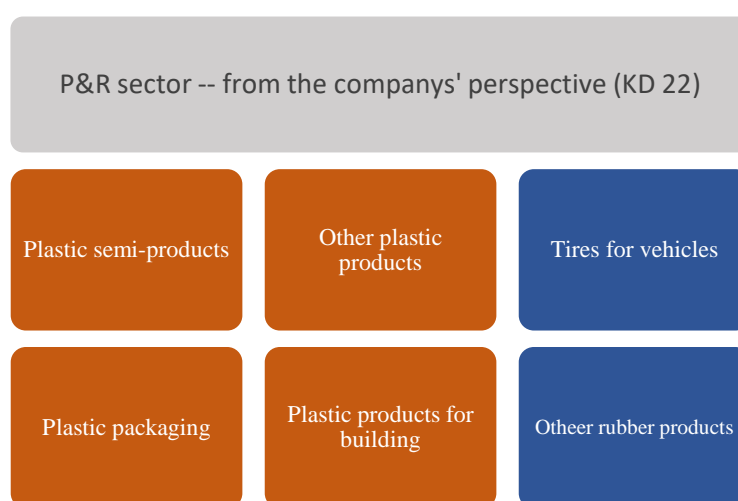
## Summary of the Analysis of the Rubber and Plastics Sector (R&P)

- Under the public radar, the rubber and plastic sector (R&P), led by export-oriented foreign companies – whose growth was accompanied by autochthonous companies – achieved significant growth and demonstrated strong international competitiveness in the post-crisis period. The R&P profiled itself as one of the few sectors of Serbian economy experiencing a dynamic and steady growth of activities, thus becoming one of the most important processing sectors.
- Knowledge and skills available in Serbia at lower cost as compared to European countries, lower energy cost, favorable geopolitical position, as well as some particular production capacities and successful privatization of several former state-owned companies operating today competitively and representing valuable custodians of everything the former sector left – have enabled Serbia, along with new EU members, to benefit from moving their production from developed EU countries to Central and Eastern European countries.
- In view of the high degree of automation and the pronounced serial production, entering the R&P sector requires more intensive capital investments and the further growth and sustainability of competitiveness are primarily dependent on potential new foreign investments. The next lever of growth is the development of domestic autochthonous companies – which is slowly already taking place; these companies may, in cooperation with foreign investors, gradually to turn from local to placements on the international market. Sources of competitiveness in the two mentioned groups of companies differ slightly. Domestic autochthonous private companies are generally competitive when it comes to limited series, custom-made customers coming primarily from the food industry; on the other hand, some of the sectors, making up the FDI, are largely positioned in large-scale production, with pre-defined sales channels.
- It is important for Serbia to support both segments: FDI as a growth locomotive, as well as the domestic SME sector as potential suppliers, stable exporters, and potential bait for new FDIs. Therefore, the two key packages of measures in the R&P sector are in the targeted attraction of new foreign investments and the support to the development of the business of autochthonous companies. Common to both packages of measures is the intention to maintain a positive trend of faster labor productivity growth from average labor costs, through the education of existing and additional staff, and raising knowledge and improving technology in production. Additionally, for autochthonous companies it is of particular importance to strengthen the quality infrastructure, cooperation among companies, investment into functionality and product design, and to adequately promote the Serbian R&P sector.

## Definition and Scope of the R&P Sector

**The rubber and plastic sector (R&P) is a part of the manufacturing industry, producing various finished household products and semi-finished products for other industries.** The common feature of both groups is the use of raw material derived from oil – caoutchouc or polymers. The sector does not include products, which may easily be classified in other industries, such as furniture, suitcases and bags, or footwear production.

*Figure R&P 1. Structure of the sector, according to national classification of economic activities (CA 2010)*



**The rubber sector consists of two sub-sectors:** tires for vehicles and other rubber products.

- **Tires for vehicles** include, on the one hand, the production of all types of pneumatics, new and recycled, which are used by various transport vehicles – passenger cars, trucks, busses, racing cars, motorcycles, bicycles and planes. This sub-sector also covers tire retreading. Tire retreading involves service activities within the scope of the multiple uses of rubber products.
- **Other rubber products** encompass, firstly, all recycled rubber, rubber waste and residues, profiles, strips, bars and rubber plates. In addition, this sub-sector focuses at both pharmaceutical and hygienic rubber packaging – like corks and all other accompanying semi-products used by medicine and pharmacy.

**Plastic sector includes the following sub-sectors:** production of plastic packaging, plastic items for civil-engineering industry, plastic semi-products, and other products.

- **Plastic packaging** includes bulk production of all plastic products used in packaging, transportation and warehousing of various types of goods, mostly food products; this includes all packaging made of various plastic material, as well as small parts rounding up its use such as – stoppers, lids and caps.
- **Plastic semi-products** include different types of sheets, pipes, fittings and profiles for much diversified use.

- **Plastic for civil engineering** includes plastic linoleums and different types of floor coverings.
- **Other plastic products** encompass production of different types of plastic pipes, used in electrical sector, automotive sector, mechanical sector and utility services.

## **The Importance of the R&P Sector**

**With the share of over 8% in gross value added (GVA), the plastic and rubber sector is the second most significant sector of manufacturing industry. It contributes to GVA more than is usual for EU countries.** Given that in no EU Member State the P&R sector does not reach this level of participation (the average is around 4.5%, while only in Poland, Czech Republic and Slovakia it is between 7% and 8%), nor is it among five largest sectors of manufacturing industry (except in Poland and Slovakia), it is clear that the P&R sector in Serbia is more pronounced than in the (new) EU Member States. Having in mind that the importance of the entire manufacturing industry in Serbia (19% GVA) is somewhat higher than in EU countries, the importance of the R&P sector for entire economy is even more pronounced (averaging 1.3% of GDP, while the EU average is around 0.5%). Apart from the high share in GVA, the contribution of the sector is unusually high in exports (7%) and employment (6%) in the manufacturing industry. The sector also has the highest value of revealed comparative advantage in the entire economy (NACE 2 level), which also indicates that, on the global market, Serbia is a more important player in this sector as compared to other sectors.

**The high significance of the R&P sector is also determined by the comparative and competitive advantages of Serbia, which have influenced its faster transformation and a relatively powerful development.** As it will be explained in more detail later, the ratio between costs of key inputs and the productivity of their utilization is more favorable in Serbia than in most of the EU countries. This advantage has attracted a significant number of foreign export oriented direct investments (FDI), which have boosted the sector growth. It should be noted that Serbia differs from most of the EU countries – because Serbia has not yet accomplished the process of transforming its manufacturing industry – whereas the R&P sector has advanced more than others in this process have, partially determining its higher position with regard to other sectors. The R&P sector has advanced further in transformation due to its competitive advantages – most of the state-owned companies were largely successfully privatized, the inflow of foreign investments was relatively higher than in other sectors, while the sector of small and medium-sized autochthonous enterprises is developing at the same time – they represent a smaller part of the sector, but are also significant as compared to other sectors.

**The characteristics of the R&P sector in Serbia suggest that it is a development opportunity worth supporting, because by developing this sector, other strategic goals related to the employment and earnings will be met, and balanced regional development will be achieved.** However, the R&P sector has a significant number of small and medium-sized enterprises, which are growing successfully and selling in foreign markets. Further on, the R&P companies are located in underdeveloped regions – out of 20 largest exporters in the sector, only one company is located in Belgrade or Novi Sad. The R&P sector is the only manufacturing sector in which both employment and earnings have increased, as compared to 2009 – the earnings are higher than the average of the Republic of Serbia. The sector is (increasingly) export-oriented, and a relatively significant number of companies are exporters.

All these characteristics differentiate this sector from most of other manufacturing sectors, making it a strategic development priority – which implies support to small, undeveloped, and/or export-oriented companies, with the creation of dignified jobs. As suggested by the GVA, a significant and growing value-added is generated by the sector, while semi-products are produced for other sectors of the domestic industry. The sector thus influences the strengthening of domestic supply, resulting in reduced imports in these sectors. It should be noted that once the process is completed, and by establishing a circular economy, large quantities of recycled raw material can be produced, which can partially substitute import of products for which this material can be used.

## Performance and Structure of the R&P Sector

**In the post-crisis period, the R&P sector was among the leaders in terms of GVA growth.**

The sector's growth exceeded the average growth of the national economy, and it grew faster than most of other manufacturing sectors; its share in the total growth in the post-crisis period (18%) of the manufacturing industry GVA accounted for 9%. Some manufacturing sectors grew at a faster rate, but most of them started from lower initial bases, and/or the growth occurred due to one or more major foreign investments, which have drastically changed the performance and appearance of the sector itself. This was the case in the textile, oil or automotive industries, which had higher growth rates – whereas only the oil and automotive industries contributed more to the growth of GVA of the manufacturing industry. Even though the R&P sector growth was high in the national context, this growth was slower than in the case of the new EU members – the total growth of the NCEA was 5%, the average per members was 4%, whilst in Serbia the growth was 3%. Having in mind the aforementioned more favorable ratio between costs and productivity, as well as other advantages which will be described later, this indicates that Serbia failed to take the full advantage of the opportunity created with the relocation of production from developed EU countries – total EU15 growth of less than 2% annually as determined by Germany, and the average by countries is 0%. This suggests that the growth of the R&P sector can be further promoted through targeted development policies.

*Table R&P 1. GVA, exports and employment for the period 2007-2016, for the manufacturing industry and R&P sector*

												CAGR (16/09)		
		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Trend	GiP	PR
Bruto dodata vrednost (BDV)	mil EUR*	251	259	265	266	251	289	306	302	305	328		3.07	2.36
Učešće u BDV-u prerađivačke (PR)	%	6.16	6.08	6.46	6.54	6.00	6.29	6.92	6.95	7.42	8.19		3.45	-
Izvoz	mil EUR	424	467	372	450	550	619	761	777	879	983		14.88	12.68
Učešće izvoza u prometu	%	43	42	43	43	47	48	53	55	59			4.62	-
Broj zaposlenih	#	22,529	21,771	19,414	18,887	19,197	19,680	19,510	19,670	19,832			0.30	-1.72

\* u stalnim dinarskim cenama 2010, preračunato u EUR po prosečnom godišnjem kursu 2010

*Source: Statistical Office of RS, calculated by the author on the basis of data from the Business Registers Agency and Customs Administration*

*GVA/Share in Manufacturing industry GVA/Exports/Share of exports in revenues/Number of employees*

*Rubber and Plastics / Manufacturing industry*

**Growth was achieved primarily thanks to the growth of exports.** Exports were a significant growth factor as illustrated by the fact that from the total post-crisis growth in turnover, exports accounted for as much as 70%. Exports grew significantly faster than the sales in the domestic market, further strengthening their position of dominant sales channel. Sales in the domestic



market grew at a slower pace, similarly to the growth in the import of R&P sector products; hence, sales followed the increase in demand for these products on the domestic market. However, total import of these products exceeds the sales of domestic companies in the domestic market, suggesting a significant potential for growth in the domestic market –which can be of paramount importance to domestic small and medium-sized companies.

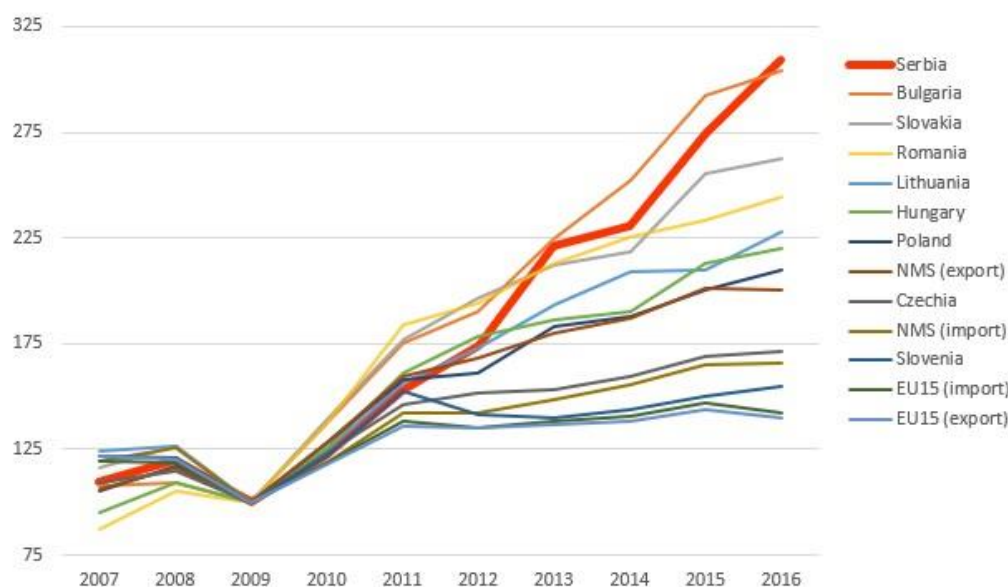
**The sector has demonstrated strong international competitiveness so that as much as 70% of its growth is a result of the growth of its market share.** In the post-crisis period exports grew very dynamically (13% annually), and the good signal is that this growth is not slowing down, due to the fact that the growth of exports in the first eight months of 2017, compared to the same period in 2016, is over 20%. The export value is more than doubled compared to the period before the crisis, and the indicator of the demonstrated strong international competitiveness is competitiveness effect which shows that a large proportion of growth was achieved on the basis of growth of the market share, at the expense of other exporting countries<sup>25</sup>.

**Serbia has achieved faster growth of exports than all potential rivals in the EU market,** as shown in the Figure 2. Namely, the overall annual growth of world import demand for R&P products in the post-crisis period amounted to 6.7%, whilst the growth rate in the EU was even slower and amounted to only 4.6%. Nevertheless, the export of Serbia has grown in these two markets, as much as 14% and 16% respectively. The positive signal for competitiveness is the fact that Serbia increased its exports to markets outside Europe by 35% annually, although the total growth of imports in these countries was 8% annually. Simultaneously, however, Serbia slightly worsened its position on the markets of the CEFTA countries, whose imports at the beginning of the crisis accounted for 11.5%, to fall mildly to 10.7% in 2015%.

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<sup>25</sup> The constant market share analysis or trade share analysis is the intuitive and simple method of analyzing expressed competitiveness of a country's total export or the groups or subgroups it consists of. The method has a starting point in an assumption that the product with growing market share expresses competitiveness at the given market, and vice versa. *Competitiveness effect* of the product on a given market is calculated as the difference between the export achieved and the export that would have been achieved if the share of the product export in the total import of the same product had remained unchanged. The total competitiveness effect in the export of a product is calculated as the sum of the competitiveness effects on all markets where the product is being exported, which may be positive or negative. This sum obviously depends not only on the export growth speed, but also on the market structure – if the export is being made to faster or slower growing markets. The high rates of the competitiveness effect should be interpreted carefully, having that as a rule, the rates would be greater where the baseline is lower. If the export product manufacturing had moved, “winning of the market share” refers to the investment beneficiary country, however the product itself may retain the same market share.

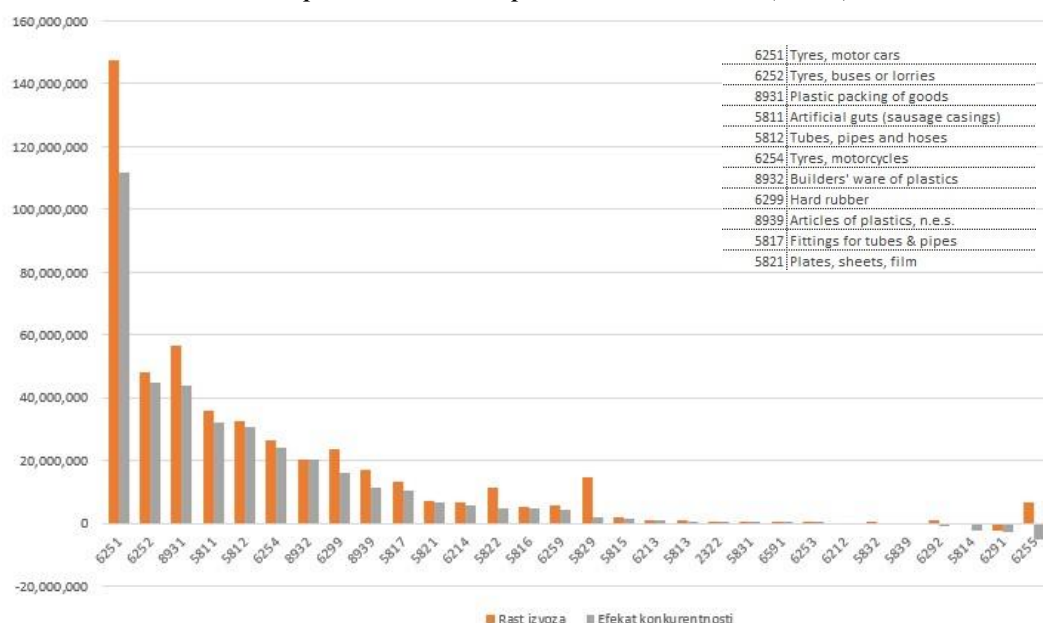
Figure R&P 2. Growth of exports of Serbia, EU-15 and NCEE and growth of imports of EU15 and NCEE, in the period 2007-2016 (Index, 2009=100)



Source: UN Comtrade

A more detailed insight into the export specifics, as shown in Figure 3, in terms of products and markets, through an analysis of the constant market share, indicates that the growth was comprehensive. Out of the total growth, three quarters were realized due to the effect of competitiveness, namely, to the demonstrated ability of the Serbian R&P sector to increase the exports of the production portfolio in the specific market faster than the growth of import demand. Of the observed 30 product groups, export growth was achieved at 26, and a positive effect of competitiveness in 23 groups. As expected, pneumatics for motor vehicles contributed most to the total growth of competitiveness (around 50%). However, significant contribution to the growth of competitiveness (30%) was made by the products in the group of plastic packaging, film and foils, pipes and hoses, which will be given greater attention in the further text.

Figure R&P 3. Growth of exports and the effect of competitiveness, according to HS4 products, in the period 09/10-15/16 (EUR)



Export growth/Competitiveness effect

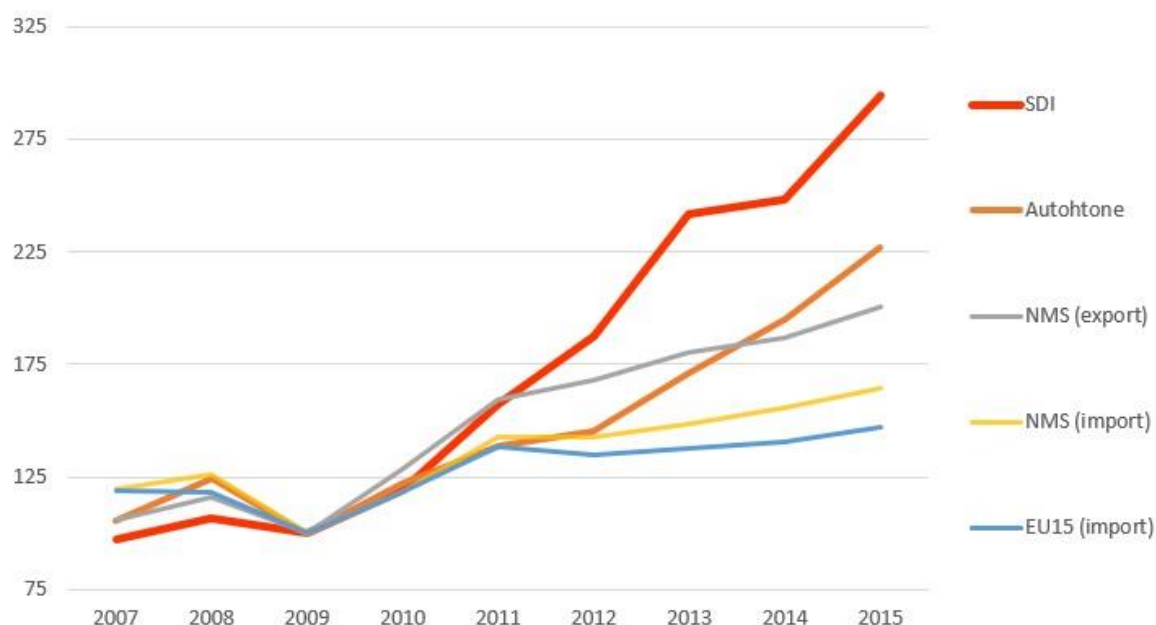
Source: UN Comtrade

**FDIs were the absolute leader in the growth of the sector.** In the past 15 years, nearly 100 foreign investments entered the R&P sector in Serbia. At first, the companies were coming through privatization of existing capacities – among which the most significant was the privatization of “TigarTyres” by Michelin. In the last 10 years, companies mainly enter the Serbian market through “greenfield” investments, so that after 2010, about 30 foreign owned companies were established. According to the National Bank of Serbia data, the inflow of foreign investments to the R&P sector from 2010 and until the first half of 2017 reached 900 million EUR, namely 20% of total investments into the manufacturing industry, making this sector the most significant destination for FDIs, immediately after the food sector. It is also important to note that the inflow of investments does not decrease, but is increasing year after year, and that in the last three years the R&P sector has been the leader in the field of foreign investments. Only 5% of businesses and 40% of employments belong to foreign companies in the R&P sector, but they make nearly 80% of exports of the entire sector. In the post-crisis period, exports of FDIs grew by 20% annually, namely, a total of 425 mil EUR, which is 80% of the total exports growth of the sector. The 20 FSDs with the largest export are: *TigarTyres, Tarkett, Contitech, Cooper Tire, Norma Grupa, Mitas, West Pharmaceutical, Greiner Packaging, Energo Pet, Kolpa, Jokey, Ital-Bath, Cooper Standard, Zlatarplast Sigit, Mecaplast, AD Plastik, Teklas, Hutchinson, Confezioni Andrea, Kolektor, and Magneti Marelli (part of the production).*

**Domestic autochthonous companies, although not comparable in terms of turnover and exports with the FDIs, are a significant generator of employment and have, to a significant extent, followed the growth of FDI and the trend of a more intensive orientation towards foreign markets.** Using advantages in key input costs and the vicinity of foreign markets, domestic autochthonous companies have made a more intensive breakthrough to foreign markets, with an annual rate of export growth of close to 15%. Export, similar to FDIs, accounted for 70% in the turnover growth and, at the end of 2015, reached the third of

the turnover. Autochthonous companies also managed to grow faster than the export growth of the NCEE and also faster than the imports growth to the markets of the NCEE and EU15, as can be seen in Figure 4.

*Figure R&P 4. Export growth of companies from Serbia, according to ownership, in comparison to EU15 and NCEE, in the period 2007-2016 (Index, 2009=100)*



Source: UN Comtrade

FDI / De novo domestic / NMS (export) / NMS (import) / EU 15 (import)

**There are a relatively significant number of autochthonous companies, which could profit from targeted support to the R&P sector – around 100 companies have a turnover worth over one million EUR, and 90% of these companies managed to export their products in the course of 2015.** When formulating support policies, the location of autochthonous companies should also be taken into account because they are currently forming practically three clusters:

- 1) On the route Aranđelovac – Gornji Milanovac – Čačak – Požega – Užice, with a focus on packaging, foils and packaging for food industry and pipes, systems, covers and carpentry for construction industry.
- 2) On the route Stara Pazova – Indija – Novi Sad, with a greater focus also upon end consumers, through production of footwear, foils, vessels and other various household products.
- 3) The third one is in and around Kragujevac, with a focus upon auto industry, as well as upon production covering also other various needs.
- 4) There is also a significant group of autochthonous businesses in Valjevo, Zrenjanin and Subotica.

The importance of geographical and product identification of group companies is reflected in the fact that the autochthonous R&P sector could significantly profit from the establishment of functional clusters, which would influence the whole range of improvements in companies' business operations – from reducing procurement costs, through use of more expensive

machinery up to joint performance and promotion on the foreign markets, to be discussed further on in the report.

**Viewed from the perspective of the product, four groups are singled out as crucial for the achieved export growth and the demonstrated competitiveness: first of all, tires for motor vehicles, and then also packaging, films and foils, and pipes and hoses.** Over 80% of exports and growth of exports, as well as of achieved competitiveness, is attributed to these four groups.

Table R&P 2. Exports by product, for the period 2007-2016

	(mil EUR)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Trend	Rast (2009-2016)		
													EUR	Doprinos	CAGR
Total		422	468	369	440	535	605	744	760	864	964		595	100	12.36
Gume za vozila		178	178	148	187	234	245	303	307	367	400		252	42	13.06
Plastična pakovanja		30	39	34	39	46	60	104	116	128	136		102	17	22.47
Filmovi i folije		41	49	46	52	69	88	96	91	110	121		75	13	8.37
Cevi i creva		28	37	27	30	38	52	64	70	93	114		87	15	21.58
Ostali proizvodi od gume		20	19	15	22	24	26	32	37	45	63		48	8	24.97
Pokrivači podova		96	108	70	84	90	94	99	80	56	54		-16	-3	-13.08
Plastika za građevinarstvo		13	17	14	12	18	20	26	28	31	34		20	3	13.48
Ostali proizvodi od plastike		11	14	11	11	13	13	15	21	22	29		18	3	20.84
Pojasevi		3	4	2	2	1	4	2	6	5	8		6	1	20.17
Monofilamenti		1	2	1	2	2	2	2	3	3	4		2	0	23.34
Farmaceutski proizvodi od gume		1	1	0	0	0	0	1	1	2	2		2	0	53.12

Source: UN Comtrade

Growth (2009-2016)/Trend/EUR/Contribution/CAGR/tires for vehicles/plastic packaging/films and films/pipes and hoses/other rubber products/floor coverings/plastic for construction/other plastic products/belts/monofilaments/pharmaceutical products of rubber

- Tires for motor vehicles are the absolute leader among the products of the R&P sector as regards volume and export growth. When it comes to the placements of tires for motor vehicles, a sign of equality can be drawn between the entire sector and the three key players within it – *Michelin*, *Cooper Tires*, and *Mitas*. All the three companies emerged through privatization of former state-owned capacities – *Tigar Tyres*, *Trayal* and *Rumaguma*. *Michelin*, the first to enter the domestic market, is convincingly the largest company in the entire sector, by all parameters. *Michelin*, one of the world's leaders, produces in Serbia car tires and so does *Cooper Tires*, which after *Goodyear* is the largest producer in the American market, whilst *Mitas* is the manufacturer and exporter of tires for agricultural machinery.
- Packaging, and films and foils, are the second and third most significant group of products, characterized by the absence of dominant players, namely, there is a relatively larger number of exporters placing a more significant value to foreign markets – over 40 companies are exporting over 1 million EUR. In the post-crisis period, the total exports of these two groups of products were increased by over 200%, mainly based on acquisition of the market share from the competition. Although these FDIs product groups are mainly the export leaders – nearly 70 % of exports is attributed to them, with leaders such as *Koteks Viscofan*, *Greiner packaging* and *Tetra Pak* – domestic autochthonous companies also emerge as significant players. Although over 1,400 domestic companies are exporting within these product groups, 15 of them have

placements exceeding 1 million EUR –among them *Divi*, *Spektar* and *ATM*, which are currently located on the mentioned route Arandelovac–Užice. Given the characteristics, which will be further on in the report explained in more detail, this group of products represents the most significant opportunity for the growth and development of domestic autochthonous companies.

- Among the four key export groups, pipes and hoses are the smallest one in terms of value. It is characterized by rapid post-crisis growth, a small number of significant exporters and a dominant participation of the top 3 export companies. The total export growth of this product group in the post-crisis period amounted to over 20% annually, only to reach over 100 million EUR in 2016. Among the three export leaders accounting for 80% of the placements and determination of the growth are two domestic autochthonous companies – *Spektar* and *Peštan* – which are located within the described route Arandelovac–Užice, as well as a foreign investment, *Norma Grupa*.

**The European market is absolutely the most significant for the placement of products, which is expected, having in mind the significant impact of transportation costs upon the final price of R&P products.** The key destination for the placement of R&P products from Serbia are the largest and most developed European markets (ITA, GER, FRA, SPA, UK), Russia and countries of the region (particularly BiH, CRO, RUM, CG, HUN). The placements are quite diversified, and are significantly dependent on the country of the FDI origin – so, *Michelin* exports mostly to France, and *Cooper Tires* to United Kingdom. The autochthonous companies export to the countries in the region– Italy, Austria and Germany – which can be explained also by the “range” of their competitiveness, i.e. lower transportation costs to the closer countries. Transportation costs have an even more significant role when the placements are smaller and rarer, as is the case with domestic autochthonous companies.

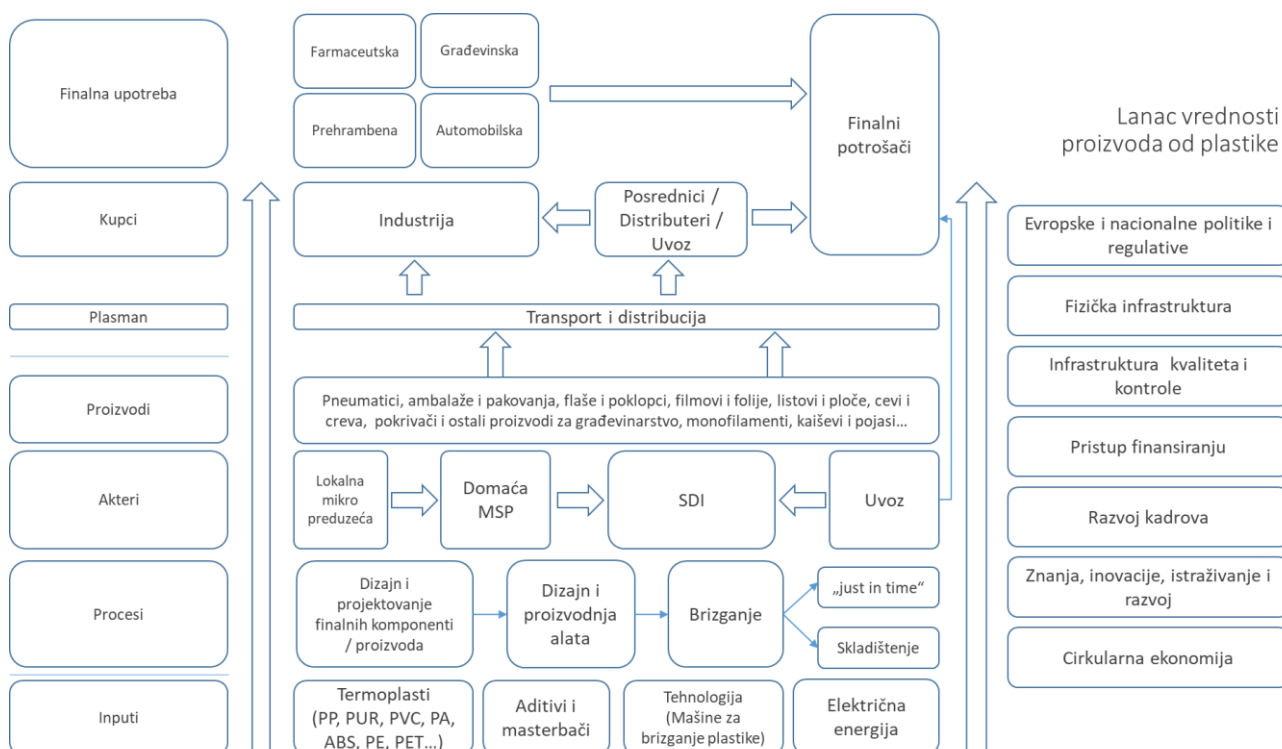
**For Serbia, European countries will remain, in the future as well, the key generators of demand for R&P products.** Apart from the geographic vicinity and their developed industries, there is also the fact of moving production from R&P to the new EU member states, which are at the same time more profitable destinations for this category of products. In the post-crisis period, the average annual GVA growth rate of the R&P sector in the new EU member states was as high as 5%, whilst in the developed EU countries GVA remained unchanged. In spite of the rapid growth of the sector in Germany, GVA remained unchanged due to the decline in value added in Spain and France, and stagnation in Great Britain and Italy. The import of the developed countries covers up the decline or stagnation of production and the bulk of imports come from the new EU member states. Contrary to belief, China is not the major competitor, particularly when it comes to production segments in the food, pharmaceutical, and car industries, because transportation costs in case of limited series are high; on the other hand, safety and quality of used materials are of key importance for the mentioned industries.

## Key Success Factors in the R&P Sector Value Chain

### Description of the Value Chain of Plastic Products

**Observation of the value chain is significant, because it enables systematic analysis of all advantages and weaknesses in the production process and the product placements.** The value chain enables comprehensive view of all activities, from the procurement of raw materials to the placement of the final product, as well as the analysis of key forces and barriers by phases, relevant partakers, processes and products. The figure further on shows the value chain in the production of plastic products, which is sufficiently representative for all groups of plastic products, as well as for rubber products – with differences to be noted. Most of the components are common to all chains in manufacture of plastic products (according to different product groups): raw materials suppliers, suppliers of machinery, product design and tool design, and production. Generally speaking, in the rubber product sector, the principle of technological procedures (thermoforming in tools/molds) in polymer moulding is also very similar.

Figure R&P 5. Scheme of the value chain for plastic products



**The value chain in manufacturing plastic products starts with procurement of raw materials.** Two main types of raw material used for plastic products are thermoplastics, mainly in form of granulates and additives. There are two ways to get granulates: from new production and from recycling. Raw material suppliers can be directly the producers, suppliers or compounders (convertors), preparing formulations by mixing. New granulate production is delivered to the local market by, among others, *Petrohemija* from Pančevo and *Hipol* from Odžaci. However, the level of raw materials production cannot satisfy the sector's total demand for raw materials, so that the largest percentage of plastic material is imported. Importers are



also globally recognized companies such as “*Du Pont Serbia*” and “*BASF Srbija*”. Information obtained up to now through talks with companies indicates that around a quarter of necessary plastic material is procured on the domestic market, while the other quantities are imported. Data of the Statistical Office on industrial production confirm this – the total produced quantity of plastic material in the primary form in 2015 was around 80,000 tons, whilst the total net import was around 250,000 tons, three times as much. In order to enable the plastic products to obtain color during manufacturing, it is necessary to add masterbatch. Companies producing masterbatch provide for around a quarter of the market, and the rest of the raw material is imported. In the production process, it is necessary to add to the plastic material additives for product durability, which are almost completely obtained from imports.

**Machines, necessary for the technological production process, are mainly imported from Germany and Italy, whilst tools are procured in the domestic market or are produced in own company.** In the absence of a domestic manufacturer of the machine industry, machines for production of plastics (injections, presses, extruders...) are supplied by distributors and representation offices for machine equipment or by representatives of world brands specialized in production in the territory of Serbia. A large number of small producers import independently machines for their needs, whilst foreign companies operating in Serbia acquire equipment in accordance with the procurement policies of their respective companies.

**Tools (molds) are a critical success factor in the production of plastic products, because they have direct impact upon the key characteristics of the final product.** The cast with plastic granules is inside the machine for molding by injection (compression or blowing). Typically, the work with the machine requires two to four workers, depending on their skills and the type of machine. Once the production in the machine is completed, usually, additional final processing is necessary (such as polishing of the product surface) before the product is fully ready for the market. The number of tools owned by a company depends on the number of different products they are manufacturing – each product requires at least one tool. A trend is observed that companies manufacturing plastic products are taking one-step backwards when it comes to the production process; namely, they produce themselves the tools they need as well as for other producers. Producers obtain the design for their tools and products from specialized companies, from their own designers and development departments, or they use ready solutions (typical of the SME sector and entrepreneurship). The product design of individual companies varies greatly depending on the type of machine they use: injectors, presses or blowers. Injectors and presses are generally used for production of solid plastic products (buttons, furniture parts, vessels, lids, etc.), while blowing is used to produce hollow products (bottles, liquid containers, jars).

**Apart from companies producing their own tools, there are examples of companies, which started production of robots to facilitate the production of packaging.** Because industries, generating demand, started fully to orient themselves to the consumer, manufacture of plastic faced the need to produce more functional and in terms of design more attractive final products. The mentioned robots combine the process of injecting and gluing of the declaration to the plastic product, thereby obtaining a plastic packaging, which is a fully homogenous entity. In addition to the aforementioned innovative initiatives identified as a trend among producers of plastics, constant focus and full compliance with consumer demands and needs has been highlighted. Often plastic manufacturers themselves make various auxiliary devices, to facilitate later the use of plastic products to their customers.



**In the center of the value chain are the producers, who could be divided in Serbia into two groups – FDI and domestic autochthonous businesses.** Key differences between the two groups are their size, i.e. production volume, and then the technology applied, as well as the approach to foreign markets. Foreign companies mainly use modern and new technologies and use established channels through which they place their products and the customers who buy them, and the basic and major goal is to optimize the production process ensuring the highest possible productivity and lower average costs. Since the production series are generally large, the average costs for the tool production, and resource use per product unit are lower. In case of autochthonous companies, due to lack of capital, machines are of smaller capacity and often also less productive, thus preventing these companies to compete in foreign markets with rivals producing massive series – so the companies are forced to look for niches in which series are not as massive.

**Between 60% and 70% of production is exported. The rest is placed on the domestic market through retail, and even in green markets, or is exchanged in compensation transactions.** Production of components for the automotive industry, food-processing industry and construction industry are the largest market for plastic products. Sales and distribution among companies (B2B) are carried out in accordance with relevant contracts. Main B2B transactions relate to the industry of food and drink, pharmaceutical companies and construction companies. Big producers and intermediaries are included into the direct value chain as OEM suppliers, or are part of a bigger distribution and sales system.

**Plastic waste is collected, sorted and sold locally at relatively low prices, or is exported.** After the value chain, the production of plastic products ends with the reuse of recycled materials in the production of plastic products disposed of by end users; these materials are obtained by collecting from the streets or organized points by specified collecting networks and sold to major recycling centers. In these centers, plastic products are further selected, washed and prepared for use as raw material for recycling. After recycling, the recycled granulate is sold to businesses as raw material for plastic products. Such raw material is with less purity than the newly produced granulate, and is mainly used for the production of cheaper plastic products (for instance, toys, bags and household items). Recycled plastic has lower production costs than the new material, which accelerates demand in the market of plastic consumer products for a wide consumption.

### *Cost Analysis*

Although the cost structure depends on the product and the processing technology applied, as well as the company typology, the approximate cost structure is sufficiently similar for the **majority of companies** (Figure 6):

- **Material costs** are by far the largest (around 65%) and relate primarily to the supply of raw material (polymer and caoutchouc, as well as steel, soot, textile etc.). Availability and price of raw material are mainly equal in all countries, but significant savings may be made by procurement of large quantities.
- **Labor** is the next largest component (with around 15%), with a 2/3 share of qualified and unqualified labor, and the rest is highly qualified labor. Labor costs are the second ranking in terms of significance – most of the costs mainly concern professional workers, masters and operators in the production process.
- **Capital costs are the next ranking** in terms of significance. They depend primarily on the selected technology and the type of the production process, as well as on the maintenance process and control of the machine fleet and other equipment. Since the production process is highly automatized, particularly in regard to plastics, it is important that production is at full capacity and continuous, in three to four shifts. This requires good work organization so that average production costs would not grow because “machines stand idle”.
- **Costs of energy-generating inputs** depend on the volume and continuity of production, as well as on the capital. Long preparatory time needed for the activation of the machines adds up to production costs.
- **Transport costs** (around 4%) depend on the location – but final R&P products are bulky, with a relatively small value per kilogram (3-4 \$/kg); therefore, the tendency is to produce many products locally or regionally, and it is very important to optimize costs for logistics and transport, so not have a significant impact upon the final price.

*Figure R&P 6. Approximate share of costs in business operations of middle-sized company in the plastic industry.*



**Labor and energy costs differ significantly from country to country, and are the decisive factor of R&P competitiveness, which is the case also in Serbia.** Transport costs also differ from country to country and depend on the distance from the market, the volume of transport and the length and quality of the road. Countries at similar distance from the end customer should have comparable transportation costs, and the (new) EU member states have a mild advantage over Serbia – faster transportation (no customs clearance and waiting hours at the borders) and better infrastructure.

### **Labor Force: Key Success Factor No. 1**

**Labor costs in Serbia are among the lowest in Europe, and skills, knowledge and flexibility are at a relatively high level.** The average annual labor cost in Serbia is lower than in any of the EU member states, except Romania and Bulgaria. Labor costs are systematically lower for all types of professions in the sector. Salaries of high-educated staff in the EU are relatively higher than salaries of those with secondary degrees or with lower education levels. For instance, average salaries for managers in the EU28 are 5.03 times higher than in Serbia, salaries

of technical experts 3.92, of machine operators 2.93, and of low qualified and unqualified workers 2.67 times higher (according to Eurostat data).

**Labor costs are lower also in other sectors in Serbia; however, it seems that in the R&P sector labor productivity is sufficiently high to place Serbia at the top among its rivals, in terms of the ratio between added value and costs per work unit, (only Bulgaria is ranked higher).** Table 3 shows that labor costs per employee in the R&P sector are lower only in Bulgaria and Romania. Productivity (measured AV per employee) is also lower in Serbia than in most of the countries, but is higher than in Bulgaria and Romania, so that the ratio regarding productivity is anyway more favorable than in case of these two countries.

Given the fact that added value per cost unit for employee is generally higher in Serbia, and that we can presume that in comparison with the countries observed, the capital costs in Serbia are not higher, **we can conclude that the combination of low energy and labor costs contribute significantly to Serbia's competitiveness.** If, furthermore, we presume equal capital cost per worker in countries listed in the Table<sup>26</sup>, we can calculate the "domestic resource cost" (DRC<sup>27</sup>) indicator which, if lower than 1, means that the country has comparative advantage. In regard to comparable countries, Serbia, together with Poland, has the lowest DRC, which gives additional power to the claim on competitive advantage. In the post-crisis period, productivity of the sector is on the rise, and which is even more significant, it grows faster than the average labor costs – which are also on the rise and are above the average for the manufacturing industry, which results in further growth of value added per RSD invested into the worker.

