IMPACT OF INNOVATION ON EMPLOYMENT AND INCOME OF SMALL AND MEDIUM-SIZED ENTERPRISES IN THE REPUBLIC OF SERBIA

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Abstract. *Small and medium-sized enterprises are the "driving force" of modern economies because of the contribution which is reflected in employment, increased exports, dynamics of competition, etc. New and existing innovative SMEs increase overall productivity and competitiveness of the economy, squeezing out less efficient enterprises with lower productivity. By constructing an appropriate econometric model, this paper shows that the income of SMEs significantly depends only on the number of employees in a particular enterprise, not on innovation and the number of employees in research and development areas. The results obtained prove that innovative SMEs do not create more jobs and do not generate higher income compared to non-innovative SMEs in the Republic of Serbia.*

Key words: *innovation, small and medium-sized enterprises, innovative small and medium-sized enterprises*

INTRODUCTORY REMARKS

In most countries, small and medium-sized sector means small and medium-sized enterprises (SME) of up to 250 or 500 employees, depending on the country and upper limit for individual economic activities. According to the legal status, the SME sector consists of individually-owned enterprises, partner enterprises, as well as small family businesses. These enterprises include owners and workers employed, as well as people engaged in handicraft business or other small business activities.

Small and medium-sized enterprises are, according to the new definition of the European Commission, enterprises with less than 250 employees, an annual turnover of up to 50 million euros, or a balance sheet total of no more than 43 million euros, where the ownership, i.e. control share by other enterprises or multiple enterprises does not exceed 25% (European Commission, 2005, 14).

In the Republic of Serbia, enterprises are, based on size, classified pursuant to the Law on Accounting, which was adopted in 2013 (Official Gazette of RS, No. 062/2013). Under this law, enterprises (legal entities) are classified into micro, small, medium-sized, and large, depending on the average number of employees, operating income, and average value of business assets determined as of the regular annual financial report for the business year. Newly established legal entities are classified on the basis of data in financial statements for the business year in which they are established and the number of months in business, and this data is used for the current and the next financial year.

Even before the adoption of the Law on Accounting, statistical monitoring of SMEs was adapted to the European Commission's recommendations in terms of definition and statistical monitoring of small and medium-sized enterprises. In an effort to harmonize its work with international recommendations and standards, Statistical Office of the Republic of Serbia in 2005 started monitoring and publishing basic macroeconomic indicators of enterprises (number of enterprises, number of employees, turnover and gross value added, number of enterprises engaged in export and export value, number of enterprises engaged in import and import value, etc.) according to their size. Statistical monitoring of enterprises is adjusted to the methodology of the System of National Accounts (SNA). The monitoring encompasses non-financial sector of the economy, with the data obtained from administrative data sources – annual statements of enterprises (processed by the BRA) and customs records. The results of the processing of individual annual financial statements (account settlement) for enterprises on the territory of the Republic of Serbia (without Kosovo and Metohija) are given from the point of division into micro, small, medium-sized, and large enterprises. The division of enterprises according to the size is done in accordance with international recommendations, based only on the number of employees, in the following way: 0 to 9 employees characterize micro enterprises, 10 to 49 employees characterize small enterprises, 50 to 249 employees characterize medium-sized enterprises, while enterprises with more than 250 employees are large enterprises.

Innovative enterprise can be defined in several ways. According to the basic definition, innovative enterprise is the one that implements at least one innovative activity, whereas the product or process innovator is an enterprise that implements either product innovation or process innovation (http://epp.eurostat. 15 June 2013). Innovative enterprises are those that have introduced innovation during the observed period, where innovation does not have to achieve commercial success. Innovative enterprises can be divided into those that develop innovation mainly independently or in collaboration with other enterprises or public research organizations, as well as enterprises that innovate mainly by taking innovation (for example, new equipment) developed by other enterprises. Innovative enterprises may also vary according to the types of innovation implemented. Accordingly, there are innovative SMEs that implement new products or processes, new marketing methods, or organizational changes (UNESCO, 2009, 28).

Innovation-active enterprises are characterized by taking innovative activities in the reporting period, including current and abandoned innovation activities. In other words,

enterprises taking innovative activities in the reporting period, regardless of whether the activity resulted in the implementation of innovation, are considered innovation-active enterprises. Potentially innovative enterprises are innovation-active enterprises, which made innovation efforts, but did not achieve innovation results (Vanhaverbeke, West, 2006, 47). This is a key element in innovation policies whose aim is to encourage, facilitate, and assist businesses to be innovative.

There are also other ways of defining and classifying innovative enterprises depending on research needs. Differentiating enterprises based on innovation could be used to determine the percentage of enterprises (by size, sector, country, or otherwise) representing each of the four types of innovation, or the percentage of enterprises that have implemented combined innovation, such as product innovation and marketing innovation or process innovation and organizational innovation. Classification by innovative status can also include other information, such as information about the creators of innovation. This can help in determining which enterprises independently develop innovation, which in cooperation with other enterprises and/or research organizations, and which assume almost an innovative solution.

The development of knowledge-based economy, changes in business environment, acceleration of the globalization process, creation of a single world market, and global competition are phenomena that enhance the role and importance of SMEs in the innovation process and the development of modern economy. Small and medium-sized enterprises are the driving force of the knowledge economy given their multiple contribution to growth, technological development, rising employment, competitiveness, and export. Through successful innovation activities, SMEs increase income, create new customer needs (new market niches) and better meet the existing ones, develop new technological and non-technological innovation, connect with each other and work together, thereby reducing the advantage of large enterprises that results from the quantity of available resources and opportunities to achieve economies of scale. The ability of SMEs to innovate is of great importance because innovation provides sustainable competitive advantage. Innovativeness of SMEs enables and encourages growth of both enterprises at the micro level and the industry in which economies at the macro level operate.

A large number of studies show that the size of an enterprise contributes little to the research intensity and innovation effort and that, in certain industries, small and medium-sized enterprises have an advantage in innovative development. This is confirmed by the fact that of the 70 most important inventions in the twentieth century, more than half comes from individual inventors, whose innovative entrepreneurial spirit has created products such as personal computers, jet engine, helicopter, color photography, pen, radar, missiles, cellophane, DDT, streptomycin, biosynthetic insulin, etc. (Group of authors, 2002, 31). Furthermore, 46 of 58 major inventions in America and Western Europe in the twentieth century belong to individuals and small businesses. In the United States, according to the National Science Foundation of the United States, small enterprises are 2.5 times more innovative and 24 times more efficient in their innovation activities than large enterprises (in enterprises with up to 500 employees, each dollar invested in scientific research activities gives 24 times more new inventions than in large enterprises with more than 10,000 employees), while innovation is commercialized one year faster, with 25% lower costs (WIPO, 2008, 7).

A large number of small and medium-sized enterprises are characterized by efficient innovation abilities, which allow them to improve business and acquire better position on

the market. In order to survive and develop, small and medium-sized enterprises need to implement and improve their innovation activities, so that they could be successful in the creation and application of new knowledge and innovation. The capacity of enterprises to successfully innovate determines the scope and type of their competitive advantage. Innovation capacity of enterprises is not the same for all SMEs, as it depends on numerous factors (Nikolic, Despotovic & Cvetanovic, 2015). Capacity of SMEs to innovate largely depends on the area in which they operate, business environment, opportunities for sharing knowledge and information, innovative cooperation, orientation of owners (managers), availability of professional, skilled, and innovation-oriented staff, capacity to manage innovation processes, access to existing technology, availability of financial resources, availability and development of infrastructure (technical facilities, training centers, etc.), regulatory framework for innovation (subsidies, tax system and tax relief, protection of intellectual property rights, standards, etc.), existence of networks, alliances, clusters, and other supporting infrastructure.

In order to monitor the level of innovation in the EU, Eurostat, in cooperation with relevant statistical organizations of the member countries, collects information on innovation in the EU, in order to meet the needs of development policy makers and the scientific community. The obtained data allows decision-making on the need and ways to help and encourage innovation, and helps in taking a variety of initiatives and programs, such as Innovation Union or the European Research Area, in the context of the European development strategy, Europe 2020.

Statistical monitoring of innovation for the needs of Eurostat, i.e. European Commission, is based on Community Innovation Survey (CIS)[2], which is implemented in all EU member states, candidate countries for accession to the EU (Iceland, Serbia, and Turkey), and Norway. This survey statistically monitors activities of enterprises in the field of product/service innovation, process innovation, organizational innovation, and marketing innovation. Legal basis for conducting surveys and collecting data on innovation activities of enterprises is the Directive 1450/2004, issued on August 13th 2004 (1608/2003/EC), which elaborates decisions relating to the implementation and development of statistics to monitor innovation.

Study of innovation activities of enterprises also relies on ad hoc modules, which focus on internal and external skills and methods to stimulate new ideas and creativity. The results highlight the differences between innovative and non-innovative enterprises. In addition, these studies provide information on enterprises that acquire specific knowledge from the environment, as well as information on enterprises that mainly rely on internal capacities (for example, in the fields such as multimedia, web design, market research, mathematics, etc.). The obtained data also shows methods that have proven to be successful for stimulating creativity: brainstorming sessions, multi-disciplinary and/or inter-functional work teams, courses and trainings, job rotation or financial and non-financial incentives for employees, and others.