*Table 3. Comparison of added value, labor costs and productivity costs for selected countries*

	Value added (mio EUR)	Labour costs (mil EUR)	# of employees	Average labour cost (EUR)	Imports per employee (EUR)	Value added per employee (EUR)	Domestic resource cost (DRC)
Serbia	341	151	19,832	7,614	24,450	17,194	0.63
Bulgaria	216	93	21,107	4,416	25,971	10,210	0.74
Romania	552	253	39,164	6,463	34,754	14,102	0.68
Slovakia	551	300	21,050	14,266	52,812	26,152	0.67
Czech	1,524	825	58,142	14,181	48,535	26,205	0.66
Poland	3,478	1,595	136,874	11,652	34,693	25,410	0.58
Hungary	690	360	32,951	10,934	40,634	20,943	0.67
Germany	18,978	14,509	335,298	43,271	47,909	56,600	0.82

*Source: Calculations by the author, based on data of the Business Registers Agency, Statistical Office of the Republic of Serbia and Eurostat*

During our research, we noticed that the interlocutors in companies generally emphasize as the first and main competitive advantage the **expertise, diversity and adaptability of the engineer and technical staff**. On the other hand, when we asked about the main limitations for the

<sup>26</sup>Capital cost is calculated as the cost of amortization per employee, using Serbia as an example, and it is presumed that it is everywhere the same. The presumption is conservative from the perspective of Serbia's competitiveness, because there is no reason to believe that Serbia is more capital-intensive than comparable countries, on the contrary – import of machines and import prices indicate that the technology applied in Serbia is more obsolete and is not at the level of comparable countries.

<sup>27</sup> DRC equals the quotient of costs for engaged resources – labor and capital – in relation to the value added. Lower value indicates that one RSD of value added requires less capital and labor in a given country.

growth of the companies, **availability of expert workforce** was once again on the top of the list. We shall analyze individually these findings and the noticed paradox.

- Knowledge, experience and diversity of the workforce in designing, as well as in industry, clearly belong to the old tradition. They are the key for Serbia's competitiveness in the R&P sector, as well as in metal processing and in the machine and equipment sector. As for the R&P sector, its main competitive advantage, as highlighted by numerous interlocutors, lies primarily in the excellent ability to produce diversified and highly accurate (metallic) tools and equipment for the production of R&P products.
- Education of mechanical and technology engineers in Serbia is very good. Although not sufficiently practical and applicable to the desired extent, this education offers a very solid foundation on which experienced workers can easily transfer their practical knowledge to new generations. Therefore, foreign companies are, as a rule, able to transfer monitoring and management over the production process to the local staff very soon after the start of their operations in Serbia. Producers of household appliances (Gorenje), wind turbines (Siemens), mechanical components for the car industry (Albon) and hydraulics (TigarTyres) – have either completed or at least started the process of transferring not only the production, but also the design and development of products (some are transferring even the procurement of strategic inputs to the broader part of their global network).
- With regard to workforce, the advantage of Serbia is perhaps even higher at the level of technicians and craftsmen. Their skills relate mostly to their highest ability to produce metallic tools and other parts necessary for the production of various products in a creative and, if necessary, adaptable manner – from the R&P sector, through large construction machinery and parts used in the production of heavy transport equipment, and up to conventional and automatic mechanisms and machines. Foreign managers evaluate the workers in Serbia as being capable of performing works, which, by far, exceed what they were assigned to do, and to make creative contributions. The Michelin factory in Pirot is able to introduce a new line of production within six months, which is as much as three times faster than at other Michelin factories in the world.<sup>28</sup> In Serbia, it is not unusual to find very small businesses (sometimes with less than 10 employees, mainly engineers) which are capable of offering narrow-professional design solutions within the production of relatively demanding mechanical designs relying entirely on external inputs, often imported.

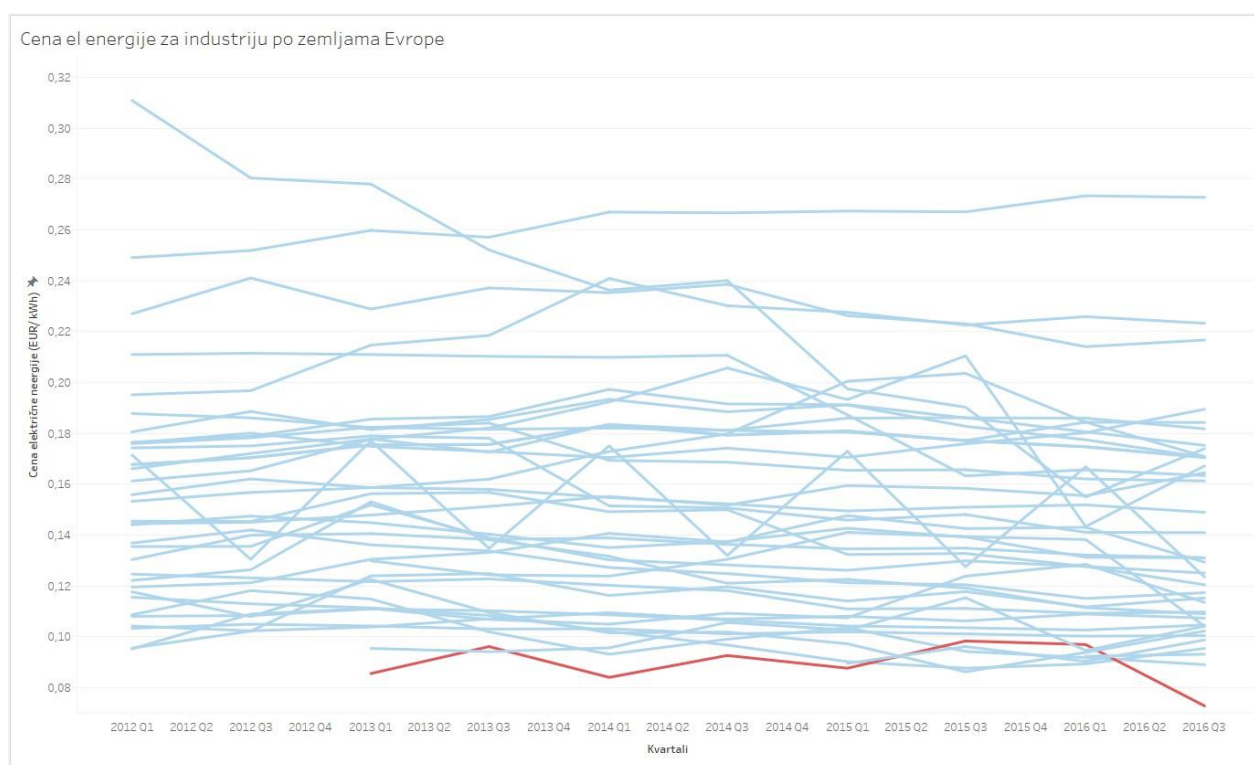
## **Cheap Energy: Key Success Factor No. 2**

**Electricity costs are also among the lowest in Europe.** The average price per kW/h for the industry, for the entire range of consumption, is lower than in most of the EU countries, as presented in Figure below.

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<sup>28</sup>We did not talk with Michelin's management, but this information was confirmed by two independent sources related to the company.

*Figure R&P 7. Price of electric energy in European countries (Serbia marked red)*



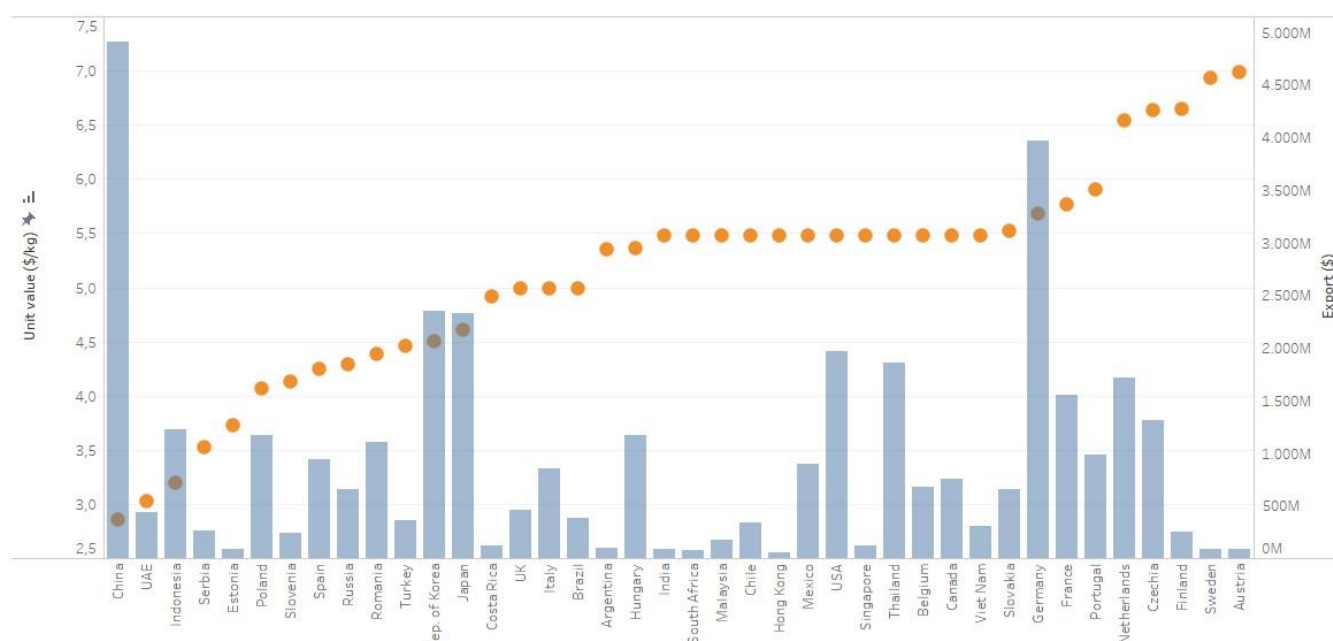
Source: Eurostat<sup>29</sup>

## High Rate of Gross Operating Surplus Despite Lower Prices Per Unit — Another Indicator of Competitiveness

**Favorable balance between productivity level and key inputs costs enables companies in Serbia to ensure higher levels of price competitiveness**, which can be seen in the example of exports of tires for motor vehicles. Figure 8 shows the total export and the export price per unit, per tire kg, for cars. The export price per unit from Serbia is drastically lower than prices of all competitors from the new EU member states. It is only higher as compared to the prices from China, UAE and Indonesia, but Serbia has a competitive advantage over Asian countries in the EU markets due to significantly lower transportation costs. The dominant exporter of car tires from Serbia is Michelin, the world's largest Tier 1 producer together with Bridgestone, which guarantees satisfactory quality of the export products, for the appropriate rank. Tires exported from Serbia are of a lower ranking and therefore are not fully comparable in terms of prices – however, according to information obtained from an industry expert, who worked with Michelin in Serbia, the difference in ranking and quality is not even as close as is the deviation in the export price, which indicates to what extent it is possible to be price competitive in the R&P sector in Serbia.

<sup>29</sup>In focus was the price of electric energy for the industry, for the consumption range 20–500 MWh, with included taxes and excises for each country. Prices differ depending on the range of consumption but, at all ranges, Serbia is at the very bottom part of the list when it comes to the price for electric energy.

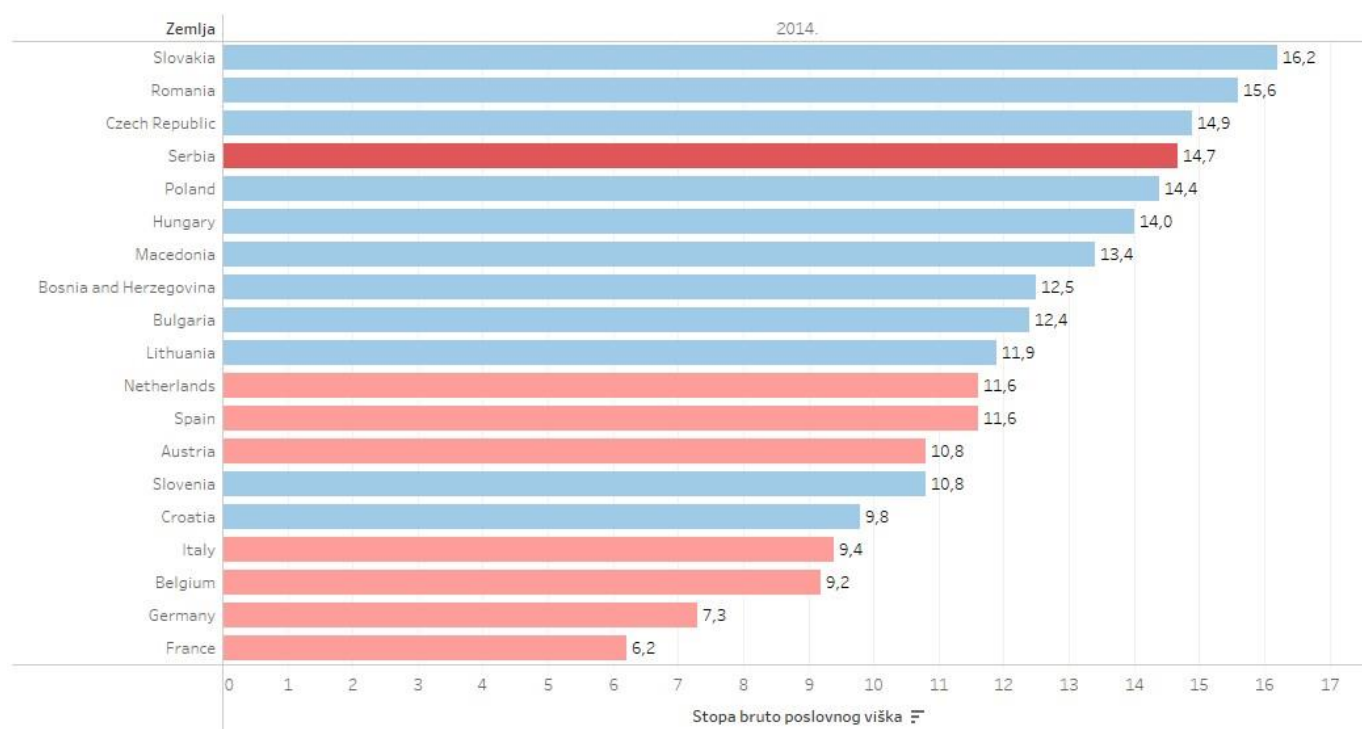
Figure R&P 8. Total export and unit price of export of tires for motor vehicles, by country



Source: UN Comtrade

**Due to the described competitive advantages, Serbia seems to be more profitable for business operations than most of the EU countries.** The very order of the countries are presented in Figure 9 explains the reasons for moving production to new EU member states – these countries are grouped at the top of the scale, while the developed countries are at the very bottom. Serbia is among the top ranking countries in terms of profitability, together with the new EU member states – Slovakia, The Czech Republic, Poland, Hungary and Romania, which are the main competitors in the European market. Developed large countries – Germany, France and Italy – are at the very bottom of the profitability scale. The gross operating surplus rate indicates to which extent the investor is profiting from operations in the primary industry. This is an important indicator of the attractiveness of the sector, assuming that the capital cost and tax levels are approximately equal among the countries, as well as that technology is predetermined, and that the depreciation costs are approximately similar, regardless of the country.

Figure R&P 9. Rate of gross operating surplus in the R&P sector, by country

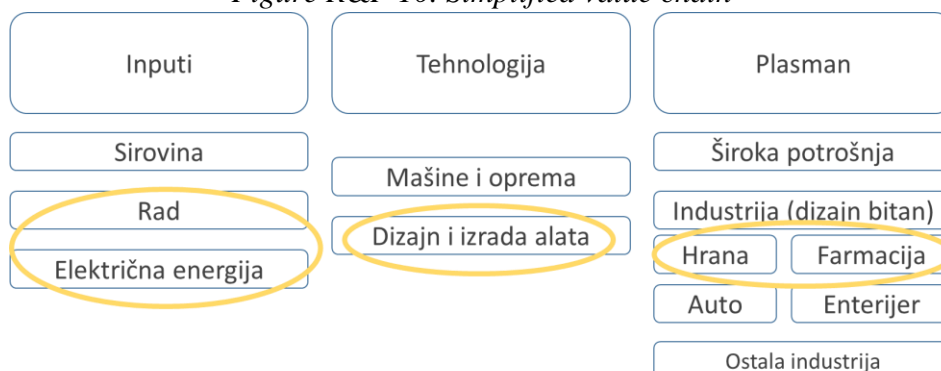


Source: Eurostat

## Segmentation of Domestic supply

In order to focus the analysis of competitiveness and to give a more concrete survey of competitive advantages and chances of the R&P sector in Serbia, Figure 10 presents a **simplified value chain sketch**. Raw material, labor and electric power are the key inputs, which through tools and machinery are transformed to final products, and are placed to the market for the end users – citizens, in case of consumer products, that is, towards the industry, in case of components and semi-products.

Figure R&P 10. Simplified value chain



Inputs/Technology/Market placement/Raw materials/Machinery and equipment/FMCG/Labour/Design and molding/Industry/Electricit/Food/Pharmacy/Auto/Interior/Other industries

**The competitive advantages, presented in detail – together with the trend of production relocation, the geopolitical position, experience and tradition in the R&P sector – have influenced an intensive presence and successful business operation of FDIs.** The price and inputs availability were key factor in case of FDIs, because they ensure competitive advantage for business operations in Serbia. The key factors of the competitiveness of Serbia are the combination of cheap inputs (labor and energy), tradition and knowledge in the sector (ability of workers to be sufficiently productive), as well as the vicinity of key markets. FDI coming to Serbia already have the necessary capital, and hence also the adequate technology and tools, as well as the established business paradigm, defined production process, sales channels and end customers for their products.

**On the other hand, Serbia's autochthonous companies have already shown to be competitive when the customers are "known".** Competitiveness of autochthonous companies depends, largely, on the end buyer – because this defines the appearance and characteristics of the production process, namely, the ability of autochthonous companies to make use of the advantages and cover up the weaknesses.

- **Serbian autochthonous companies have shown to be competitive when the customers are the food and pharmaceutical industries, and with weak and moderate competitiveness when the customers are the automotive industry and the construction industry.** What is common to these industries is that they have limited series because the products are profiled specifically for one company, not for wide consumption and unknown customers. In pharmaceuticals and food, safety and product design are very important, and these product characteristics have to be constantly adjusted and improved. This requires constant adjustment or designing and produce of new tools, which, in turn, requires quite a lot of master knowledge and increased labor – and these are the key advantages of Serbian companies. Besides, in cases where series are smaller and the products are susceptible to change, more electric power per unit of product is needed – which gives advantage to Serbian companies due to lower costs for electric power.
- **Such course of activities "eliminates" the greatest competitive weakness of Serbian autochthonous companies, namely, the lack of capital for more abundant investments, mass production and the creation of the economy of scale.** Limited series and constant adjustments of products disable mass production (which is a weakness, i.e. the deficiency of the Serbian companies), and imply flexibility, adjustment of tools, greater share of labor, particularly master labor, and energy (which is the advantage of the Serbian companies). It should also be taken into account that it is a lesser risk for family companies when growth is gradual. Thus, in Serbia, they get the opportunity to balance between gradual introduction of modern technologies and the degree to which cheaper workforce is used – which leads to the conclusion that some companies are competitive exactly because they are gradually transferring from obsolete to modern technologies, gradually adjusting the production process and are less exposing themselves to the risk of jumping from one business paradigm to another.
- **Activities in the production for a known customer differs also when looking downstream, the more so when the product is more unique, because this reduces investments into market research, marketing and branding – which is also a deficiency of the Serbian companies.** As a rule, the known buyer is more informed, namely, is able directly to check the quality and reliability of the company. On the other



hand, if the buyer is unknown, specific investments in market research (in the first segment of the chain), is necessary for the purpose of defining incoming demands as well as involvement into complex global input procurement networks (in the second segment of the chain) and participation in distribution networks, larger investments into marketing and branding products in the third, downstream, value chain.

- **As a rule, the size of the series is also closely linked to the type of technology, namely, to different production factors and the manner in which the production process is organized.** Thus, shifting from smaller to larger series presupposes, as a rule, automation, that is, reduced use of expensive master/craftsmen work, increased use of capital equipment and less qualified work. Having in mind that in terms of relation between price and knowledge and skills the master/craftsmen work is the competitive advantage of Serbia and that companies have limited access to capital, it is clear that the limited series is the advantage of autochthonous companies.
- **Finally, as a rule, the larger the series, the higher are the demands for the degree of organization of all processes in the chain– which is not a comparative advantage of Serbia.** Since technology, dependent on appropriate equipment, can be easily copied (provided that adequate capital is available), the competitive advantage in large-scale production depends primarily on achieving a high level of reliability and efficiency – on reduction of relatively small per unit product costs– through a better organization of the production process, impeccable quality control, “just in time” procurement of reproductive material and inputs, and an equally efficient product distribution. These capabilities are in short supply in Serbia. Foreign employers report that they generally need to make initial investments in building mid-management capacity, or bring experienced Serbian-speakers from the diaspora. This weakness goes relatively deep as management schools, although numerous, do not offer adequately trained graduates.

## Sector Perspective and Recommendations for Further Development

**In this chapter, we are dealing with the development vision and recommendations of immediate measures to be undertaken in order to remove the main perceived obstacles to further growth and to the competitiveness of the R&P sector.** Recommendations can be divided into two groups by their focus:

- Some of the identified problems are to a large extent **common to all sectors, researched in the present study package**–they derive predominantly from the SME nature of a large part of Serbian economy. On the other hand, implementation of these measures presupposes certain preparatory steps and development of capacities of state institutions for the implementation of proactive industrial policy measures presented here. General recommendations, common to all sectors, are based primarily on the capacity of the administration to act more flexibly, more complex and in more proactive manner, to the development of the workforce, to the necessary shift in the way of attracting FDIs, to the need to concentrate and verticalize resources for support to SME, as well as to other measures to which the state administration must proactively pay attention – such as the further development of quality infrastructure or regarding services provided by the EPS. These common aspects are described in more detail in **Annex2**, Framework measures of industrial policies for Serbia, and we refer to them, as needed, in the text further on.

- Some of the identified problems in the R&P sector – such as quality infrastructure, organization of business operation, availability and quality of workforce, improved visibility and cooperation among the companies, need for renovating of the machine fleet – coincide with problems common to the entire economy described in Annex 2, but for the purpose of the analysis in this section, they are visualized from the perspective of the R&P sector. Therefore, the broader context of the recommendations to be presented further on is available in Annex 2 and we elaborate only what is of specific significance to the R&P sector.

**Having in mind the described characteristics of the R&P sector regarding the needs for capital and the size of series, as well as that the bulk of both the exports and export growth can be attributed to FDIs, it is clear that the further growth of the sector depends on (i) the activity of existing foreign companies, and (ii) new foreign investments.** Serbia has already shown to be internationally competitive, and the key factor for both the development of existing and the arrival of new investors is the further availability of resources that have determined the stated competitiveness. Therefore, the key factors for attracting new investments are the availability of the workforce and availability of locations with adequate infrastructure.

**Key recommendations specific for attracting FDIs relate to two groups of activities: (i) a more focused and more targeted selection of FDIs and (ii) ensuring conditions for their efficient business operations.** The issue of attracting FDIs is elaborated in more detail in Annex 2, and in this part, we present only the key aspects for the R&P sector.

- Serbia is already an attractive destination for the R&P sector, and unlike other sectors, it is necessary to set more stringent criteria when attracting FDIs:
  - Targeted attraction of FDIs –as many as possible of those which are not a “blind alley” concerning complexity of the product and the production process, and which are ready to invest into the development of workforce.
  - Transition from subsidies per job to subsidies per estimated developmental effect – certainly including as well the number of newly employed as a criterion, but also emphasizing the type/quality of technology, and the development of workers’ skills. Considering the high availability and emigration of the most skilled engineering personnel, the special goal of attracting companies that would be willing to transfer their research and development (R & D) here should also be considered.
  - Transparent cost/benefit analysis regarding foreign investments.
  - Evaluation of the program (achieved, regarding the projected cost/benefit analysis)
  - Stimulate the arrival of those FDIs, which are able systematically to develop the network of suppliers.
- On the other hand, apart from already well-known preconditions for the arrival of FDI, which have mostly already been mentioned, measured and monitored in internationally recognized analyses and surveys of competitiveness, availability of different categories of workforce is becoming imperative. It is obvious that at the moment Serbia is a sufficiently attractive destination for FDIs in the R&P sector, however, it is necessary systematically to research for how many more new investments Serbia has the adequate quantity of human resources. Given that the difficulties in finding good quality and trained workforce are a problem for other companies in the sector, these difficulties will be elaborated in more detail further on.

**Apart from attracting and developing FDIs, it is desirable also to support the existing ones and develop new autochthonous companies.** Autochthonous companies are significant job generators, since they make for almost 50% of employment of the entire sector, and they have proved to be flexible and competitive exporters, and with adequate support they can more intensively join global value chains and contribute to the growth of competitiveness and business in the Serbian economy. Key support measures, both in regard to autochthonous and all other companies in the R&P sector are shown as follows:

### **Targeted Support to the Development of SMEs**

- Precisely and timely elaborated supplier development programs for each FDI; identified domestic companies, which, if they get support, can become part of the value chain; prioritized challenges and implemented promotion programs; constant monitoring and regular evaluation of program effects and of founding of the businesses.
  - Example of initiative – systematic research of possibilities and conditions (required scope, type and quality of raw material, expected quality standards) for the development of suppliers of foreign companies importing plastic products.
  - Total import of R&P products exceeds 500 million EUR, and large foreign companies make for nearly 50% of the imports.
    - Fiat –cca50 mil EUR, plastic packaging
    - Fresenius –cca20 mil EUR, pipes and hoses
    - Yura and Leoni – cca20 mil EUR, tapes, pipes and hoses, boxes and trunks.
    - Tetra Pak, Henkel, Coca Cola – cca. 20 mil EUR, lids and caps ... and many other companies.
  - The first step is to identify potential domestic producers, to scan their situation and systematically support those with capacity to meet, with support, the necessary conditions. The possibility should be taken into account for cooperation of companies (particularly those from same localities) in meeting of the goals (lower raw material procurement price, cooperation in tool production, transportation and distribution, courses and trainings). The precondition for the entire initiative is the understanding of the domestic small economy (existence of database, not only on information pertaining to the status and financial information, but also information on quality standards, production capacities, the equipment of the machine fleet, technology level...), and the regional chambers of commerce and regional development agencies should render assistance in this regard.
- Construction and increased accessibility of physical infrastructure through functional industrial zones. One of the interviewed companies – which is located exactly at the described routes where the R&P sector is developed – showed that, in spite of promises, it had to pave itself the access roads, remove the interfering transmission tower, and build up a hydrant network. Anyway, there still are problems, which directly affect the productivity work – voltage instability of electric power and instability of the internet flow.
- Reduction of administrative procedures to the minimum, particularly those related to the customs in cases of good exports.

## Improving Quality Infrastructure

- It is necessary to support domestic companies to reach the standards, depending on which industries are their customers:
  - For companies wanting to be part of the value chain in car industry, two standards are necessary: ISO 9001 (new version, 2015) and IATF 16949, which relate to the standardization process in the supply chain of the automotive industry.
  - For companies whose products are intended for packaging purposes (for instance, BRC/IoP (British Retail Consortium/Institute of Packaging) the standard related to packaging and material used in production, is owned by over 20,000 companies in Europe.
  - Apart from these, companies are expected to have also ISO 14001 (environmental protection management system), ISO 18001 (protection at work, occupational health and safety management system), ISO 26000 (system of adequate assessment and addressing of social responsibilities), and ISO 27001 (information security management system). A significant number of companies have ISO 9001 and ISO 14001, while even some of the most developed domestic companies do not have IATF 16949/ specialized standards for packaging.
  - REACH (Registration, Evaluation, Authorization and Restriction of Chemicals) standard will have a significant impact upon the entire chain of plastic products – it refers to safety and acceptability of raw materials used in the production process. It will not be possible to export to the EU market a product, which is not in accordance with REACH. At present, Serbia has no possibility to even test such products (the risk of importing products which cannot be placed on the EU market), nor is there a growing awareness on the importance of regulations replacing 40 other regulations and relate to over 30,000 substances).
- Support to reaching the standard implies:
  - Establishing the database of domestic companies and the standards they own, and constantly matching the database with standards necessary for the industry within which the companies are operating.
  - Learning about examples of best practices in the sector and comprehension and dissemination of their experiences – in order to understand at which moment a standard is needed/desirable for the company, how to reach it, and which the benefits are.
  - Extending awareness on the significance of quality / “QMS” (PR campaigns, guides, workshops, and seminars).
  - Establishing quality hubs as the knowledge centers on the needs and standards of quality to render assistance to companies (in the beginning, with support from the State, later on through co-financing).
  - Implementation of cost/benefit analyses, and establishing of necessary and cost-effective testing laboratories.
  - Strengthening inspection surveillance over utilization of raw materials.

- Training domestic consultants for evaluation (foreign consultants are significantly more expensive).
- Subsidizing the achievement of the necessary standards based on the defined priorities (“rod and carrot” system during promotion process within the company itself – it is expensive to reach a standard due to expensive trainings and the use of specialized laboratories).

## **Improving Operations and Production Operations**

- This type of support is mainly related to trainings, courses and support in procuring and installation of the necessary systems. Key activities, in which assistance is needed, and which currently are bottlenecks in business operations are:
  - Integrated information system (IIS) – which is crucial for even more applicable principle “just in time” business operation, applied particularly in the automobile industry. With IIS, the enterprise optimizes procurement, stock, number of workers and product transportation.
  - Control of tools and products through CMM machines – which guarantees constant quality.
  - Repairs and maintenance of tools and machines.
  - Corporate management, whose lack is particularly affecting the MSME sector.
  - Strategic financial planning – enterprises do not recognize trends in the international market, nor are they able to establish their prices on the bases of economic principles (there are also successful examples, where a model was established through cooperation with big buyers).

## **Increasing Availability and Quality of Labor Force**

- The education system does not provide sufficient number of the necessary profiles, and occupational retraining is difficult because the system is not sufficiently flexible. The problem of insufficient staff is particularly outstanding now that older generations, i.e. experienced staff from the traditional system, are retiring. On the other hand, even in cases of profiles educated in sufficient numbers (and even in numbers exceeding the needs of the economy) – for instance, managers –they generally do not have the adequate quality and experience, as neither the education system generates sufficient quality professionals nor do these professionals have sufficient opportunity in practice to acquire the necessary experience. If the labor market supply does not match the needs of the economy, and the younger generations which should carry the sector in the future does not receive necessary qualifications, knowledge and skills, the Serbian R&P sector will risk losing its most important competitive advantage. More detailed recommendations concerning the workforce, whose availability is a problem also in other sectors, are presented in Annex 2. Further on, we are presenting problems of availability and quality of the workforce which to a great extent – but not fully – relate to the R&P sector, and which of the companies were highlighted as hindrance to growth.

- As regards engineers, the greatest limitation is the lack of good quality constructors and controllers, CNC programmers, as well as technology engineers specialized in rubber/plastic.
- As regards master staff, the greatest limitations relate to control and repair of tools, as well as to general technical support. There is a gap between experienced masters, who are facing retirement, and the forthcoming generations, which are not sufficiently trained in terms of practice.
- As regards unqualified workforce, the greatest limitations relate to machine operators. In regard to unqualified workers, work mobility is a serious limitation – in certain regions, due to engagement in, or connections to, other family activities (first of all, in agriculture) workers often have a high reservation price (Požega is a good example, having in mind its intensive raspberry production). On the other hand, in other regions of Serbia, the reservation price is lower and unemployment is high – however, workforce mobility is non-existent, although there would be economic reasons to make the effort and encourage unemployed labor force in one part of the country to be the answer to the lack of workforce in another.

## **Improving Visibility and Cooperation among Companies**

- It is necessary to promote the image of Serbian R&P industry, as well as to present domestic companies and make them visible. For companies, it is most difficult to establish “first contact” with the customer, and here the support is the most important. Key activities for the improvement of the status and finding customers are:
  - Understanding of market developments, players, potential customers and the targeted dissemination of key information (in cooperation with sector-oriented consultants – at the beginning, the State is financing it, in the second iteration most of the financing is taken over by the private sector).
  - Perspicuous presentation of domestic companies and products (database with key information on companies and products, functional, articulate and meaningful websites).
  - Identifying potential buyers (database with key information on companies, components and products they are interested in, telephone numbers / websites...).
  - Training for communication with clients – small companies do not communicate with the same “terminology” as the large companies (they often do not even understand which KPIs are crucial to business, nor do they have established them for their own company).
  - Training for e-procurement (subsidies for software procurement, training of employees, survey of queries, participation in competition, tracking the success rate and realization...).
  - Presence in key international databases of suppliers (assistance in identifying key databases, establishing orders...).

- Promotion of Serbian R&P sector (presence at international fairs, with adequate product presentations, Matchmaking, B2B meetings).

## **Encouraging the Creation of Functional Associations**

- Associations of small and medium-sized enterprises (SME), which are linked through the value chain, are very meaningful in the R&P sector. Associations can be formed geographically, because there is a clearly visible concentration of companies in certain regions.
  - Since the plastics and rubber are used for serial production (which by vocation does not fully correspond to the MSME sector), pooling could result in rationalization of procurement costs, optimization of utilization capacities and a greater visibility of the companies. The larger the quantity of procured raw material, the price per unit is lower (current import of raw material by domestic companies is close to 200 million EUR).
  - Expensive, and often insufficiently utilized machines become more available (3D printers, CMM, robots).
  - Joint performance, which in case of plastics is often possible, increases the visibility of the companies, as well as their negotiating power in front of the clients and intermediaries (and other stakeholders – the State could easier collect necessary information for supplier development, participation in fairs).
  - Companies need quality market information on potential buyers and their requirements, as well as on characteristics of the rivals, developments in the global markets, and marketing channels (this could be one of the tasks of analytical teams of associations – lower costs for accessing key databases).
  - Lower costs of training and courses concerning joint activities (for instance – e-procurement).
  -

## **Gradual Renovation and Modernization of the Machine Fleet**

- Due to technological limitations, Serbian companies are not able to ensure either adequate quantities (small capacity machines), or the adequate quality (obsolete technology) of the products. Germany and Italy are the main suppliers of machines for the Serbian market; from China, mainly lower value machines are imported. Relatively small number of modern machines is imported – which are used for efficient serial production by “injecting or blowing” into the tools. Quite a number of other machines are imported – these machines are generally of lower value per unit and of weaker performance. Also, imported is a relatively small quantity of spare parts and components – which indicates also a low level of assembling and maintaining of final machines in Serbia.
- Emphasis should be on introducing more modern and more productive machines of higher capacities (500-1000t), robots multiplying productivity in certain segments of production, and 3D printers enabling the production of prototype products.

Nevertheless, when defining measures, caution is needed; namely, it must not necessarily mean that the presented structure of imports is currently unfavorable for competitiveness, having in mind that the companies consciously import machines corresponding to their needs, and most probably combine less productive machines with more workforce, which in Serbia is a cheaper input than in other countries. However, in the mid-term, the increase of the level and of participation in the import of modern machines would be a good signal, which would indicate that modernization of the machine fleet is in view, as well as a probable increase of the productivity of the companies. In the long-term, this is also the only way to establish sustainable competitiveness.

- Currently there is a “hen-and-egg” problem – companies do not have clients due to insufficient capacities and obsolete technology, but they do not want to invest because they do not have clients and do not have secured placements. The majority of companies also do not have access to finances, at least not at favorable terms, and they overcome the gap through low prices for the workforce and energy. In order to find clients and to have long-term competitiveness it is, however, necessary to modernize the machine fleet. This requires that the State, initially, takes over part of the costs / risks and encourage the companies to cooperate by applying the following measures:
  - Trainings and courses with the aim to modernize and implement new technologies.
  - Loan guarantees (or guarantees for subsidized loans) for procurement of equipment, regardless of age (with more favorable conditions for new machines).
  - Partial return of funds for procurement of high technology, regardless of the country of origin of such technology.
  - Encouraging joint procurement of certain types of machines (3D printers).
  - More intensive investments into research, development and innovations in the production of robots/tools.



# Machines and Electrical Equipment Sector Performance and Value Chain Analysis

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## **Summary of the Analysis of the Machines and Electrical Equipment Sector (M&E)**

- Formerly recognizable and internationally acknowledged, the M&E sector today has less-than-dazzling performance than before, yet retains a significant potential based on released past resources. Although the past sector performance does not indicate this potential, there are several reasons convincing us that it exists to a significant extent.
- The modest post-crisis growth of gross added value is mostly due to the fact that the sector is still being restructured, however, this process is nearly finished, and high export orientation and swift export growth in post-crisis period, sophisticated knowledge and skills left behind by the traditional sector and taken over for (a partial) further development by the new one, along with demand growth trend covering such knowledge and skills pushed by manufacturers from the most developed European countries (so-called nearshoring trend) indicate the probable sustainable growth of Serbian M&E sector.
- The sector already exhibits high international competitiveness and manages to achieve the majority of export growth through the increase of market share on export markets. With this regard, although the FDI's create most of this growth, the domestic originally private companies (i.e. the companies that did not "spring" from former state-owned enterprises – at least formally) are also seeing a significant growth in a wide range of various products. Both base their competitiveness predominantly on knowledge and skills available in Serbia at a lower cost than in European countries, with the source of competitiveness of the two groups differing. Domestic autochthonous private companies are competitive in individual or small series custom made manufacturing, while the FDI's are commonly positioned in large series manufacturing. It is important for Serbia to support both parts of the sector since they are necessary for the development of the economy and have the potential to significantly improve the future performance of the sector.
- Having the existence of competitive advantages in this sector, it is preferable for development since it can contribute a broader technical-technological development of the country.

## Scope and Definition of the M&E Sector

The subject of the present analysis are the following sectors: *Electrical Equipment Manufacturing* (Field 27, BC<sup>30</sup> 2010) and *Manufacturing of Machines and Equipment not otherwise mentioned* (Field 28, BC 2010). The machines and equipment sector takes a central position in the manufacturing network of a country, having resource and technical links to the other sectors of the economy. The outputs of this sector are machines, devices, and components, being mechanical or electrical. Having the common properties of the two sectors mentioned above, along with the fact that in the machines sector relies on a part of electrical equipment sector in a broader value chain, there is a rationale to analyze them jointly, thus this part of the analysis shall view them as a whole, under the abbreviated title “Machines and Equipment” (hereinafter: the M&E). The analysis covers all product groups (at the four-figure SITC codes level) within the two statistical sectors mentioned above, excluding only wiring and cabling for motor vehicles, which are produced by three foreign direct investments (Yura, Dad Draxmailer, and Leoni), which were erroneously categorized in the M&E sector instead of the transportation vehicles sector due to the statistical aggregation.

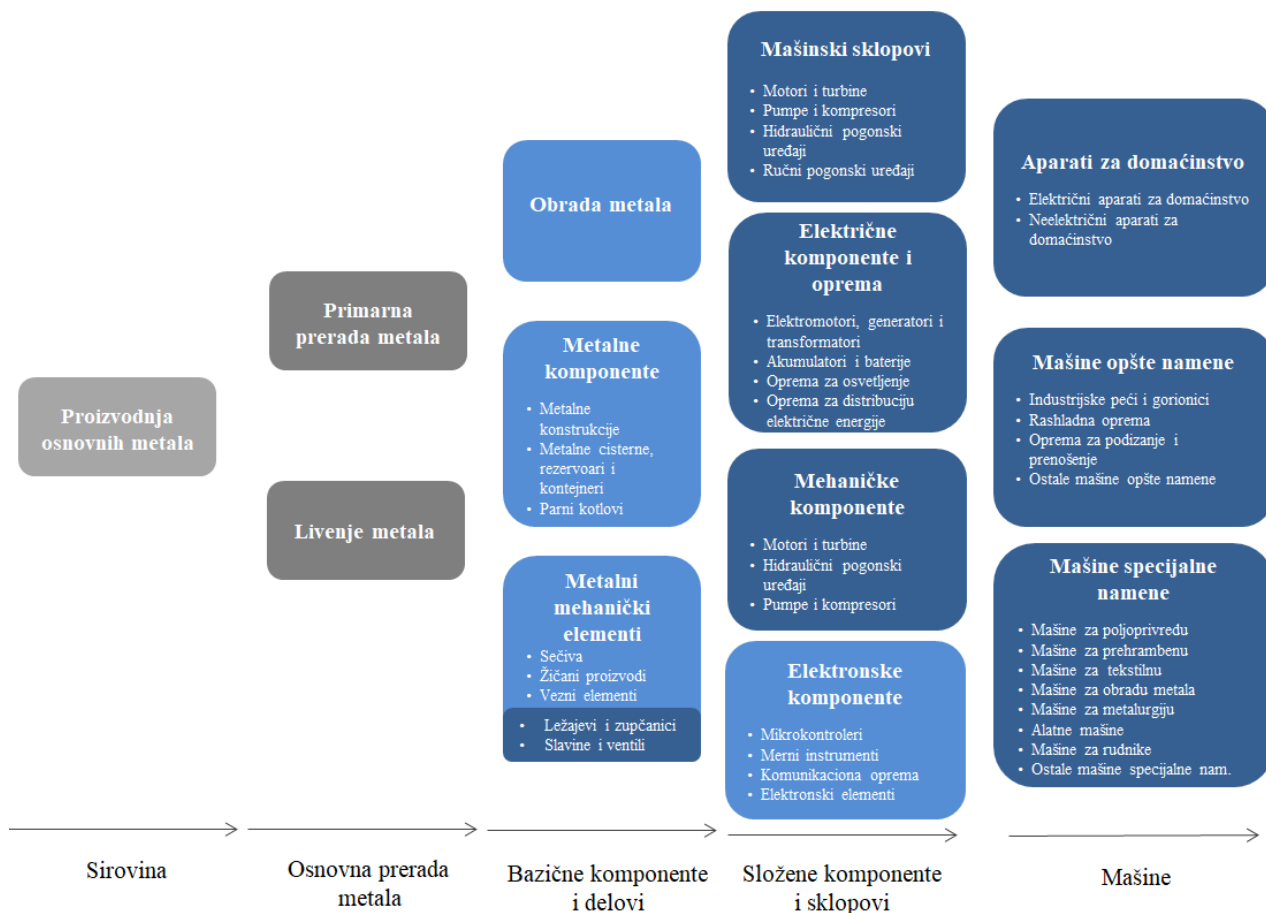
The M&E sector covers a broad range of products for which the complex production is intertwined and closely linked with the manufacturing of some of the products belonging to the metallurgy products sector (Field 25, BC 2010) and electronic and optical products sector (Field 26, BC 2010); and although the two sectors are not covered by the present analysis, Figure 1 presents the products of all sectors above and their relations, to provide for better understanding of the M&E sector products position in the broader production chain. There is a thin line between all of the products above, thus the products within the M&E sector are shown in dark blue.