Since the survey of innovation activities of enterprises, conducted for Eurostat, also contains data related to innovative enterprises in Serbia, the following part will provide a comparative overview of the results of innovation activities of enterprises from EU member states and candidate countries (including Serbia), judged by several innovation aspects, using the latest available data related to the reporting period from 2008 to 2010

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[2] Community Innovation Survey

(Nikolic, Cvetanovic & Despotovic, 2015). The greatest attention is paid to the position of Serbia in relation to the average of the EU and neighboring countries (Hungary, Slovenia, Croatia, Romania, and Bulgaria).

The subject of research presented in this paper is the relationship between innovative small and medium-sized enterprises in the Republic of Serbia and their employment and the generated income. The research covers the period from 2004 to 2014. The goal of the research is to gain the answers to the following questions: a) Do innovative SMEs in Serbia create more jobs in comparison to non-innovative enterprises, and b) Do they generate higher income compared to non-innovative SMEs. Answers are obtained through the appropriate econometric model, using specific statistical data on innovation activities of SMEs in Serbia, obtained from the Community Innovation Survey.

The subject and goal of the research determine the paper structure. The first part deals with the development of the SME sector in the Republic of Serbia, with emphasis on technological intensity of the sector. The second part looks at the sources of the data used in the study. The third section presents the research results.

1. THE DEVELOPMENT AND TECHNOLOGICAL INTENSITY OF SMALL AND MEDIUM-SIZED ENTERPRISES IN SERBIA

In the modern economy, SMEs are considered the drivers of economic growth and employment growth. The achieved level of development and the importance of small and medium-sized enterprises are usually measured by three main indicators: number of enterprises, number of employees, and GVA.

A typical enterprise in Serbia employs on average 3.6 workers, which shows that Serbian economy is dominated by small business entities (entrepreneurs and micro enterprises). In terms of employment, as in previous years, SMEs employ over two thirds of workers in the economy.

Due to higher capital intensity, growth of enterprise size increases its share in the creation of added value. Although small and medium-sized enterprises in 2014 accounted for 56% in the creation of total value added, their importance in terms of employment was lower.

The three basic indicators of SME business have different trends, especially during the economic crisis (after 2008). Trend in the number of SMEs in the observed ten-year period (from 2004 to 2014) differs from the trend in employment and gross value added. In times of crisis, out of the three observed indicators, only the number of SMEs had a positive growth trend (though at a significantly slower pace), while the other two indicators (employment and GVA) recorded stagnant or declining trends (Fig. 1).

After three years of constant decline (2004 to 2006), the number of SMEs recorded constant growth (2007 to 2011), with the largest growth achieved in 2007. The next three years recorded a cyclical trend in the number of SMEs. First, 2012 and 2013 recorded a slight fall in the number of SMEs, followed by slightly higher growth in 2014. In 2014, as compared to 2004, the number of SMEs increased by 39,134 enterprises, i.e. by 13.7%. Such trend in the number of SMEs was primarily affected by the number of entrepreneurs, micro, and small enterprises, while the number of medium-sized enterprises after 2008 constantly decreased. The number of small businesses constantly increased in the period

from 2004 to 2008, then, in the next three years, their number decreased, and again recorded an upward trend. A similar trend was also observed in respect of micro enterprises, which, from 2006, recorded constant growth, which slowed down in 2014.
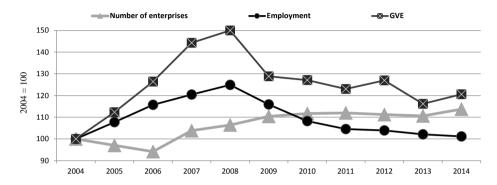

Fig. 1 Trend in the number of enterprises, employment, and gross value added of SMEs
in Serbia in the period from 2004 to 2014 (2004 = 100)
Source: Authors, based on the data of the Statistical Office of the Republic of Serbia

In times of crisis, the number of entrepreneurs and micro enterprises constantly increased, contrary to the changes in the number of other enterprises, judging by size. The constant increase in the number of entrepreneurs and micro enterprises was the result of several factors. Specifically, most of these enterprises came from the service sector, where crisis had a lower impact. However, it hit production activities stronger, particularly those fields, i.e. export-oriented production enterprises that export a large part of its products to foreign markets. Due to reduced foreign demand, export-oriented enterprises had to reduce both the volume and value of exports, which had a direct impact on their number and performance. Furthermore, lower dependency of these enterprises on financial market conditions (financing, loans, obtaining guarantees, and the like) affecting mainly larger enterprises proved to be good, because the financial market crisis had a much lower spillover effect on their operations. In addition, closing, i.e. extinguishing of a large number of micro enterprises and entrepreneurial businesses was offset by the opening of new (the so-called start-up) businesses.