The end products of the M&E sector find their application in various segments of the commercial and household purposes. Namely, a part of the M&E sector products is being used predominantly in households (household appliances), while the majority of the products find their place at the beginning of production chain in various processing industry sector. In the broadest sense, the products may be categorized into finished machines (special-purpose machines, general-purpose machines, household appliances) and components (electrical components and equipment, mechanical elements, machines circuits), having that the second ones are commonly not operational on their own, instead, they need to be incorporated in a finished machine or system.

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<sup>30</sup> The Decree on Business Classification (“Official Gazette RS”, No. 54/2010)

Figure M&E 1: Relations between metallurgy, electronic, electrical and machines sector in the machines and electrical equipment production chain



(Basic metal production; Primary metal processing; Metal casting; Metal processing; Metal components: metal construction, metal tanks, reservoirs and containers, steam boilers; Metal mechanical elements: blades, wire products, joints; bearings and gears, faucets and valves; Machine assemblies: motors and turbines, pumps and compressors, hydraulic drive devices, manual drive devices; Electric components and equipment: electric motors, generators and transformers, accumulators and batteries, luminaries, electric power distribution equipment; Mechanical components: motors and turbines, hydraulic drive devices, pumps and compressors; Electronic components: micro-controllers, measuring instruments, communication equipment, electronic elements; Household appliances: electrical household appliances, non-electrical household appliances; General-purpose machines: industrial furnaces and burners, cooling equipment, lifting and transportation equipment, other general purpose machines; Special-purpose machines: machines for agriculture, machines for food industry, machines for textile industry, machines for metal processing, machines for metallurgy, tooling machines, mining machines, other special purpose machines // Raw material; Basic metal processing; Basic components and parts; Complex components and assemblies; Machines)

## Relevance, Structure and General Performance of the M&E Sector

In order to properly evaluate the importance and potential of the M&E sector in Serbia, the performance must be explained in the context of the sector structure. This sector is approaching the end of the structural transformation at the moment, with a majority of the traditional part of the sector being closed (former state-owned enterprises) along with the growth of the new sector (domestic autochthonous private companies and foreign direct investments) which will determine the sector performances in the future and indicate its sustainability. Having that both traditional and new sector have equal impact on the Gross Added Value (GVA), and the export mostly depicts the new sector performance for a long time, the past performance (mostly observing the post-crisis period from 2009 to 2016) varies significantly between the two aggregates.

The M&E sector creates 1.2 % of Serbian GDP and 7.4 % of added value within the processing industry (PI), making it the fourth greatest sector of the industry, right behind the metallurgy.

However, compared to the relevant<sup>31</sup> European countries, Serbian M&E sector has a significantly lower share. This is relatively the most important sector in Germany and Italy – leaders in the M&E production in Europe, with the share in PI being 22 % and 17 % respectively. On the other hand, the sector is also prominent in the new EU Member States, which had undergone the transition much before Serbia. In particular, Hungary, Slovenia, Czech Republic and Slovakia have the share of added value to the PI ranging from 15 – 18 %, which is more than the double than in Serbia.

*Table M&E 1: Importance of the M&E sector – added value, employment, export orientation*

	Bruto dodata vrednost (BDV)			Dodata vrednost preduzetnika*	BDV	Zaposlenost	Učešće izvoza u prihodima**
	mil RSD	%BDP	%PI				
	2016			%BDV	CAGR 2016/2009	# 2015	%
BDP	4.261.927	100,0			0,70		
Prerađivačka industrija (PI)	666.059	15,6	100,0	19,8	2,36	364.758	46
Hrana i piće	167.143	3,9	25,1	25,2	-1,00	77.915	24
Drvo i nameštaj	30.022	0,7	4,5	32,4	0,68	27.574	34
Guma i plastika	54.574	1,3	8,2	12,2	3,07	21.666	59
Mašine i oprema	49.318	1,2	7,4	14,2	2,69	30.261	61

Izvori: RZS, APR, kalkulacije CEVEŠa

(Gross value added (GVA); Entrepreneurs' added value; GVA; Employment; Export share in revenues // GDP; Processing industry (PI); Food and drink; Wood and furniture; Rubber and plastic; Machines and equipment // Sources: SORS, SBRA, CEVES calculations)

\* The estimate of the added value created by the entrepreneurs is made based on the difference between the gross added value of the sector from the national accounts and the added value of the sector based on the companies with registered business in the sector taken from the structural business statistics (the second one does not include the entrepreneurs). This estimate is presented as a percentage of the gross added value of the sector from the national accounts.

\*\* Share of the export in revenues was calculated only for the companies with registered business in the sector in order to provide the impression on the export orientation of the sector. Note that the majority

<sup>31</sup> Serbian M&E sector is logically to be compared with the countries with economical and historical characteristics similar to Serbia. These are mostly the new EU Member States (NEUMS) and former Yugoslavian countries, and the European leaders in this sector – Germany and Italy – are given for a broader illustration.

*of entrepreneurs with registered business in the sector were not included in this estimate since they do not submit the financial reports to the SBRA.*

The M&E sector Gross Added Value (GVA) growth in the post-crisis period had somewhat exceeded the PI average. Although it was one of the fastest-growing processing sectors in Serbia (following rubber and plastic sector, textile and textile products sector and transportation vehicles sectors), the average annual growth of 2.7 % is not an impressive growth that would bring the relevance of the Serbian machines sector close to the level of the countries used as a benchmark.

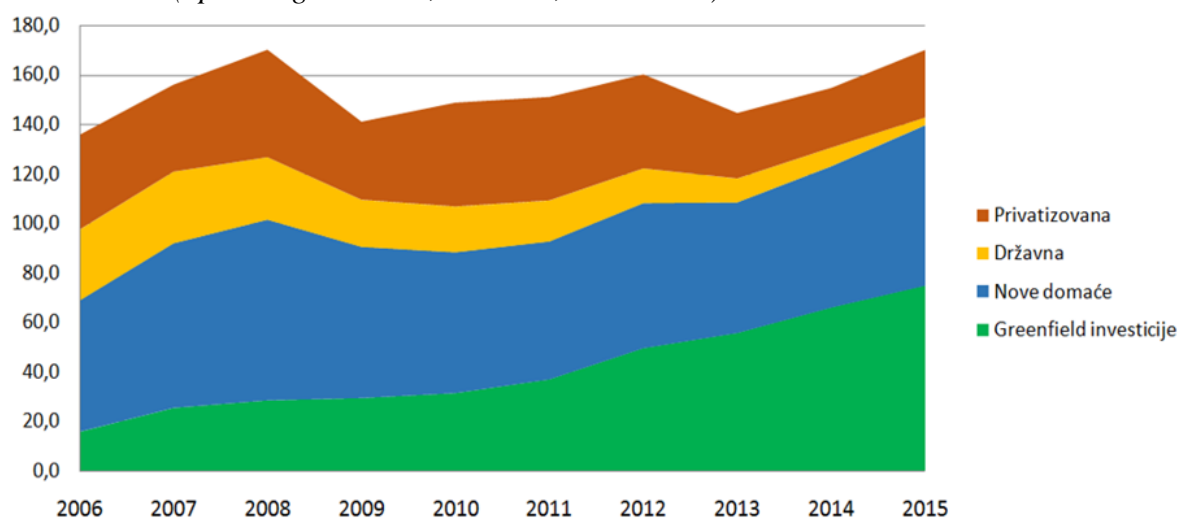
**However, there are several reasons for us to believe that the growth will be faster than before in the upcoming period, which would contribute the increase in this sector's relevance for the economy of Serbia.**

**Firstly**, the post-crisis “medium” performance of the GVA was the result of the sector restructuring process implemented over that period, which is nearing the completion presently. The M&E sector growth would have been greater had the ownership transformation been completed earlier, similarly to some other sectors (e.g. rubber and plastic production sector or food sector). One of the originally state-owned enterprises is still owned by the state, and such companies are seeing a significant decrease in the past years, while the privatized companies are also seeing the decrease in the activities over the most of the period observed. This jointly blurs up the performance of this sector, which may be expected to dictate the future sector performance (Figure 2<sup>32</sup>).

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<sup>32</sup> The chart shows only the companies with registered business in the M&E sector, since there is no purpose to review the revenues of the companies from the other branches that may be creating only *a part* of their business revenues through the production of machines or equipment.

*Figure M&E 2: Sector transformation – discontinuation of the traditional and development of the new sector (operating revenues, bill RSD, 2006-2015)*



*Izvor: APR, Kalkulacije CEVESa*

*(Privatized; State-owned; New domestic (De novo domestic); Greenfield FDI // Source: SBRA, CEVES calculations)*

The new sector, in fact, increases the added value approximately 4.5 times faster than the entire sector. This powerful growth in performance of the new part of the sector is mostly brought up by the FDI's, with the revenues in the post-crisis period (2009 – 2015) increasing by 169 % contributing to over 2/3 of the sector growth. However, the domestic autochthonous companies (hereinafter: the domestic) growth was also noted, yet only after 2011, when these companies had begun the recovery after the crisis (since then, the revenues had increased by 17 % until 2015).

**Secondly**, the export performance of Serbia is incomparably stronger than the added value performance. The average annual export growth rate was 12.6 % (Table 2) in the post-crisis period, which significantly exceeds the GVA growth rate. Although this gap might have been a consequence of the small added value in the export, the M&E sector had undoubtedly achieved the growth in the export added value as well (analysis provided in the next chapter). Therefore, the strong growth of the M&E sector export indicates the possibility for the sector to base its future growth on the international market placement, which is, in fact, the only possible way to assure the significant future growth. Another great contribution of so-called competitiveness effect<sup>33</sup> indicates that most of the export growth achieved based on the market share on the export markets. Apart from that, Table 1 had shown that the M&E sector is

<sup>33</sup> The constant market share analysis or trade share analysis is the intuitive and simple method of analyzing expressed competitiveness of a country's total export or the groups or subgroups it consists of. The method has a starting point in an assumption that the product with growing market share expresses competitiveness at the given market, and vice versa. *Competitiveness effect* of the product on a given market is calculated as the difference between the export achieved and the export that would have been achieved if the share of the product export in the total import of the same product had remained unchanged. The total competitiveness effect in the export of a product is calculated as the sum of the competitiveness effects on all markets where the product is being exported, which may be positive or negative. This sum obviously depends not only on the export growth speed, but also on the market structure – if the export is being made to faster or slower growing markets. The high rates of the competitiveness effect should be interpreted carefully, having that as a rule, the rates would be greater where the baseline is lower. If the export product manufacturing had moved, "winning of the market share" refers to the investment beneficiary country, however the product itself may retain the same market share.



predominantly export-oriented as compared to the other three sectors analyzed under this project in more depth.

*Table M&E 2: Export performance of the M&E sector*

	Izvoz	Učešće u ukupnom izvozu zemlje	CAGR izvoza	Doprinos rastu ukupnog izvoza zemlje	Doprinos Efekta konkurentnosti	CAGR svetskog uvoza	Očekivani rast izvoza
	2016		2009/10-2015/16				2016-2017
	mil EUR	%	%				%
Privreda, total	13.432	100,0	10,5	100,0	76,0	5,3	13,4
Prerađivačka industrija	12.124	90,3	10,5	43,3	78,3	5,8	13,3
Hrana i piće	1.665	12,4	5,7	3,9	49,5	6,2	9,3
Drvo i nameštaj	559	4,2	9,1	1,2	78,9	6,5	16,1
Guma i plastika	983	7,3	13,8	3,8	76,2	6,4	26,1
Mašine i oprema	1.348	10,0	12,6	6,3	77,1	5,6	19,0

*Izvori: RZS, UN Comtrade*

*(Amount; Share in total national export; Export CAGR; Contribution to total national export growth; Competitiveness effect contribution; Global import CAGR; Expected export growth // Economy total; Processing industry (PI); Food and drink; Wood and furniture; Rubber and plastic; Machines and equipment // Sources: SBRA, UN Comtrade)*

**Third** reason for our belief that there is a potential for a greater role of the M&E sector is the fact that this sector has an exceptionally strong tradition in Serbia (see Box 1), and the chapter on competitiveness factors indicates that some of those are still valid. It used to be a well-developed and internationally recognizable sector that had left significant unused resources which are, as we will show in the next chapters, according to all indicators the reason for the sector growth today. These are firstly knowledge and skills being a foundation of the present sector's success. The new domestic private companies had commonly been founded by the people who used to work in the former systems, and the foreign investors are able to significantly rely on the domestic engineers and craftsmen soon after establishing the production in Serbia. Apart from that, the former sector had left certain production capacities that may be employed. These are brownfield sites in various parts of the countries, as well as the machines parks that may be re-commissioned with certain modifications.

#### ***Box M&E 1: M&E sector's history in Serbia***

It is well known that the M&E sector used to have an incomparably greater role in Serbian economy compared to today. Transformation of the country from predominantly agricultural to industrial had commenced back in the period when Yugoslavia was the kingdom, with the development speeding up significantly after the World War II, during the "golden age" of high economic growth and industrialization in 1950's and early 1960's. The M&E sector had been built, in line with the beliefs of the time, as the condition for the desired industrialization of the country – extensive and diversified. The industrial centers had been established throughout the country, the domestic product had 8.0 % and industrial manufacturing 12.4 % annual growth, and although the M&E sector has been developed by all Yugoslav republics, the Serbian sector was particularly developed compared to the development level of the republic. Late 1980 are the M&E sector in Serbia employed 129,315 people, making up 5.6 % of the total number of employees in the economy, and creates 4.7 % of GDP.<sup>34</sup>

<sup>34</sup> Data refer to Serbia, without Kosovo and Metohija, in 1987. Exact GDP for the period is not known. Empirical assumption was used that the ratio GDP/Domestic product was 1.12.



With the knowledge and the skills available, the Serbian M&E sector was one of the most prominent sectors of Yugoslav economy. Giants such as IMK 14. oktobar, Ivo Lola Ribar, Prva Petoletka, Gosa, Zmaj, IMR, and others had been driving economic growth and complete national development. High technical capacity and expertise were being developed all over the country, and in all segments of the sector – IMK 14. oktobar built advanced construction machines, Ivo Lola Ribar constructed robots that competed with German and Japanese companies on the greatest exhibition of the time in Hamburg and built Computer Numerical Control (CNC) tooling machines for export to the USA; Prva Petoletka built parts for Boeing; and Zmaj had produced threshers that had been exported to all continents.

Yugoslav economy, along with Serbian economy and the M&E sector, began slowing down in 1980's, with dilapidation beginning by the end of the decade. Serbian industry lags behind the competition in technology sense as soon as 1980's, being unable, similar to the other parts of the country, to adjust to the new global business conditions that came to be after the first and the second oil strike. War and sanctions came to be in early 1990's, suddenly pushing Serbia in de-industrialization phase. Both physical infrastructure and accumulated knowledge are being destroyed. Serbian machines sector enters the transition process in early 2000's completely devastated – with a prominent technological gap, excessive workforce, in factual financial bankruptcy and with deeply disturbed managerial structure. Along with that, privatization process of such dilapidated enterprises began in a very unfavorable moment – global economy was undergoing recession after *dot-com* crisis, and other former planning economies had already passed half of the transition path<sup>35</sup>, on the way to the EU membership, absorbing a significant portion of foreign investments.

Multiple waves of the Serbian economy privatization had barely managed to rescue the resources of enterprises that had been managing to retain solid operations before, is quite scarce in this sector. Such enterprises were privatized the first, in late 1990's, according to the law providing for buy-off by the employees (mostly under the leadership of the management), which had additionally decreased the probability for such companies, few of which from this sector, to adjust to the new business conditions. After 2002, bidding and auction-based privatization began, which had excluded 70 major industrial systems at the very beginning – some of which were in the electrical and machines sector. They were in *de facto* financial bankruptcy, thus there was the need for restructuring prior to the privatization. The process is yet to be completed by the present day.

**The fourth** reason that supports expected growth of the M&E sector in the future comes from the demand side. Although Serbia had missed the train of foreign direct investments at the end of 1990's and early 2000's that had built machines industry of the new EU Member States, there is the new trend of so-called *nearshoring* that favors Serbia (please see Box 2 regarding the trends). The most developed EU Member States are increasingly moving manufacturing to the nearby countries having the appropriate knowledge and lower costs, instead of to the remote Asian countries (although the major or moving is still going there, yet mostly regarding big series and simple manufacturing). Within this *nearshoring* process, the new EU Member States (such as Lithuania, Romania, Poland, etc.) appear as the leading competitors to Serbia, which will be discussed later. These countries had had similar M&E sector tradition to Serbia,

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<sup>35</sup> Transitional period of former planning economies such as Czech Republic, Slovakia, Poland, Romania, Bulgaria and Hungary is considered to last from 1995 to 2005.

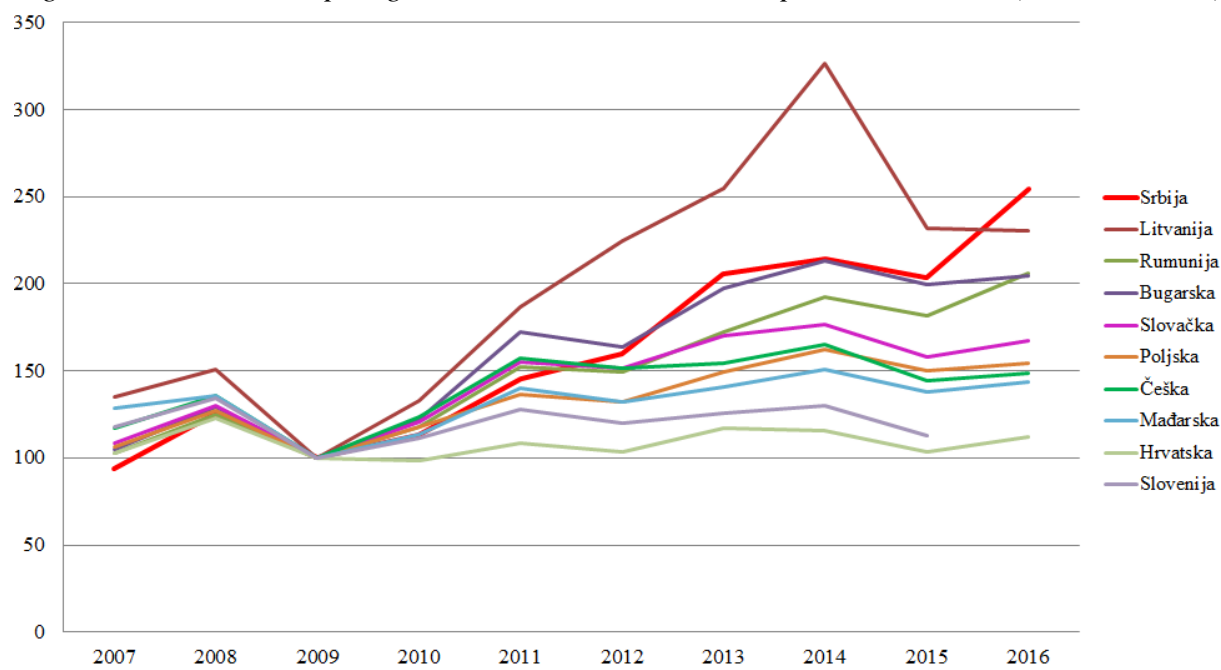
undergoing the transition process, yet one must keep in mind that the industry recovery in Serbia starts from a much lower point and far later than in these countries (the 1998 level is reached only in 2007, is only a half of 1989 level). It is important for Serbia to use the development opportunity provided by the nearshoring this time.

***Box M&E 2: Trends and production redistribution in the M&E sector (highlighting nearshoring)***

Trends of digitalization (Industry 4.0), customization, tertialization, consolidation and nearshoring jointly bring up the shift of production between the types of countries. Developed countries – led by the USA, Japan, Germany, and Italy – are the leading drivers of sector development on a global level. These countries place a great focus on high technologies, R&D, innovation and digitalization along the entire value chain (Industry 4.0). They create the highest value and the greatest added value products while moving the production itself to the countries with lower labor costs, while keeping the upstream and downstream parts of the value chain (so-called service parts of chain) “at home” (tertialization). These are the activities demanding the most complex technological knowledge and strategic approach to the global market – e.g. development, design, branding, marketing, etc. Regarding the production, the main destination for relocation used to be China, which slowly becomes a less attractive destination for production displacement. First, the salaries in that country are growing; and second, there is a growing fear that China would take over the technology and step in front of the current sector leaders (the greatest fear came to be after the purchase of German robot manufacturer Kuk). In that regard, the manufacturers from the most developed countries join forces to improve their strength (consolidation) and increasingly move manufacturing to other countries. By decreasing the manufacturing displacement to China there is a diminishing trend of moving to distant Asian countries since the producers are becoming aware of all of the problems regarding the manufacturing in distant countries and establishing new contacts in the countries far away from both regarding geography and language and culture. In that regard, a part of the products previously manufactured in China (predominantly large series component manufacturing) is slowly moving to other Asian countries with low salaries, great workforce and increasingly better technical equipment (Vietnam, Indonesia, India, Malaysia, etc.), with a part of manufacturing (predominantly for complex solutions done in small series) gets moved to the nearby countries ever so often, with language, cultural and geographic barriers much lower (nearshoring). In Europe, these include Southeastern Europe countries – predominantly Poland and Romania – which certainly includes Serbia as the country with long M&E sector tradition and competitive labor cost.

Benchmarking with the competitors indicates that Serbia already has a good use of the potential for export growth available. During the post-crisis period, Serbia had increased the M&E export in excess of 2.5-fold, making it the leader among the comparable countries, that is, the new EU Member States. Figure 3 shows that only Lithuania has the export growth at a similar pace to Serbia; however, both Romania and Serbia are showing good performance.

Figure M&E 3: M&E export growth index – Serbia and comparable countries (baseline: 2009)



Source: UN Comtrade

(Export growth index // Serbia; Lithuania; Romania; Bulgaria; Slovakia; Poland Czech Republic; Hungary; Croatia; Slovenia)

Along with the importance of value creation and export growth, the M&E sector has relevance for the country both regarding technical-technological and social development. This sector is commonly referred to as the “key enabling sector” since it both dictates the production in nearly all sectors of the economy, and the skills and knowledge developed in this sector are beneficial for the development of other sectors as well. The accumulation of various knowledge built through the various aspects of the M&E sector creates the critical know-how bulk, needed for mastering higher technologies and the development of the entire economy.

Finally, the M&E sector is also significant for Serbia from the social aspect. By employing over 30,000 people, this is the major sector in the PI. Out of that, the major number is in family-owned micro and small companies, situated throughout the country, which indicates the potential to contribute uniform regional development, especially through the empowerment of underdeveloped regions.

## Aspect of the Industrial Organization of the Sector

In order to better understand the sector performance and perspective, there is the need to understand the industrial organization, both regarding *size* and *ownership*. It is well-known that the big companies are enjoying numerous advantages against the medium, small, and especially micro-companies. Likewise, the companies owned by corporations established on the global market (globally integrated FDI's) have an expectable set of advantages as compared to domestic and regional companies – firstly referring to the established networks of suppliers and distributors on the global market. In that sense, the industrial organization and performance of the M&E sector, from the export standpoint, are shown in Table 3 per company size and in Figure 3 per ownership.

Table M&E 3: Export per exporter company size (2009-2015<sup>36</sup>)

	TOP 3 izvoznika	TOP 25 izvoznika	Velika		Srednja		Mala i Mikro	
	Učešće %		Učešće	CAGR	Učešće	CAGR	Učešće	CAGR
Privreda, ukupno	13,5	32,3	54,7	14,9	23,3	11,0	19,7	7,8
<b>PI</b>	<b>15,1</b>	<b>35,2</b>	<b>58,6</b>	<b>15,3</b>	<b>23,2</b>	<b>10,4</b>	<b>16,0</b>	<b>7,6</b>
PI bez osnovnih metala i transp. sredstava			50,5	13,6	27,3	9,9	19,5	8,6
Hrana i piće	8,5	36,1	45,8	11,3	30,1	3,8	22,8	8,7
Drvo i nameštaj	15,7	41,5	21,6	9,4	32,8	13,9	40,9	12,2
Guma i plastika	43,7	75,6	61,8	19,8	19,4	17,4	12,6	8,1
Mašine i oprema	32,4	77,3	62,1	21,9	15,9	10,7	18,1	8,5

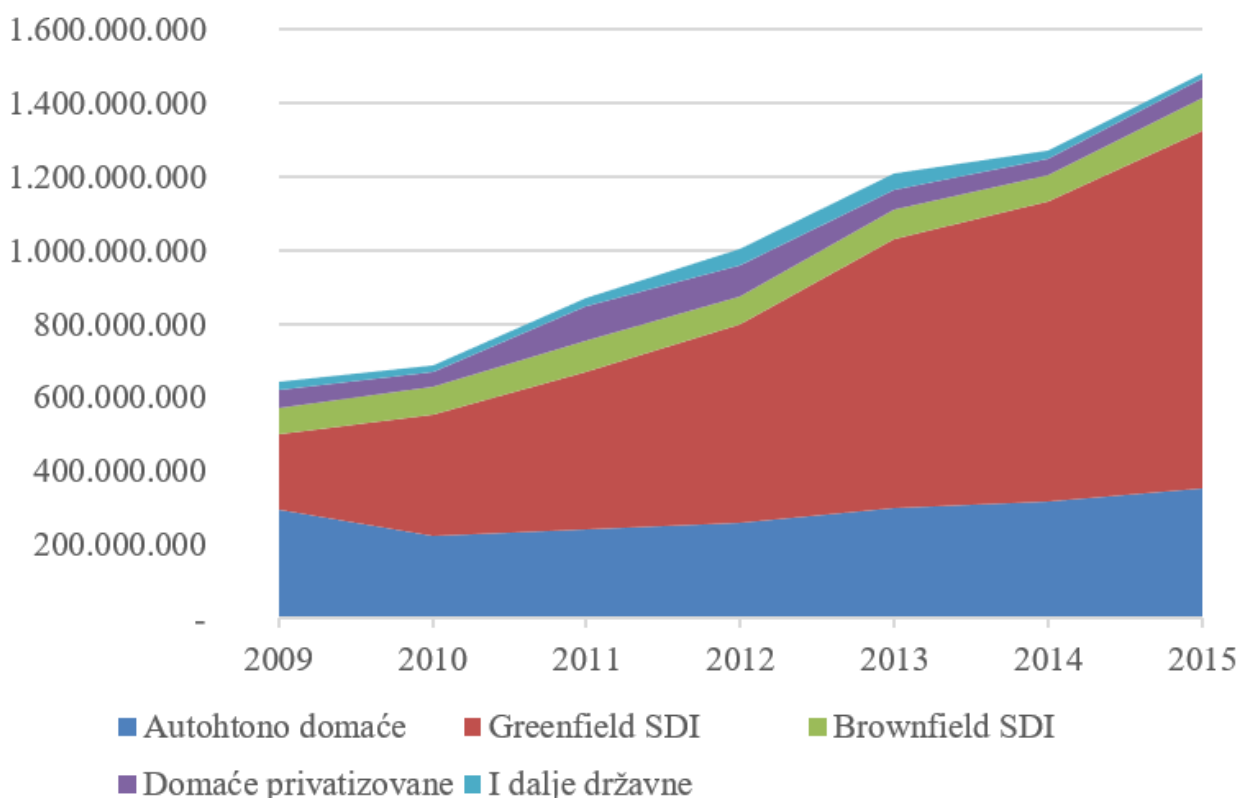
Izvori: RZS, APR

(Top 3 exporters; Top 25 exporters; Large; Medium; Small and micro; Share; Share, CAGR; Share, CAGR; Share, CAGR; // Economy total; PI; PI excluding basic metals and vehicles; Food and drink; Wood and furniture; Rubber and plastic; Machines and equipment // Sources: SORS, SBRA)

As expected, the majority of export and export growth is being created by the big companies, if the exporters are classified by size, or foreign companies, of classified by ownership. The export concentration in major companies is similar to the rubber and plastic sector, which, however, is not the case in food and drink and wood and furniture sectors. An interesting thing, however, is that the export share of micro and small companies combined is greater than for the medium companies (Table 3), indicating that this is the sector where even the relatively small companies may have significant volume of foreign market entrance, since there is no need for great volumes of export to provide economic feasibility (as is the case in food or rubber and plastic industries, where the products due to low price, do not tolerate transport costs easily). It is also interesting that the M&E sector is among the few sectors where the still predominantly state-owned companies did not cut their export as compared to 2009 (on contrary, it was moderately increased meanwhile). However, the export performance in the post-crisis period had been primarily driven by the new sector, which has no formal ties to the originally state-owned enterprises (except for the fact that the domestic private companies were often established by the persons who used to work in the traditional sector). The export growth during the post-crisis period was mostly driven by the greenfield FDI's, however, the autochthonous companies export is also growing, with the recovery notable only after 2010 (Figure 4).

<sup>36</sup> In the cases where status data on the companies are required for calculations, the last data available are from 2015.

Figure M&E 4: Export of machines and equipment in post-crisis period – ownership categorized (EUR, 2006-2015)



(Autochthonous domestic; Greenfield FDI; Brownfield FDI; Domestic privatized; State-owned)

\* wiring excluded (SITC 7731) since it predominantly refers to the wiring for motor vehicles, which is outside the scope of this analysis

Source: Customs and SBRA

## Export Performance and Competitiveness of the M&E Sector

A strong export performance of the M&E sector was predominantly driven by the FDI's export. Of 25 major exporters, only four are domestically owned, all are former state-owned enterprises privatized by the domestic capital. The first 12 exporters are all foreign companies (10 greenfield and two brownfield FDI's) and them "alone" are covering in excess of 70 % of the total export growth of the sector in the post-crisis period (2009/10 – 2015/16). However, the export of these companies varies significantly per the product type, thus the export performance is not as concentrated as it may appear to be. Likewise, the rest of the export growth is due to a vast number of companies (both foreign and domestic) that had exported a broad range of various products to a number of markets. Such a diversified export performance indicates that the sector has a broad range of knowledge and skills to make a competitive product under varying conditions, for diverse purposes. To provide for better understanding of the export diversification, we are providing Table 4 with grouping under six sub-sectors mentioned in the first part of this report per statistical product groups (four-figure SITC codes level). The grouping was made per product types and their places in the value chain.

Table M&E 4: M&E sector products export grouped per sub-sectors and ownership of exporter companies

Izvoz u 2015 (EUR)		Učešće u izvozu, po vlasništvu (2015)			Stopa porasta izvoza	Doprinos efekta konkurentnosti porastu izvoza	Stopa porasta ukunog svetskog uvoza
Podsektori, sa prikazom najznačajnijih izvoznih grupa proizvoda na nivou SITC kodova na četiri cifre	UKUPNO	Autohtono domaće	Privatizovane	Greenfield SDI	2009/10 - 2015/2016		
Električne komponente i oprema	623.323.015	14	9	72	198	77	55
Delovi za elektromotore i vetrogeneratore	219.867.401	0	1	99	600	95	27
Žice i kablovi*	123.742.203	9	30	38	280	79	77
Prekidači za električna kola, do 1000V napona	75.153.282	16	1	83	95	84	55
Motori i generatori	52.541.423	0	0	100	5514	99	108
Aparati za domaćinstvo	300.660.601	10	11	79	157	88	50
Frizideri i zamrzivači	144.376.601	1	0	99	163	92	47
Ostali elektrotermički uređaji	84.203.473	17	1	81	219	89	49
Neelektrični šporeti	47.863.557	20	67	12	63	66	47
Mašinski sklopovi	263.866.067	9	7	81	159	90	54
Delovi za motore sa unutrašnjim sagorevanjem	95.182.162	3	1	96	117	77	48
Centrifugalne pumpe	78.011.753	3	0	97	6571	100	53
Mašine specijalne namene	240.500.836	52	12	35	68	72	28
Kancelarijske mašine	44.476.177	15	0	85	171	103	9
Mašine za beton, rudnike i sl.	29.720.857	39	57	4	104	84	24
Mašine opšte namene	124.897.025	47	24	28	112	60	62
Mašine za pakovanje, punjenje, lepljenje etiketa, sortiranje i sl.	13.984.587	56	8	36	187	81	55
Rashladna oprema i delovi	13.678.593	45	9	46	362	94	65
Mehanički elementi	48.376.692	53	29	16	46	1	58
Slavine i ventili	18.122.827	86	1	12	54	24	64
UKUPNO	1.601.624.236	22	11	64	154	70	44

\* Od svih prikazanih grupa proizvoda, jedino u ovoj grupi značajan deo izvoza (23%) kreiraju još uvek državne firme. S obzirom da je u svim drugim značajnim izvoznim proizvodima ovo učešće zanemarljivo, kolona sa učešćem još uvek državnih firmi nije prikazana u tabeli.

Izvor: RZS, UN Comtrade

Source: SORS, UN Comtrade)

(Export in 2015 (EUR); Export share per ownership (2015); Export growth rate; Competitiveness effect contribution to export growth; Global import growth rate // Subsectors with the most important product groups at four figure SITC code level; TOTAL; Autochthonous domestic; Privatized; Greenfield FDI // Electrical components and equipment: parts for electric motors and wind turbines, wires and cables\*, electric circuit breaks up to 1000 V, motors, and generators; Household appliances: refrigerators and freezers, other electrical appliances, non-electrical appliances; Machine assemblies: parts for internal combustion engines, centrifugal pumps; Special-purpose machines: office machines, machines for concrete, mining, etc.; General-purpose machines: machines for packaging, filling, labeling, sorting, etc., Cooling equipment and parts; Mechanical elements: Faucets and valves; TOTAL //)

\* Out of all product groups shown, this is the only group where the state-owned companies retain a significant portion of export (23 %). Having that their share in any other export products is negligible; the table does not contain a column with state-owned companies' share.

The major export share belongs to the **Electrical Components and Equipment** sub-sector. The products categorized under this sector generate EUR mil 623 of export, which is nearly 40 % of the total M&E export. The most significant export products within this sub-sector are wind turbines and cables, and the most significant companies exporting these products are one *greenfield* FDI (Siemens) and one *brownfield* FDI (TF Kable, established through the purchase of the former state-owned enterprise “Fabrika kablova Zajecar”). The second and third greatest export belongs to **Household appliances** (EUR mil 301) and **Machines assemblies** (EUR mil 264), with the respective share in total export of 19 % and 16 %. As for the household appliances, the most important group of export products are refrigerators and freezers, and for

machines assemblies, these are parts for internal combustion engines and centrifugal pumps. For both sub-sectors, the dominant exporters are the foreign companies (*greenfield* predominantly), similar to the electrical components and equipment. However, for the fourth major sub-sector, **Special-purpose machines**, which brings EUR mil 241 or 15 % share of the total export, the majority of the export is provided by the domestic, autochthonous companies (a total of 52 %). A broad range of products is exported (no dominant product), most frequently various machines for the food industry, metal processing machines, concrete machines, and office machines. Finally, the fifth and sixth sub-sector per export is **General-purpose machines** and **Mechanical elements**, with the respective share of 8 % and 3 %. The leading export products within these sub-sectors are packaging machines and cooling equipment, and faucets and valves (Table 4), and the majority of the export is being created by autochthonous companies, similar to the special-purpose machines.

Although the M&E sector export performance is much-diversified product-wise, the situation changes when companies are considered, as noted at the beginning of this chapter. Foreign companies bring as much as 72 % of Serbia's M&E export today (64 % *greenfield* and 8 % *brownfield*), with the share being 43 % back in 2009 (31 % *greenfield* and 12 % *brownfield*). On the other hand, although the foreign companies export growth had caused the decrease of autochthonous companies' share of export, these companies had in fact seen the positive export performance during the post-crisis period. The number of autochthonous companies that had exported the M&E sector products had increased from 3,800 to 4,290, and the value of export had increased by 32 % in 2015 compared to 2009/2010 average (if comparing to 2009, the export increase would be only 16 %, since these companies had suffered a major drop in export in 2010 compared to 2009). The rest of the export, apart from foreign and autochthonous companies, is provided by the companies privatized by domestic capital and the companies still owned by the state. Since the role of the later is presently negligible, they will not be taken into consideration, and the export of domestic privatized companies below will be grouped with the companies privatized by foreign capital (*brownfield*), since in spite of the differences between the domestically and foreign privatized companies performance-wise (in the growth sense), their products are similar regarding the type of products and the manufacturing technology.

We will review the export of companies grouped by ownership below to provide for better understanding of the types of products exported and the recipient markets.



## Greenfield FDI

*Greenfield FDI* provides a total of 64 % of the M&E export. The top 10 provide for 70 % of the export, while the remaining 30 % is being created by additional 860 FDI's (however, this number of FDI's is exaggerated, since a part of these companies are in fact the domestic companies established in tax heavens, and a part is erroneously recorded in the database, which has been established through sampling and verification, having that the ownership of smaller companies had not been verified individually as for the bigger companies). Although such an export structure appears quite concentrated, the fact is that the top 10 FDI's are positioned in various products, i.e. there is no high concentration in one or two product types. For instance, Siemens produces wind turbines (for more about Siemens see Box 3), Grudfos produces pumps, Gorenje group and Robert Bosch various electrical household appliances, Eaton Electric produces electrical installations, Le belier produces parts for internal combustion engines, Clover produces office machines, Panasonic Lighting produces luminaries, etc. The main export destinations of these companies are Germany, Switzerland, Austria, Russia, and the USA.

### ***Box M&E 3: Siemens - "accidental" arrival to Serbia and successful stay***

Siemens is present in Subotica since 2010 when the principal headquarters had bought German company Loher GmbH that had part of its production situated in Serbia since 2001. Today, Siemens produces electric motors and wind turbines for the European market in Subotica.



The wind turbines manufacturing is highly technologically demanding production, done in large series, which requires a high level of organization and

operations management; Siemens employs over 1,800 persons in Serbia, with a high share of engineers, managers and experienced craftsmen, in line with the production complexity.

Only manufacturing is presently being done in Serbia, while upstream and downstream activities are performed in the headquarters or other branches of the company. The manufacturing itself was gradually yet continually moved to Serbia, thus the situation today is that every fourth windmill in Europe uses the generator produced in Subotica. As for the upstream activities, the counterparts from Siemens announce the potential transfer of strategic inputs procurement to Serbia, perhaps even the development functions.

Having a company such as Siemens in the country is significant for several reasons. Firstly, by employing qualified staff and manufacturing complex products, this company generates a valuable know-how in the country. It also provides the opportunity for Serbian workforce to learn how to work for major, globally integrated systems, which requires immaculate quality of work, high efficiency, communication skills, etc. Secondly, Siemens also contributes the technical-technological development of the country by placing a great focus on R&D and introduction of innovation (in 2016 alone the company had introduced more than 12 innovations in their generators). Finally, Siemens transfers good values to the rest of the economy by providing the examples of good practice through its social responsibility shown through rewarding the best students of the Faculty of Electrical Engineering, establishing a new department in the Technical school of Subotica (locksmith welder), recycling 75 % of all industrial waste generated, etc.

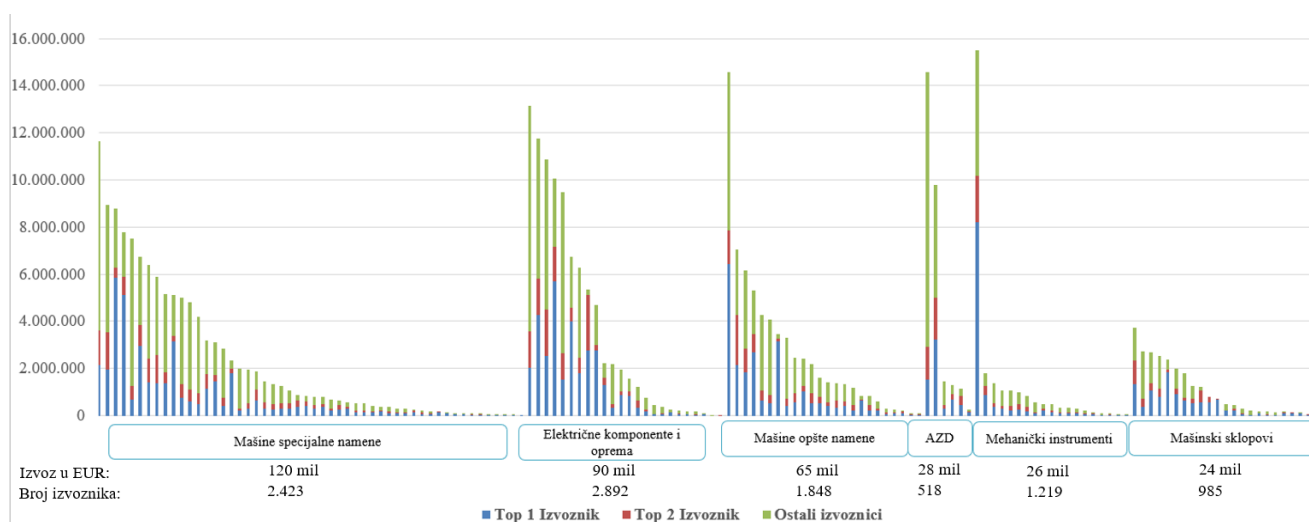


## Autochthonous Domestic Companies

The export by autochthonous domestic companies is highly diversified from various aspects – per companies, per export markets, as well as per products. A total of 4,290 companies export products from the M&E sector, 720 of which being registered in the M&E sector business (others are mostly in the trade, metallurgy, and computer sector). The majority of these companies registered in the M&E business are micro, small and medium enterprises (MSME), often family-owned. Although we know that the M&E sector is very open for export even in the case of smaller companies, there is a surprisingly positive data that 44 % of autochthonous MSME's (registered business of M&E manufacturing) does export. If we would focus on SME's only, as much as 83 % of them exports, 90 % of which exporting continuously. The export covers a vast number of markets – from the regional market to the most demanding European markets, such as Germany and Italy.