The number of newly established enterprises in times of crisis was largely influenced by various government (primarily financial) incentives, through which the state sought to increase the establishment of new enterprises, and thus mitigate the negative effects of the crisis (primarily unemployment growth). Furthermore, it is a well-known fact that economic crisis, i.e. economic downturn, leads to faster growth of newly established enterprises, because economic depression improves conditions for the launch of new, primarily micro enterprises (due to depreciated input prices, lower real estate prices, cheaper labour, etc.), and the growth in the number of potential entrepreneurs, who mostly come from the group of redundant (dismissed) workers in large enterprises or other enterprises closed due to the crisis (the so-called necessity entrepreneurs), or those who are dissatisfied with current conditions in large enterprises and decide to start their own business (the so-called opportunity entrepreneurs).

In the reporting period, the number of large enterprises had a constant declining trend (opposite to SMEs), so that the number of large enterprises in 2014, compared to 2004, decreased by 275 enterprises, i.e. 35.8%. The opposite trend in the number of SMEs and large enterprises resulted in a decrease in the average enterprise size in the economy (in 2004, the average enterprise in Serbia had 4.8 workers, while in 2011, that number decreased to 3.6 workers).

The share of SME employees in total employment in the period from 2004 to 2008 had an increasing trend (from 54.7% in 2004 to 67.2% in 2008), while the period of crisis recorded the opposite trend. In the period from 2008 to 2014, the share of SMEs in total employment gradually decreased, so that, in 2014, it amounted to 64.8%. However, despite the reduction in the time of crisis, the share of SME employees in 2014 was by 10 percentage points higher, compared to 2004.

The largest increase in employment in entrepreneurial businesses was recorded in 2005 and 2006, while in the next two years the number of employees in these businesses stagnated. The onset of crisis in 2008 strongly hit these businesses, so that employment in the next three years recorded a significant decline, while in the period from 2011 to 2014 employment in entrepreneurial businesses stagnated. Despite the fall in the period of crisis and stagnation thereafter, employment in entrepreneurial businesses in 2014 was still higher compared to 2004. Similar trends were recorded in other enterprises (growth of employment in the years before the crisis, decline in conditions of crisis, and stagnation after the crisis). In 2014, as compared to 2013, only entrepreneurial businesses increased employment, while micro, small, medium-sized, and large enterprises decreased employment (Fig. 2).
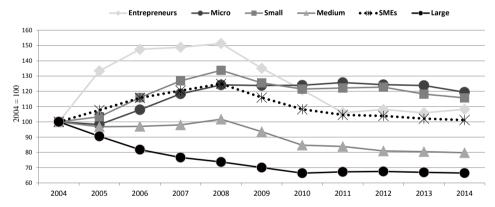

Fig. 2 Change in employment by enterprise size in Serbia in the period from 2004 to 2014 (2004 = 100)

Source: Authors, based on the data of the Statistical Office of the Republic of Serbia

Less pronounced employment trend in relation to other indicators, especially GVA, can be explained by various factors. First, changes in employment are generally less pronounced, compared to other indicators which measure business activity of the company, because due to the existence of collective agreements, high cost of training of new workers, and the like, employment does not completely go in line with economic conditions. At the same time, in the years of crisis, especially in 2010 and 2011, various measures to support the operations of enterprises played an important role in mitigating

the crisis. The key element in the anti-crisis support programs was the maintenance of employment, i.e. keeping of employment at the highest possible level, so that the state approved a variety of subsidies in order for enterprises to maintain the same level of employment, thereby reducing the pressure that enterprises had related to the dismissal of workers because of the sharp drop in demand. Effects of state aid were significantly more pronounced in large enterprises than in SMEs, but were completely absent in entrepreneurial businesses. However, despite state aid, unemployment in Serbia is extremely high and represents a major development, social, and community problem. The current policy of encouraging new employment (for example, by financial incentives to large enterprises to hire new workers – up to 10 thousand euros per employee) has proved to be expensive and insufficiently effective mechanism. Therefore, the solution to high unemployment should be sought in encouraging SMEs, because only they have the capacity to significantly hire new workers and thus mitigate or completely solve the long-term problem of unemployment in the economy.

The research of employment in small and medium-sized enterprises may be supplemented by an analysis of the volume and trends of the gross wages paid to employees by enterprises for the work performed. In most economies, wages of workers in SMEs are on average lower than wages in large enterprises. This rule also applies to Serbia. This can best be seen when comparing the average gross wage per employee in enterprises of various sizes. In 2014, the average wage in SME was 23.2% lower than the average wage in large enterprises, and, within SMEs, the highest average was achieved by those employed in medium-sized enterprises. Observed by sectors, the highest average wages were in the sectors of Information and communication, Professional, scientific, and technical activities, and State administration and compulsory social insurance, which employed only 10% of all employees in SMEs. The lowest average wages were in sectors: Accommodation and food services, Education, Manufacturing industry, and Construction. The difference in wages in SMEs and large enterprises is the result of a greater presence of large enterprises in capital-intensive sectors. It is known that employees in sectors with relatively large capital and more complex manufacturing processes have higher wages. Another reason which, in the present conditions, leads to a nominal difference in the average wages between SMEs and large enterprises is the phenomenon of underreporting of total wages (most often in entrepreneurial businesses and small enterprises), in order to reduce the tax base. In practice, this means that employers pay wages to employees in two ways. The first is the legal way, which involves the payment of the minimum prescribed wage or slightly above it (this portion of the wage is taxed and statistically recorded), and the second portion of the wage is paid outside of legal flows (in cash), which is not subject to taxation and statistical recording. The difference in wages between large enterprises and SMEs also occurs due to uneven protection of employees, i.e. weak unionisation of workers in SMEs and better trade union protection of workers in large enterprises, especially in large state-owned or privatized socially owned enterprises.

Gross value added is a good indicator of business efficiency of enterprises. In the period from 2004 to 2009, real GVA of enterprises in Serbia was constantly growing. As GVA grew faster in SMEs in relation to large enterprises during this period, the share of SMEs in creating GVA of the economy constantly increased. After 2009, the trend was completely opposite, since there was a constant decline in the total GVA, and the decline in the share of SMEs in creating GVA of the non-financial sector of the economy (Fig. 3).
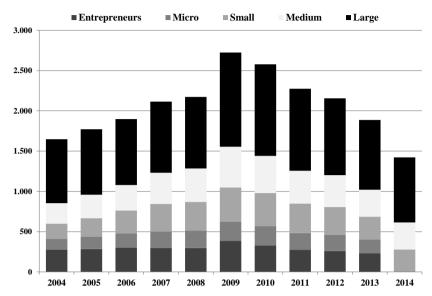
Fig. 3 The value of GVA according to the size of enterprises in Serbia in the period from 2004 to 2014 in millions of dinars (constant prices from 2014)
Source: Authors, based on the data of the Statistical Office of the Republic of Serbia

Analysis of movement of real GVA growth rate indicates that entrepreneurial businesses lag behind other enterprises, and a negative growth of real GVA from 2007. In other enterprises, slowdown in the annual real growth of GVA was observed in 2008, and in 2009, the decline was recorded in all enterprises (the largest fall was in micro and small enterprises). In 2010, the decline continued with entrepreneurial businesses and medium-sized enterprises, whereas micro, small, and large enterprises achieved growth of real GVA. In 2011, the negative trends from 2009 repeated, but at a much lower level. Negative trends were recorded in the next three years as well, except that particularly negative trends were recorded in 2013, when the real annual fall in GVA was the largest in all enterprises.

Innovation, research and development, and knowledge are considered important drivers of productivity, growth, and competitiveness, whereby small and medium-sized enterprises are attached the key role in the creation of knowledge. Accordingly, the focus is on the activity of SMEs in high-tech knowledge-intensive manufacturing and service industries, and their participation in these sectors compared to large enterprises. This is especially important in times of crisis, when it is necessary to restart the development of the economy, because innovative SMEs can play a key role in reviving the economy and achieving significant long-term growth.

In 2014, high technology sectors (HT and HKIS) employed 30,485 workers, which makes 4.0% of total employment in the non-financial sector of the economy (Fig. 4). Although the total number of employees in 2014 in the high-tech sector decreased by 299 employees (1.0%), compared to 2009, its share in total employment increased because employment in the economy decreased at a higher rate (12.7%).
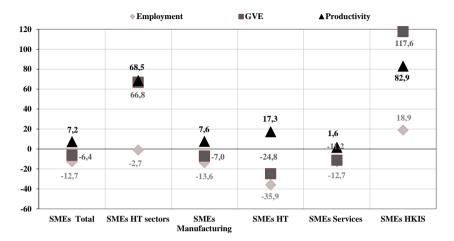
Fig. 4 Real growth in employment, GVA, and productivity in the period 2009-2014
Source: Authors, based on the data of the Statistical Office of the Republic of Serbia

The increase in employment in 2014 (by 496 employees – 1.7%), compared to 2013, which is contrary to the movement of the average of the economy and other sectors, demonstrates the importance of high-tech sectors in terms of employment. The significance is even greater because the level of wages in these sectors is significantly above average than most other sectors in the economy, which increases the purchasing power of employees in these enterprises and, consequently, the market demand.
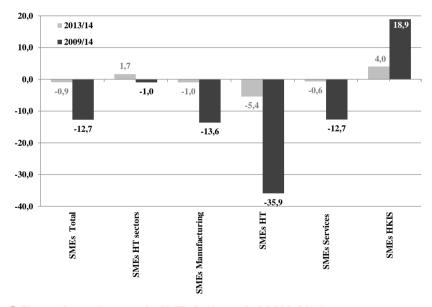