Autochthonous companies export a very broad range of products. Figure 4 shows that the export of these companies covers all product groups within the M&E sector (149 product groups according to the 4 figure SITC classification) and that the vast majority of them have significant share – no high concentration in few products. Yet, there is a certain grouping. The major share in the export by autochthonous companies belongs to the special-purpose machines (36 %), electrical components and equipment (25 %) and general-purpose machines (17 %), which cover the export of a vast number of various products to a great extent, such as machines for different industries or different types of electrical installations. Of course, a great share goes to non-electric furnaces within the household appliances sub-sector (along with electric-thermal appliances) and mechanical components (faucets and valves in particular). It is interesting that the majority of 149 product groups indeed have high concentration, with two major exporters dominating, making up over one half of the export on average. This is clearly depicted in Figure 5, where the major exporter of this product group is shown in blue, and the second largest in red. However, the number of other exporters (shown in green) is rather large within each of the product groups.

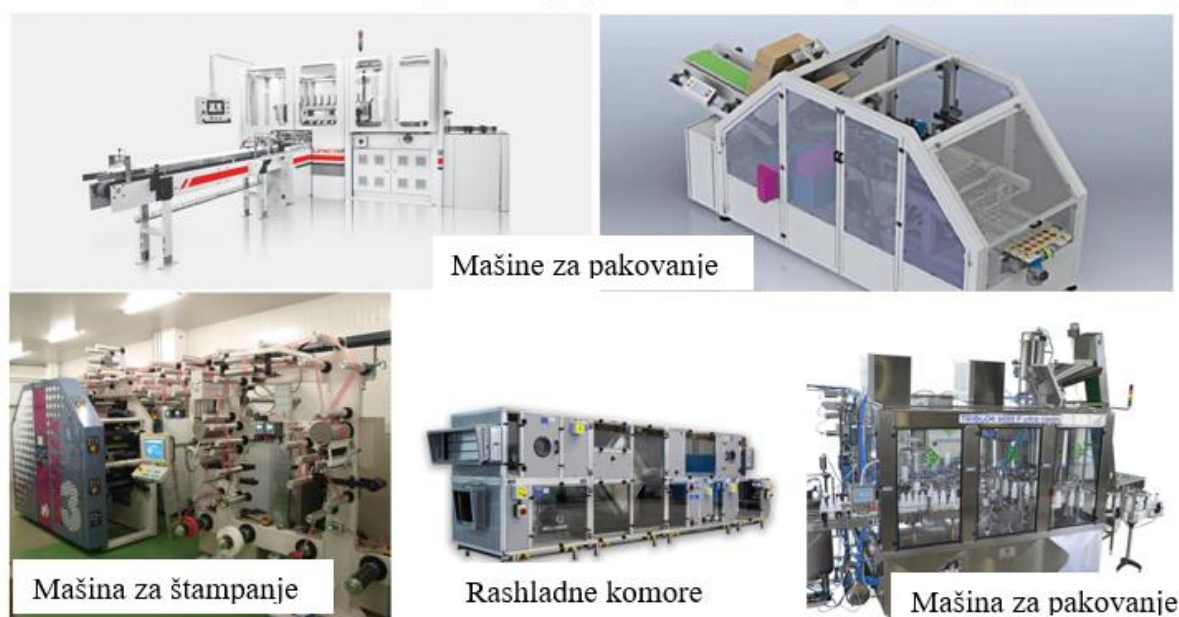
*Figure M&E 5: Product diversification of autochthonous companies export*



*(Special-purpose machines; Electrical components and equipment; General-purpose machines; Household appliances; Mechanical instruments; Machine assemblies // Export in EUR; Number of exporters // Top 1 exporter; Top 2 exporter; Other exporters)*

The majority of the successful autochthonous companies' examples are in the *customized finished machines and equipment* for food industry manufacturing (including design and furnishing the entire production systems), the reason is probably relatively developed domestic food industry. Special-purpose machines and equipment are mostly produced to measure, for the known buyer, thus the closeness of the “client” sector is important for the development of these product types. The *majority* of food industry machines exporters are in the group of machines for food production itself (mixing, cutting, processing with heating, etc.), while the majority of equipment exporters are in the group of cooling and ventilation equipment. On the other hand, *the most successful* examples of food industry machines exporters are in the production of somewhat more complex machines, mostly customized to the specific requirements of the buyer: machines for foodstuffs packaging (either primary or secondary packaging), machines for packaging production for foodstuffs and machines for printing foodstuffs packaging (see Box 4), while the most successful manufacturers of cooling and ventilation equipment are the ones offering the service of complete furnishing of the production facilities under the “turnkey” principle (these are so-called system integrators that combine various devices to create and implement systems customized to the clients' needs). The examples of products by the most successful autochthonous exporters are shown in Figure 6.

*Figure M&E 6: Customized machines and equipment manufactured by autochthonous companies (“niche of manufacturers”)*



*Izvor: Internet*

*(Packaging machines; Printing machine; Cooling chambers; Packaging machine // Source: Internet)*

***Box M&E 4: A vast number of companies in packaging machines manufacturing (example: Stax)***

Among the autochthonous exporters, there is a prominent group of packaging machines (primary or secondary). The export of these machines by autochthonous companies in the post-crisis period had grown by staggering 600 %. These are usually machines for food and drink packaging, with some of the examples of packaging machines manufacturers being Pak Promet

and Stan technologies, with the most successful company manufacturing paper accessories packaging machines – Stax.

“Stax” is a company from Cacak doing an individual production of sophisticated paper accessories packaging machines. The company produces 55 to 60 such machines annually, none of which is identical to the previous (each being “a prototype by itself”). In general, “Stax” began its operation after understanding the market and recognizing the niche through the previous company “9. septembar”. Having that each machine is customized to the buyer’s requirements, there is a great share of engineering work in the product design and elaboration and customization of manufacturing equipment for the particular product. Apart from that, out of the total staff (78), the majority are qualified workers (engineers and predominantly experienced craftsmen), while there are very few workers in the assembly area. Manufacturing of a machine starts after the agreement with a buyer, thus the business of this market segment does not require entering global distribution networks.

Stax notes that their success is mostly due to the investment in three activities: 1) innovations, technological development, and following trends; 2) branding (participating in exhibitions, distribution channels, sales agents abroad); and 3) service support (online support and interactive instructions).

On the other hand, unlike the companies producing finished special-purpose machines and equipment for end-users, a significant portion of autochthonous companies had opted for or gotten the opportunity to manufacture *customized components* for finished machines manufacturers. The most successful among these companies are the ones working for foreign partners or clients (mostly one or two). The partners/clients are usually also manufacturers in the M&E sector, however, some are from automotive, construction or metallurgy sector. In these cases there is certainly a great dependence of domestic manufacturers from the partners/clients (since all of the production capacities are linked to the manufacturing for them); however, the relations built in the machines industry are long-term, since it is mostly difficult to replace a partner due to the complexity of manufacturing. For that reason, this kind of strategy commonly turns out to be sound, especially having that the efficiency and productivity are significantly improved when working with the demanding foreign clients. Having that the most common mode of cooperation is a partnership; the foreign clients are usually willing to transfer knowledge and skills to Serbian companies, both in the field of production and management. The interest for long-term and fair relation is mutual, therefore such types of partnership relations are usually fruitful (successful examples are presented in Box 5).

***Box M&E 5: Components manufacturing for foreign partner (example: Termometal Ada)***

Some of the successful examples of the manufacturers that opted for components manufacturing for a foreign partner are Gosa Simicevo (although this is not an autochthonous company, its present production portfolio is completely different from the production of former state-owned enterprise) that produces concrete mixers for German partner; Iva 28 that produces tools for German and Swiss partner; and Termometal Ada that produces parts for German automotive industry development center.

Termometal Ada is one of the brightest examples of companies that produce components for a foreign partner, and its story deserves the attention. The company was founded in 1986, as an independent crafting shop for thermal metal processing (thus the name), since there was a deficit of this service at the time. Later on, the company enters into serial manufacturing of agricultural mechanization and parts. However, the key moment in the development of this company was the arrival of a German company looking for a partner for manufacturing metal assemblies in Serbia. After winning this contract, the company began to grow and develop along

the German partner. Today, it is the company with more than 300 employees having modern machines in its production facility, mostly CNC. The main business of the company is the manufacturing of components for a German automotive industry development center, with each of the product for this center being the prototype itself. For this reason, the major share in the workforce of these companies goes to qualified staff: engineers (for designing of each individual product manufacturing from a drawing delivered by the partner) and craftsmen experienced in operating CNC machines (it takes 3 to 5 years to obtain the necessary experience level).

*Figure M&E 7: Components manufactured by domestic companies for foreign clients/partners*



*Izvor: Internet*

*(Concrete mixer; Parts for tooling machines; Welded components // Source: Internet)*

## Privatized Companies

The products exported by the privatized companies vary depending on the domestic or foreign source of capital for privatization. Regarding the export of domestically privatized companies, there is a dominant share of non-electric household appliances (stoves and furnaces) and special-purpose machines (agricultural machines), while the export of foreign privatized companies (brownfield FDI) have predominating export of electrical components and equipment (cables, joints, etc.) and some general-purpose machines (e.g. pumps, lifting, and transportation machines). The first group consists of the companies such as Alfa Plam, Milan Blagojević, FPM Agromehanika, Majeveca poljooprema or Goša FOM, and the companies of the second group are Tf Kable (cables), FKL Temerin (ball bearings), ATB FOD (mining machines), and Rapp Zastava (winches for trans-oceanic ships).

However, regardless of the division on privatization capital, these are mostly the products with a low degree of customization, i.e. serial production, for an unknown buyer. Only a few privatized companies manufacture customized products and the ones that do differ from the



autochthonous companies firstly by having vast manufacturing capacities and the ability to manufacture very bulky products. These are lifting and transportation machines for mines produced by Gosa FOM or ATB FOD, concrete mixers produced by Gosa Simicevo or winches for ships produced by Rapp Zastava. The examples of products manufactured by privatized companies are shown in Figure 8.

*Figure M&E 8: Examples of products manufactured by privatized companies*



*(Transporter; Ship winch; Ball bearings; Non-electric stove; Cables; Portal crane)*

## Analysis of the M&E Sector Competitiveness from the Value Chain Perspective

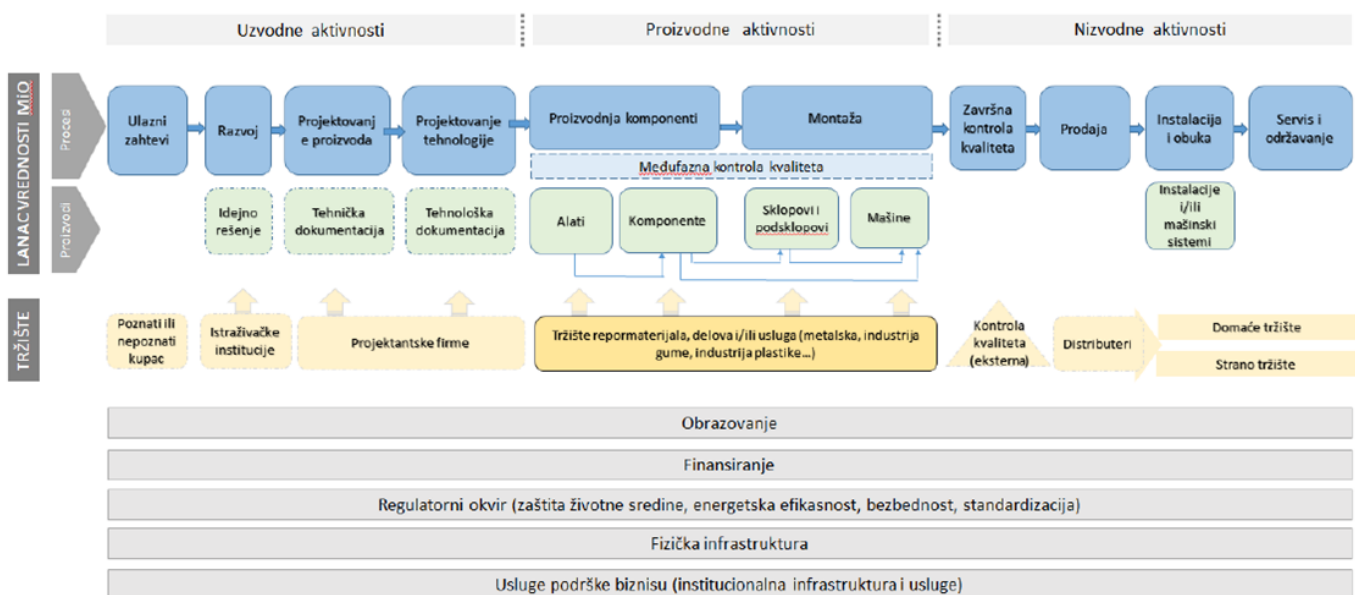
It is clear that the M&E is the sector with highly diversified products, where inputs, specific processes, and manufacturing technologies, along with the market, vary significantly. For the majority of the products, the competitiveness analysis would need to be done with separate value chain (VC) analyses, and with a particular focus on the understanding of the manufacturing technology employed, equipment used and production organization. Implementing such analyses for the purpose of the industrial development strategy drafting would make no sense since each case would be specific and non-representative for most of the sector. However, researching some general factors indicating strengths and weaknesses in the competitiveness of various types of companies (predominantly ownership-wise) is sensible, along with their choice of various product groups. For that purpose, we will start by describing a VC with the most common characteristics, and how its characteristics change depending on the key factors for production competitiveness. Regardless if producing a valve or an entire machine, the process of adding value looks like the one shown in Figure 9.

### Value Chain Characteristics

The **lines** in the chain, three of which being fundamental plus five supporting (Figure 9) show the following: the first line contains the processes constituting the chain, i.e. producing the value; the second line contains outputs of these processes, and the third one contains external market participants. After them, at the bottom of the chain, there are five lines representing the factors of environment – education, financing, regulatory framework, physical infrastructure and business support services. These factors have a less direct, yet powerful impact on shaping and success of value creation.

The chain itself consists of three **segments**, determined by the activity type. Looking at the processes, in the *upstream* segment, the activities are linked to defining characteristics of product and manufacturing process, which are performed prior to the process commencement. They involve predominantly recognizing the input requirements coming from the buyer, design, and elaboration of the product and elaboration of manufacturing process technology. The middle, *production* segment consists of the production itself (manufacturing components, machines or systems) and procurement of all materials, supplies, and components necessary for the production. At the end, the *downstream* segment consists of sales and post-sales activities (marketing, distribution, installation, servicing).

Figure M&E 9: General value chain of the M&E sector



(Upstream activities; Production activities; Downstream activities // M&E value chain; Process: Input requirements, Development, Product design, Technology design, Component manufacturing, Assembly (Intermediary quality control), Final quality control, Sale, Installation and training, Servicing and maintenance; Products: Draft design, Technical documentation, Technological documentation; Tools, Components, Assemblies and sub-assemblies, Machines, Installations and/or machine systems // Market; Known or unknown buyer, Research institutions, Design companies, Material, parts and/or services market (metal, rubber, plastic industry...), Quality control (external), Distributors: Domestic market, Foreign market; Education; Finance; Regulatory framework (environment protection, energy

*efficiency, safety, standardization; Physical infrastructure; Business support services (institutional infrastructure and services)*

Three product characteristics have the prevailing influence on the critical success factors in its manufacturing. The first one is certainly the **technology level**. This factor does not change the shape of this chain on its own in a systematic manner (except, possibly, with today's 3D printing the sequence of production activities), but the greater it gets, there is the need to employ more resources (in quantitative and/or qualitative sense) within each of the activity (VC depth). The other characteristic is the **product complexity**. The more components and parts, as well as the phases on the path to the new product there are, the potential to add value in own production logically rises by extending the chain, i.e. by "mastering" the production phases of a product. At the end, the third characteristic impacting critical success factors is if the product is being manufactured **for the known or unknown buyer**. This predominantly due to major implications on the value chain shape, and secondly, since it is as a rule closely linked to the type of work engaged in the manufacturing and the size of series manufactured. In fact, it is highly improbable that the small series would be manufactured for an unknown buyer (bigger series are common in that case). A special type of manufacturer for the known buyer, having the longest value chain, as a rule, are the manufacturers also serving as the "system integrators", i.e. not only manufacturing machines and/or equipment; instead, they also offer the service of full equipping the manufacturing facilities with the devices produced by them. This involves complex upstream and downstream activities: system design and elaboration on one side, and system installation/setup on the other.

**Value chain shape** in the manufacturing for unknown buyer looks like the general case shown in Figure 7; such a manufacturer needs to research the market characteristics beforehand in order to define the input requirements in product design. When manufacturing for a known buyer, the production is guided by their requirements, thus the first box on the left of the figure does not go into the VC. Of course, in most of the cases, the product is not fully customized to the buyer, meaning that there are certain parts, aspects or predominant characteristics of products that remain unchanged regardless of the product customization level (e.g. certain standard components). Likewise, once "customized" product may be one of the kind or may be produced in smaller or larger series, depending on buyer's requirements. Depending on the portion of product value going into the customized part, and the size of the series for subsequent manufacturing, the manufacturing may appear as the extreme case of individual production, or the extreme case of large series production.

The value chain in manufacturing for known buyer varies both in upstream and downstream parts since in the event of the known buyer there are lower investments in market research, marketing, and branding. On the other hand, in the case of unknown buyer, defining the input requirements takes significant investment in market research (in the first segment of the chain) and the involvement in the complex global networks of input procurement (in the second segment of the chain), involvement in distribution networks, and finally greater investment in marketing and product branding (in the third segment of the chain). However, the known buyer is commonly better informed than the unknown one (ordering custom-made product, the one that fully suits his requirements), which puts a greater focus on verifying output performance by the buyer and therefore the product quality.

*Size of series* is, as a rule, also closely related to the technology type, i.e. reliance on various production factors and method of organizing manufacturing process. The transition from smaller to bigger series, as a rule, requires automation, i.e. diminishing the use of expensive, highly qualified, crafting work on one hand, and increasing the volume of lower qualified labor and the share of machines work. In this case, the use of highly qualified engineering work is being increased in the upstream segment of the chain, since the product and manufacturing technology are defined in that part (which must be firmly defined in the case of large series manufacturing). Once the manufacturing is organized and established, it is expensive and difficult for it to be changed, adjusted or corrected in any manner. Yet, per product unit, the highly qualified labor share grows lower as the series size increases, and the cost of highly qualified labor is lower than capital costs as a rule.

Finally, the bigger the series, the requirements regarding the organization level of all processes within the chain become greater. Since the technology predominantly depends on the appropriate equipment, it can easily be replicated (providing the availability of the appropriate capital), the competitive advantage in large series manufacturing predominantly depends on achieving a high degree of reliability and efficiency, i.e. further decrease of unit costs, through better organization of the manufacturing process itself, 100 % quality control, “just in time” supply of material and inputs and efficient product distribution.

### **Positioning Products and Companies Depending on Value Chain Characteristics**

According to the characteristics described – technological level, chain complexity/length, and size – the M&E sector **products** may be positioned in three-dimensional space, projected here onto two dimensions: x-axis – series size, and y-axis – product complexity (under the assumption that the technological level variations in Serbia are relatively low, and projected on the vertical axis). In that case, the coordinate system is established with series size on horizontal axis – from an individual (total customization) to mass production (no customization whatsoever), and product complexity on vertical axis – in the sense of production chain length (weighted by technological level).

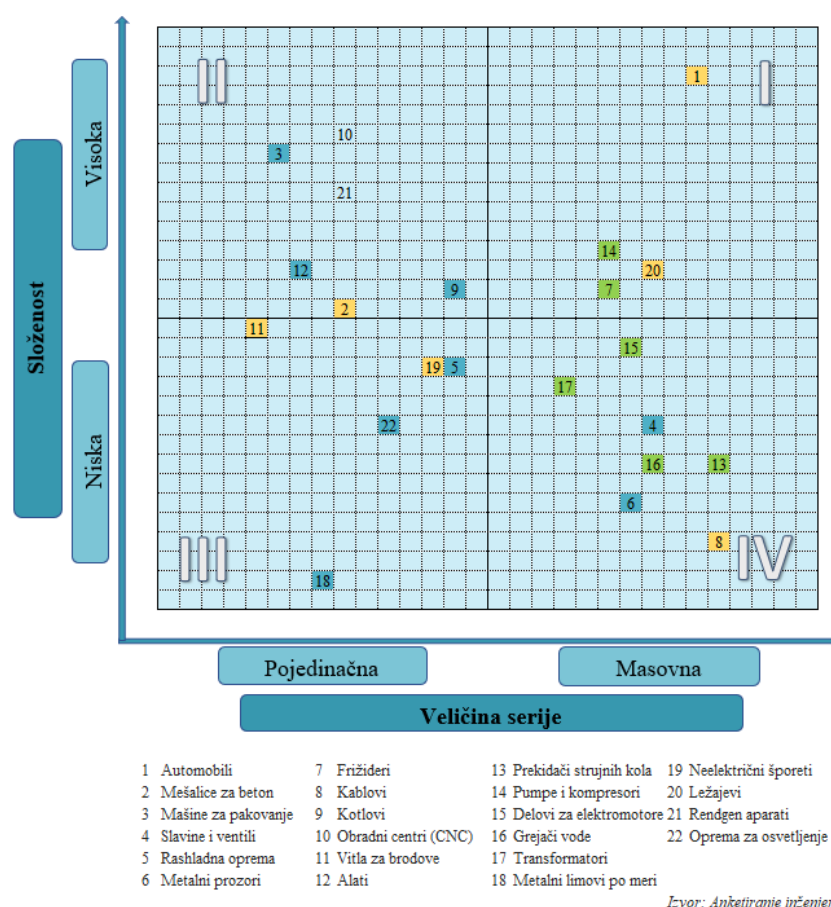
Figure 10 illustrates such a coordinate system in which, with the assistance of the engineers<sup>37</sup>, we had positioned 18 products from the M&E sector, three products from metallurgy sector (metal sheets, metal windows, tools) and one product from automotive sector (cars) in order to obtain a broader picture of the relevant position of the M&E sector products. The least demanding products are in III quadrant (low complexity and small series/individual manufacturing), and the most demanding ones are in I quadrant (high complexity of the product and high complexity of manufacturing process due to the mass production that requires complex manufacturing technology designing for the international competitiveness). Color-coding of the products will be described below.

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<sup>37</sup> Estimate of product complexity is according to the literature made in line with the opinions of professionals, since there are no scientific methods with sufficient precision for estimate disaggregated products (Sanjaya Lall, John Weiss and Jinkang Zhang, The ‘Sophistication’ of Exports: A New Measure of Product Characteristics, ADB Institute Discussion Paper No. 23, January 2005)



Figure M&E 10: Illustrated complexity matrix – review of various M&E sector products and several similar products from other sectors



(Complexity: Low – High // Series size: Individual- Mass // Cars; Concrete mixers; Packaging machines; Faucets and valves; Cooling equipment; Metal windows; Refrigerators; Cables; Boilers; Processing centers (CNC); Ship winches; Tools; Electrical circuit breaks; Pumps and compressors; Electrical motor parts; Water heaters; Transformers; Metal sheets to measure; Non-electric stoves; Bearings; X-ray machines; Luminaries // Source: Engineers survey)

As shown in Chapter III, export performance, export structure per product type and characteristics of most frequent products in the export significantly vary between the **companies** depending on the ownership type. The greatest differences exist between greenfield FDI's on one side and domestic autochthonous companies on the other, while the characteristics of privatized companies products are somewhere between the two extremes (although somewhat more similar to the foreign companies).

The matrix in Figure 8 indicates that the products in I and IV quadrants are mostly manufactured by greenfield FDI's (green squares), and the products in II and III quadrants are mostly manufactured by domestic autochthonous private companies (blue squares). On the other hand, privatized companies appear in all quadrants (yellow squares), with rather clear differentiation between the ones privatized by foreign capital and the ones privatized by the domestic capital, since the former are mostly situated in I and IV quadrant (just like greenfield FDI's), and the later is in II and III quadrant.

Grouping of companies per products may also be noted by observing 8 of the most important companies registered within the M&E within each ownership group (the companies were sorted

per business revenue amount and contribution to the total business revenue growth in the post-crisis period) in Table 5. All these companies are seeing high export growth in the post-crisis period, which means that all of them are competitive in their own way. In order to determine the segments in which the companies are competitive, Table 5 categorizes companies by ownership and by manufacturing type (large series vs. individual/small series), the degree of customization to the buyer (known vs. unknown buyer) and product complexity level.

Table M&E 5: The major companies of the M&E sector (par added value and revenues) categorized per ownership

Major companies per added value and revenues (2015)	Main product	Production type		Number of employees	Added value per employee (EUR)	EBITDA margin (%)	Added value	Revenues	Export	Added value	Revenues	Export
		Customization	Type of production technology and/or service									
Greenfield FDI												
Siemens Beograd	Wind generators	Universal	Serial	1.122	22.360	8.5	7.4	6.0	19.7	-16.5	7.6	79.8
Gorenje Doo Valjevo	Refrigerators	Universal	Serial	1.411	16.394	7.9	6.9	12.4	14.4	2.1	20.7	23.1
Gorenje Tiki Doo Stara Pazova	Boilers	Universal	Serial	458	14.888	12.4	2.0	2.0	2.6	0.9	16.3	24.0
Gorenje Home, Zaječar	Laundry machines	Universal	Serial	122	19.401	11.5	0.7	1.0	1.4	...	...	...
Muehlbauer Technologies Doo Novi Sad	ID machines	Custom-made	Individual and small series	138	49.542	23.5	2.0	0.9	1.2	...	...	...
Dunkermotoren Doo Subotica	Electric motors and small power engines	Universal	Serial	188	11.329	2.6	0.6	1.0	1.4	...	...	...
Grundfos Srbija Doo Novi Sad	Pumps and compressors	Universal	Serial	366	28.328	5.1	3.1	7.0	9.3	0.2	89.4	175.4
Eaton Electric Doo Sremska Kupa	Switches and circuits	Universal	Serial	680	12.377	6.0	2.5	2.6	3.6	2.2	1.5	6.0
Traditional sector												
Alfa Plam Ad	Stoves and furnaces	Universal	Serial	690	22.874	18.8	4.7	3.1	2.6	8.2	4.1	3.4
Goša Form Ad Smederevo	Reducers and coke mach.	Custom-made	Individual	862	7.117	5.7	1.8	1.5	1.1	2.0	1.0	-2.6
Milan Blagojević, Smederevo	Stoves and furnaces	Universal	Serial	382	11.358	13.2	1.3	1.0	0.8	9.2	9.5	9.3
Soko Inženjering Doo Novi Sad	A/C and cooling	Custom-made	Configured series + SI	136	31.763	13.4	1.3	1.2	0.3	10.3	8.8	55.8
Ats Sever Doo Novi Sad	Motors and transformers	Universal	Serial	408	13.272	5.3	1.6	1.2	1.1	5.3	-9.1	-8.0
FKI Ad Temerin	Ball bearings	Universal	Serial	603	8.698	14.8	1.6	0.8	1.0	-1.2	1.8	6.3
TiKable Fkz Doo Zaječar	Cables	Universal	Serial	392	7.626	0.4	0.9	4.3	3.7	24.7	19.5	27.1
Novikabel Ad Novi Sad	Cables	Universal	Serial	471	7.912	-5.4	1.1	1.2	0.8	2.3	-5.1	-2.9
Autochthonous domestic private sector												
Termometal Doo Ada	Complex automotive co.	Custom-made	Individual and small series	335	19.540	26.9	1.9	0.8	0.8	7.9	19.3	31.9
Aling-Conel Doo Gajdobra	Assemblies and joints	Universal	Large series	195	28.926	49.9	1.7	0.6	0.2	7.3	17.2	18.7
Doo Termovent Sc Temerin	High-pressure faucets and valves	Custom-made	Configured series	147	27.742	27.4	1.2	0.7	0.9	9.6	11.7	23.4
Svetlost Teatar Doo Beograd	Theater appliances	Custom-made	Configured series + SI	55	28.651	4.5	0.5	1.0	1.0	15.6	15.3	54.9
Alatnica Barović International Doo Novi Sad	Sheet metal m&t	Custom-made	Individual	44	6.623	34.8	0.7	0.4	0.4	205.8	124.1	0.0
Doo Star Technologies Čačak	Paper packaging mach.	Custom-made	Individual	49	5.762	22.8	0.7	0.6	0.7	-	0.0	0.0
Master Frigo Doo Beograd	Cooling equipment	Custom-made	Trade + SI	63	4.368	12.7	0.7	1.0	0.8	9.0	14.3	54.1
Gasteh Doo Indija	Gas equipment	Universal	Serial + SI	103	2.452	21.4	0.6	0.4	0.2	5.4	5.1	63.5

\*SI = system integrator

Source: SBRA

## Critical Success Factors – Ownership Dependent

The positioning of various companies (according to ownership) in the manufacturing of various products is not by accident. The FDI's, privatized and autochthonous companies base their competitiveness on *different* sources, coming from different characteristics of their manufacturing. These different sources are *critical success factors* for them.

For example, in the case of ***autochthonous companies***, although it may appear contrary, manufacturing of *specialized customized machines* and *furnishing production facilities* with cooling or ventilation equipment have several key similarities, being the very reason for the autochthonous sector to be particularly developed in these segments.

- First of all, this is the manufacturing of products/systems customized to the specific requirements of a buyer (customized solutions), which means that this is the individual manufacturing that requires a high share of highly qualified labor, both of engineers (designing) and experienced craftsmen. Although special-purpose machines and facility systems may consist exclusively of standardized components, the point with such products is that the value is added through designing and “smart fitting” of these components. Thus, the special-purpose machines manufacturers are in a sense the “system integrators”, similarly to the equipment manufacturers offering full furnishing of production facilities, since such companies, in fact, integrate the existing products/components into the customized solutions.
- The second common characteristic of this type of manufacturing is that it does not require a large workforce. For instance, machines for food and beverage industry, although bulky and complex, may be manufactured (assembled) by a small workforce; therefore it is common for some very small companies to produce machines with several hundred thousand Euro value. Sometimes the companies manufacturing these machines employ nearly all engineers since the essence of manufacturing is in innovative, and/or client-customized fitting.
- Finally, the third common characteristic is that there is no need for great capital investment, since the manufacturing may nearly fully consist of designing, fitting and assembly, and the majority of components may be purchased as final products available as universal offer on the market (e.g. motors, pumps, etc.), and when the need for customized components arise to be manufactured to demand, the special-purpose machines manufacturers usually include subcontractors in their value chain to produce the elements, since the machine manufacturers themselves cannot specialize in manufacturing a broad range of elements needed for their machines.

On the other hand, the reason to position a part of the automotive sector in *components* manufacturing for final manufacturers lies, similarly to the special-purpose machines and furnishing the entire manufacturing systems, in the high degree of professionalism and the ability to produce customized solutions, per buyer's needs, with relatively low costs. Some of the most successful component manufacturers for foreign companies that had started as small crafting shops, without any capital and cost availability of such knowledge and skills, and the foreign manufacturers were interested to invest in them and help them make up for what they do not have. However, the degree of domestic companies' participation in foreign companies' value chain is low, and the reasons for that are described in Box 6.

As for the **greenfield FDI's**, they mostly manufacture large series for unknown buyer (i.e. for the market), which involves the existence of highly developed machines part (which is feasible only for large series), high investment in designing production process technology, and excellent organization of operation which provides for the maximum utilization of capacity. As for the upstream parts of the VC, such type of manufacturing requires high investment in market research and low investments in the workforce (since it requires non-qualified or low-qualified laborers servicing the machines); and the downstream parts require high investments in marketing and distribution channels.

Regarding the **privatized companies**, their positioning is, as seen, in line with their current ownership. Of course, this is not the accident. Foreign capital entered the places where it may utilize its advantages to the maximum – existing broad distribution channels and great demand that could be satisfied by the major production capacities of formerly state-owned enterprises. On the other hand, domestic privatizations (often insider-type) had happened more often to the companies that had required lower capital investment and based their competitiveness predominantly on quality and experienced labor.

In the summary, **critical success factors** mostly differ between foreign and domestic companies, with the reasons being the **importance** of different factors for different manufacturing types and the **access to various factors** for different companies (Table 6). Therefore, we have the situation where:

- **Foreign companies** (especially large, well-established ones) base their competitiveness in Serbia on 1) great availability and low cost of non-qualified and low-qualified labor, and the other factors that are usually *not* available to the domestic autochthonous private companies, namely: 2) significant ex-ante availability of significant starting capital; 3) capacity of integrated management approach that provides for maximum capacity utilization; and 4) inclusion in the global networks of supply and distribution (large market).
- **Domestic companies** base their competitiveness on the availability of the following factors: 1) low cost of qualified and quality labor; 2) capacity for flexible manufacturing organization; and 3) close cooperation with the buyer (importance of closeness – both communication and geographic). All of the factors are available to the domestic companies, even the smaller ones (in fact, they are more available to the smaller companies due to the greater flexibility in manufacturing change and positioning closer to the goal buyer), and this is the reason for the domestic autochthonous private sector, mostly consisting of the SME's, to be positioned in individual or small-series manufacturing for the known buyer.

### ***Box M&E 6: Domestic suppliers inclusion in the FDI's value chains***

The majority of foreign companies operating in Serbia did not include domestic companies in their value chain to a significant extent. The part of the reason is in the fact that these companies usually bring their own suppliers with many years of cooperation (due to all advantages brought by such cooperation), but part of the reason also lies in the characteristics of domestic companies, which in fact determine the critical success factors described above.

First, the type of manufacturing by significant FDI's in Serbia (large series manufacturing of complex products) is such that they mostly need large series of inputs, where many of those are complex (vital) parts of the end products. In that regard, Serbian manufacturers often lack the *ability* to become suppliers of these companies. The ones that might achieve that regarding the types of products they know how to manufacture, often lack the capacity for large series manufacturing, while the domestic manufacturers of vital components (motors, pumps, compressors, etc.) are nearly inexistent. Thus the FDI's mostly import their inputs or procure them from the distributors on the domestic markets.

On the other hand, even if the domestic companies have the manufacturing technology appropriate to become the suppliers of FDI's, one of the main reasons for this not to happen is lack of FDI's confidence in the stability of quality and adherence to deadlines by the domestic companies, and the inability of domestic companies to meet the criteria required by the foreign companies when deciding to include domestic suppliers in their chain. The most critical ones are the quality control and product traceability, while the obstacle to the cooperation may even be as trivial as the inability of domestic companies to properly fill in the application form (especially for the e-procurement).

Although we had noted the successful autochthonous companies above (because they dictate the domestic sector performance, the *majority* of autochthonous companies are in fact small family-owned firms operating as crafting workshops or small companies with basic elements of the of industrial manufacturing (Step 1 and Step 2 in Figure 11). These are the companies that had mastered manufacturing, yet lack established quality systems and operation mechanisms necessary for efficiency and reliability. In order to become a potential supplier of a globally integrated company, they need to take certain steps referred to as the *first transition*. Those steps involve the improvement of individual processes of *manufacturing*, *control*, and *management*, in order to provide the performances required by the global buyers. It is estimated that less than 10 % of private domestic companies in the M&E sector currently has the potential to meet the requirements needed to enter the value chain of globally integrated companies within a short deadline<sup>38</sup>.

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<sup>38</sup> Source: SORS (Suppliers day 2016)

Figure M&E 11: Organic development of companies – five steps



(Development phase; Company typology through development phase; Process improvement // Step 1: Local workshop/tool shop; Step 2: Small firm with industrial manufacturing elements; First transition; Step 3: Supplier for globally integrated company; Second transition; Step 4: Supplier capable to serve multiple global buyers; Third transition; Step 5: Supplier fully integrated with global suppliers' networks // Management process integration (the entire process takes 3 to 5 years)

Table M&E 6: Importance of various factors for different manufacturing types and product categories

	FACTOR RELEVANCE		FACTOR ACCESSIBILITY	
	Series size		Company size	
	Large series	Small series and individual	Large companies	MSM companies
<b>Capital</b>	+	-	+	-
<b>Access to global supply sources and networks</b>	+	-/+	+	-
<b>Capacity for integrated process management</b>	+	-/+	+	-
<b>Work&amp;knowledge, experience, skills</b>				
Engineers				
Process management and design	+	+/-	+	-
Product design and elaboration	+	+	+	+
Product manufacturing technology design	+	+/-	+	+
Operators				
Highly qualified operators of high-tech processes and assembly (CNC, etc.)	-	+	+	+
Qualified operators in processes and assembly	-/+	+/-	+	+
Unqualified laborers*	+	-	-/+	-/+
<b>Energy</b>	+	+/-	+/-	+/-
<b>Closeness to buyer</b>	-	+	-	+
<b>Inclusion in global sales and distribution network</b>	+	-	+	-

\* Unqualified laborers are available regarding the numbers, however relative expensive against comparable countries, thus -/+ in access columns.

\*\* Major companies in Serbian M&E sector are globally integrated FDI's as a rule (either Greenfield or brownfield), while the domestic companies (regardless if autochthonous or former state-owned privatized by the domestic capital) are mostly micro, small or medium-sized.



Although the majority of critical success factor differ among autochthonous, privatized and Greenfield FDI's, the labor is a **joint critical success factor**. Various types of manufacturing require different types of labor, however, the fact that various types of manufacturing had developed indicates that Serbia has both knowledge and skills for a broad range of products and technologies. Therefore, it is without a doubt that the key success factor of Serbian M&E sector lies in still available (however not sufficiently plentiful and accessible) knowledge and skills that may be obtained for somewhat lower costs than in the majority of competitors (predominantly the new EU Member States<sup>39</sup>). Those are both engineering and crafting knowledge and skills due to the long tradition in machines and equipment manufacturing, dating back to the time of former Yugoslavia. These also include related knowledge and skills in metallurgy, electrical and construction sector.

- Serbia has qualified and quality engineering and crafting knowledge based on the broader tradition, *for a very competitive cost compared to the quality*. That explains the fact that Siemens, Gorenje, and other foreign investors deepen and expand their production in Serbia and the fact that small domestic manufacturers such as Stax or Dimteh may forcefully compete on the global market, although they need persistence and quality to overcome suspicion of foreign partners towards an unfamiliar Serbian brand. Education of machine and technological engineers in Serbia (although not practical and applicable to the desirable extent) offers a very sturdy foundation to extend knowledge and skills upon with relative ease. For example, experienced staff can transfer their practical knowledge to the new generations. Due to such a quality engineering staff, certain FDI's opt for transferring supervision and management of manufacturing process to the local staff soon after commencing their operation in Serbia. Thus the manufacturers of household appliances (Gorenje), wind turbines (Siemens) and machines components for automotive industry (Albon) had either completed or at least initiated the process of moving both manufacturing and product design and development to Serbia (some of them even transfer the strategic input procurement for a broader part of their global network).
- Regarding craftsmen and mid-level professional staff, the tradition of machines production in Serbia becomes very prominent. Characteristics of this staff mostly refer to the capability to process various materials and use demanding techniques requiring years of experience in a creative and customized manner. Likewise, it is not uncommon to find autochthonous companies in Serbia (sometimes less than 10 employees, mostly engineers) capable to offer very narrow professional designing solutions in manufacturing relatively demanding machines project that fully relies on the inputs procured as finished products or sourced from their subcontractors.

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<sup>39</sup> Primarily Czech Republic, Lithuania, Hungary, Poland, Slovakia and Slovenia.

## Labor Cost

Labor cost in Serbia is lower than in other European countries, and the discrepancies increase with the qualification level. For instance, average managers' salaries in the EU 28 are 5.03 times higher than in Serbia; with 3.92 for technical professionals, 2.93 for machine operators and 2.67 times for low and unqualified laborers. Table 8 shows this comparison per individual countries, at the entire industry level (not available at the individual NACE sectors level).

*Table M&E 8: Annual salary of various categories of staff in industry<sup>40</sup> – Serbia and other European countries*

	EUR						
	Menadžeri	Visoko kvalifikovani kadar	Tehničari i tehnički stručnjaci	Kvalifikovani manuelni radnici	Operateri na mašinama	Nisko- i ne-kvalifikovani radnici	Prosek svih kategorija
Švajcarska	112.029	90.188	75.905	61.425	60.924	57.826	76.383
Norveška	106.492	89.306	76.381	54.957	57.619	49.436	72.365
Danska	103.508	84.881	64.835	52.005	50.686	50.138	67.676
Luksemburg	124.866	80.966	60.163	39.367	41.904	32.874	63.357
Nemačka	106.435	76.585	57.067	37.995	37.948	30.395	57.738
Finska	101.523	65.208	50.508	40.066	40.617	38.123	56.008
Austrija	101.099	68.260	55.110	37.791	38.630	31.929	55.470
Belgija	94.503	65.486	51.664	39.824	40.947	36.440	54.811
Irska	73.295	66.549	55.524	43.132	42.598	37.136	53.039
Holandija	85.051	62.374	54.437	36.902	37.387	30.940	51.182
Island	79.763	61.777	47.155	42.729	38.513	33.066	50.501
Italija	124.231	49.623	40.062	29.715	29.691	27.593	50.153
Švedska	78.047	59.376	49.815	39.425	39.123	34.354	50.023
Francuska	76.774	63.155	39.333	28.717	28.930	24.785	43.616
Velika Britanija	70.670	53.842	41.664	33.708	30.515	27.829	43.038
Prosek EU 28	67.296	52.883	40.844	26.059	24.607	18.753	38.407
Španija	64.625	44.320	36.228	25.771	26.027	20.930	36.317
Grčka	53.657	32.237	27.679	22.724	22.207	16.850	29.226
Kipar	51.762	31.911	27.177	20.482	21.590	15.606	28.088
Slovenija	48.217	34.671	26.045	18.065	18.082	15.116	26.699
Malta	40.208	29.009	22.254	17.654	17.378	14.073	23.429
Portugal	41.572	30.283	19.969	11.173	10.866	9.742	20.601
Estonija	25.837	21.660	15.763	12.170	11.728	9.731	16.148
Češka	28.886	19.402	14.203	10.343	10.058	7.942	15.139
Slovačka	29.144	18.430	14.134	10.250	9.968	7.449	14.896
Hrvatska	27.184	20.691	13.398	9.383	9.760	7.774	14.698
Turska	31.722	19.472	11.978	7.453	7.352	6.304	14.047
Poljska	24.477	15.924	12.943	9.504	9.944	7.342	13.356
Mađarska	25.880	19.843	12.244	8.005	7.890	5.797	13.277
Latvija	16.366	14.123	11.435	8.948	8.784	7.017	11.112
Litvanija	17.316	11.550	9.680	7.587	8.026	5.599	9.960
Rumunija	15.998	10.431	8.064	5.572	5.569	3.769	8.234
Srbija	11.163	11.363	8.295	5.885	6.254	5.103	8.011
Makedonija	12.610	9.182	7.514	4.631	4.649	4.148	7.122
Bugarska	12.461	9.203	7.576	4.796	4.659	3.223	6.986

Izvor: Eurostat (Structure of Earnings survey 2014)

(Managers; Highly qualified staff; Technicians and technical professionals; Qualified laborers; Machine operators; Low and unqualified laborers; Average for all categories // Switzerland; Norway; Denmark; Luxemburg; Germany; Finland; Austria; Belgium; Ireland; Netherlands; Iceland; Italy; Sweden; France; Great Britain; EU 28 average; Spain; Greece; Cyprus; Slovenia; Malta; Portugal; Estonia Czech Republic; Slovakia; Croatia; Turkey; Poland; Hungary; Latvia; Lithuania; Romania; Serbia; Macedonia; Bulgaria // Source: Eurostat (Structure of Earnings survey 2014)

<sup>40</sup> Manufacturing and Construction sector (there are no comparable data for more disaggregated classification)

The stronger competition for Serbian M&E sector comes from Eastern European countries. Production costs in these countries are marginally higher than in Serbia, with Bulgaria and sometimes Romania having somewhat lower costs, especially for lower qualified labor. These countries had entered the transition process with similar characteristics to Serbia – mostly lower developed capabilities, however also less devastated industry – and had seen a fast transformation thanks to the strong wave of European investment in the context of preparation for the EU accession, and even more so as the Member States.