Fig. 5 Change in employment in SMEs in the period 2009-2014
Source: Authors, based on the data of the Statistical Office of the Republic of Serbia

The slower decline in employment in the high technology sector in the period 2009-2014, and growth in 2014, compared to 2013, indicates a lower elasticity of employment in high technology sectors in relation to the rest of the economy (Fig. 6). This can be explained by the higher complexity of jobs and more sophisticated knowledge of employees in high technology sectors, so that each fluctuation (replacement or dismissal) of employees causes higher costs for the enterprise compared to enterprises from other parts of the economy.
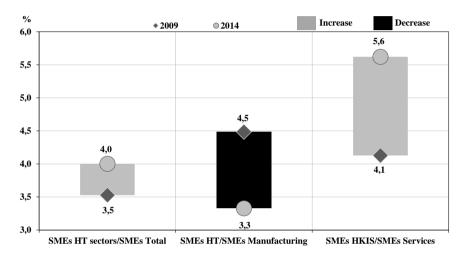

Fig. 6 Change in the structure of employment in the period 2009-2014
Source: Authors, based on the data of the Statistical Office of the Republic of Serbia

Viewed by the structure of high-tech sectors, there is a big difference between employment trends in HT SMEs and HKIS SMEs. Unlike HT SMEs, which constantly decreased employment in the observed period (2009-2014), and where the employment decline was more pronounced than in other sectors of the manufacturing industry (the share of HT SMEs in the manufacturing industry decreased in 2014, compared to 2009, by 1.2 percentage points), employment in HKIS SMEs increased all the time, so that employment growth in 2014, compared to 2009, was 18.9%. Employment growth in HKIS SMEs was contrary to the employment in SMEs in most other service industries, so that employment share of HKIS SMEs in employment in SMEs in the service sector of the economy increased by 1.5 percentage points. Employment growth in HKIS SMEs confirms the greater development and market power of high-tech SMEs in knowledge-intensive service industries in relation to production high-tech SMEs in Serbia.

Small and medium-sized enterprises in the field of high technology in 2014 generated 8.0% (82.7 billion dinars) of the total value added of SMEs, which is by 3.5 percentage points more than in 2009. Unlike GVA trends in all SMEs, which saw a real drop in GVA in 2014, compared to 2009, GVA in the high technology SME sector constantly increased, so that in 2014, compared to 2009, it increased by 66.8% (33.1 billion dinars). The constant growth of GVA of SMEs in the high-tech sector can be explained by the high competitiveness of SMEs that managed to retain the existing customers and expand the market through competitive business.

Products and services that are created in the high-tech sector generally have higher quality, meet the specific needs of customers, are more exclusive, and can be sold at higher prices. Movement of GVA in Serbia is largely in opposition to the movement of GVA in most EU countries, where, in times of crisis, GVA in high technology sectors decreased more than GVA created in the rest of the economy (Edgett, 1993). The reason for the decrease in GVA in these countries is explained by higher income elasticity of demand for high-tech products and services in relation to products and services from other sectors of the economy. In 2010, Berthou and Emlinger showed that the sale of high quality products was more sensitive to changes in income per capita than the sale of low-quality products (Dess et al. 2007, 92). Esposito et al. indicate that the decline in revenue during the crisis, both in the EU and globally, disproportionately affected products and manufacturers from high-tech sectors (Esposito & Vicarelli, 2011, 92). These authors also expect that after the crisis the trend will reverse, which implies faster growth in the sale of high-tech products.
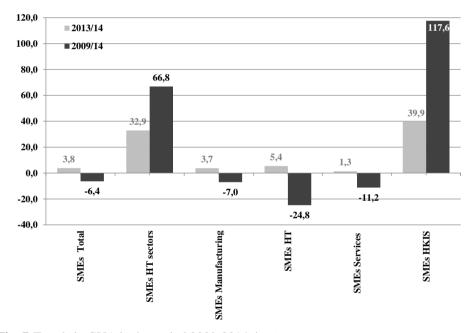

Fig. 7 Trends in GVA in the period 2009-2014, in %
        Source: Authors, based on the data of the Statistical Office of the Republic of Serbia

Similar to the employment trends, there is a significant difference in the movement of GVA in the high technology sector between HT SMEs and HKIS SMEs. In the observed three-year period, GVA in HKIS SMEs constantly grew (contrary to trends in other service sectors), so that the share of GVA generated by HKIS SMEs in the total GVA in the service sector increased. In high-tech manufacturing SMEs, situation is the opposite, because the decline in GVA in HT SMEs was higher than the decline in GVA in other manufacturing sectors, so that the share of GVA generated by HT SMEs in the manufacturing industry decreased.
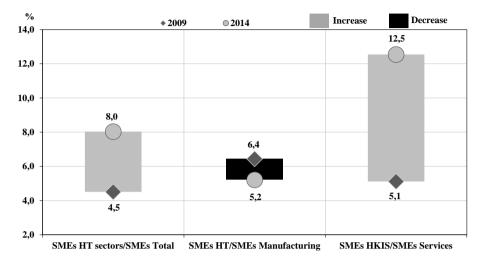
Fig. 8 Change in the structure of GVA in the period 2009-2014
Source: Authors, based on the data of the Statistical Office of the Republic of Serbia

2. DATA USED IN THE STUDY

Most of the world research in this field is based on data obtained from the Community Innovation Survey (CIS), as the method of data collection, coverage of observed units, and the data obtained allow various econometric and statistical studies (Mairesse & Mohnen, 2010). In this way, researchers have the opportunity to explore the starting hypotheses and establish various aspects of SME innovation in the modern economy. Accordingly, the basis for econometric research in this paper is the specifically collected statistical data on innovation activities of SMEs in Serbia, obtained from the Community Innovation Survey.

Econometric analysis was conducted using the Eviews 7 software package, based on data from Community Innovation Survey (CIS), which the Statistical Office of the Republic of Serbia conducted in 2008 and 2010 (the reference year is 2010). The survey included a sample of 3,500 small and medium-sized enterprises from Serbia, reaching to the level of regions, in proportion to the number of SMEs, selected from a set of 12,141 active enterprises with 10 and more employees registered in the Statistical Business Register. The survey of small and medium-sized enterprises focused on a sample stratified by the size of a business entity (small: from 10 to 49 employees; medium-sized: from 50 to 249 employees) and by activity (groups of activities under KD08 – groups of activities were selected according to the Eurostat recommendations). Realization of the sample was 71.37% (about 15% of the selected business entities were blocked or bankrupt, and about 14% of businesses did not respond to the survey). The obtained results were weighted and calculated at the population level of the enterprise. Data collection was based on web questionnaire (51%), survey via e-mail (12%), and printed questionnaire, which was distributed and collected by mail (37%).

The survey on innovation activities of enterprises is the main source of data for measuring innovation, designed to collect information on innovation activities, various aspects of organizational and marketing innovation within the enterprise, as well as on various aspects of the innovation process. The survey recorded the activities of enterprises in terms of product/service innovation, process innovation, organizational innovation, and marketing innovation. The aim of the research was to gain a comprehensive understanding of the real attitude of business policy of enterprises towards innovative activities, in terms of awareness of the needs and effects of innovation in an enterprise, the existing capacities in the enterprise, as well as of factors that hinder or slow down this type of activity. The data obtained shows the type, volume, and quality of innovation activities in enterprises: new or significantly improved products and services, implementation of new or significantly improved processes, logistics, and ways of distribution and promotion (Statistical Office of the Republic of Serbia, 2009, 2).

The data obtained allows users to understand the process of innovation, sources of information, organization of work, cooperation among enterprises, relationships with the environment, the objectives pursued by enterprises, and other aspects related to innovation activities of enterprises. The enterprise can simultaneously have more than one type of innovative activity over the observed period. In the survey, the enterprise is viewed as a unit, whereas an innovative activity is seen as a phenomenon (multiplied number).

The survey saw innovation as based on the application of a new or significantly improved product (goods or service) or process, a new marketing method, or a new organizational business method, organized work and relations with the environment. Such innovation activities can be developed by the innovating enterprise itself, along with other enterprises, by another enterprise, or can represent adaptation or application of the processes originally developed by other enterprises or institutions. Simple resale of new products and services purchased from other enterprises is not considered innovation. Innovation should be new at least for the observed enterprise. In some cases, innovative enterprises may cooperate with other entities in the business environment, and partners for cooperation may be found in other countries.

3. RESEARCH RESULTS[3]

The research focused attention on the examination of the links between innovativeness of SMEs, on the one hand, and employment and income, as important enterprise performance indicators, on the other hand. The basic assumption is that innovative SMEs recruit more workers and have better production processes through which they are able to, with less investment of labour and capital, achieve higher income.

Accordingly, the following research hypotheses were defined:

H0: Innovative small and medium-sized enterprises create more new jobs and generate higher income;

H1: Innovative small and medium-sized enterprises do not create many new jobs and do not generate higher income.

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[3]The obtained results of econometric research should be interpreted with caution, since the data series of only two years is short for this kind of research, which reduces the possibility of reliable and solid conclusion, but is a good basis for future research.