Regarding the *cost* of one hour of contracted work in Serbia and the major competitors of Serbian machines sector (Romania, Croatia, Poland, and Hungary), this price is at a similar level, and even lower in Romania. The cost of contracted work hour – engineering designing, craftsman’s processing on the CNC machine, etc. – includes total manufacturing costs, with proportional allocation of overhead and capital cost. According to the knowledgeable counterparts, one hour of engineering designing from Serbia is sold for EUR 25 at the international market, similar to Croatia and Poland, while the cost in Germany is approximately EUR 100. Craftsman’s hour for metal processing on the CNC machine is approximately EUR 50 since it includes amortization of the expensive machine. If someone has a lower productivity, or if other sources of lower competitiveness exist, the effective salary paid to the laborer gets lower, as is the case in Serbian M&E. The global company that had analyzed these estimates had also informed us that compared to China, generally speaking moving the production to Serbia is some 30 % cheaper (transport costs included).

### *Labor Productivity*

Considering that the labor is the key source of competitive advantage, especially due to its relatively low cost, there is also the need to review the productivity of Serbian M&E sector, to evaluate the real competitive position of Serbia. Table 9 shows that it is one of the lower compared to the other European countries, yet relatively higher than the labor cost. In that regard, if we take a credible assumption that Serbian M&E sector is not capitally more intensive, we may conclude that it is more competitive than half of the European countries (upon the added value per employee compared to the cost per employee). In that regard, one needs to have in mind that this Serbian sector is still undergoing transformation, so by observing originally private companies only (Table 9 row marked with \*), the ratio of added value and cost per employee is in fact much more favorable, which places the competitiveness of Serbian M&E sector only behind Hungary and Romania.

Table M&E 9: Labor costs, productivity, and competitiveness of M&E sector – Serbia and other European countries

EUR

	Broj zaposlenih	Dodata vrednost po zaposlenom (EUR)	Trošak po zaposlenom (EUR)	Dodata vrednost / Trošak (po zaposlenom)
Mađarska	102.056	39.399	14.579	2,70
Rumunija	92.018	17.814	9.278	1,92
Srbija*	17.489	15.665	8.226	1,90
Bugarska	53.232	13.817	7.531	1,83
Bosna i Hercegovina	6.183	14.087	7.796	1,81
Poljska	229.135	25.163	14.193	1,77
Latvija	6.341	19.997	11.370	1,76
Grčka	16.722	34.601	19.884	1,74
Češka	229.029	27.247	15.728	1,73
Litvanija	11.106	19.314	11.642	1,66
Nizozemska	100.926	102.633	62.925	1,63
Hrvatska	22.168	24.418	15.107	1,62
Srbija	29.509	10.936	6.880	1,58
Portugal	41.133	34.780	21.999	1,58
Belgija	45.961	97.191	61.663	1,58
Italija	602.271	71.283	45.544	1,57
Slovenija	33.826	37.980	24.280	1,56
Luksemburg	4.504	92.984	60.679	1,53
Velika Britanija	281.216	73.894	48.528	1,52
Slovačka	73.321	25.473	17.062	1,49
Estonija	9.411	28.499	19.520	1,46
Španija	161.484	59.897	41.221	1,45
Finska	66.356	76.686	53.480	1,43
Austrija	126.002	89.628	63.289	1,42
Norveška	30.340	116.101	86.678	1,34
Švajcarska	113.062	125.741	94.959	1,32
Danska	82.534	68.493	51.911	1,32
Francuska	288.037	71.463	57.533	1,24
Nemačka	1.594.766	76.763	62.678	1,22

Izvor: SBS (Eurostat i RZS)

\* U ovom redu su posmatrane samo originalno privatne firme, jer bivše državne firme (čak i one koje su privatizovane) često posluju u drugačijim uslovima.

(Number of employees; Added value per employee (EUR); Cost per employee (EUR); Added value / Cost (per employee) // Hungary; Romania; Serbia\*; Bulgaria; Bosnia and Herzegovina; Poland; Latvia; Greece; Czech Republic; Lithuania; Netherlands; Croatia; Serbia; Portugal; Belgium; Italy; Slovenia; Luxembourg; Great Britain; Slovakia; Estonia; Spain; Finland; Austria; Norway; Switzerland; Denmark; France; Germany // Source: SBS (Eurostat and SORS))

\* This row covers originally private companies only since the former state-owned enterprises (even the privatized ones) often operate under different conditions.

### Threat for the Future

However, as much as knowledge and skills are the advantage/strength of this sector, on one hand, they are also the **restraint, i.e. threat for the future**. The field research had shown that the problem of production to find the appropriate staff is one of the main issues faced by the

companies. When asked about the greatest limit to the growth in the event of swift growth in demand, the majority of companies had replied it would be finding the sufficient number of appropriately skilled workers.

### ***Box M&E 7: Qualified labor paradox***

Understanding the qualified labor paradox being simultaneously the major success factor and the *limitation* of the M&E sector growth is assisted by the analytical framework that links the economic development to the complexity theory. According to this theory, the development process is the process of acquiring capabilities – knowledge, skills and experience – and establishing an increasing number of links between the holders.

“For the society to work on the high level of total productive knowledge, individuals must know different things. Yet, the diversity of productive knowledge is not sufficient. For that knowledge to be put to a productive use, societies must merge those dispersed bits in teams, organizations and markets.” (translation by the author)<sup>41</sup> This concept of capabilities does not cover only, for instance, the engineering knowledge attainable at the university or best professional secondary school. The experience of applying such knowledge is also needed, along with the ability to transfer the experience, and, more importantly, the capacity to link engineering and organizational knowledge in building organizational systems that efficiently and effectively put technological knowledge to use. The engineering knowledge is not sufficient particularly in this sector; instead, it requires both organizational and managerial knowledge and experience, which is capable to provide for meeting high requirements regarding reliability, quality, and efficiency – the necessary prerequisites for competitiveness in this demanding industry. Furthermore, knowledge and experience linking manufacturing to the market are also needed – who are the buyers, where they are and what are their needs.

The thing that had happened to Serbia in 1990’s may be described as breaking the links between the capabilities that existed at the time, most prominent being the product placement. Those capabilities had become *dispersed* at the time: the companies had lost markets and contacts with former partner foreign organizations, organizational units were torn apart, the links between former employees were lost, and faculties and professional secondary schools had begun training the staff that had no opportunity to obtain the experience. A good question that we have no answer to is the degree of the capabilities existence to efficiently organize manufacturing in an economically sustainable manner, however, it is the fact that this knowledge is very scarce today.

Over time, capabilities that had dispersed, along with their quality, bring up dispersion and loss unless reactivated. In order to activate the “dispersed capacities” and put them into operation, entrepreneurship and the link to market are needed – otherwise, they get dispersed and disappear. The opportunities and the ways for this link to be achieved differ between the major FDI’s, companies that are established as suppliers/subcontractors of foreign companies and autochthonous domestic companies that turn their focus abroad only after getting fully established on the domestic market.

Low salaries also impact the decrease of labor mobility – since meeting the basic needs require sharing salary and resources with the entire household. That, on the other hand, increases dispersion of resources, since the labor cannot be activated by moving to the location where the opportunities exist. Although the insufficient mobility diminishes the availability of qualified labor, it may also reverse effect on salaries – by impacting expectations, unemployment and low salaries of the ones that had no opportunity to employ their skills, the salaries of the ones whose employers cannot find sufficient staff is also kept lower.

<sup>41</sup> Atlas of Economic Complexity (Hausman, Hidalgo et al.) - [https://atlas.media.mit.edu/static/pdf/atlas/AtlasOfEconomicComplexity\\_Part\\_I.pdf](https://atlas.media.mit.edu/static/pdf/atlas/AtlasOfEconomicComplexity_Part_I.pdf)

## Perspective of the M&E Sector and Potential Limitations

In the global machines scene, there is a manufacturing redistribution happening over past years favoring Serbia (described in more detail in Box 2 at the beginning of this document). The particularly important trend for Serbia is nearshoring which is already happening and has the potential to bring investments and development missed in the first investment wave in early 2000's to Serbia. Manufacturers from the most developed countries increasingly opt to move the production to closer areas, where the production is more financially feasible (also due to transportation and lower cultural limitations). In that regard, we may expect that the manufacturers from the old EU Member States will be interested to move manufacturing of complex and customized products to the Eastern European countries, while the countries with low salaries, great workforce and increasingly better technical equipment (Vietnam, Indonesia, India, Malaysia, and others, with China still being an important player, although they had lost leading position in 2016 to India) would be left with mass production.

This very setup of global manufacturing opens an opportunity for Serbia through various channels:

- 1) **FDI.** Since the companies from the most developed countries increasingly opt to move their entire manufacturing facilities to the countries near the EU market, there is the room for the new FDI's arrival to Serbia. However, the effort must be made to improve the business landscape and infrastructure being the major barriers for this option at the time. Likewise, having the nearshoring trend, other countries of Southeastern Europe are trying to set up the incentives to attract the companies from the most advanced countries, thus the competition is very harsh. For instance, Poland, Bulgaria, and Romania<sup>42</sup> are presently setting up the most attractive locations for the arrival of foreign companies and move of manufacturing, since they do have good business landscape, infrastructure and human resources, and yet along with these advantages they are introducing tax and cash incentives for the FDI's. Through the arrival of FDI's and growing factory digitalization, Poland had become one of the fastest-growing industries regarding the advanced production (this production has double growth in Poland compared to the EU15). Other popular locations are Hungary and the Czech Republic<sup>43</sup>. Serbia is not on the list of the most attractive locations, firstly due to yet suboptimal general business conditions (although the situation there is improving) and inappropriate infrastructure (transportation, energy, etc.). On the other hand, defined brownfield and Greenfield locations, lower salaries, ability to adopt knowledge and skills faster and governmental subsidies – attractive incentives for the FDI arrival had been the very reason for the arrival of significant FDI's over the past years. As shown above, FDI's currently operating in Serbia manufacture highly complex products (e.g. Siemens – wind turbines) and very simple products (e.g. Tf Kable), which means that Serbia is attractive for both. However, in the case of the FDI's manufacturing simple products, the benefits for Serbia are not as plentiful, except for the employment increase, having that it is unqualified or low-qualified labor. In fact, there is no technology transfer (since the manufacturing is nearly completely automated and the laborers are mostly just “assisting” the machines, thus there is no room for adoption of

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<sup>42</sup> Global Services Location Index, A.T. Kearney

<sup>43</sup> The Future of Manufacturing in Europe (2016)

new knowledge or skills), or the potential for the inclusion of domestic component manufacturers in the value chain (since the only inputs for simple products are raw materials or basic semi-products). Apart from that, if certain conditions are changed (e.g. increase in salaries, increase in energy costs or decreasing/cutting subsidies), such FDI's may leave the country easily, since they did not "put down the roots". In that regard, there is a rationale to attract the FDI's with a greater potential of getting rooted and transferring their knowledge and skills, both to the staff they employ and to the local domestic suppliers.

- 2) **The niche of buyer-customized *final machines and systems* manufacturers.** The global demand for customized solutions to the buyer's measure is growing. On one hand, there is a growth of industries where such buyers are situated (e.g. agriculture, food, textile, etc.), and on the other hand, the consumers' preferences change rapidly, and the need for customized solutions that provide for diversification from the competition grows. Having that such machines are mostly built from a single or several pieces and often ordered ad hoc, their manufacturing is not interesting for major companies in highly developed countries. The closeness of Serbia to the EU market and inexistence of cultural (an even language) barriers makes Serbia appropriate for the development of competitive niches of manufacturers and/or system integrators working under "turnkey" principle (market closeness is very important for this). The proof for this is provided by the existing niche manufacturers and system integrators achieving excellent performance. Some of the examples of complex special-purpose machines producers are Stax, Dmitch, Caro Concept, etc., and the major examples of system integrators are manufacturers of equipment – e.g. cooling (Vos System, Termovent Komerc, Master Frigo), illumination equipment (Buck) or lifting and transportation equipment (Svetlost Teatar). Having in mind the great number of creative engineers and growing popularity of mechanical and electrical profession, there is the potential for networking such companies in Serbia, and the main limitations on that path are business environment and finance (since entering this type of manufacturing is expensive).
- 3) **Manufacturers of *components* for known buyers.** In line with the *nearshoring* trend, the room for Serbian component manufacturers' entry into value chains of globally integrated companies grows. A particular potential exists for the manufacturer's custom-made components, where the manufacturing involves high labor-intensiveness and great know-how of the workforce. Similar to the custom-made machines manufacturing, the advantage of Serbia is in high share of highly qualified labor, having that in the components manufacturing the engineering and designing part of work is commonly done by the client, and the component supplier performs manufacturing only. However, in the small series complex component manufacturing, there is a great share of not only experienced craftsman's work in manufacturing but also in the production process designing (how to manufacture a product on the drawing). This labor is cheaper in Serbia compared to other European countries, and the small companies having the potential to become suppliers are very flexible and able to meet ad hoc orders, which is also their vast advantage compared to the larger companies from the developed countries. However, as shown above, the majority of companies in Serbia presently does not meet the requirements to become a part of globally integrated manufacturers' value chain; however, a number of them may meet these requirements

in short-term, i.e. going through the first transition. The main limitations along this path are staffing and financial capacity since they had already mastered the manufacturing, yet they lack knowledge and resources to introduce the quality system, integrated management, modern communication methods, etc. However, with the external support (by the state or donors), these issues are relatively easy to solve. It is important for Serbia to continuously support the development of such companies since by working for globally integrated companies, domestic companies develop the lacking knowledge and skills – firstly in the field of quality, management, and communication.

## **Recommendations for the M&E Sector**

*This chapter provides recommendations regarding the direct measures needed to remedy the main obstacles noted for further development and competitiveness of the M&E sector. On one hand, the issues noted are mostly common to all sectors investigated in the package of the studies. They originate to a great extent from predominantly SME nature of the majority of the Serbian economy. On the other hand, implementing these measures requires certain preparatory steps and building capacity of governmental institutions to implement proactive measures of industrial policy presented here. These common aspects are described in Annex 2 of this document – Framework industrial policy measures for Serbia – in more detail and we will refer them below as needed.*

The M&E sector needs to be supported predominantly along three lines bringing the greatest opportunity for Serbia (described in detail in the previous chapter) – attracting the goal FDI's, empowering domestic potential suppliers for foreign manufacturers (nearshoring as an opportunity) and motivating the “niche” manufacturers as the potential domestic leaders. In that regard, there is the need to create particular support programs along the three lines, with the key being for the three programs to be focused and clearly prioritized. If the support would “disperse” all over, it may result in the lack of visible effects. On the other hand, giving greater amounts of support to a small number of companies may increase the risk of erroneous selection. In that regard, there is the need to assure that the competitions for the support program have full credibility, thus it is recommended to have their design and implementation with the participation of the international organizations, at least at the very beginning. The particular types of support for the three lines above should be designed having in mind the following recommendations:

### **1) Targeted FDI attracting**

- Targeted FDI attracting – the FDI's that are not the “dead end” regarding product and manufacturing process complexity, that are prepared to invest in the labor development.
- The transition from subsidies per job to subsidies per estimated development effect, which by all means includes the number of new jobs as a criterion, however focusing on the technology type/quality and staff skills development. Considering the great availability and emigration of the highest qualified engineering staff noted a particular goal to attract the companies that are prepared to move here their research and development (R&D) should also be considered.
- Transparent cost-benefit analysis for all of the potential FDI's before their entry.
- Evaluation of the existing FDI's and support programs they had received (achievement against the projected cost-benefit analysis)



- Try to bring the FDI's that provide for working on systematic suppliers' network development.
- 2) Support development of suppliers and linking them to the foreign companies, with the incentive for import substitution.**
- In the beginning, the most particular support would be professional and financial assistance for going through the first transition (shown in Figure 9) for the companies that meet the requirements for becoming suppliers for globally integrated companies in a short term. The first step is to identify potential domestic suppliers, scan their situation and provide systematic support for the ones with the capacity to meet the requirements with a support. The option of cooperation between the companies (especially the ones from the same locations) in meeting the objectives (lower cost of raw material procurement, cooperation in manufacturing, sharing transportation and distribution costs, organizing joint courses and training) should also be considered. Prerequisite for such a support from the government would be the knowledge of domestic economy (existence of databases covering both status and financial information and quality standards, production capacity, machines park equipment level, technology level, etc.), which is to be assisted by regional chambers of commerce and regional development agencies.
  - After building up the manufacturers prepared to become suppliers for globally integrated companies, the support should focus on linking potential suppliers with such companies. However, this type of support also requires good information on potential clients and their needs. In that sense, the recommendation is to start by building up domestic suppliers for globally integrated companies operating in Serbia (regardless if foreign or domestic) by determining the inputs imported by such companies and by providing special support for potential suppliers that may substitute the import of these companies.
- 3) Support for niche manufacturers having the opportunity for significant increase in export**
- Regarding the autochthonous manufacturers of niche products that market their products on their own, they all should be supported for certain; however, support dispersion does not provide visible results for the entire sector. Therefore, all the manufacturers need to be supported through horizontal measures (described below), but we suggest creating the particular programs of financial support for the ones that have the opportunity for a significant increase of export and lack the capacity to use the opportunity on their own. These support measures predominantly refer to favorable loans for productions or capital investment. However, it is very difficult to design a particular support and choose the criteria for selecting the companies to be supported, thus this measure requires a more detailed analysis and a careful designing of measures, with the assistance of the international institutions.

Apart from the particular support programs above that need to be designed carefully upon in-depth analyses and potential cooperation with the international institutions, we also propose several horizontal measures needed to increase the competitiveness of the M&E sector as a whole. These measures are necessary for the sector, in order not to miss out on the nearshoring

trend and provide for a more significant independent presentation in foreign markets, having the existing potential. These recommendations would also have a more significant effect on the three lines that require a particular focus of support. The recommendations are grouped into the following packages:

➤ **Package of measures to raise labor availability and quality**

As seen above, while the labor is one of the major advantages of the M&E sector, on one hand, it is also its major limitation, i.e. threat for future on the other. Necessary profiles are not trained in the sufficient volumes, and retraining from other profiles is made difficult due to the lack of system flexibility. The issue of appropriate staff lack is particularly prominent now when the older generations of experienced staff from the transitional system are retiring. On the other hand, even for the profiles trained in sufficient volume (even more than needed by the economy) – e.g. managers, there is usually lack of the appropriate quality and experience, since the education does not generate staff with sufficient quality, and such staff do not have many opportunities to gain the necessary practical experience. If the labor market offer does not match the demand of economy, and if younger generations that are to be the holders of the sector in the future are not equipped with the necessary qualifications, knowledge, and skills, Serbian M&E sector will risk losing its major competitive advantage. Until the educational system reform begins yielding the results regarding the provision of the appropriate profiles and applicable knowledge (both higher and secondary learning), there are other measures that may be beneficial and are valid for all sectors, since the labor issue is the key horizontal issue for the entire economy. Having the importance and relevance of this issue, it had received an entire chapter in Horizontal recommendations (Annex 2, point 3), with measures and short descriptions listed below:

- *Complete and adopt the National framework of qualifications Serbia (NFQS).* Although the Law on NFQS is in the public hearing process, and its adoption is expected by the end of the year, there is the need to note that the adoption procedure must not be extended.
- *Establish support program for hiring experienced professionals from Diaspora.* This type of support is predominantly needed for the domestic SME's in the domain of staff for process management, and some of the steps towards this are establishing reference contact lists, support in resolving administrative and logistic challenges regarding repatriation, potential subsidies for part of the return costs, etc.
- *Create the incentives, i.e. subsidies for the companies investing in the development of knowledge and staff training.* This measure would both lead to greater employment as do the current subsidies per number of new jobs, and by employment to desirable and more sustainable positions and greater cooperation between the companies and the educational institution, with the potential incentive for cooperation between multiple companies towards development of training of common interest or contracting companies for developing new educational centers under the cooperation with educational institutions, in the format of public-private partnerships.
- *Potential introduction of training vouchers.* This measure would motivate smaller companies to take part in creating practical skills for students or newly employed persons, who would receive the vouchers to be cashed in by the employers after the trainee passes the test for a certain practical skill at a qualified institution.
- *Greater sustainability of the Ministry of Education and cooperation between the Ministry of Economy and the Ministry of Education in customizing the curricula of*

*professional secondary schools to the requirements of the local economy.* One of the possibilities to be considered is establishing so-called *sector skill councils*, preferably on a county level, where representatives of economy and secondary schools would sit together and recommend adjustments to the secondary school curricula to their requirements.<sup>44[2]</sup> *Strengthening and modernizing academic curricula of industrial sectors and organization economic analysis and the introduction of economic feasibility programs in technical/engineering curricula.* In particular, in the case of economic profiles, the significant modernizing sectoral analysis is required, along with the support of linking them to the practice, while the engineering and designing profiles for the production profession need to cover the economic and cost analysis courses. In both cases, such courses should be introduced only after the initial development of curricula and teaching with the international experts, since such knowledge is simply lacking in Serbia.

- *Examine the reasons for unavailability of certain secondary school profiles at the sub-national level.* The first examination is to cover if the issue lies in the appropriate macro-structure of educational profiles or in their regional distribution, or perhaps students do not wish to do the job they trained for after finishing school. On the other hand, there are also some challenges on labor demand side, where the differences between the regions are particularly notable, where the employers from certain developed regions offer higher salaries and promote production-related occupations, which results in the greater interest of the youth in these regions.
- *Support mobility of students and labor.* This firstly requires better and more available commuter transportation, and for the secondary school students, local government units need to get a legal mandate to finance bus transport for high school students.

### ➤ **Sector promotion**

Serbia is still suffering negative image abroad. The support provided thus far for visiting exhibitions and occasional suppliers' missions does yield effects and need to be continued. However, some more systematic and targeted presentation and promotion options for Serbian economy also need to be devised. In the M&E sector, in particular, these are sophisticated knowledge and skills, particularly in the manufacturing of customized and innovative solutions, especially considering the current nearshoring trend. To narrowly target this promotion and put it in service of positioning Serbia in the nearshoring context, the particular offer of the sector needs to be examined in more detail, along with the market needs, to be presented professionally, targeting the appropriate audience.

### ➤ **Package of measures for raising quality**

Having that the production in other sectors depends on the M&E sector products, it is clear that the quality and reliability are the key characteristics of buyers' interest, while the domestic manufacturers often struggle to achieve and to demonstrate the appropriate quality. Therefore, a more significant penetration of the international market requires special measures to raise the quality at the entire M&E sector level (both from companies' and from state aspect).

- *Establish a database of domestic companies and standards they hold.* This database needs to be constantly matched to the standard required for this line of business where the companies operate.

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<sup>44</sup> „Sector Skills Councils. What? Why? How? Contributing to Better Vet Relevance to the Labor Market Needs“ Petri Lempinen, Specialist in VET and Social Partnership, European Training Foundation, 2013 <https://www.etf.europa.eu/.../SSCs%20position%20paper.docx>

- *Collect best practice examples* in the sector, understand critical success factors of these companies and spread their experience – in order to understand when the standard is needed/desirable, how to reach it and what the benefits are.
- *Subsidies for companies to introduce the quality system.* This measure would be focused on the companies with a potential to go into the foreign markets, yet lack the capacity to establish the appropriate quality system and/or demonstrate the quality of their products. In particular, the funds should be primarily granted for: introducing necessary quality standards, establishing traceability system or purchasing measuring equipment for quality control. It is of particular importance to increase quality system “availability” for micro, small and medium-size enterprises, as described in the Annex 2 Point 7 in more detail.
- *Raise awareness of the importance of quality and establish quality hubs.* Raising awareness of the importance of quality system introduction may be achieved through the PR campaigns, guides, workshops, seminars, etc., and increasing knowledge about the standards needed for the particular products may be achieved by establishing so-called quality hubs, i.e. knowledge centers to provide support to the manufacturers.
- *Strengthen national-level quality infrastructure.* It is normal that a small country such as Serbia cannot have the bodies for all types of harmonization checks; however, there is the need to introduce the regular performance of cost-benefit analyses which would serve as the foundation for establishing the new bodies when it shows to be justified. This measure is described in the Annex 2 Point 7 in more detail.

#### ➤ **Package of measures for improving organization of operation and production**

This type of support predominantly refers to training, education, and support for procurement and installation of the systems required for organization and operational management. The key activities where the companies need support, which is presently the bottleneck in the operation, are:

- Integrated information systems for managing operations and processes optimization.
- Product control using measuring machines which are expensive and often inaccessible by the companies, although they are very important for assuring a continuous quality.
- Tools and machines repairs and maintenance.
- Corporative management, with the lack being very prominent in the MSME sector.
- Strategic financial planning – companies are not familiar with trends on the international market, nor are able to establish their prices based on the economic principles.

#### ➤ **Gradual renewal and modernization of machines park**

Due to technological limitations, Serbian companies are unable to provide the appropriate quantity (low capacity machines) or quality (outdated technology) of products. To improve productivity and achieve long-term competitiveness, the machines park needs to be modernized at the sector level. The government should take over a part of cost/risk, at least early on, and motivate companies to cooperate through:

- Training towards the establishment of modernization and new technologies implementation plan.
- Loan guarantees (or subsidized loans) for equipment procurement, regardless of age (with better conditions for new machines).
- Partial reimbursement for high technology procurement, regardless of the country of origin.

- Motivating joint procurement of the certain types of machines (3D printers).

➤ **Support for innovation and technology transfer**

Support for innovation, technology transfer and building knowledge bases is described in Annex 2 in more detail; here we note the recommendation of the greatest importance for the M&E sector, considering that this is a multi-disciplinary sector that carries the technical-technological development of a country.

Support establishing cooperation between companies and educational institutions with advanced companies, for the potential creation of the knowledge transfer center(s). The initiative for such a support should come from the regional level, having that the regional institutions understand needs and offer of both companies and educational institutions the best.

# Overview on Performance and Recommendations for the Remaining Eight Sectors

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## Fabricated Metal Products Sector

The fabricated metal products sector (FMP) is a large and traditionally developed sector in Serbia. The sector's products are mostly inputs for other industries (for example tins and cans for the food industry, metal joinery for the construction, tools and blades for various manufacturing, simple products like wire and screws for general purpose, etc.), but they also include products used mostly in households (for example metal accessories for kitchens). Because of that, the FMP is often described as a supporting industry for the entire economy, and for the manufacturing industry (MI) in particular. The FMP is made up mostly of micro and small family firms with a long-standing tradition. They were launched to meet the needs of various parts of the economy. It is exactly this type of specialization that explains their small size and their location – the industry is mostly developed in central Serbia where most of the established factories were located within the «client» industries (mechanical, auto, or military industries).

Small size of firms in the FMP is typical also for the EU countries and not only for Serbia. The small company size makes the sector «invisible» - regarding the decision makers, and regarding buyers and suppliers, as well as the financial institutions, the potential work force, and the final users. Because of that, the FMP is mainly the key target of government support<sup>45</sup>. In Serbia however, only a part of the FMP is subject of the government support – i.e. the subsector of Arms and ammunition. On the other hand, the firms' small size brings a kind of sectoral advantage, because it enables the industry's success in certain niche markets, in particular domestically. The small size of the companies, together with the long-standing experience and skills, enables the FMP to be highly flexible and in close contact with clients. That usually means a higher added value and a higher potential to create innovation.

The FMP is one of the biggest and «most felt» industries in the MI in Serbia. With about 2,000 firms and about 6,000 entrepreneurial shops, the industry employs 10.6% of the MI's workforce (second only to the food and textile industries) and accounts for 8.1% of the added value (following the food, chemical, and rubber and plastic industries). However, so big FMP's share in respect of employment and jobs within the MI is not unusual – in the EU countries, the industry's share of the added value ranges between 6% (Romania, Hungary) and 11% (Germany, Austria, Croatia) and it is quite stable over the past decade.

The FMP is one of the most important industries because it is one of the very few industries within the MI in Serbia that operates with a foreign trade surplus. At the end of 2016 the surplus stood at EUR 240 million (the export was 739 million), the highest surplus save for the food, rubber and plastic, and electrical equipment industries.

For the purpose of this analysis we shall exclude export of Arms and ammunition from the industry's overall export, considering that the subsector is dominated by the state-owned firms and subject to the state's strategic support. Hence the export volume we are looking at here is EUR 690 million.

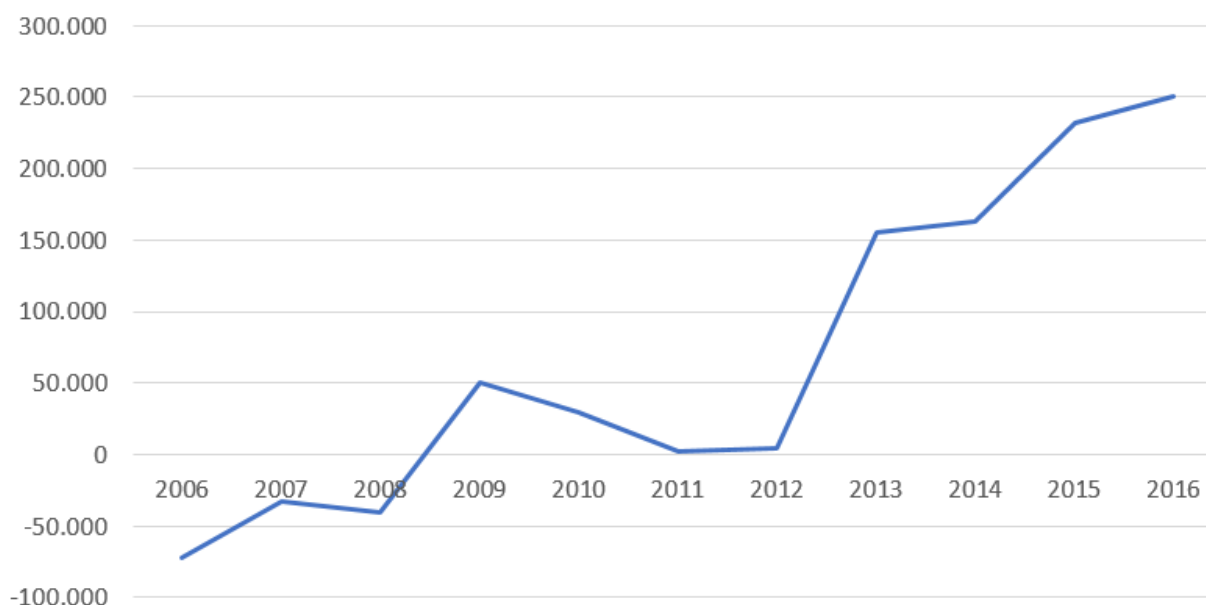
Regarding the post-crisis performance, the industry did slightly better than the MI's average. The FMP increased the added value by 1.8% on average between 2009-2016, while the overall MI growth was 1.5%. Considering that the FMP «supports» the whole of the MI, its growth on domestic markets was followed by the MI's growth – while the export growth accounts for the

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<sup>45</sup> *FWC Sector Competitiveness Studies - Competitiveness of the EU Metalworking and Metal Articles Industries* (2009), ECORYS SCS Group

positive balance. The export was a strong driving force for growth like in most of other industries. For example, the firms registered for the production of FMPs owe as much as 80% of their post-crisis revenue growth<sup>46</sup> to the revenue growth from export. Due to that, in 2009 the export's share in the companies' total revenue was just 12%, while in 2015 it stood at 35%<sup>47</sup>. At the same time, the industry's export growth was not matched by the same level of import growth so we can see that the foreign trade sufficit shows continuous rise from 2012 (Graph 1).

*Graph FMP 1. Foreign trade balance in FMP trade*



Nevertheless, a comparison with the competitors<sup>48</sup> (Hungary, Bulgaria, Croatia, Romania, Lithuania, Poland, Slovenia, Czech Republic) shows that the export growth could have been faster. The post-crisis export growth of FMPs from Serbia (100% up in 2016 compared to 2009) was somewhere «in the middle» (Graph 2) – slower than Bulgaria's, Latvia's, Hungary's, and Romania's (in these countries the average export growth was 117%) – and faster than the growth in the remaining four countries (the average export growth in these countries was 90%). Regarding the FMP's export growth, another less pleasing fact is that most of its post-crisis growth was driven by rising demand in the export markets, and not so much by increased market share, i.e. not by winning a better part of the increase in demand (the so-called competitiveness effect; it stood at 30% for the FMP while for example it was 77% in the Machinery and equipment industry – M&E). This is shown in Table 1 below.

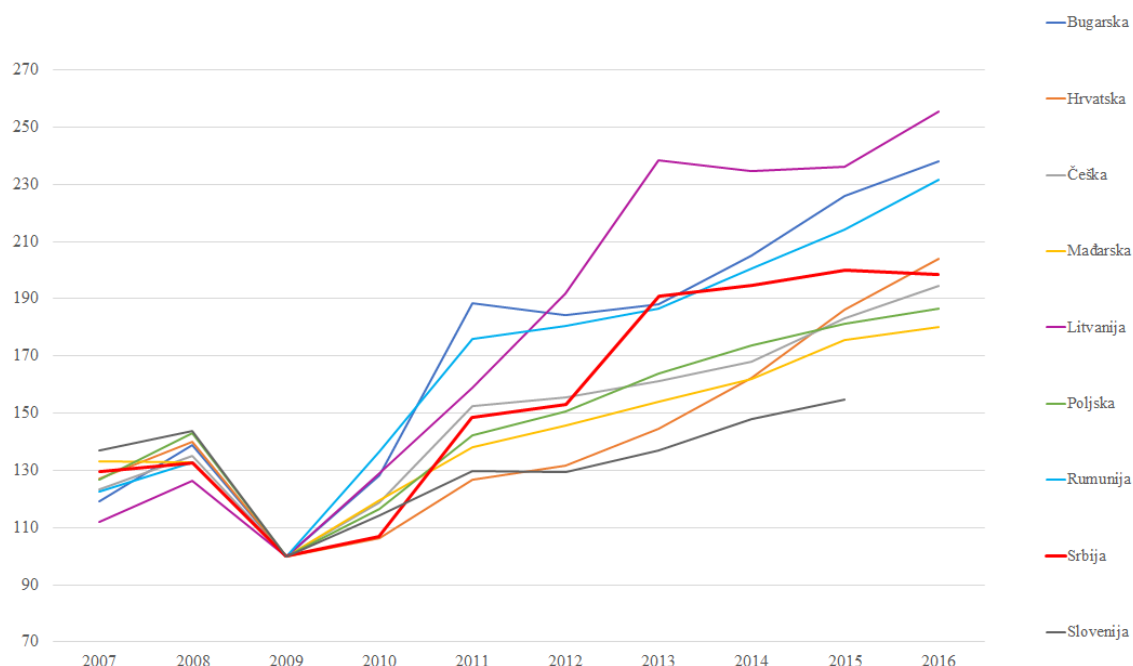
<sup>46</sup> Source: Company register agency/APR

<sup>47</sup> Although this share may seem to be low, that is not unusual because the FMP is the «supporting» industry for the entire MI and is thus oriented locally. This is particularly the case in countries with developed industries downstream from the FMP.

<sup>48</sup> The countries are comparable to Serbia – because of the transition they went through, because of their location, and because of the tradition they have in the metal industry.



Graph FMP 2. Export growth in FMP (2009-2016) – Serbia and comparable countries



Source: UN Comtrade

The FMP's export in Serbia is highly diversified – measured either by the number of exporting firms, by products or by markets. The FMP's products are also exported by both the firms registered for FMP production as their main activity (691 firms, accounting for 57% of the export) and the firms registered for other main activities (for example, trade, construction or other manufacturing activity<sup>49</sup> (2,899 43%)<sup>50</sup>. The five biggest FMP exporters account for «only» 33% of the overall sector's export<sup>51</sup>, three of them registered for FMP production (Ball Packaging – FDI, Metalac – domestic privatized company, Geze – FDI), one registered for auto industry (Fiat), and one registered for trade (Denso Thermal Systems). The biggest company of them all, Ball Packaging, accounts alone for 16% of the sector's export. Mostly micro, small, and medium size companies account for the remaining export and those are usually family businesses.

49 Mostly manufacturing of machinery or transport vehicles.

50 On the other hand, the firms registered for the FMP production also export products that don't fall in the FMP category, and most often those products are machines or electrical equipment as well as various parts classified in the transport vehicles industry.

51 The most recent available data for the companies are for 2015.

Table FMP 1. Export performance of FMP sector (without Arms and ammunition) – 2009-2015

Sektor, podsektor, proizvod	Učešće u izvozu	Doprinos porastu izvoza u odnosu na ukupni izvoz 2009	Rast srpskog izvoza (%)	Rast svetskog uvoza (%)	Učešće efekta konkurentnosti u rastu izvoza (%)
<b>FMP (bez Oružja i municije)</b>	<b>100,0</b>	<b>118,7</b>	<b>118,7</b>	<b>61,78</b>	<b>30,3</b>
Razni predmeti od gvožđa i čelika	21,9	32,6	232,1	71,5	8,2
Limenke, poklopci i slični proizvodi	20,7	23,9	112,0	41,3	0,0
Konstrukcije od lima, gvožđa i čelika	13,6	10,2	54,3	48,0	39,5
Okovi i zatvarači za prozore i vrata	5,1	7,8	252,8	74,0	65,5
Konstrukcije od aluminijuma	4,5	4,4	85,4	75,2	45,0
Kotlovi i radijatori za centralno grejanje	3,5	3,3	79,3	31,0	93,9
Alati i sečiva za mašine	3,1	3,7	120,6	84,9	22,1
Metalna galanterija za kuhinje i domove	3,0	1,2	23,5	65,1	-13,2
Kalupi za alate	2,9	4,0	180,0	74,0	72,8
Vezni elementi i vijačni proizvodi (šrafovi, ekseri...)	2,9	3,1	101,2	95,7	50,4
Žice, lanci i opruge	2,7	-0,7	-10,5	60,4	*
Ostalo (kotlovi, cisterne, sečiva, escajg...)	5,9	6,0	86,7	43,7	-

\* Efekat konkurentnosti ove grupe proizvoda je negativan, kao i ukupan rast izvoza, pa nema smisla pokazivati učešće efekta konkurentnosti.

Source: UN Comtrade

Almost 60% of the FMP export is made up of three groups of products: tins, lids and similar products that fall in the packaging category (Ball Packaging covers 75% thereof); various iron and steel objects (45% of them are pallets for motor vehicles exported by Fiat and Denso Thermal); and tin, iron, and steel structures. While the export of cans and lids is quite concentrated in one company, and that is a foreign one (Ball Packaging), the export of the other two groups of products is quite diversified and mostly created by domestic SMEs (small and medium size companies). More than 1,500 companies (500 of them trade companies) in Serbia export various iron and steel objects (that cannot be classified in any other category), while almost 800 companies (150 of them trade companies) export tin, iron and steel structures.

On the other hand, the remaining 40% of the FMP's export consists of a relatively balanced export of the following groups of products (listed here by size): boilers and radiators for central heating, tools and blades for machines, metal accessories for kitchens and households, molds for making tools, binding materials and screws: wires, chains, and springs; boilers; cisterns; blades etc. All these groups of products participate in the overall export in the range of 3-6%. Table 1 shows the export performance for all the above groups of products, while Table 3 shows the diversification of the FMP's export, not only by products but also by the export markets and by exporting companies.

The high level of the FMP's diversification points to a wide range of knowledge, skills, and know-how in the industry, and they are present mainly due to the long standing tradition of the metal sector in Serbia. Further, the sector's high flexibility (that should be supported, as explained for the European countries in the paragraph two above) represents an FMP's additional competitive advantage. The flexibility is not owed only to the sector's labour's knowledge and skills but also to the small size of the companies in the sector. These companies can relatively easily adjust their production to the client's needs and thus manufacture a big

variety of custom made metal products – either as one-off pieces or as small series. This is particularly important considering the trend of nearshoring, where the developed European countries move their production to neighbouring countries with a lower labour cost. Firms from Serbia have an advantage in this regard, compared to some relatively bigger firms in other (somewhat more developed) European countries – because their small size and high expertise enables them to manufacture a required product in very short time, even in cases of one-off production (for example the tools).