To analyse these hypotheses, the following two equations were used:

$$Emp = c + c_1\, Inov + c_2\, Erd + c_3\, Inc + Ɛ \tag{1}$$

$$Inc = c + c_1\, Emp + c_2\, Erd + c_3\, Inov + Ɛ. \tag{2}$$

Emp – Number of employees in the surveyed small and medium-sized enterprises;

Inov – Dummy variable for innovation (in the event that the enterprise declared itself as a non-innovator, it takes the value of 0, and if the enterprise declared itself as an innovator, it takes the value of 1);

Erd – Number of employees in research and development in the surveyed small and medium-sized enterprises;

Inc – Generated income of the surveyed enterprises.

The first equation proves the first part of the hypothesis, based on which innovative small and medium-sized enterprises create more jobs. The obtained result shows that the number of employees in small and medium-sized enterprises is statistically significantly affected by the number of research and development employees within the enterprise and income of the enterprise, but not its innovation activity (Table 1).

Table 1 Employees in the surveyed small and medium-sized enterprises

Dependent Variable: Emp
Method: Least Squares
Date: 25/02/16 Time: 17:52
Sample (adjusted): 1,794
Included observations: 790 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	89.60895	29.11450	3.077812	0.0022
INOV	-16.80740	22.17116	-0.758075	0.4486
ERD	26.41740	1.185967	22.27499	0.0000
INC	2.05E-06	7.75E-07	2.647385	0.0083
R-squared	0.397535	Mean dependent var		256.4342
Adjusted R-squared	0.395235	S.D. dependent var		957.1531
S.E. of regression	744.3455	Akaike info criterion		16.06794
Sum squared resid	4.35E+08	Schwarz criterion		16.09159
Log likelihood	-6342.836	Hannan-Quinn criter.		16.07703
F-statistic	172.8800	Durbin-Watson stat		1.912994
Prob(F-statistic)	0.000000			

Based on the results of the second equation, it can be concluded that the income of small and medium-sized enterprises statistically significantly depends only on the number of employees in a particular enterprise, not on innovation and the number of employees in research and development (Table 2).

Table 2 The income of the surveyed small and medium-sized enterprises

Dependent Variable: INC
Method: Least Squares
Date: 25/02/16 Time: 21:37
Sample (adjusted): 1,794
Included observations: 790 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2439354.	1339918.	1.820525	0.0691
EMP	4309.823	1627.955	2.647385	0.0083
ERD	27054.43	69434.32	0.389641	0.6969
INOV	-581395.8	1016572.	-0.571918	0.5675
R-squared	0.017733	Mean dependent var		3463872.
Adjusted R-squared	0.013984	S.D. dependent var		34364798
S.E. of regression	34123676	Akaike info criterion		37.53393
Sum squared resid	9.15E+17	Schwarz criterion		37.55759
Log likelihood	-14821.90	Hannan-Quinn criter.		37.54302
F-statistic	4.729916	Durbin-Watson stat		2.024413
Prob (F-statistic)	0.002809			

Based on these results, H0 hypothesis cannot be accepted, but H1 hypothesis can, based on which innovative SMEs do not create more jobs and do not generate higher income, compared to non-innovative small and medium-sized enterprises in the Republic of Serbia.

CONCLUSION

Income of SMEs statistically significantly depends only on the number of employees in a particular enterprise, not on innovation and the number of employees in research and development departments. The results obtained prove that innovative SMEs do not create more jobs and do not generate higher income, compared to non-innovative small and medium-sized enterprises in the Republic of Serbia.

Innovative SMEs do not create more jobs. The obtained result shows that the number of employees in small and medium-sized enterprises is significantly affected by the number of employees in the research and development within the enterprise and enterprise income, but not its innovation activity.

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UTICAJ INOVACIJA NA ZAPOLJŠAVANJE I PRIHOD MALIH I SREDNJIH PREDUZEĆA U REPUBLICI SRBIJI

Mala i srednja preduzeća su "pokretačka snaga" savremenih privreda zbog doprinosa koji se ogleda u zapošljavanju, povećanju izvoza, dinamiziranju konkurencije, itd. Nova i postojeća inovativna MSP doprinose povećanju ukupne produktivnosti i konkurentnosti privrede, istiskujući manje efikasna preduzeća sa nižom produktivnošću. U radu je putem konstruiranja odgovarajućeg ekonometrijskog modela dokazano da prihod MSP statistički značajno zavisi samo od broja zaposlenih u konkretnom preduzeću, ne i od inovativnosti i broja zaposlenih u istraživanju i razvoju. Na osnovu dobijenih rezultata dokzano je da inovativna MSP ne kreiraju više novih radnih mesta i ne stvaraju veći prihod u odnosu na neinovativna mala i srednja preduzeća u Republici Srbiji.

Ključne reči: *inovacije, mala i srednja preduzeća, inovativna mala srednja preduzeća*