*Table FMP 3. Main exporters and export destinations – by groups of products (2009-2015)*

Sektor, podsektor, proizvod	Top 1 tržište	Top 2 tržište	Top 3 tržište	Top 4 tržište	Top 5 tržište	Učešće TOP 5 tržišta (%)	Ukupan broj firmi izvoznica	Učešće TOP 3 firme (%)
<b>FMP (bez Oružja i municije)</b>	<b>Italija</b>	<b>Nemačka</b>	<b>BiH</b>	<b>Poljska</b>	<b>Rusija</b>	<b>43</b>	<b>3.933</b>	<b>26</b>
Razni predmeti od gvožđa i čelika	Italija	Austrija	Nemačka	Belgija	Slovenija	56	1.537	50
Limenke, poklopci i slični proizvodi	Italija	Rumunija	Grčka	Mađarska	Turska	49	574	85
Konstrukcije od lima, gvožđa i čelika	Nemačka	Austrija	Švajcarska	Crna Gora	BiH	51	788	23
Okovi i zatvarači za prozore i vrata	Nemačka	Rusija	BiH	Belorusija	Crna Gora	76	565	64
Konstrukcije od aluminijuma	Rusija	Francuska	Švajcarska	Crna Gora	Nemačka	59	483	33
Kotlovi i radijatori za centralno grejanje	Austrija	Španija	Italija	BiH	Rumunija	55	115	51
Alati i sečiva za mašine	Slovenija	Nemačka	Rusija	Francuska	BiH	63	430	50
Metalna galanterija za kuhinje i domove	BiH	Rusija	Hrvatska	Francuska	Slovenija	69	206	87
Kalupi za alate	Nemačka	Slovenija	Meksiko	Italija	Rusija	58	151	50
Vezni elementi i vijačni proizvodi (šrafovi, ekseri...)	Italija	Nemačka	Turska	BiH	Mađarska	59	825	55
Žice, lanci i opruge	BiH	Crna Gora	Hrvatska	Švedska	Italija	68	602	62
Ostalo (kotlovi, cisterne, sečiva, escajg...)							1.023	21

Source: RZS i APR

Considering the above knowledge and skills, the FMP sector has a potential for development and the direction the development will take depends on other factors also. In the case of the FDIs - considering they bring with them the capital and their own already established channels of procurement and sale, and considering that the labour in Serbia has the necessary knowledge and skills – the sector's firms can launch virtually any kind of production in Serbia. However, we should keep in mind that foreign investments in the FMP are rarer than for example in the transport vehicles sector, due to the small size of the companies<sup>52</sup>. Regarding the *domestic* part of the sector, the biggest potential lays in the manufacturing of *tools, metal structures and various iron and steel products*.<sup>53</sup> These subsectors are the most important ones for the sector's overall performance, in both domestic and foreign markets. These subsectors account for the greatest number of both firms and employees, while the firms manage to increase their revenue and grow export faster than the others. The subsectors' performance is mainly owed to the

<sup>52</sup> FWC Sector Competitiveness Studies - Competitiveness of the EU Metalworking and Metal Articles Industries (2009), ECORYS SCS Group

<sup>53</sup> This conclusion was reached based on an in-depth analysis of the companies registered in the FMP industry, excluding other companies exporting the FMP products (e.g. trade or auto industry companies). So, if we observe only the FMP industry, the performance is mostly driven by the domestic micro, small, and medium-size private firms. There are not many big, nor foreign firms. Domestic firms creating the biggest part of export is a rare occasion in Serbia's economy, considering that the foreign companies can penetrate more easily foreign markets, i.e. they already have established distribution networks prior to their arrival to Serbia. However, in the FMP industry, the domestic firms (although not big in size) managed to account for 55% of the industry's export. Also, the autochthonous private domestic firms account for almost the entire industry's export, as the privatized firms (originally state-owned) account for only 3% of the export.

autochthonous<sup>54</sup> domestic firms. Also, these are highly diversified subsectors – by the products, by the firms, and by the export markets. Finally, these subsectors manufacture products of a higher complexity (as indicated by the higher added value per employee) and they manage to sell most of their export in the developed and demanding markets like Germany, Italy, USA, Austria and France.

The sector's performance hitherto and projections by the international consultancy Technavio<sup>55</sup> indicate that the future may bring a stable growth to the FMP sector, and a faster increase of the export's share in the companies' revenues. Nevertheless, the FMP's features (both globally and in Serbia) suggest that any relevant growth and development of the sector requires a state support in respect of: the development; animating and keeping the needed staff; and a targeted sectoral support for the sector's firms. This is required because the horizontal support measures in the FMP are not enough to provide a tangible growth and development of the FMP sector.

Considering the economic importance of the entire FMP - as the «supporting» sector for the overall MI, and as an important driving force behind the technical-technological, social, and balanced regional developments – we are of the opinion that the overall FMP sector should be supported by the state, in particular in the area of finance and labour. As the FMP represents just a hoop in a longer value chain dominated by big players, new firms find it quite difficult to position themselves against both their suppliers and the buyers, while the equipment needed to start the production is expensive. In addition to the finance, another important challenge for the FMP is the labour – in particular skilled artisans and craftsmen – because more experienced staff is going into retirement and it is a challenge to find high quality workers among the younger staff, since a lot of time is required for the youth to «learn a trade». The hardest to find in Serbia are experienced welders, lathe operators and honers. Without such workers, the metal sector cannot develop further (at least not within the conventional production modes).

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<sup>54</sup> The firms that were privately owned from their launch, i.e. did not originate from within the former system.

<sup>55</sup> *Fabricated Metal Products Market in Serbia 2016-2020 (2016)*, Technavio

## Textile Sector

**The textile sector consists of two subsectors – the textile production (KD13) and the apparel production (KD14)**

- The textile production includes manufacturing of textiles and other textile products that are not apparel – such as carpets, bed covers, curtains, ropes, technical textiles etc. The apparel production includes manufacturing of clothes, underwear, and socks.
- Although they are monitored within a single textile sector, the two subsectors differ in their features – the apparel production is more labour-intensive a more fragmented sector of the two, adjusted to the final user and thus offers a better opportunity for the inclusion of SMC (small and medium size companies); on the other hand, the textile production is more concentrated, linked in a higher degree to raw materials not available in Serbia, more technology dependent, and directed toward producing larger-scale standardized quantities. These differences further determined the ones regarding performance and competitiveness of the two subsectors in Serbia. The latter favour the apparel subsector – and those differences (in respect of performance and competitiveness) will be mentioned in the report when relevant.
- The two major companies, Magna Seating and Grammer System, are registered officially (with the Company register agency/APR) within the textile sector (KD13-14) while they produce seats and other equipment for the auto sector. They were not monitored within the analysis of: performance, structure, and competitiveness of the textile sector, but of the auto sector.

**The textile sector, traditionally important in Serbia, missed its opportunity during the 1990s and the early 2000s to join a deep reorganization of the global labour – and that has led, together with the sanctions and shrinking of the domestic market during the 1990s, to a long drop in competitiveness.**

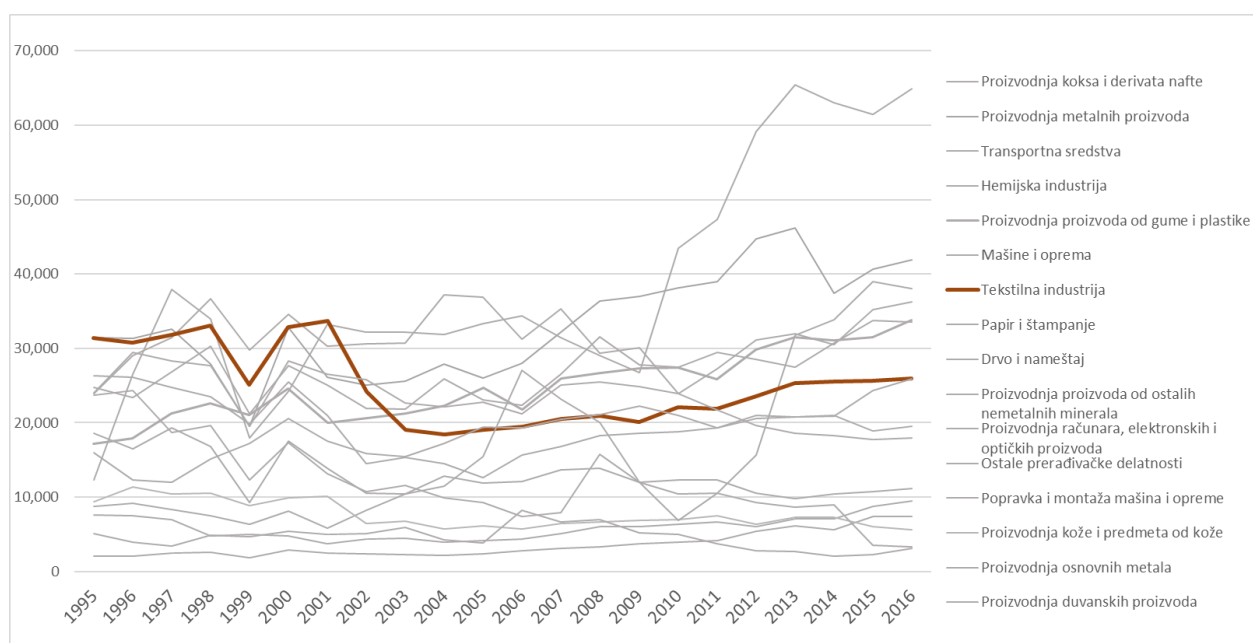
- Before the disintegration of Yugoslavia, the textile sector in Serbia was the third most important generator (following food and machines industries) of the added value and of jobs in the manufacturing industry. In 1989 the textile sector accounted for 6% of the GDP and it employed about 7% of the economy's workforce (about 170,000 employees, out of that 125,000 were women). The textile sector was also well positioned in foreign markets and was able to compete with them in respect of the product quality<sup>56</sup>, while the sector's export accounted for 9% of the overall export.
- During the 1990s and the early 2000s, some major changes occurred also in the textile sector – which is today one of the most globalized industries. The companies from Serbia did not take part in the changes. Manufacturing and jobs moved from Germany to Poland, from Hong Kong to China, and from Italy to Turkey and Hungary and later to Romania and Bulgaria.

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<sup>56</sup> Competitiveness of Serbia's economy, Jefferson Institute, 2003

- The competitiveness of these countries was drastically upgraded, and in addition there was a significant rise in export of jobs – in Bulgaria the export grew from USD 280 million to USD 2 billion and over 100,000 new jobs were created in the period between 1990-2010.
- The end of the sanctions and conflicts, in the late 1990s, found the Serbia's textile sector companies oversized – in respect of both their capacity and the number of employees, and they were completely outside the global trends after a decade wasted. During the first five years following 2000, at the time when the sector's structural transformation was launched, GVA was rapidly reduced by about 50% compared to the already significantly reduced GDP from 2000 – as shown in Graph T1.

Graph T1. Sectoral GVA\* in manufacturing industry, between 1995-2016 (constant prices 2010, mil. RSD)



Source: National Statistics Bureau/RZS

\* without food sector, which is by far the most important sector.

**The textile sector is today well below levels from 15-20 years ago – and it is further below levels from 30 years ago – but beginning of a more dynamic recovery can be identified post-crisis, spearheaded by export of apparel more than anything else.**

- The textile sector's GVA in 2016 was by 30% lower than at the beginning of the 2000s, and it accounted for 5.1% of the overall manufacturing industry's GVA, and for 0.8% of the GDP. The textile sector's importance for society as a whole is overall higher than shown by the added value itself – the sector employs over 45,000 workers in more than 1,500 companies and about 5,000 entrepreneurial shops. That accounts for about 11% of jobs in the manufacturing industry. Most of the employees are women, and the companies are mostly located in less developed regions, which is a fact relevant in respect of the socio-economic objectives and priorities.

- The textile sector's GVA started to recover during the post-crisis period (2009-2016) – growing at the annual rate of 3.5%, among the highest within the manufacturing industry. The apparel production grew at even a higher rate – just under 5%, while the textile production's added value continued its decades long continuous fall.
- The textile sector's overall growth of activities resulted from the export growth, that stood at 60% at the beginning of the crisis, only to reach as much as  $\frac{3}{4}$  of the sector's business revenue in 2016. During the post-crisis period, the export strengthened its position as the sector's main sales channel, and it still plays the key role in the sector's further growth, being the principal source of revenue. Serbia is a mild net importer regarding the overall textile sector – nevertheless, the subsectors differ significantly in this regard. Serbia is a growing net exporter of apparel; while on the other hand it is a growing net importer of textiles.

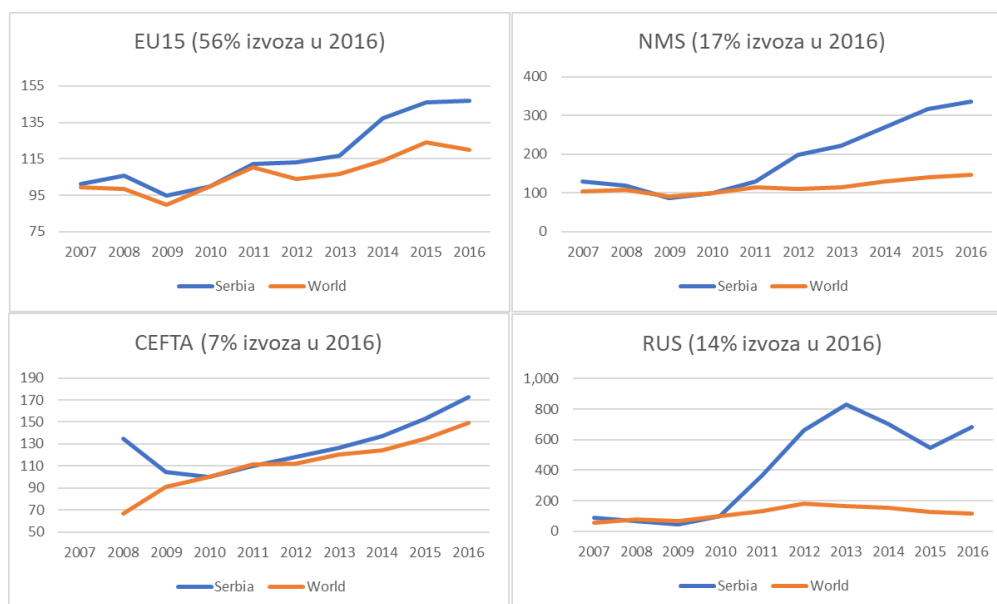
**The export grew due to an increased market share. i.e. due to the growth that was faster than the competitors' and due to a higher import demand in the sector's main export markets.**

- Although a relatively small exporter of textiles and apparel, Serbia recorded growth in the post-crisis period that was significantly faster than the growth of import demand in the Serbia's key export markets; Serbia's growth was also faster than the export growth of its key competitors (Graphs T2 and T3). In 2016 the export reached EUR 700 million ( $\frac{3}{4}$  of that apparel), growing at the annual rate of 11% in 2010<sup>57</sup>. The overall growth was achieved in the EU and Russia markets – with rising Russia's share in Serbia's overall export. As much as  $\frac{3}{4}$  of the Serbia's export growth is owed to Serbia's increased share in those markets, as it grew faster than the import demand there. The key export products (exceeding EUR 10 million) were socks, underwear, jumpers, men's trousers, cladded thread, packing bags, ropes, and awnings.

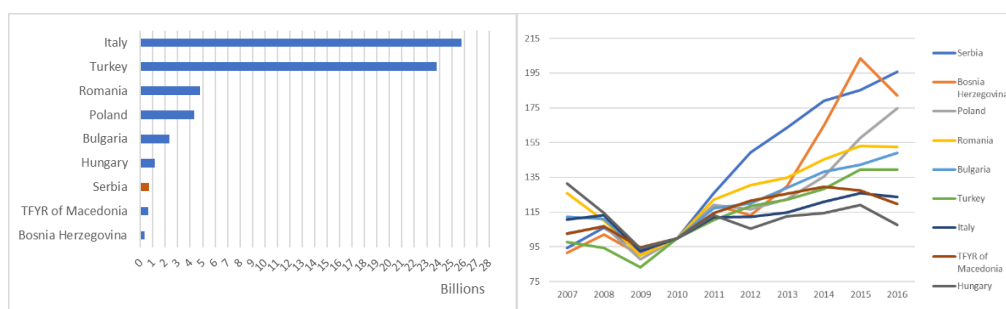
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<sup>57</sup> 2009 is not representative to be taken as the base for gauging the export growth, because it is the last year in which the state-owned companies played a significant part in the industry's export. Already a year later, in 2010, the state-owned companies recorded a drastic fall in export – as the export remained close to the 2010 low levels, that year was taken as the base year.

Graph T2. Import demand growth in key four markets, global and in Serbia (Index, 2010=100)



Graph T3. Level (2016, EUR) and growth (2007-2016, mil EUR) in export, Serbia and selected European countries



Source: UN Comtrade

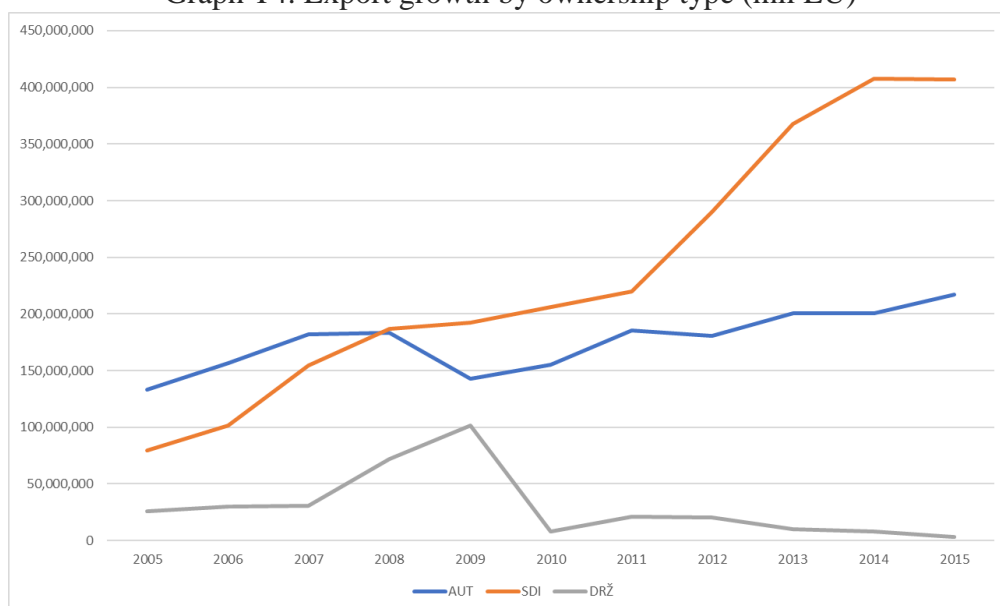
**The growth was spearheaded primarily by the FDIs, but autochthonous small and medium size companies also contributed – while export of the state-owned firms fell drastically or ceased altogether.**

- Most of the growth is owed to the FDIs (about 20 of them, with companies: Valy, Golden Lady, Pompea, Fiorano, Olimpias, Gordon, Flake, and Real Knittin, being the leaders). They exported mainly socks and underwear – save for a couple of firms that exported apparel for men and women (jumpers, shirts, dresses etc.). The FDIs tangible presence followed by their growth in Serbia, is not unusual nor was it unexpected – the textile sector is mainly labour-intensive and does not require high complexity of work, and consequently the production process itself is concentrated in developing or underdeveloped countries due to the lower labour cost. Considering Serbia's good geostrategic position – on the edge of the EU market, with signed trade agreements with both the EU and Russia – and considering the textile sector's tradition, Serbia is obviously an attractive destination for FDIs.



- Domestic autochthonous companies grew at a slower rate than the FDIs – but still they grew faster than most of their competitors and faster than the import demand in the key markets – and thus the autochthonous s managed to compensate mostly for the fall in export by the state-owned companies.
  - The autochthonous companies' export structure is fragmented. No single firm stands out, and the facts that: almost 200 companies exported over EUR 100,000 in 2015; and the top 10 exporters account for just 35% of the autochthonous export – show an extreme fragmentation of autochthonous companies in the sector. Such fragmentation is caused by the fact that the textile sector represents a favourable environment for the development of entrepreneurial shops and small companies. It is favourable due to relatively low entry barriers, low initial cost of launching a business, and a possibility for product diversity owing to the final buyers' diverse preferences. Also, one comparative advantage the autochthonous s have is the traditional know-how that is still present – in some cases it is passed from generation to generation, but also there are specialized schools for textile workers in places that were once textile hubs. In addition, many former workers in big factories have launched spin-off companies.
  - The export of state-owned companies fell sharply compared to 2009, and in 2015 it was almost non-existent. On one hand, some of the key exporters of textiles and apparel in the pre-crisis period closed businesses and ceased exporting (among them Prvi maj Piroć, MK Rudnik, Javor, Trayal, and Simpo) – while on the other hand, among relevant exporters in the sector were the companies engaged in making uniforms, caps, work apparel, and other textile products for the military and for other professions. Those companies had exported much more pre-crisis. The export growth by types of ownership is shown in Graph T4, and the FDIs leading role is clearly visible as are the supporting role of the autochthonous and the fall of the state-owned exporters.

Graph T4. Export growth by ownership type (mil EU)



Source: Customs, CEVES' staff calculations

- **Serbia certainly has basic comparative advantages in the subsector of apparel** (RCA 1.69), and they are visible in the lower labour costs, available tradition and skills, and the favourable geostrategic location. Any further growth in competitiveness will require exploring possibilities to extend the value chain and to reduce the impact of fragmentation. **The following three options merit a research and analysis more than others:**
  - **A possibility to achieve higher levels of the added value within the FDI's.** The real challenge for any developing country is not only how to attract FDI's but also - how to attract phases (in the value chain) of a higher added value together with attracting the FDI's, and not just to host a present production process. Although the textile production process is concentrated in the developing or underdeveloped countries, the downstream distribution of the added value differs due to the lower cost of labour – the phases with higher added value (such as designing, branding, or promotion) are as a rule still concentrated in the developed countries.
  - **A possibility to provide a more active support to the fashion industry.** The fashion industry is made up mostly of domestic companies that have developed own design and built their own brand, although not being fully included in the global value chain. Those companies strive to place themselves the best they can in the niche markets. The fashion industry itself can be important in respect of the socio-economic priorities because it's suitable for the development of entrepreneurship – that may range from branded domestic firms to creative design. Hence, the fashion industry has the potential for more evenly spread regional development, it has an adequate balance between labour-intensity and creating a huge added value through apparel design, and it also enables an image-building while making the country more recognizable (for example the gloves designed by Evica Milovanov-Penezic). We should also explore possible ties between the fashion industry and other creative industries and services.
  - **A possibility for a more active support for associations and joint activities of the industry's companies, especially in the less developed regions.** For example, we should explore a possible cooperation and joint efforts by the companies from Raska county. In Raska there are over 200 active companies and at the end of 2015 they generated about RSD 5 billion in revenues, while as many as 39% of them managed to sell their products outside Serbia. Joint efforts on part of the companies, together with support by the state, would help neutralize the fragmentation effect – shown in harder access to the capital, information, and markets while the companies remain not visible enough and their products not noticeable enough. The fragmentation effect is described in more detail in Annex 2.

## **Automotive Sector**

**The automotive sector includes the production of motor vehicles and other transportation means, and also of spare parts, equipment and motor vehicles' bodies (the classification corresponds to NACE sectors 29 and 30).**

- In most countries the most important segment of the automotive sector pertains to the manufacturing of the motor vehicles or to be more precise, of the passenger vehicles. The sector includes also the manufacturing of all the products that make up spare parts or components for motor vehicles, regardless of the material they are made of – vehicle bodies, electrical and electronic equipment, various rubber and plastic components, seats etc. Tyres for the motor vehicles are an exception, and they are classified as part of the Rubber and Plastic (R&P) sector. Also produced within the automotive sector are ships and boats, locomotives and rail vehicles, combat vehicles, aircraft, wheel-chairs, motorbikes and bicycles.

**The automotive sector has a long tradition in Serbia, and it is mostly providing for the needs and capacities of domestic market. The sector was reanimated with the arrival of Fiat.**

- The sector's tradition in Serbia spans a period of over 70 years and at its peak during the 1970s it produced annually up to 200,000 automobiles. A small part of the production was for export (not in excess 10-15%) and that raises the question whether the several decades long tradition can be treated as an inherited competitive advantage today. Not even in those days were the products made to meet demands of the international market – while the market became only more demanding in the meantime.
- The conflicts, the country's disintegration and the sanctions halted in most part the production process during the 1990s. The production was continued after the year 2000 in significantly smaller volume (up to 20,000 cars annually) and the products lacked competitiveness internationally due to the obsolete technology and ruined capacities.
- The sector came back to life with the arrival of Fiat, attracted by the Serbia's government as a strategic partner through a network of incentives. Although Fiat had arrived to the Market several years earlier, the company began its production in full volume in 2013 when it also reached the hitherto record level of about 115,000 manufactured vehicles. In addition to Fiat, in the post-crisis period, Serbia attracted also several original manufacturers of spare parts and equipment (group «Tier 1»), among them «Johnson Controls», «Magnetit Marelli», «Grupo Proma», «Yura Corporation», «Draexlmaier», and «HT&L» - most of them were Fiat's direct suppliers.

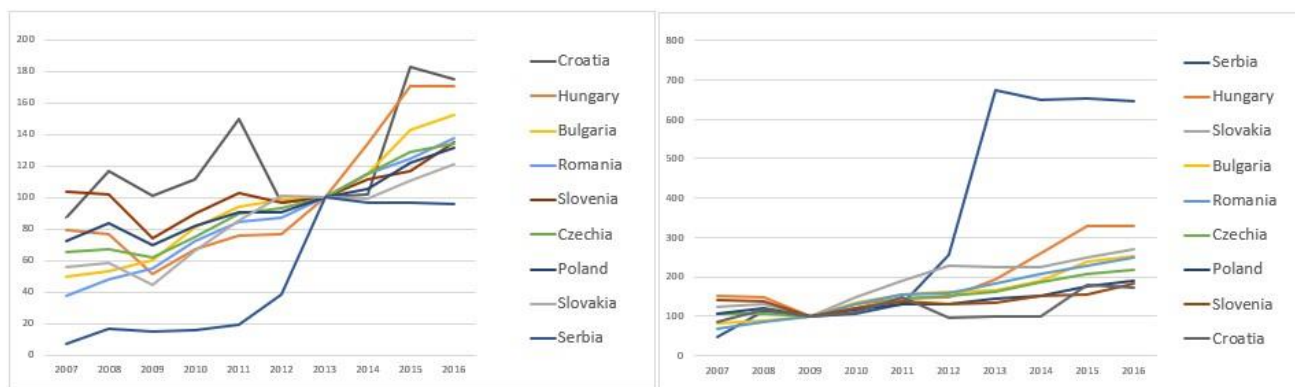
**The importance of the automotive sector increased promptly with the arrival of Fiat – nevertheless the initial dynamic growth was halted not long after the sector's reestablishment.**

- In 2016, the automotive sector reached 7.1% share in the GDP (1.1% of GDP) and also in the manufacturing sector's employment (30,000 workers). This level of share in the GDP is relatively low – in the EU countries it usually stands between 10% and 15%,

while in some of the NMS countries it exceeds 20% (Czech Republic, Slovakia, Hungary) – and this probably feeds the decision makers' tendency to support the sector so as to enable it to reach the international standards. However, the countries like Denmark, Ireland, or Holland demonstrate that the transport sector does not have to lead the development. These three countries are highly developed, export oriented, while their transport sector is relatively less important in both the economies' GVA and in their export.

- GVA's growth in the post-crisis period (2009-2016) was high due to the very low base year levels – until 2012 the production did not exceed 20,000 motor vehicles, and after the arrival of Fiat, about 115,000 motor vehicles were produced in 2013 already. However, following a dynamic initial growth, over the last three years the growth of GVA has been halted and it either stagnates or falls year by year. The number of manufactured automobiles has been falling constantly since 2013 and in 2016 it dropped to the level of 85,000 – probably due to the company's dependence on just one model (Fiat 500L) that is gradually becoming obsolete while the competitiveness is falling.
- The commanding part of the sector's sale is through export – and like the GVA, the export was also halted in the years following the huge growth in 2013. Due to the arrival of Fiat the export grew from EUR 820 million in 2012 to EUR 2,100 million in 2013. During the entire post-crisis period we can observe that Serbia recorded a significantly faster growth than its competitors (Graph A1 right); however, looking at the period after 2013, when Fiat's production and sales reached their full volume, the overall sector's export and its share in the market keep falling while all the key competitors grow faster (Graph A1 left).

Graph A1. Serbia's export growth, relative to competitors (left 2013=100; right 2009=100)



Source: UN Comtrade

**The sector's performance is defined completely by the export activities of the FDIs (95%), whether the sector's firms export directly (Fiat, Yura) or indirectly (as suppliers to an exporter, like in the case of Fiat and its suppliers). Also, the export itself is directional and mainly linked to the country of origin of the key FDIs (Italy – Fiat; Germany – Leoni, Draxlmaier, Contitech; Czech Republic and Slovakia – Yura (Kia, Hyundai)). The companies that became the key for the sector's export performance can be classified into three groups:**

- Fiat and its suppliers (about 20 companies) are the sector's most important segment – and they make up about 60% of the sector's export. The export is conducted mainly through Fiat itself, while independent export by the suppliers is low. Fiat with its suppliers defines export trends for the entire sector – and thus a fall in Fiat's production and sales leads to the export's stagnation for the overall sector, despite more dynamic growth in the other two groups within the transport sector.
- The companies that produce electrical and electronic equipment for motor vehicles, spearheaded by Yura, Leoni, and Draxlmaier account for about 15% of the export – but this group showed the most consistent growth in the post-crisis period. That growth continued also after 2013. Production in these companies is extremely labour-intensive, and the products themselves are simple, so the companies from this subsector contribute to the sector's overall employment with almost 50%.
- Seats for motor vehicles is «the youngest» among the three groups and it is spearheaded by Grammer and Magna. This subsector accounts for under 10% of the overall export, but it shows the fastest growth since 2013 when it began to internationalize its activities more intensely.
- The remaining 15% of the export is divided between a great number of companies that fall outside of the three groups above. The companies that merit to be mentioned among this heterogeneous group are mostly the FDIs, and mostly in the field of rubber and plastic components (like Contitech, Mecafor, Mecaplast, ADP, Uniplast, Poliester, etc.) Among the companies producing other transportation means, with export worth over EUR 5 million, the FDIs also stand out – Knott and Lohr (trailers and parts for trailers), Vahali (ships), and Kovis (ball bearings for freight rail wagons). The only domestic company in this group is «Milanovic inzinjering», with its international sale of parts for rail vehicles. Towards the end of 2017 the company has been sold to Siemens.

**Although the automotive sector dominates export within the manufacturing industry (20% of the export), the net export is low and shows no relevant growth – and that is the reason for a relatively low overall added value.** The transport sector is only fifth biggest contributor to the GVA, and the reasons for such a low contribution lie in the insufficient investment volume and chain deepening.

- The net export, defining the industry's GVA mostly, is low due to high import. The import is linked mainly to import of body and spare parts (over 60%) made of the type of galvanized steel not produced in Serbia. However, significant part of the import (mainly by the FDIs) is a result of undeveloped network of (domestic) suppliers in Serbia. For example Yura, Leoni, and Draxlmaier import over EUR 100 million of conductor sets, cable connections and contacts, and plastic insulations.

**A detailed analysis is needed of costs and benefits of any further incentives aimed at the auto sector's development, and it is needed prior to implementation of any such measures.**

- It is well known that the auto industry is strategically important for many countries because it used to be often the development's driving force, in both the developed and developing countries. Hence, a strong support to the industry's development may appear to be the simplest and the most logical solution for a dynamic and sustainable growth.
- On the other hand, this sector is among those most difficult to build and establish, especially in countries with underdeveloped business environment and infrastructure. Because it requires huge capital investment, large volume production, strict and ever stricter quality and safety standards, and continuous innovations – it is more difficult for the OEM companies to opt for outsourcing. Hence, the developed countries are still the undisputed leaders in the manufacturing, together with several other countries that managed to outsource their production successfully (Czech Republic, Slovakia, Poland) and China.
- In Serbia's context, we recommend a detailed analysis of the effectiveness of expenditures and investments towards the automobile sector. The analysis should bear in mind that «the nearshoring» is not present much in the auto sector. We should also bear in mind Serbia's striking competitive weaknesses (similar to the weaknesses in high-volume machine production, only more visible) - described in the chapter on The performance and value chain analysis, in Machinery and Equipment sector (M&E). Lastly, such detailed analysis should bear in mind the development capacity of the FDIs in Serbia (for more details see Annex 2), and also the possibilities for deepening the value chain through creating a network of suppliers for the FDIs (for more details see Annex 2).

## Chemical Sector

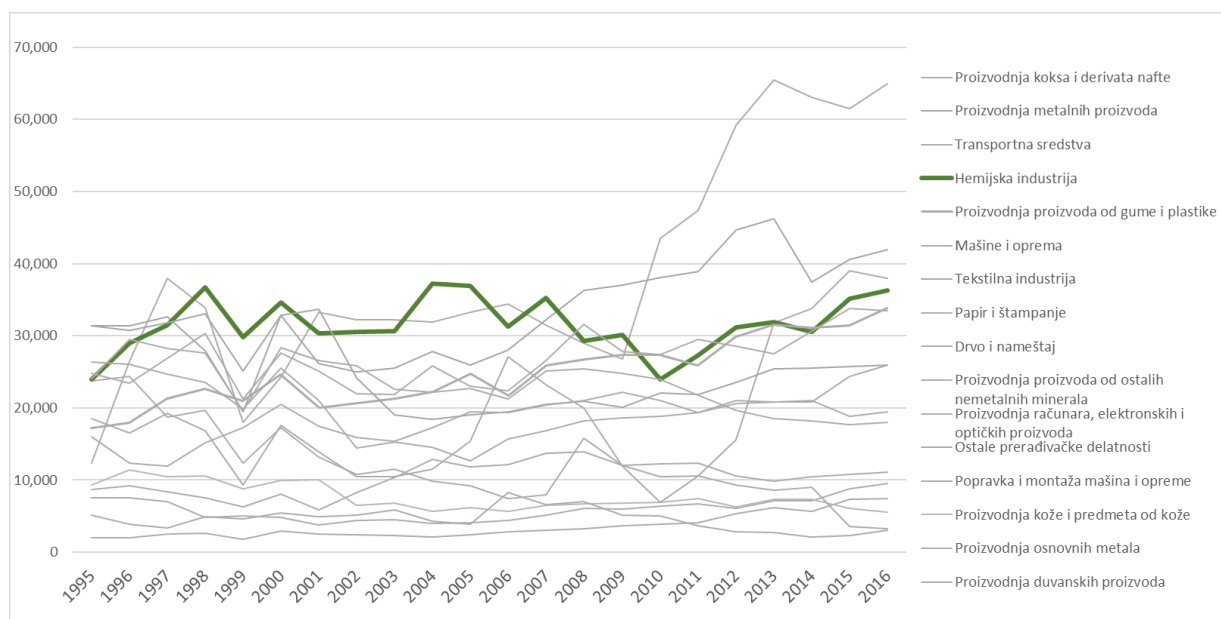
**The Chemical sector consists of two subsectors – the production of chemicals and chemical products (KD20) and the production of basic pharmaceutical products (KD21).**

- The subsector of chemicals and chemical products includes the production of basic chemistry – industrial gases, plastics, and synthetic caoutchouc and also the production of artificial fertilizers and of the intermediate as well as the end products – pesticides and chemicals for agriculture, adhesives, paints and varnishes, soap and washing powder, perfumes and toiletry; and it also includes the production of explosives i.e. the subsector's products are made among else in the defence industry.
- The subsector of the production of basic pharmaceutical products includes the production of pharmaceuticals and also the production of medical chemicals and herbal products for pharmaceutical use.
- Such a wide scope of the subsector's products is an indicator of it's diversity and internal heterogeneity, which are also mirrored in both the products' structure size and ownership as well as in the subsector's performance. When relevant, this will be emphasized throughout our analysis.

**The Chemical sector is important in Serbia traditionally, and we need to understand better the historical context in order to conduct a more adequate analysis of the sector's present day competitiveness. The historical background is marked by the emergence of state-owned chemical giants, and it is they who undermine or blur a more adequate analysis today.**

- According to The federation of chemistry and technology professionals (SHTS) the chemical sector in Serbia has gone through three phases during its development – the first phase during the 1960's witnessed the production launch in most of today's refinery's; the second phase between 1970 and 1982 was focused on the development of the petrochemical industry; and the third phase between 1987 and 1990 when record levels of production and consumption were reached at the national level.
- After the conflict began and the sanctions were introduced against Serbia, we witnessed a sharp contraction in the sector's production and a fall in its competitiveness. The production volume for chemical products in 1995 stood at about 30% of the volume reached in the record year of 1989. The bombing from 1999 upended the recovery trend, as shown in graph H1, and it has destroyed almost entirely the capacities of a relevant number of chemical plants.

Graph H1. GVA per sectors\* in manufacturing industry between 1995-2016 (constant prices, 2010, billion RSD)



Source: NSB/RZS

\*excluding food sector, by far the most important sector

- In 2016 the real GVA in the chemical sector equalled the level from 1998 – and was still far from the level from 1989. The sector's share of the manufacturing sector's GVA in 2016 stood at 8.7% (1.4% of the GDP) – the second highest share after the food sector. At the same time, the chemical sector's impact on employment was significantly lower (4.2% of the manufacturing industry) – and this indicates a relative rise in productivity in the chemical sector, resulting from the sector's highly capital-intensive nature.
- An analysis of the sector's performance must be aware of a big share of state-owned companies in it. These companies benefit from either direct or indirect state support. The sector's GVA itself showed frequent variations during the first decade of the century (as shown in graph H1) and that resulted from high performance variations in the state-owned companies. From 2010, the sector's GVA shows continuous growth. However, it is not fully realistic nor indicative to take the GVA as the measure, because we believe adjustments have not been made for the situations where state-owned companies are supported by being allowed not to pay their gas or electricity bills. It is more adequate to view the sector's performance and competitiveness through its export – which has determined the sector's overall post-crisis growth. First of all, when possible, the performance should be viewed through the export data for non-state-owned companies alone.

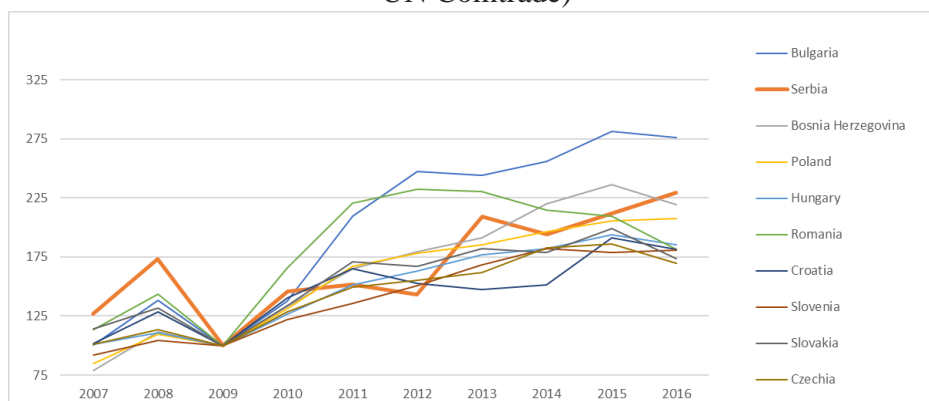
**The chemical sector's export has recorded strong growth in the post-crisis period – following a sharp fall in 2009 – by increasing its market share in the key export markets.**

- The annual export growth was 13% in the post-crisis period, and the export in chemical sector reached EUR 960 billion in 2016. The dynamic growth continued for the first

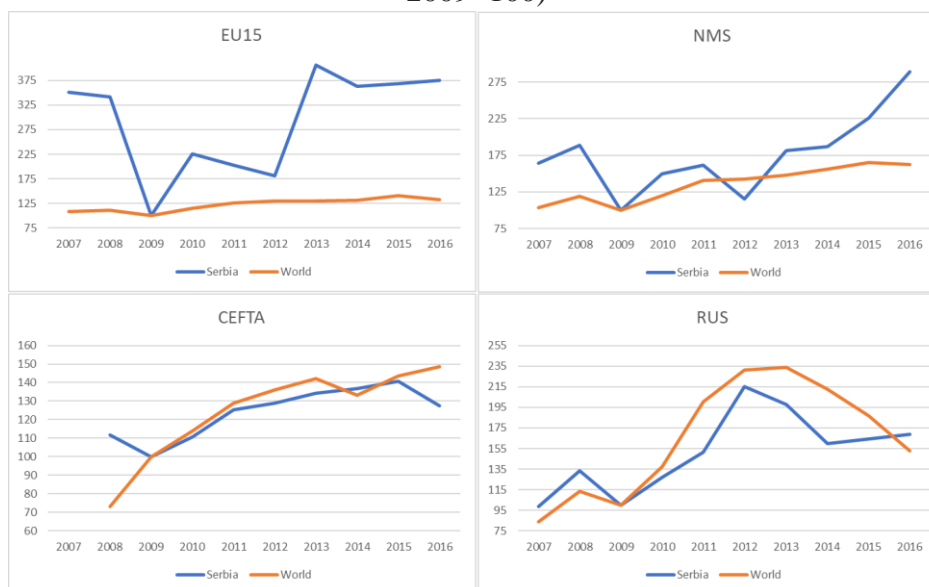


eight months of 2017 and was up 15% compared to the same period in 2016. It is of utmost importance that the chemical sector in Serbia has recovered from the sharp fall in 2009, that it grew at a higher rate than its European competitors, with the exception of Bulgaria (graph H2), and that it grew faster than the import demand in the key markets (graph H3). The export growth to the NMS markets (accounting for 36% of the sector's export) and to the EU15 (27%) was significantly faster than the respective import demand in those markets – and thus the market share has been increased, while in the CEFTA and Russia markets the export growth followed the import demand – thus keeping the market share unchanged.

Graph H2. Export growth, Serbia and selected European countries (Index, 2009=100) (source: UN Comtrade)



Graph H3. Growth of import demand in the key four markets, global and in Serbia (Index, 2009=100)



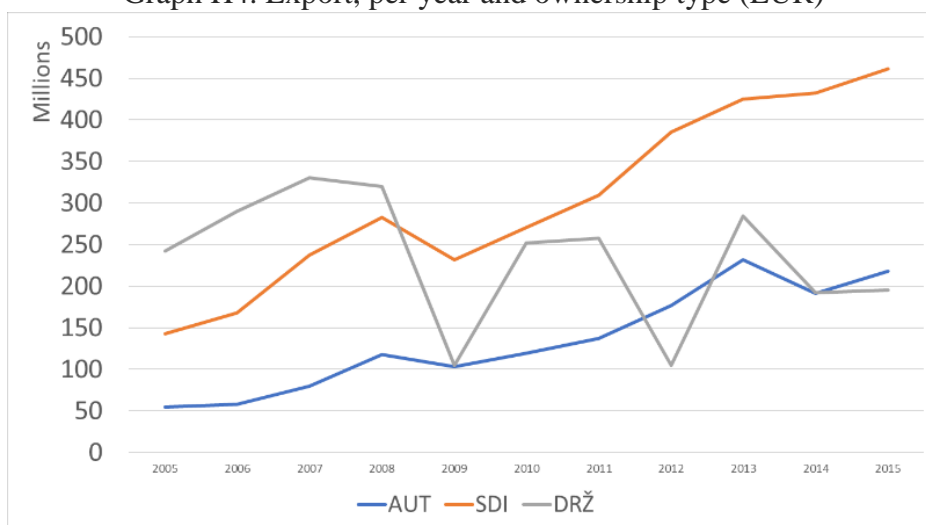
Source: UN Comtrade

**The FDIs contributed the most to the export growth, and a similar growth dynamic has been recorautocded recorded in both autochthonous and state-owned companies – however, with drastically different structures and export stability.**

- As shown in graph H4, the export by the FDIs and autochthonous companies recorded constantly a growing trend, with an expected fall in 2009 – while the export by the state-owned companies contributed to the overall instability of the export's volume and growth. In order to assess the sector's potential competitiveness, in its state-owned

segment in particular, a deeper analysis is needed taking into account the impact the state policy had on the sector's competitiveness.

Graph H4. Export, per year and ownership type (EUR)



Source: Customs, CEVES' staff calculations

- The FDIs have spearheaded the growth – they account for half of the overall export, and to the same extent they have contributed to the export's growth. The FDIs overall export performance, taking into account both the subsectors, is defined by 25-30 exporting companies and ten largest companies among them account for almost 80% of the export sales. In the production of chemicals and chemical products, accounting for 60% of the export, Henkel company is the leader. It mainly exports washing machines and dishwashers that make up one third of the overall export in the entire subsector. Other companies, relevant exporters in the subsector, include NIS and Messer (organic chemicals and industrial gases), Jub and Helios (paints, varnishes and solvents), Borealis (artificial fertilizers), and Beiersdorf – the only company with a relevant export of final products for personal hygiene. On the other hand, the export of pharmaceuticals is much more concentrated – Hemofarm accounts for 80% of the export, and among relevant exporters are also Zdravlje, owned by Actavis, and Pharmaswiss.
- Autochthonous companies grew by the same dynamics as the FDIs, and thus they kept their share in the overall export at about 25%. As expected, the export of the autochthonous is nevertheless more fragmented, with 20 biggest exporters accounting for 60% of the export, with the remaining 40% distributed among large number of companies exporting small amounts – either because they are small companies or because the exported chemical products are just by-products of their primary production. The most important exporters are in the segments of artificial fertilizers (Elixir, Promist, Fertil), paints and varnishes (Bekament and Maxima), and cleaning products (BH Chemical).
- The export of the state-owned companies, that accounts for over 20% of the sector's export, is absolutely determined by the activities of HIP-Petrohemija, while Hipol, Azotara, and MSK also account for a share of the export. All of the four companies operate with net losses for years, and have very high levels of debt – even short term. In addition to the above-mentioned companies, that trade primarily in the basic

chemicals – the exporters include companies from the defence industry exporting the gunpowder and explosives. Obviously, the performance of the described state-owned companies depends greatly on the state policy and state interventions – and it is not possible to draw clear conclusions about their performance in spite of the annual export growth of 10%, because the state policy was highly unstable in the last ten years.

## Paper and Printing Sector

**The paper and printing sector consists of two subsectors – production of paper and paper products (KD13) and printing and printing services (KD14).**

- The production of paper and paper products (KD13) encompasses manufacturing of cellulose, paper and cardboard, as well as the production of products made from paper and cardboard -- packaging, items for personal, home and office use (tissues, diapers, etc.), and wallpapers. Printing and printing services include the services of prepress, bookbinding, newspaper printing and other printing services.

### **Key global characteristics of paper and printing sector:**

- **The degree of internationalization of the sector is lower** due to relatively high transportation expenses, lower unit value of products, as well as the weight and product dimensions.
- **The sector is resource intensive** -- it uses wood as a basic raw material and represents one of the biggest consumers of electric energy and water.
- **The sector is relatively concentrated at the global level** – competitive environment in the sector implies large-scale production and the use of the economies-of-scale effects in order to decrease fixed unit costs.
- In the previous period, **high value-added products for personal use (e.g. tissues) and paper and cardboard packaging have achieved growth**, while the production of printing-related products is in decline - due to intensive digitization.

### **The characteristics of sector in Serbia are similar:**

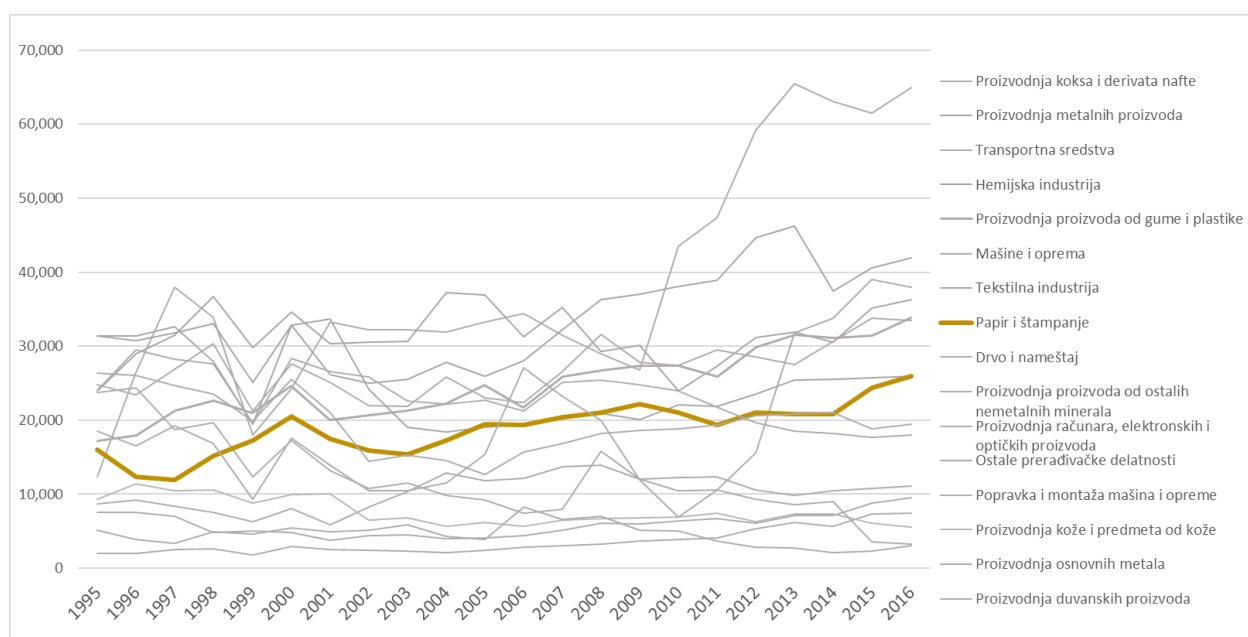
- The sector is traditionally oriented towards meeting demands of the domestic market – at the beginning of the crisis, exports accounted for only 20% of total volume of the sector. However, as well as in most other industries, in the post-crisis period the export was the biggest contributor to the sector's growth, reaching 33% of total sector volume in 2015.
- By looking at the big picture, **we can see that the sector is concentrated**—10 largest companies account for almost 50% of total sector volume, while 10 biggest paper and paper-made products exporters make up to 70% of total exports. However, HHI of the whole sector, according to business incomes, is only 542, which indicates that the remaining 1.500 companies, companies outside top 10, are fragmented to a great degree (the median of the income of those companies is 70k EUR).

- Similarly to the global level, the fastest growth, measured in volume, has been achieved by the companies registered for the production of high value-added products for personal use, while the newspaper sector has experienced the biggest decline.

**Considering that it produces normal goods, aimed at meeting the domestic market demands, the sector has shown relative stability, but still poor performance.**

- In 2016 the sector only contributed with 4,7% to the manufacturing industry GVA, and with 0.9% to GDP – which is the average share of the sector in those aggregations since 2000. The sector accounts for 4.3% of total employment of the manufacturing industry (17.000 employees).
- Similarly to most other industries, the paper and printing sector suffered a drop at the beginning of the new millennium – when the sector was adapting to new market conditions, as well as in 2009 when the effects of the global crisis had the greatest impact on economic activities in Serbia. In other years, the sector recorded constant, but a mild growth (1.5 - 2% per year).
- During the last two years (2014-2016), according to National Statistics Bureau (RZS) data, a faster growth of GVA has been recorded (11.5% per year). This needs to be further examined, as the growth cannot be explained by the growth in industrial activities nor by the domestic market consumption, while the foreign trade balance of the sector has not significantly changed either and therefore cannot be considered as the source of the growth of the GVA.

Graph P1. Sectoral GVA\* in manufacturing industry, between 1995-2016 (constant prices 2010, mil. RSD)



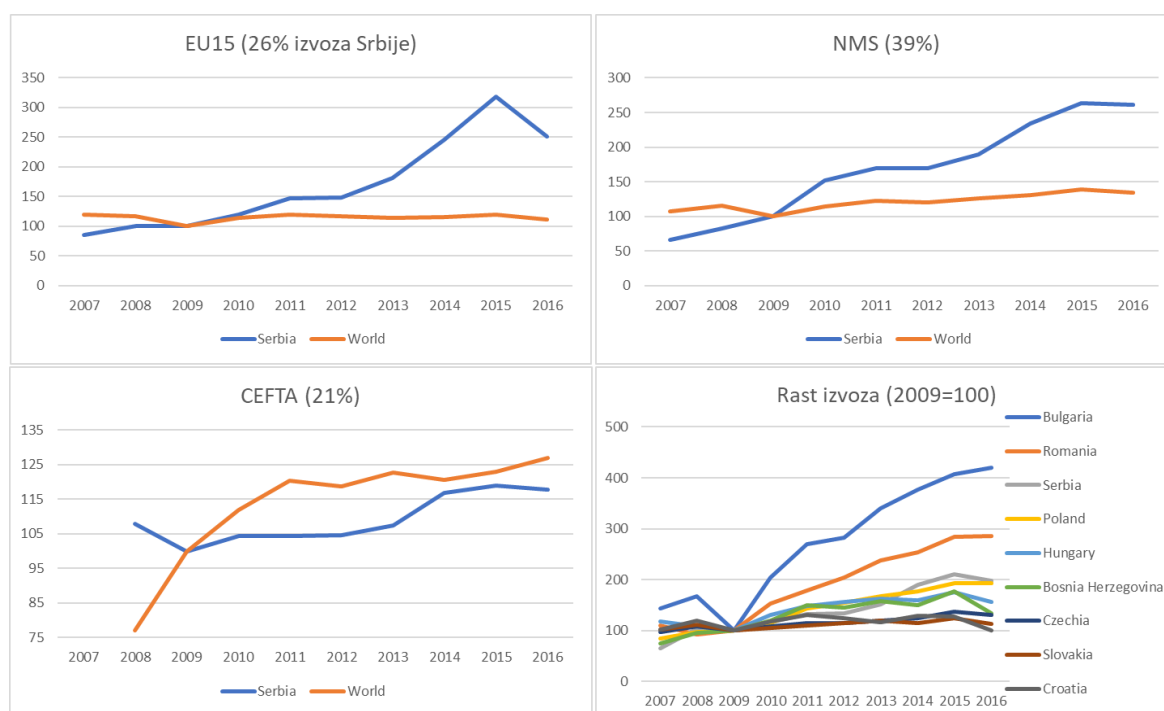
Source: National Statistics Bureau/RZS

\* Without food sector, which is by far the most significant sector.

Although the sector has achieved a dynamic growth of exports in the post-crisis period, sector's position regarding the foreign trade has not been improved, considering that the net import is on the rise.

- The export has grown, with the growth of 12% per year, from 144 mil EUR to 319 mil EUR. Given the fact that the growth was similar to the total export growth, the sector has kept its share of 2.5% in the total export. When it comes to the export of paper and paper-made products, Serbia's export is relatively more significant comparing to the other industries – RCA stands around 2.5. According to exports per capita, Serbia is ahead of Romania and Bulgaria, while lags behind Hungary, Czech Republic and Slovakia but to a lesser extent than in other industries.
- The export has grown on the basis of the increased market share – 75% of a total export growth was achieved due to the competitiveness effect. The export of Serbia has grown faster than import demands in three key markets, as well as faster than the exports of most of the competitors – except for Bulgaria and Romania, as indicated on the Graph P2.

Graph P2. Serbian export growth in comparison to the import demands in the key markets and competitors



Source: UN Comtrade

- Although import has had a slower growth (9% per year) comparing to export, absolute net position has got worse. At the beginning of the period the import was 324 mil EUR, but reached 568 mil EUR at the end of the period, while at the same time net import has increased from 180 to 250 mil EUR. The largest part of the import (around 60%) consists of paper and cardboard, which is mostly used by companies from the paper and printing sector, followed by diapers and pads imported by distributors (around 10%), followed by boxes and paper-made packaging mostly imported by companies from the tobacco sector.

**Export growth has been driven both by foreign direct investments and domestic autochthonous companies.**

- FDI/SDI contributes to total exports by 57%. The most significant FDI is Tetrapak, which exports paper and cardboard-made packaging from Serbia and accounts for 60% of total FDI export (around 160 mil EUR). 10 biggest FDI exporters account for 90% of total FDI export. Apart from Tetrapak, amongst top exporters are Rotografika (12 mil EUR, magazines, brochures and books), Zannini East (6 mil EUR, cardboard boxes), Litopapir (4 mil EUR, bags), and DS Smith (4 mil EUR, paper, packaging and recycling).
- The export of domestic autochthonous companies accounts for the remaining 43% of total exports – and has been growing with the same rate as the FDI export (11%), although domestic exporters are significantly more fragmented. Around 130 domestic exporters have in total exported over 100.000 EUR, while over 20 domestic companies exported over 1 mil EUR. Leading companies, with exports over 5 mil EUR, are the following: Umka (around 40 mil EUR, mostly cardboard and paper), Drenik (27 mil EUR, mostly personal hygiene products), Avala Ada (7 mil EUR, packaging), Arabesa (old newspapers and magazines) and Fabrika hartije (6 mil EUR, testliners and fluting). Umka, Avala Ada and Fabrika hartije are owned by the same holding company.

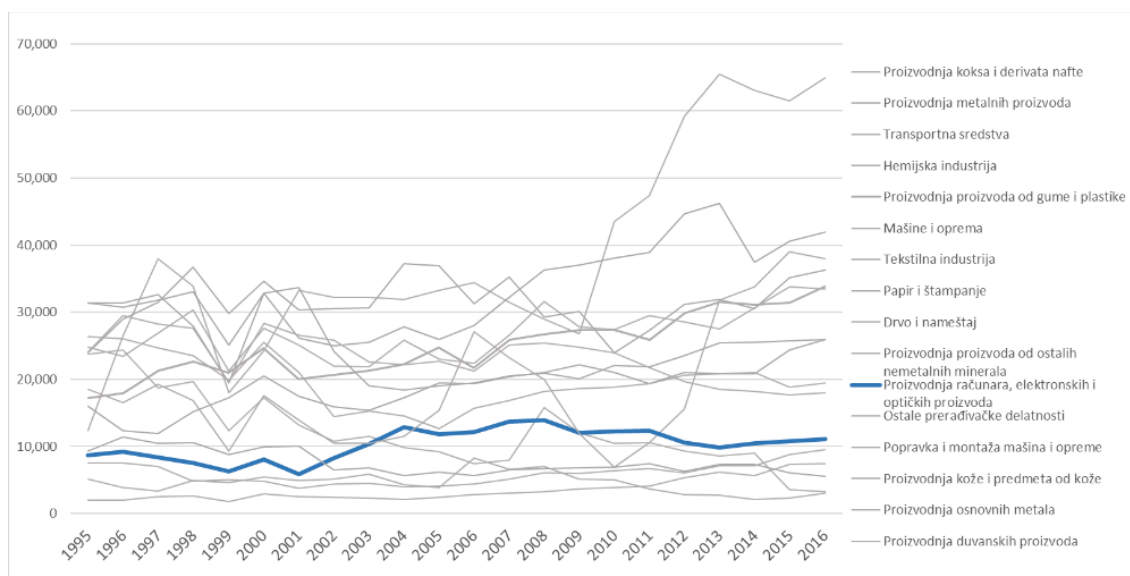
## **Computers, Electronic and Optical Products Sector**

The computers, electronic and optical products sector includes the production of computers, peripheral computer devices, communication devices and similar electronic products, including components of those devices. The sector also includes the production of electronic devices for entertainment, measuring, researching, control, laser, electromedical and electrotherapeutic appliances and instruments, optical instruments and appliances as well as the production of magnetic and optical media (KD26).

**The importance of this sector is relatively low considering the rest of the manufacturing industry, while the sector's post-crisis performance is weak.**

- GVA of the sector accounts for 2.1% of the GVA of the manufacturing industry and 0.4% of the GDP, which makes it one of the smallest contributors within the manufacturing industry. As indicated on the Graph E1, the sector made progress in the first half of the 2000s, while the second half of the 2000s was marked by stagnation. The impact of the crisis was followed by contraction, from which the sector has not recovered yet.

Graph E1. Sectoral GVA\* in manufacturing industry, between 1995-2016 (constant prices 2010, mil. RSD)



Source: National Statistics Bureau (RZS)

\* without food sector, which is by far the most significant sector.

### During the last period, Serbia has not been a competitive exporter.

- Export growth in the post-crisis period was only 5% per year, resulting in the total growth of the export from 168 mil EUR in 2009 to 231 mil EUR in 2016. The growth of the export was slow in comparison to the global trade of the same products, which was more intensive.
- Serbia is a relatively small exporter. Measured by RCA index, which is significantly lower than 1 and amounts to only 0.04, Serbia has no competitive advantages in analyzed products.
- The sector is a large and growing net importer – net import reached over 600 mil Eur in 2016.

## Leather and Leather Products Sector

**Leather and leather products sector encompasses tanning, processing and dyeing of leather and fur, and the production of leather goods – belts, bags, shoes, etc (KD15).**

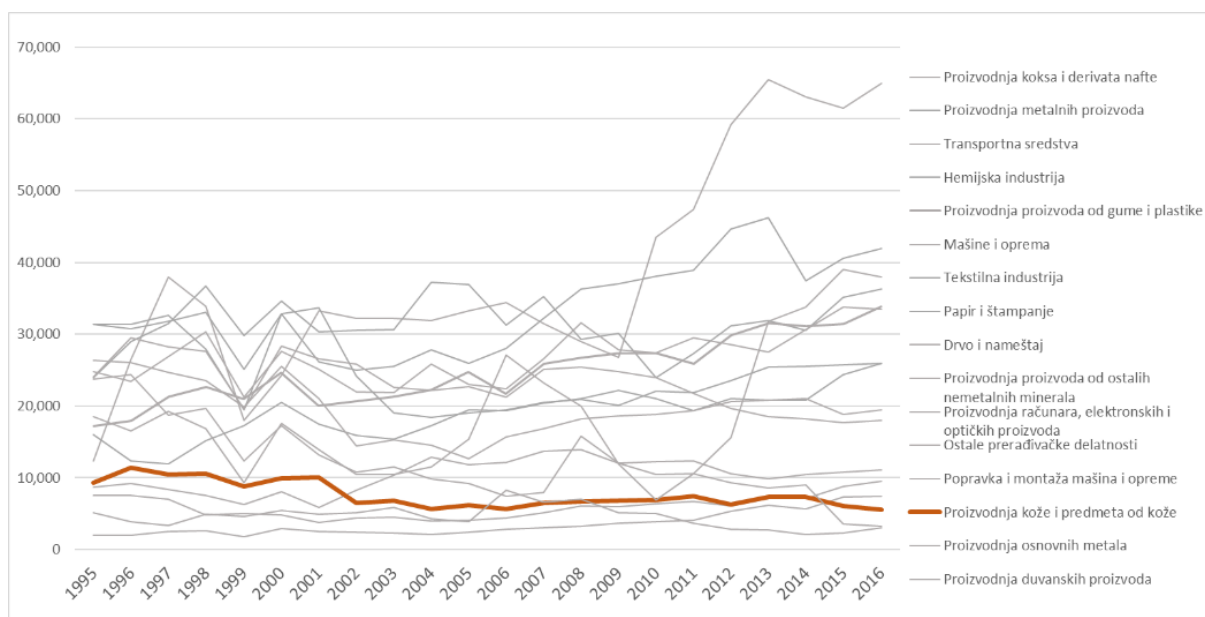
**The significance of this sector within the manufacturing industry is low and the sector's performance is poor – both in the pre-crisis and the post-crisis period.**

- The GVA of leather and leather products sector accounts for 1.25% of the manufacturing industry's GVA and for 0.2% of the GDP, which represents the lowest contribution of a single sector within the manufacturing industry (the production of textile and other transportation products have even lower contributions, but those industries are for the purposes of this study considered as segments of a broadly defined industries).
- The leather and leather products sector's GVA is in a continuous decrease. In 2016, the GVA was exactly one half of its size from 20 years ago. Moreover, in the post-crisis



period the GVA has been declining by 3% on average per year (it has decreased by 19% in total). Dynamics of changes in the GVA, in real prices, is shown on the Graph L1.

Graph L1. Sectoral GVA\* in manufacturing industry, between 1995-2016 (constant prices 2010, mil. RSD)



Source: National Statistics Bureau (RZS)

\* Without food sector, which is by far the most important sector.

**Export of leather and leather products sector has been growing in the post-crisis period at a higher rate than the import, which has improved the net export position.**

- Export growth in the post-crisis period stood at 11% per year, making the sector's export reaching 314 mil EUR. The growth has continued during the first 8 months of 2017, which made export higher by 17% compared to the same period in 2016.
- At the beginning of the analysed period (in 2009) the sector was a moderate net importer (balance -20 mil EUR), but has become a net exporter (balance + 55 mil EUR) in 2016 due to the faster growth of the export in comparison with the import (11% vs 7%). The import is mostly comprised of raw materials (mainly cattle skin), and footwear imported by distributors and official representatives.
- The growth of net export, which in 2016 accounted for 80% of sector's GVA – in combination with the constant decline of GVA, indicates the significant decline in the domestic consumption. This phenomenon has to be further examined in order to gain a better understanding of the domestic market trends.

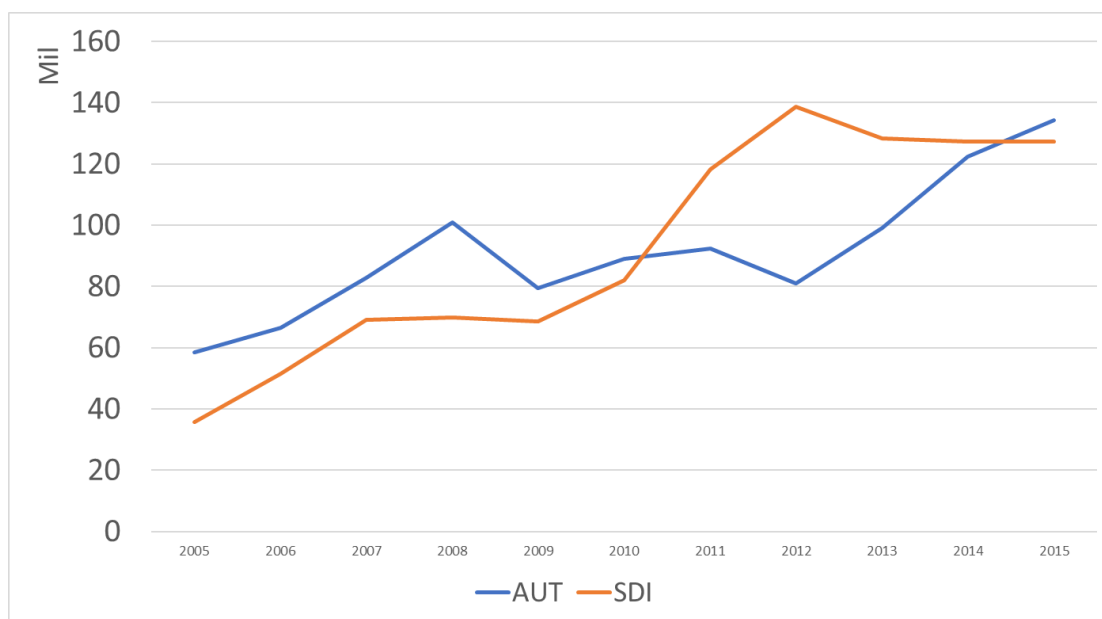
**Export growth was equally created by FDIs and domestic companies, with the difference that the FDIs' exports have been stagnating over the last couple of years, while the domestic companies' exports have been growing (Graph L2).**

- FDIs' export is more concentrated – top 10 exporters make up 90% of the export, while the footwear is by far the most significant export product in the most FDI companies SDI (key footwear exporters are Falc East, Fas Shoes, Adidas, Progetti, Euroin, and Technic Development). The structure of the export of the domestic companies is, as



expected more fragmented, with around 80 companies that export more than 100k EUR and that are primarily focused on export of footwear from Serbia.

Graph L2. export by year and type of ownership (EUR)



Source: Customs, CEVES' staff calculations

## Other Manufacturing Activities

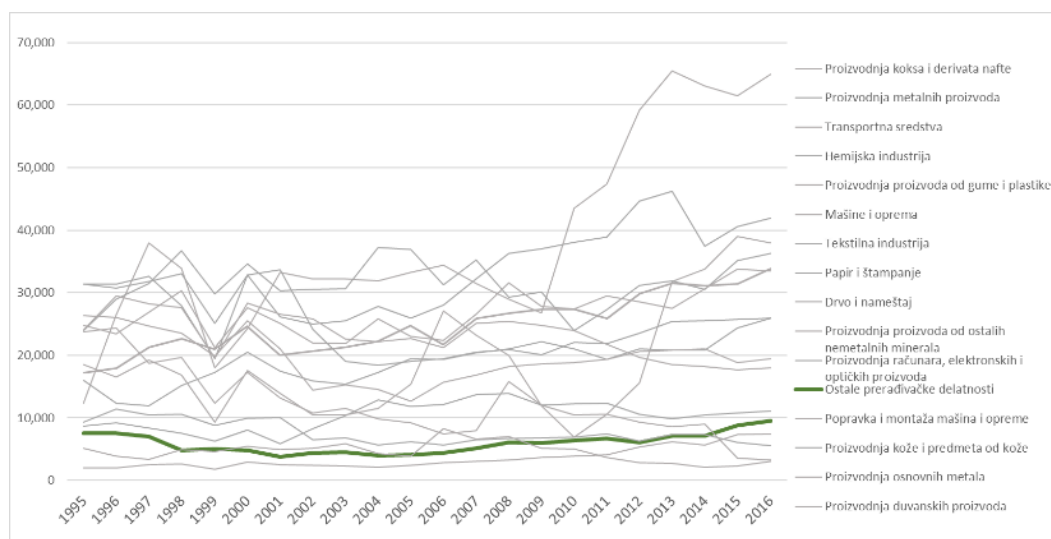
**This sector includes diverse products that haven't been included in other industries:**

- Production of jewellery, trinkets and similar items
- Production of musical instruments
- Production of sports equipment
- Production of games and toys
- Production of medical and dental devices and materials
- Other products (brooms and brushes, safety equipment, candles, lighters...)

**The significance of this sector is relatively low in the context of the manufacturing industry, but the post-crisis performance of the sector was strong.**

- Sector's GVA accounts for 0.3% of the GDP – which is one of the lowest contributions from the manufacturing industry. However, as it is shown on the Graph O1, the sector has been achieving a constant growth since 2005 with exception in 2009, which was an expected consequence of the effects of the crisis.

Graph O1. Sectoral GVA\* in manufacturing industry, between 1995-2016 (constant prices 2010, mil. RSD)



Source: National Statistics Bureau (RZS)

\* Without food sector, which is by far the most important sector.

**The sector is a small exporter, but the post-crisis growth of the export was dynamic and based on the growth of competitiveness, which has contributed to the improvement of sector's foreign trade balance.**

- Export growth in the post-crisis period amounted to 16% per year, resulting in the rise of the export from 46 mil EUR in 2009 to 129 mil EUR in 2016.
- Almost entire growth (95%) was achieved due to the effect of competitiveness and the rise of market share in key foreign markets.
- After the crisis the sector has improved its net position. Although it is still a net importer, net import fell to 80 mil EUR in 2016, in comparison to the 130 mil EUR in 2009.

**FDI companies lead the sector's export growth (67% of the export and 85% of the growth), while the export of domestic companies is stagnating.**

- Two FDI which decisively influence the almost entire level and growth of the export are Fresenius (medical equipment) and Swarovski (jewellery).
- The structure of domestic companies is notably fragmented with around 70 companies that export more than 100.000 EUR, without any of them having the leading role (the largest domestic exporter accounts for 8% of the total export of domestic companies).

## Annex 1 – Quality and statistical data sources

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This annex provides additional information on methodology and data sources, used for the analysis of the observed Serbian economy sectors' structure, performance, and competitiveness.

### Sector definition and scope

- Sector definition is based on business classification BC (2010). Business classification is fully compatible with the international standard business classification of the EU – NACE REV. 2, having that it has been transcribed into national legislation without any changes, providing for a high degree of international comparability.
- For the purpose of the analysis, the BC 2010 fields that represent the second highest level of aggregation within this classification, had been merged into “sectors” upon the demand and needs of the Ministry of Economy, therefore:
  - Food sector covers production of foodstuffs (BC10) and production of drink (BC11);
  - Machine and equipment sectors covers production of electrical equipment (BC27) and manufacturing of not otherwise mentioned machines and equipment (BC28);
  - Sector of rubber and plastic covers manufacturing of rubber and plastic products (BC22);
  - Sector of wood and furniture covers wood processing and wood, cork, straw and wattle products (BC16) and furniture manufacturing (BC31);
  - Sector of manufactured metal products covers metal products manufacturing, without machines and devices (BC25);
  - Textile sector covers textile production (BC13) and clothing manufacturing (BC14);
  - Sector of transportation vehicles covers manufacturing of motor vehicles, sidecars and semi-sidecars (BC29) and manufacturing of other transportation vehicles (BC30);
  - Chemical sector covers production of chemicals and chemical products (BC20) and production of basic pharmaceutical products and preparations (BC21);
  - Paper sector covers production of paper and paper products (BC17) and printing and copying audio and video recordings (BC18);
  - Leather sector covers production of leather and leather items (BC15);
  - Electronic and optical sector covers production of computers, electronic and optical products (BC26);
  - Miscellaneous sector covers other manufacturing activities (BC32);
  - The fields not covered by the analysis are tobacco products manufacturing (BC12), coke and oil derivatives production (BC24), production of other non-metal minerals production (BC23), production of basic metals (BC24), repair and installation of machines and equipment (BC33). Upon the need, these fields are grouped in “other miscellaneous” sector to provide for a comprehensive overview of the economy performance and characteristics.

## National accounts statistics

- The national accounts statistics was used as the primary, key indicator of sector activity and performance, i.e. the GDP statistics pursuant to the production approach. The SORS was used as the official source of data for Serbia, and Eurostat was the official source of data for the other countries. When doing international comparisons, Eurostat was used as the data source for Serbia where possible as a rule, in order to assure maximum comparability.
- Having that the national accounts statistics does not provide deeper insight into the sectoral structure – and heterogeneous sectors such as food sector require a significant understanding of trends and shares at sub-sector or ownership level, the SBR database was used for approximative calculations. Although the SBR's data provide a general picture of shares and trends of added value at a sub-sector or company ownership level, data lack sufficient detail to calculate the added value using the identical methodology as for the national accounts. Likewise, the scope of subjects and activities differs, having that the financial data for entrepreneurs who do not submit financial reports are not available in the SBR's database, and the added value obtained at the company level cannot be disaggregated further and allocated to the appropriate lines of business – for example, if a company is registered within the foodstuffs business achieving 40 % of its added value through pure trade or another line of business, the entire added value will still be assigned to the food sector.

## Structural business statistics

- Structural business statistics (SBS) both for Serbia (SORS) and for the EU (Eurostat) was used as the source for auxiliary general performance indicators at the sector level.
  - Added value indicators per factor costs, gross business surplus, number of staff, labor costs had been used as the auxiliary general performance indicators – along with the derived indicators – labor productivity, average labor cost and added value per employee. These indicators are also available from the SORS and Eurostat. Having that the SBS does not provide data at constant prices when calculating growth rate at the sector level, deflation factor used by the SORS for the national accounts was applied.
  - Apart from the insufficient disaggregation level, the issue that needs to be noted in the case of SBS in Serbia is that it covers formally registered legal persons only, without entrepreneurs being more than 200,000 with a significant contribution to the sector performance – mostly to the employment. For that purpose, the SBS data were corrected using the Statistical Yearbook data for labor market where possible – available in electronic form, however not organized in databases, and without the possibility of systematic download. The difference between such corrected data is significant – for instance, in food sector where entrepreneur shops are prevalent, the difference is approximately 23,000 or as much as 33 %. For rubber and plastic, the difference is moderate at approximately 10 %. We need to note that the statistical yearbook covers formally employed persons in legal persons, entrepreneurs and their employees, thus it does not cover other employees (other types of contract or no contract) – and the labor survey does not provide public data at the individual manufacturing industry level (neither report, nor database); the entire manufacturing only is covered.

## Data on foreign trade

- The SORS data on foreign trade per business lines were used as the primary indicator of status and flows of export and import when analyzing foreign trade performance. However, this also contains limitation: sectoral data are not available before 2009; there is a very high share of unclassified products per sectors, which is growing each year (in 2010, the share of such products was 0 %, only to reach 8 % and 10 % in 2015 and 2016 respective); insufficient disaggregation (only the second level of NACE classification is systematically available); lack of matching possibility (markets and products cannot be systematically paired and matched with the number of exporters – available at Eurostat)
- The UN Comtrade data were used as the additional export performance indicators, for the purpose of in-depth analysis of the export structure and competitiveness, being the most frequently used international source of data on foreign trade, along with the Customs Administration data.
  - The UN Comtrade data provide for a detail disaggregation at the sector level (down to 6<sup>th</sup> level, which already contains detailed products), matching products with markets, and a set of international comparisons regarding the export structure and dynamics – having that such detailed data are available for all countries in the world for past 10+ years). Key challenges in using the UN Comtrade database are:
    1. The need to establish a correspondence, i.e. the bridge between SITC / HS classification and NACE classification, since there is no official, publicly available relevant correspondence. All available international sources and “manual” sorting by the CEVES team had been used in this process.
    2. There is the difference between the value of import into other countries from Serbia (so-called “mirror image”) and the value of export from Serbia to the other countries (regular image). On one hand, it is logical that such differences would exist (due to FOB / CIF value); it is illogical to have significant differences in the trend itself (the example being FMP sector). Origin and cause of differences that cannot be explained by the cost of transport and insurance need to be examined in more depth – the report notes differences where they exist and if they are significant.
  - The Customs Administration data provide deeper insight in the placement structure, since they provide the foreign trade data at the Customs Tariff (CT) level (down to the 10 figure level), with long series reaching back to 2005.

## Ownership structure definition

- Data from the SBR’s database were used predominantly to analyze performance and competitiveness of sectors according to various definitions of structure types. The SBR’s data, unlike the SORS’s, provide for the companies within the sector to be categorized per sub-sectors (third level of aggregation within the business classification) and to group them per ownership type or company size. The CEVES had refined and established the SBRA’s database during its years of real sector analysis in Serbian economy.

- Size / sub-sector structure was defined under the SBR based on the number of employees and business line code – a simple and intuitive procedure, using the existing standards for categorization per size (micro – up to 10, small – up to 50, medium – up to 250, large – over 250) and business code (already aligned to the NACE classification).
- The greater challenge was to define ownership type – which should have divided companies to state-owned, domestic private and foreign. The original SBR's ownership variable (foreign, domestic private, domestic state-owned, mixed ownership) was used as the initial indicator, which was subsequently verified and extended through the data of the Public funds beneficiaries register and the Central register of securities (CRS). Data of the Public funds beneficiaries register had provided for verification and filling out “state-owned” variable since this register shows all entities founded by the state and where the state has over 50 % share in ownership (e.g. FIAT is not the part of public sector since the state is minority owner). The CRS data had provided for precise determination of ownership structure in all stock companies, mostly being large companies, formerly founded by the state and subsequently privatized. For the remaining major companies that are not a part of the public sector and CRS could not provide for ownership type definition, the fields were completed “manually”, in line with publicly available ownership data on the SBR's website.
- Data of the Privatization Agency were additionally used to create the historical ownership variable – in order to determine if a company was established as state-owned (traditional sector) or it was domestic or foreign from the start (de novo sector).
- Cross-referencing information on present and historical ownership had provided for the definition of five groups of companies – state-owned, foreign from privatization, foreign “de novo”, domestic private from privatization and domestic private “de novo”. The CEVES had created the variables earlier for the purposes of studying Serbian economy characteristics and had updated the ownership database with the latest information for the purposes of this project.
- Apart from the detailed overview of the structure, the SBR database was also used as an auxiliary source for performance analysis since it provides for calculating and presenting average (mean, median, percentiles) growth rates of key performance indicators (business revenues, EBITDA, labor productivity) at sub-sector / size/ownership level.

## **Key challenges in data analysis**

- Deeper insight in the sector performance and analysis – beyond financial analysis, was often not possible due to data unavailability (for instance, consistent multi-annual balance sheets for key agricultural products were unattainable) or insufficient reliability (severe underestimated primary production of raspberries, per the industrial manufacturing indicators – as shown in the fruit and vegetables value chain analysis). Likewise, many other in-depth data available for all EU Member States at Eurostat on sub-sector / product level, are not available from the SORS, which disables international comparisons (for instance, Eurostat provides for production and export per ownership, sub-sector and size structure).

- Cross-referencing of various data series also indicates illogicalities in the GVA trends in individual sectors. As shown in the food sector value chain analysis, the GVA data indicate that the total real created value at the end of 2016 was some 7 % lower than in 2008 and 2009. Having that the net export of foodstuffs had grown significantly (45 %) meanwhile, this may be explained by a very unusual and radical cost cuts between agricultural and food products, or very steep decrease of domestic consumption – which is not credible. Additional doubt in official data sources is indicated by the fact that 2012 is the only post-crisis year when the food sector had achieved a significant growth in activity, as much as 4.2 %. Due to intensive drought, the agriculture sector had seen a strong 18 % drop in activity. Agricultural prices had a significant rise in 2012, which means that the companies had operated with significantly lower profit margins (which is not the case, judging by the SBR data) or the population – contrary to previous and rational behavior – had opted to intensify food purchases per higher prices, which is also very unlikely.

## Annex 2 – Industrial policy framework measures for Serbia

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Introduction .....	212
Justification for proactive industrial policy in Serbia.....	212
1. Basic institutional capacity for adoption/implementation of industrial policies .....	214
1.1. Quality economic, business and technological information as public goods and investment in a productive public-private dialogue .....	214
1.2. Strengthening capacities for purposeful actions by relevant institutions and supervision over them.....	216
2. Tailored knowledge resulting in a higher productive potential of the labour force .....	219
2.1. Urgent completion and adoption of the national qualifications framework .....	219
2.2. Programmes of support for recruiting experienced professional personnel from the diaspora, particularly with process management skills .....	220
2.3. Incentives / subsidies for investment in development of knowledge and employee training .....	220
2.4. Training vouchers—test for collection of payment .....	221
2.5. Higher responsiveness of the Ministry of Education, as well as improvement of cooperation between the ministries of economy and education with regard to adjustment of the curriculum of secondary vocational schools to the needs of the local economy .....	221
2.6. Programmes of strengthening and modernization of academic programmes of economic analysis of industrial sectors and organizations - as well as introduction of programmes of economic applicability in technical and engineering schools .....	222
2.7. Research reasons for unavailability of certain secondary school profiles on the sub-national level .....	222
2.8. Support the mobility of students and labour force—legalize payment for transport of secondary school students .....	222
3. Complex policy of attracting FDI, directed to developmental effects.....	223
4. Intensify and defragment measures for supporting SMEs and export.....	223
5. Overcoming fragmentation by SMEs association and strengthening market mediation.....	225
6. Other measures directly under the competence of the state .....	226
6.1. Further development of the quality infrastructure and its accessibility to SMEs .....	226
6.2. Available and stable supply of electric power.....	228
6.3. Detailed research and solution proposal for „inactive“ public property and property trapped in industrial locations under unresolved ownership relations.....	228
6.4. Evaluation and promotion of quality .....	228



## Introduction

This study is expected to focus on the issues referring to the development of the narrowly defined term “active industrial policy”— measures for elimination of bottlenecks within the sector, or support to its actors whose development may produce special external effects on the development of the entire sector.<sup>58</sup> It is thus recommended, for instance, that system for sale of wood by the public enterprises should be reorganized in such a manner as to make the system transparent, enable the identification of the market price of wood, and allow the conclusion of long-term and stable contracts, at least with major buyers.

However, problems/obstacles to competitiveness as described in all sectoral studies are largely common for all sector - and originate primarily from the SME nature of the large part of these sectors, as well as from the insufficient effectiveness and serviceability with which the state fulfils the functions that are expected of it in any case. Some of these problems are addressed by a number of reforms and programmes planned in the context of strengthening competitiveness prior to accession to the European Union. For instance, only a comprehensive reform of the education system makes it possible to permanently build human capital which would ensure sustainable competitiveness, as well as compensate for the lost momentum during the previous decades. There is a similar situation with problems which are to be addressed by the public administration reform or public enterprises reform,<sup>59</sup> which should considerably contribute to the improvement of the business environment in Serbia. An analysis of these wider systemic obstacles to competitiveness would extend beyond this study, and we will not address them in these recommendations.

This Annex addresses in more detail the common aspects of obstacles to competitiveness identified in most or all of the researched sectors, whose elimination is within the scope of industrial policy, and primarily the changes in industrial policy instruments and preparations of institutional capacities which are necessary for these industrial policies to be implemented.

## Justification for proactive industrial policy in Serbia

First and foremost, there is the question if it is justified to enter industrial policies if the state is not showing any capability to first raise the level of its general, “horizontal” performances. Serbia still does not have an established wider system of planning public policies, and consequently no economic development strategy/plan. The law which is to establish such a system has been submitted for adoption to the National Assembly, but even once it has been adopted, a lot of time will have to pass before its enforcement significantly raises the level of coordination and design of actions in the area of economic development and industrial policies. Implementation of targeted industrial policies without a well considered and previously researched plan would be risking a dissipation of resources.

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<sup>58</sup>Industrial policy measures are measures that go beyond “ensuring a favourable economic environment” for development of the private sector. While favourable economic environment just refers to ensuring equally favourable terms for all market participants - institutional protection, familiar and predictable rules of the game, supporting public services and lack of any unnecessary administrative burdens - the industrial policy, as a rule, focuses on certain parts of the economy (sectors, sub-sectors or enterprises with certain characteristic) and thus singles them out of the rest of the economy. As a matter of fact, industrial policy often consists of interventions favouring certain market participants through specific support programmes for development of labour, market, technology etc. which are expected to indirectly produce benefits for the entire industry.

<sup>59</sup>As a matter of fact, the above mentioned vertical measure of organisation of sale of wood by public enterprises may be classified as a public enterprise reform task.

We believe that it, in the short and medium term, implementation of policies we are proposing within the sectoral analyses package, together with the previous measures hereby described, is nevertheless justified - the so-called “second best” solution - for Serbia, for multiple reasons. Firstly, most of the measures proposed hereby refer to generation and transfer of knowledge and development of skills, assistance to exchange of information and connecting market participants. Such measures may significantly contribute to connecting insufficiently mobilized scattered resources which are widely present in Serbia, and produce a development effect with relatively few public funds. To illustrate: until political and economic oppositions to a more thorough education reform weaken, measures may be undertaken to assist with the adjustment of the profile of knowledge and skills of the active population to the market needs; it would not be wrong to direct them to any sector with a reasonably likely growth perspective.

Another, possibly stronger reason, for a more intense implementation of industrial policies is that, through incentives that Serbia has been giving to investors for multiple years (largely by subsidies for creating jobs), funds are already being invested, but in a less systematic manner. At the moment, there is competition in the region in attracting FDI through significant incentives and subsidies. Until a much more favourable economic environment is created, Serbia probably may not afford not to participate in this game. Nevertheless, as explained in section 4, it is necessary to deepen and further develop criteria for providing incentives for various investments - which then become industrial support.

The third reason is that the targeted industrial policy may give an example of the way that certain measures/changes in the behaviour of the state focused on certain sectors may yield results. Such examples may subsequently increase the political and economic acceptability of reforms which are currently being implemented too slowly or with insufficient depth. We definitely expect that, for instance, measures of capacity building for industrial policy which are proposed in the next section of this Annex will help the capacity building and wider reforms.

It is also important to stress that this research confirms that the selected 4 sectors undoubtedly deserve attention and focus of the industrial policy only in competition with other processing industries. Comprehensive analysis and measuring of potentials of all economic sectors - including and particularly service sectors - has not been conducted. Such an analysis may not be conducted without a serious investment in checking and deepening of statistical data on the production and export of services, and we recommend that such an analysis be conducted<sup>60</sup>.

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We begin our review of umbrella recommendations by presenting minimum institutional presumptions necessary for pursuing a proactive industrial policy. One of the aspects is development of the wealth of knowledge necessary for industrial support and the framework which will ensure the necessary institutional “learning” and institutional memory for that knowledge - primarily through the communication between the economy and the state. Industrial policy may not be built only on consultative information. Another aspect is

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<sup>60</sup>It should be stressed, for the benefits of all users of this study - particularly in state institutions and the international community - that the English term “industrial policy” and Serbian term “industrijska politika” are not used/interpreted in the same manner. In Serbia, both due to terminological nuances and the institutional division of the treatment of economy, this term refers to a much larger extent and more frequently just to the industry defined as the NACE 1 sector of economic activity. Thus, we would like to emphasize that our research confirms that the selected 4-5 processing industry sectors have undoubted competitive advantages only in comparison to the rest of the industry; namely, considering the defined terms of reference, the rest of the processing industry.

development of administrative capacities for acting in a more flexible, complex and proactive manner. Next, the third section addresses the key presumption for strengthening competitiveness and development of the considered 4-5 sectors: labour force development. Next we consider the necessary turnaround in the manner of attracting FDI, and the fifth section addresses the other side of the coin - the need to focus resources on support to SME. We believe that it is also reasonable to reduce the level of investments in FDI and increase the investments into SME. In the sixth section, we discuss the challenges of unifying Serbian market actors, who, due to fragmentation (a large number of relatively small SME and fragmented natural resources), face serious obstacles in their performance on global markets. Incentives for a joined and unified market performance of SME have also been mentioned in previous measures and chapters. Finally, in the seventh chapter, we also discuss other measures that the state must proactively pay attention to: further development of quality infrastructure, provision of EPS services, management of public property, and stimulation of quality through better inspections and tailored public procurement.

## **1. Basic institutional capacity for adoption/implementation of industrial policies**

In order for the state to favour some private actors over others through its industrial policy, there need to be clear reasons - analyses of the way that satisfying certain criteria achieves the desired results. It is also necessary for the economy to understand these criteria and plans and to act in a uniform manner, thus harmonised with actions of the state. Also, general public should at least to an extent understand these criteria, and there should be trust that the established criteria are really being observed. However, all this requires economic and practical market knowledge which is to be shared by the state and the economy, as well as administrative procedures which are to allow the development of institutions which will be able to reason and which inspire trust.

### **1.1. Quality economic, business and technological information as public goods and investment in a productive public-private dialogue**

Serbia is one of the rare European countries without an institution on which it systematically relies (and which it systematically supports) with regard to monitoring, analysing and predicting economic developments.<sup>61</sup> A certain amount of information is circulating in the public, but it is generated by international financial institutions, on the basis of consultative arrangements, often for European Union projects, sometimes for the needs of private beneficiaries. Both the economy and the public policy makers must invest special resources every time they need information relating to the future, first and foremost to investment decisions. In addition, there are serious problems relating to the quality of economic statistics (Annex 2), thus the majority of analyses actually become adjustments of statistical data, instead of analyses and predictions. Finally, development of specific sectoral policies requires targeted accumulation of technological, market and operational knowledge which is less reliant on the field of science and more on the field of experience.

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<sup>61</sup>The National Bank of Serbia conducts a quality analysis focused on the stability of prices, while Fiscal Council of Serbia conducts a quality analysis focused on fiscal developments. However, neither of these institutions has the resources tailored to the needs of the analysis and forecast of real developments, especially not sectoral developments.

### *1.1.1. Considerably strengthen the quality of statistics and availability of SORS and SBRA data*

It is necessary to first strengthen the quality of the public statistics. Serbia has good experts on statistical methods, and SORS is receiving good grades from Eurostat with respect to the research methodology.<sup>62</sup> However, the results are obviously and very frequently unusable. We believe that, at least to an extent, it is a consequence of the fact that, in a country going through a slow but deep transformation, statistical research must either rely on non-standard presumptions on the population characteristics, or invest much larger funds with a view to making them more reliably representative. Also, there are many obvious examples of non-cooperation between the official institutions, which often generate unreliable databases, making the tasks more difficult for SORS.

The third and especially serious problem lies in the manner in which SORS and SBRA are financed, where it is necessary for the majority of information generated to rely on collection from beneficiaries, in order to fill the budget. In such a manner, information must be withdrawn from the public domain, which considerably reduces its contribution to the development, and may also skew the priorities in the creation and preparation of research by these institutions.

### *1.1.2. Permanently support/build an independent institution for monitoring economic developments*

We are not aware of any EU Member State without such an institution: UMAR in Slovenia, WIFO in Austria, CPB in Netherlands. Nowadays, EU recommends that such institutions be established as independent institutions.<sup>63</sup> Such an institution may be built either as a public institution, a non-governmental organization, or a research institute supported in large part by public funds. Without public funds, development of such an institution is not possible, as the generated information is a public good: it would not be profitable for individual market participants to pay for them, but the benefits to everyone far outweigh the costs.

### *1.1.3. Centres for transfer of economic and technological knowledge and business and market analysis (business intelligence) as a basis for development of togetherness and public-private dialogue*

It is also in public interest, but of a completely different nature, to ensure business, market and technological knowledge relating to specific sectors, which are necessary to both businessmen and industrial policy makers in those sectors. They are of a less analytical and more experience-based nature and more likely to be gained in a permanent information exchange and through development of a network of contacts between market participants and other institutions (scientific, academic, beneficiary) participating in the operations of the sector, than through a data analysis. Establishment of contacts and information exchange with participants in the international market are of particular value and importance here.

They could be any of the number of vary different organizations, which may be focused on different things — some may be more focused on the transfer of technological knowledge (for instance, relating to 3D printing and opportunities it provides to the machinery and equipment

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<sup>62</sup>European Commission, COMMISSION STAFF WORKING DOCUMENT, 2016, (p. 49)

<sup>63</sup>COUNCIL DIRECTIVE 2011/85/EU of 8 November 2011 on requirements for budgetary frameworks of the Member States recommends to Member States to, when preparing forecasts, rely on comparisons with independent authorities for preparation of macroeconomic forecasts.

sector). One such example is the Croatian cluster project for Slavonic oak, *Centar kompetencija za Slavonski hrast (Centre of competencies for Slavonic oak)*<sup>64</sup>. Or they may be focused on knowledge relating to improvement of management of processes and all tools that may be used in them. Finally, focus may also be on market understanding, for example, better understanding of opportunities to use the *nearshoring* trend and subsequently for the businessmen gathered around this issue to develop a common approach to such markets. Of course, knowledge transfer centres may be designed in such a manner to combine multiple focuses or even multiple sectors. What is common for all the centres is that they must be oriented towards meeting world level standards, both in terms of management and in terms of selected activities they are implementing.

“Verticalization” of horizontal policies primarily concerns the choice of sector where the limited time and resources of the administration will be invested in development of such deep sectoral ties and knowledge. The centres themselves must be established outside of the administration, in collaboration with the economy, at first through projects supported by the state and other actors, with a view to having the appropriate flexibility. However, through investment in such centres and close cooperation with them, state institutions such as the Ministry of Justice and the Serbian Development Agency would also develop their own competencies and deep sector knowledge. This is the only way to develop a stronger and more detailed dialogue with the economy, and subsequently to successfully develop policies.

It is very important that, with such centres, gaining and sharing technological knowledge and business information is of equal interest as the fact that it encourages, or in fact *requires*, cooperation and linkage of sectoral actors. So far, clusters in Serbia have been difficult to establish, and we believe that such centres may constitute a multiply useful way to encourage economic linkage.

Such organizations may also be developed according to the public-private partnership model. On one hand, this is a way to reduce the relatively high cost of their development, having in mind that they are used only by a small circle of businessmen - those interested in the sector in question. On the other hand, it is also in direct interest of businessmen to present their knowledge and experience and gain such knowledge and experience from others, and for that reason, they may be interested in helping the programme. Technological parks may also be established on the basis of similar principles, but they are mostly focused on technological knowledge transfer. In case of a public-private partnership, public investments would particularly refer to trainings, not only on technological innovations and options, but also good business practice and developments of specific markets.

## **1.2. Strengthening capacities for purposeful actions by relevant institutions and supervision over them**

Perhaps the biggest obstacle to development of a genuinely proactive and successful industrial policy in Serbia today is notable formalism in administrative actions of state institutions in Serbia (this issue is well known and addressed by the public administration reform). It is not an accepted practice in Serbia to, for instance, elaborate on perfectly reasonable criteria such as those often established in laws, by-laws and policies, on the basis of more specific guidelines for application and examples / instructions how to assess the justifiability of an action on the basis of criteria whose fulfilment is verified with the aid of common sense/expert reasoning. Instead, the application is, as a rule, defined by detailed instructions which leave no space for

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<sup>64</sup><http://www.ar-hrast.hr/default.aspx?id=440>

any reasoning and which are verifiable by unambiguous criteria. Within the Framework A1, an example of Law on Investments has been developed, indicating that the incentives shall be allocated in proportion with developmental effects of the project, and subsequently the Regulation determines the amount of incentive on the basis of just a few verifiable criteria (the main one is the amount of reasonable wages costs) which precisely indicate the amount of the incentive. Thus, the Law mostly encourages an increase of the number of jobs.

Such an approach considerably limits or prevents a complex and nuanced decision making necessary for successful industrial policy. The example of the Law on Investments includes a “valve” - element which enables the flexibility of decision making through allocation of additional funds for certain amounts of invested capital. Their amount, however, is allowed to be within a relatively wide range<sup>65</sup>. In that case, the amount is fully up to the discretion of the decision maker (the Council, which is a political body, rather than the administration), which is also not desirable. However, this also does not allow an increase of incentives in certain cases where they would have larger developmental effects, e.g. investments which, by their nature, mobilize and develop a large number of suppliers (e.g. in food sector), or which bring knowledge to be transferred through training and examples (requiring a higher level of technology and skills).

Such rigidity is a serious obstacle to implementation of measures requiring measuring multiple factors in the assessment of whether something is reasonable or not - e.g. we recommend that incentives be given through compensation of employee training costs (see 3.3). It is difficult to imagine that all reasonable possibilities could be specifically listed in the Regulation, as it is a case now. A decision maker would have to use an inspection into documents and logic in decision making on whether costs are likely to have been directed into training and improvement of employees or not, in accordance with criteria/principles which should be further prescribed by the Regulation.

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<sup>65</sup>Due to the above mentioned notable formalism, incentive contracts between the Serbian Development Agency and investors sometimes got terminated because the number of employees was 2% lower than the contracted number.

The Law on Investments establishes expected and logical criteria on how to prioritize the choice and the amount of support to investments. Is it tied to developmental effects of the project, and criteria for assessment of the importance of investments, in addition to the number of new jobs, effect of investments on the number of employees in the economy and the amount of investments, also include criteria such as the type of investment, impact on the total foreign trade balance of the Republic of Serbia, long-term nature of investments etc. as well as the references and credibility of investors.<sup>1</sup> However, the Regulation on Terms and Conditions for Attracting Direct Investments is a good example of limitations imposed by the existing system on also logically focused efforts of the decision makers to not allow any randomness in decision making. As, according to the generally accepted interpretation of administrative law, decision making with respect to the Regulation in practice may not be oriented to a logical assessment of economically established principles, the Regulation considerably narrows down the choice of logic in decision making by unambiguous, directive provisions based on firm quantitative frameworks according to which the amounts of incentives are tied only to jobs, development of the region which is being invested in, as well as the amount of investment.

For instance, Article 13 prescribes that the incentive amounts to 20% of the value of reasonable costs of gross wages for investments in new jobs linked to the investment project in a local self-government unit which has been classified in the first development level group. The amount of subsidy is increased to 25%, 30% and 35% for local self-governments of the second, third and fourth level of development, and 40% for a devastated area. Article 14 subsequently increases that amount by e.g. up to 10% of reasonable costs of investment into fixed assets for the first level of development, etc. And finally, Article 15 prescribes that the beneficiary of funds which are realized through a labour-intensive investment project may be provided an increase of the amount of grant by further 10% of the amount of reasonable costs of employee gross wages for over 200 new jobs, etc.<sup>1</sup> Decision makers, recognizing that developmental effects desirable in accordance with the law are very limiting, are introducing the *discretionary valve*. It consists of the amount of incentive tied to the capital value of investments. It is formulated as the maximum - not outlined - percentage of reasonable costs of capital, which, depending on the amount of capital investments, allows a rather large space for discretionary decision making. An unwanted consequence of such limitation is that, if a decision maker does not want to place too much weight in discretionary decision making tied to the amount of capital investments, such a framework considerably favours labour-intensive projects, mostly those mobilizing less qualified labour force. In any case, due to the vague criteria of determination of “valve”, the amount of support is actually not sufficiently predictable.

If regulations and criteria are adopted which would really allow the possibility that the state transfers significant incentives only to some private individuals, as well as create conditions for such decisions to be adopted without too many discretionary valves, but with freedom for reasonable flexibility - there is still the remaining problem of public perception and trust in the reasonability and fairness of the decision making. The best way to build such a trust would be maximum transparency of decision making: public and detailed explanations of such decisions, as well as development of third parties - independent organizations (probably civil society organizations, but possibly also e.g. the Fiscal Council or business associations) - whose task would be to conduct supervision over such decisions.

If, say, the state decides to encourage the development of market mediation in the fractured food sector, or to encourage the creation of certain clusters on the basis of incentives for joint procurement; it would probably issue a public call to businessmen to propose projects, with clear tender criteria, and then the decision would have to be publically explained in detail.

This approach could contribute to reduction of administration tasks, as a series of formal criteria that enterprises nowadays must document in detail could be replaced by something more essential.

The state should also encourage the development of organizations which would supervise the quality of this type of decision making, so an expert circle would be created around them, as well as a circle of trust in proper establishment and enforcement of criteria. (Similar to the so-called *watchdog* organizations which conduct anti-corruption control nowadays, but with a different orientation.) But for a start, until practice and trust is established, it should be reconsidered if such decisions are made with the participation of representatives of the international community, or even if specific programmes discussed on the following pages are developed in partnership with international aid organizations and programmes.

## **2. Tailored knowledge resulting in a higher productive potential of the labour force**

The key challenge for the competitiveness of the growing part of the processing industry is to accelerate the concentration of people with the necessary skills, as well as to adjust the expert structure/profiles of educated personnel to the needs of the economy in a faster and wider manner. An analysis how to achieve that should take into account that some knowledge is learned in school, but the majority of skills may be acquired only through work and practice. Schools that we should create through an education system reform shall prepare students for quick adoption of practical skills and expose them to practice. The current education system is not succeeding in creating a sufficient number of expert personnel of all profiles that the economy needs, while the adjustment of others is made more difficult due to the lack of adjustability. On the other hand, in case of the lack of quality management, Serbia has a twofold problem, as a large number of them is getting education, but not a sufficient or good education, and neither do they get many opportunities to learn in practice how to organize production and other company processes on the global efficiency level.

Until the education system reform starts to yield results in terms of generation of appropriate profiles and applicable knowledge (both in terms of higher and secondary education), there are also other measures and programmes which could be very useful in this regard. A considerable number of all our recommendations address in some way the improvement of knowledge, but this section focuses on measures directly affecting labour force.

### **2.1. Urgent completion and adoption of the national qualifications framework**

An individual acquires a qualification, i.e. appropriate competences, through the formal or informal education system, as well as through the process of validation of knowledge previously acquired through work and life experience. The national qualifications framework (NQF) has been established in EU with a view to establishing the comparability / measurability of specific competences on the level of higher and secondary education, regardless of whether they have been acquired through various educational programmes, or through practical training, and thus ensuring the mobility of labour force among EU members.

In order to determine which qualifications and which levels of qualifications are needed in Serbia, establishment of a national qualifications framework is a necessary precondition. The National Qualifications Framework in Serbia (NQFS) regulates the types and levels of



qualifications that may be acquired in Serbia, the manner of their acquisition, as well as the quality assurance system applied in NQFS. Qualifications in NQFS are classified by levels and appropriate sectors. Thus it is possible to overcome the current situation in which personnel is educated in certain higher education institutions for specific jobs, but it is still not ensured that individuals will really acquire a certain level of competences through that education. The number of qualifications in the higher education system, without any specific ties with certain jobs, i.e. the fact that very similar programmes under different names are implemented in a number of higher education institutions, causes a problem for employers, who are unable to identify the competences that an individual applying for a certain job possesses. In addition, linking NQFS with the European Qualifications Framework ensures direct comparability of qualifications acquired in Serbia with the qualifications acquired in other European countries.

Although the law on NQFS is undergoing the public hearing procedure and its adoption is expected by the end of the year, it is still necessary to point out that the procedure of its adoption must not be prolonged.

## **2.2. Programmes of support for recruiting experienced professional personnel from the diaspora, particularly with process management skills**

Serbia has been suffering a large brain drain, often of people who have just completed their education. For the missing job profiles, most frequently management ones, larger foreign companies in the country often recruit Serbian citizens who have already gained experience abroad. They can also recruit them from the ranks of their own employees from anywhere in the world. Smaller foreign or Serbian companies do not have opportunities to easily find such personnel, nor to cover the costs of their return and adjustment to the life in the country and, as a rule, lower wages. Nevertheless, the country has a number of ways to assist in such a process of “brain circulation”, from creating reference contact lists, through special services of resolution of all possible administrative and logistic challenges relating to the return to the country, to subsidizing a portion of costs of the return<sup>66</sup>.

## **2.3. Incentives / subsidies for investment in development of knowledge and employee training**

The majority of successful investors and entrepreneurs we have interviewed, particularly in sectors relating to technological knowledge, have more or less clearly defined employee training programmes for explicitly defined skills - engineers, craftsmen, managers or marketing employees. Such investments and programmes are particularly intense during the expansion of capacities. If subsidies which are currently directed into new jobs were made proportional to the investments of the enterprise into building knowledge and skills of employees, rather than just the number of individuals employed, not only would employment be increased in general, but specifically employment with regard to desirable and sustainable jobs. Subsidies could also be provided in the form of tax exemptions for certain types of employee costs<sup>67</sup>.

Current efforts to build a dual education system constitute one such form of subsidy - the enterprise acquires a student who is simultaneously learning and working and who will not be receiving (full) salary that a new employee would be receiving. Incentives for training would

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<sup>66</sup>In this context, an especially useful example may be Ireland, which worked on encouraging its diaspora to return, as a part of stimulation of FDI (Dennis O’Hearn, *Inside the Celtic Tiger*, Pluto Press, 1998)

also encourage more self-initiated cooperation between businessmen and schools (examples of such cooperation already exist), but they could be further developed if followed by harmonisation of regulations in such a manner to allow development and recognition of programmes developed in such a manner (as public-private partnership). Also, it is possible to develop support programmes for cooperation of multiple economic subjects with regard to the development of trainings for which they have a common interest. It is also desirable to develop support programmes for cooperation of businessmen with educational centres, as well as their recruitment for the development of new educational centres as a public-private partnership.

#### **2.4. Training vouchers—test for collection of payment**

It would be difficult to support trainings of potential employees in small enterprises, as monitoring costs would be too high. However, a possibility to consider is that the voucher system should be adopted for practical skills which may be checked through examinations/tests. For instance, there is currently a lack of highly qualified welders in Serbia. Vouchers may be distributed to interested students or unemployed persons at the National Employment Service, which their employers, who are training them, could use to get cash after the trainee passes the welding test in a suitably qualified institution.

#### **2.5. Higher responsiveness of the Ministry of Education, as well as improvement of cooperation between the ministries of economy and education with regard to adjustment of the curriculum of secondary vocational schools to the needs of the local economy**

A considerable number of interviewees/businessmen showed an awareness of and interest for the educational method of the secondary school student personnel. While we have found examples of good cooperation with local schools, many of the interviewees believed that recommendations on how to adjust the curricula to their needs were not being applied in practice. Such a situation occurs when needs/recommendations of firms exceed the possibilities of adjustment through the operational curriculum, which is within the competence of local schools, and require modifications of the *general* curriculum. Whether the problem lies in the fact that schools sometimes do not deliver such requests to the central level, or that there is a lack of capacity or will to adjust the curriculum - in any case, our interviewees believe that requests often go unanswered.

One of the possibilities to certainly consider is establishment of the so-called *sector skill councils*, optimally on the level of districts, where representatives of the economy and the secondary schools would sit together and recommend adjustments of secondary school curricula to their needs.<sup>[2]</sup>

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<sup>[2]</sup>“Sector Skills Councils. What? Why? How? Contributing to Better Vet Relevance to the Labor Market Needs“ Petri Lempinen, Specialist in VET and Social Partnership, European Training Foundation, 2013 <https://www.etf.europa.eu/.../SSCs%20position%20paper.docx>

## **2.6. Programmes of strengthening and modernization of academic programmes of economic analysis of industrial sectors and organizations - as well as introduction of programmes of economic applicability in technical and engineering schools**

While political and economic oppositions to structural or programming modifications in higher education institutions are very strong, it is possible to increase the practicality of higher education through targeted introduction of new curricula which would complement the existing curricula with some of the missing knowledge. In case of faculties of economy, a considerable updating of sectoral analyses is needed, as well as support for their linking to practice. In case of faculties of engineering/design and similar sciences for professions in production, it is necessary to introduce subjects relating to economic and cost analysis. In both cases, such studies are worth introducing only if curricula and classes are initially developed together with international experts, as such knowledge simply is missing in Serbia.

## **2.7. Research reasons for unavailability of certain secondary school profiles on the sub-national level**

Interviewees in most regions state that it is difficult to find even the beginner level secondary school personnel. In this regard, we have noticed regional differences - interviewees from less developed regions complained more, while we found examples of good cooperation between enterprises and secondary schools in more developed regions. Having in mind that Serbia educates a number of the secondary school personnel from other countries, this problem is difficult to explain. It is necessary to research if the problem lies in the inappropriate macrostructure of educational profiles, or in their regional distribution, or in the fact that students, after completing certain trainings, do not want to look for jobs in that specific profession. On the other hand, there are also challenges in terms of searching for labour force, where differences are particularly noticeable between more and less developed regions. Namely, employers in more developed regions are ready and capable to offer higher wages for the same job, and are also investing more efforts in cooperation with local schools with a view to improving the quality and promotion of expert educational profiles - which has resulted in a higher interest of young people in these regions. An example of this is a Polytechnic School in Kragujevac, where there is a lot of interest in the professional profile of locksmith/welder, and the school principal points out that there are 2-4 persons waiting for every job vacancy.

## **2.8. Support the mobility of students and labour force—legalize payment for transport of secondary school students**

Having in mind the exceptionally low mobility of labour force in Serbia, it is necessary to encourage linking of supply and demand for certain profiles in such a manner as to expand the scope of each citizen and enterprise through a **better and more available intercity transport**. Also, it is outrageous that regulations in Serbia are currently preventing local self-government units from financing bus transport of secondary school students.

In locations with a higher density of enterprises which may have difficulties in finding young personnel in vocations with good perspective of wage growth - such as engineers and craftsmen - the possibility of supporting housing costs during the initial employment years should be considered.

### **3. Complex policy of attracting FDI, directed to developmental effects**

At the moment, Serbia is attracting FDI almost exclusively through financial methods, primarily the incentive programme with respect to the amount of investment and number of jobs described in the Framework A1 (and other monetary incentives such as taxation policy). As we can see from the Framework, incentives favour attracting investors whose products/technology require a larger mobilization of low qualified labour force, and smaller investments into the physical or human capital. Same incentives are simply more important with such investments. Also, incentives are higher if the investment is in a less developed region, which is more likely to attract investors who find the quality of knowledge, infrastructure and business environment to be of lesser significance. Such incentives may be an acceptable way to achieve social effects in places where employment is exceptionally high, if they are not too high. However, their developmental effects are limited.

Developmental effects of incentives (execution of a programme for attracting investments in 2016 was around 80 million EUR) would undoubtedly increase through a wider understanding and a more complex approach to attracting FDI. A portion of the funds should be turned into more complex types of direct incentives, and another portion on strengthening the programmes of development of national economy, which are listed below. These programmes directed at SME also attract FDI by improving the quality of immediate sectoral environment to which they are invited. Investors interested in the business environment are those with a need for a more direct cooperation with SME and an interest in a greater availability of labour force with specific and better knowledge. At the same time, those are, as a rule, investors with more interest in engaging and having a reciprocal developmental effect on the environment.<sup>68</sup>

Such a complex approach may initially reduce the number of investors encouraged by incentives to intervene, but developmental effects would increase. At first, it would affect the type of investors attracted and their comprehensive effects. It should also be considered that reduction of the subsidy and the number of jobs created in such a manner may be profitable in cases of FDI which are dead ends, whose production may not be enlarged, value chain may not be expanded, and there is no overflowing knowledge. In that case, subsidies are actually subsidies to employees which do not ensure their future. It would be more profitable to invest in any kind of regional development programmes, as long as they train the population in terms of entrepreneurship, and little by little generate sustainable business ideas.

### **4. Intensify and defragment measures for supporting SMEs and export**

The Ministry of Economy supports the “small business” through the Development Agency of Serbia (RAS). Through the Program for Support to Micro, Small, Medium Enterprises and Entrepreneurs (MSME) the Agency provides grants to companies in the amount from 50% (for existing companies) to 70% for new companies) of total investment, or project costs. Effective support is somewhat lower, because it refers to the value of the investment without VAT, and therefore in real terms ranges from 40% to 60%. The program covers support to beginners for starting a business, support for competitiveness development (capacity building of MSME

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<sup>68</sup>Payments for jobs are worth only and to the extent that they create external effects— i.e. benefits for other market participants, by developing the national chain or investing into building a labour force with certain skills etc. Otherwise it is better to give those funds directly, through any kind of public competition and training for entrepreneurship for the population seeking employment.

management, networking, and development of supplier network), support for projects to improve economic development, support for innovative MSMEs, support for exporters and export promotion (visits and fairs), and support through mentoring.

Although at first glance the support programs cover the largest number of activities necessary for improving competitiveness, a deeper review of the amount and allocation of funds indicates that RAS support is largely fragmented and split, therefore unable to produce tangible effects. If support for individual companies is increased, then it must also be prioritized; otherwise, it would become too costly.

- Total funds provided by RAS for supporting MSMEs in 2016 amounted to around EUR 7.5 million. This is several times lower than the amounts provided in support of investment in job creation, which is mostly beneficial to foreign direct investment. Total support directed to the MSME sector is often less than the support provided to a single FDI, which plans to employ up to a few hundred workers. Bearing in mind the needs of the MSME sector for the improvement of production technology and standards, and that quality knowledge and training in specific skills, such as management skills, are expensive, it is clear that the total value of this support is low. For example, these funds can be used for 5 three-year international PR campaigns, or for the purchase of 50-100 CNC machines (latest technology and medium capacity).
- Even such small support is fragmented – in 2016 the support was directed at 1,100 companies, which means that average support provided to a single company was EUR 7,000. Support is also fragmented into a relatively large number of programs - support program for supplier development in 2017 amounted to EUR 170,000 (with a room for increase to EUR 250,000 by the end of the year), or about EUR 11,000 per company, which is far below companies' needs in terms of advancement needed to achieve long-term cooperation with larger foreign companies.
- One of the reasons why support is fragmented (many programs and users) is the lack of clear priorities. Prioritization requires a deep knowledge of sector performance and potentials, as well as a more systematic knowledge of specific critical success factors and needs at the company level. The support program equally treats all activities and all companies, under conditions / criteria that are broadly defined (the company has been operating for a specific period of time, that it has a business plan, etc.).
- Prioritization requires a clear evaluation, i.e. a cost-benefit analysis, and analysis of implemented programs and projects. It is unclear how many of the supported companies managed to get involved in the value chains of large companies, how many companies have managed to conclude a contract with a foreign buyer after visiting fairs, or how many companies raised their management to a higher level after undergoing mentoring by consultants and, most importantly, what are the conditions that ensure success. A quality evaluation is not only relevant for assessing the purpose of spending, but for future prioritization and definition of support programs.
- Instead of the prioritization criteria, the focus of the program on a smaller number of companies is achieved by the administrative burden of those who compete. This can contribute to a higher number of applications of companies that really need help, but it creates a risk of dividing companies into those that are investing in their own training,

and those who improve the methods for obtaining assistance. In that case, those most desirable companies will not participate in the competition.

In the following period, it would be desirable to intensify the support to MSME sector, that is, to increase the overall support value, and to develop programs as integrated entities in two ways. First, to provide multidimensional support to companies that are on the verge of serious performance improvement. Second, it is necessary that RAS “monitors” each of its support programs from concept to realization and evaluation with each company, so as to improve them over time and “learn” from it. In any case, to produce real effects from the increase in funds, it would also be necessary to defragment and “verticalize” support, as well as to reduce the level of administrative burden.

- Defragmentation - it is preferable that a smaller number of companies receive a higher average amount of support, which can significantly help in rising competitiveness.
- Verticalization - it is also desirable to direct support to those sectors that have the greatest potential to advance and benefit from such targeted support.

However, if support is limited to fewer companies and certain sectors, more clear criteria and deep knowledge of the needs and potentials of companies and sectors are necessary.

- In the process of building specific knowledge about sector needs and performance, it is necessary to use the capacities of regional development agencies and regional chambers of commerce, and systematize the existing knowledge/information on companies and sectors, but also help them to define and systematically collect all the missing information which are important for the support focus (information on capacities, quality standards, missing staff, communication with customers, etc.).
- A tool such as the Purchasing Managers' Index (PMI) would enable regular systematic testing of needs and performance measurement of the sector and help to establish and target the support measures portfolio.
- Achieving global standards in the field of sector analysis and the evaluation of support measures is also necessary in order to select beneficiaries more effectively, to define programs, and to evaluate support measures.

## **5. Overcoming fragmentation by SMEs association and strengthening market mediation**

Pronounced fragmentation and the prevailing nature of the Serbian economy, characterized by SMEs, pose a particular problem when it comes to the global market, whether in terms of procurement of intermediate goods or in terms of placement of Serbian goods. Furniture manufacturers can hardly compete with foreign customers in the procurement of lumber on domestic and especially foreign markets. Serbian producers of raspberries and other fruits, who are one of the major global producers, are placing their products to global distributors reactively, without any specific identification of the origin and advantages that are or can be common and the basis for the Serbian brand.

Although many attempts to overcome this problem, through the establishment of a cluster or “Serbian brand”, have so far largely failed to yield results, these efforts should not be dropped. We believe that some of these attempts simply came to the scene too soon. If business actors

are busy and are earning enough money on the domestic market, it is difficult to motivate them to become engaged in something for which they do not have time. On the other hand, we need to carefully examine what kind of incentives those efforts have been based on. The motive for organizing and joint appearance must be stronger than a simple support for joining efforts. In sectoral chapters we refer to the possibility of association towards specific goals and incentives related to the problems and competitiveness of specific sectors. For example, we believe that the transparent sale of wood raw materials at more favorable terms for larger and long-term contracts, with the incentive of SMEs association, could produce significant and productive cooperation with furniture manufacturers, sawmills, or both. A more risky measure, which Serbian institutions should not attempt before becoming proficient in methods described in Section 2.2, is given in the section on the food sector: encouraging the development of domestic or bringing foreign trade intermediaries for a proactive placement of fruits and vegetables in international markets.

Apart from simple association, the focus and interest should be directed at cooperation at all levels. Benefits of a collaborative process at different levels create the greatest benefits on the micro and macroeconomic plan. This primarily refers to the involvement in the process of cooperation, both by the companies and by the state, the education sector, non-governmental organizations and other stakeholders.

We have repeatedly emphasized the possibility of incorporating the association incentives into other incentive measures (for example, development of training programs for deficient secondary vocational profiles). However, we especially want to emphasize the role that knowledge transfer centers and business / market information transfer centers can play in fostering community cooperation and cooperation with SMEs. Namely, community cooperation is the sharing of the same information / conceptual space. Joint action may come only after reaching a common view on certain issues. Each of these centers should start from gathering and sharing information that is useful and interesting for the sectoral community concerned. This information should describe both the reality in the global market as well as the one at home, by describing entrepreneurship trends and flows in the sector, or creating awareness of the common and special aspects of the “fate” of each one of them. At the same time, such sharing of information will save significant resources that each entrepreneur would have to spend to get the same information by himself.

The key word in this regard is “quality information”. Quality information costs, and knowledge transfer business / market analytics centers should not be established if they are not sufficiently equipped per unit of information or interventions assigned to them. It is better to focus their programs on a very narrow set of knowledge, rather than recycling obsolete broad-scale information on a broader scale.

After they begin operations and gather business people around the issues that are really useful to them, these centers can and should serve to further expand the engagements and programs of state institutions and entrepreneurs.

## **6. Other measures directly under the competence of the state**

### **6.1. Further development of the quality infrastructure and its accessibility to SMEs**

Harmonization of regulations, standards, and procedures for assessing the conformity of products, as well as market surveillance, in other words - the functioning of quality infrastructures (QI) - is one of the key preconditions for truly free flow of goods in international exchange<sup>69</sup>. This harmonization, or mutual recognition of the equivalence of the accreditation system between Serbia and the EU, was fully achieved in the period 2012-2014. Today, all EU certificates are issued by accredited institutions in Serbia. However, there is still a lot of room to advance the functioning of QI in practice, and to facilitate the improvement of competitiveness by increasing reliability and quality of products and reducing the costs of certification for Serbian producers.

First, although European standards have been adopted, they are not fully implemented. They have only been partially transposed (slightly above 10%) and therefore are not fully available to our businessmen. In parallel with the adopted European standard, the original Serbian standard is still in force, from which very few elements have been deleted to this day. Since this regulation is contrary to international regulation, this sometimes leads to dual certification. Also, the practice to automatically use and recognize European legislation when no domestic regulation exists for a product has not been fully adopted. Finally, although the recognition of foreign certificates for already certified imported products should be automatic, this is not the case in practice, hence double certification.

When it comes to conformity assessment, we must note that it cannot be expected that all bodies necessary for the assessment of conformity (laboratories, control bodies, certification bodies, etc.) exist for all the products produced in Serbia. Nevertheless, it is necessary to keep an ongoing process of continuous identification of bodies and tests for which there is a sufficient interest to make it worthwhile to establish them in the country. Also, when there is no body in place in the country, it is advisable to enable domestic producers to obtain necessary conformity assessments abroad. Finally, **it is necessary to prescribe the obligation to disclose whether a product meets EU standards or not, which would facilitate compliance with EU standards throughout the entire value chain of domestic products.**

In order to eliminate the aforementioned problems and create a lasting process of improvement of the QI, it is first necessary to **significantly intensify and persevere in efforts to improve communication and cooperation between the economy and the institutions responsible for the development of QI, or which are part of it.** The initiative must come from institutions, regardless of the fact that at the moment they are met with a lack of response from the economy. In this study, we encountered equally convincing arguments about insufficient communication from both sides. Business actors often do not know which options are available to them, but there are also numerous examples of uninformed officials misinterpreting regulations. One option to be considered is to **establish a permanent coordinating body for the improvement of quality infrastructure** within the Ministry of Economy, but this body can only be operational if at least some of the institutions for knowledge transfer and business analytics are operational. Only such institutions, which are in constant communication with a number of stakeholders in the sector, can come up with information that is sufficiently specific and sufficiently representative for a given sector, and beneficial for further system improvement. **Accelerating the transposition of EU standards would also improve QI in practice.**

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<sup>69</sup>Quality infrastructure consists of methodology, adopted (regulations) for standards, certification (that a certain product or process meets a given standard or has specific characteristics), and accreditation (of persons' or institutions' ability to perform specific functions).



Finally, RAS now provides facilities for achieving certain standards and improving production quality, but these **programs need to be expanded and intensified, since facilitating the availability of QI of SMEs can be a very important factor in their development and competitiveness.** They certainly need help in accessing / financing the use of foreign laboratories when none are available at home. It is also necessary to develop education and counseling programs in this area that would be partially subsidized - most likely in knowledge transfer centers.

## **6.2. Available and stable supply of electric power.**

Although the issue of reform of public enterprises is beyond the scope of this study, we must emphasize that we often hear that the inability to expand electric power infrastructure, as well as the unreliability of the transfer of electricity within the provided infrastructure is a serious obstacle to the development and expansion of industrial plants. It is clear that there is a problem with wrong incentives on which the business of EPS is based.

## **6.3. Detailed reserach and solution proposal for „inactive“ public property and property trapped in industrial locations under unresolved ownership relations**

These two problems represent a very serious development limitation for Serbia, and a burden for competitiveness, especially for smaller investors. The problem of unavailability of industrial sites in bankruptcy or with unresolved property relations was mentioned several times in our conversations with businessmen. They have described how difficult it is to expand business on one of these locations, which only produces the necessity of a far more costly development of new locations. We need to investigate how much of the property is “trapped” in this way, and if it is still as important as it seems to us, we feel it would be worth to find special legal solutions, beyond the usual treatment of property rights in bankruptcy, and put this property in use as soon as possible.

Also, the issue of regulating public property is not receiving the deserved attention in the economy or in literature - because it is understood as a part of general “administration”. However, this issue runs deeper, and targeted solutions could be provided. Today, public property, primarily land and immovable property, is fragmented and paralyzed in the hands of public companies (primarily Srbijavode and Srbijasume) who manage this property inefficiently, under unresolved ownership relations between republican and local authorities.

The process of registering the property of local self-government units, which according to the Law on Public Property of 2011<sup>70</sup> they must prove is going very slowly. One of the main obstacles is a completely unnecessary and bureaucratic request to register it in the Republic Directorate for Property, in two steps. The Directorate is unable to perform its part in time. We do not see what benefit is gained from this behavior, which seriously limits the likelihood of activating the country's limited resources.

## **6.4. Evaluation and promotion of quality**

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<sup>70</sup>This law aims to „correct“ the „nationalization“ of property of local self-government and public enterprise implemented by the Law on Assets in the Ownership of the Republic of Serbia (Official Gazette 53/95 to Official Gazette 32/97).

- Evaluation of quality of public procurement - The Law on Public Procurement provides for this, but in practice, public calls are almost exclusively focused on the principle of the lowest price. This deprives and punishes the development efforts of companies with strategic commitment to high quality products.
- Systematic and consistent implementation of inspection controls, which ensure that the declared and adopted quality standards are really respected, which is especially important for consumer products such as plastic products, is an important condition for the success of those enterprises whose methods and commitment can bring them international competitiveness.