

# INNOVATION AND MEASURING OF INNOVATION – EMPIRICAL RESEARCH OF COMPANIES IN SERBIA

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**Introduction/background:** The application of innovative business strategies is considered to be a very prominent tool when it comes to improving the company's competitiveness on the (global) market, which can be of a special significance for the economy growth in developing countries. The measuring of innovation is thus seen as an important activity in this context, both for theoretical and practical tests.

**Aim of the paper:** The main goal of the research, whose results are shown in this paper, was to investigate the level of the innovation strategies implementation in companies in Serbia, according to the specialized INNOVATE model.

**Materials and methods:** For the research purposes, the questionnaire was constructed, based on the previously determined 21 innovation management dimensions. The observed sample included 106 companies in Serbia, of various sizes, activities and structures. The data were processed by a statistical program IBM SPSS.

**Results and conclusions:** The research results indicate the main problems that Serbian companies are facing in order to improve their innovative capacities: focus on the domestic market, lack of innovation strategy, insufficient business networking, short-term planning, inadequate management system, technological backwardness, and the differences among companies of different activities and small-scale and big-scale companies in regard to the levels of the innovation capacity dimensions application. It is also shown that the expectations regarding the business growth depend on the characteristics of the company.

**Keywords:** innovation, innovation capacity dimensions, the growth expectation.

## 1. Introduction

Innovation refers to something new, original, or improved. From an economic point of view, innovation implies the application of new and improved ideas, products, services and processes that create benefits for one organization and/or society. Innovations are not exclusively represented by new devices, ideas or methods, but they can also refer to modifying business models and adapting to market or technology changes. Currently scientific progress and innovation play a decisive role in economic and social development in

the world, since the new features of the contemporary economy include the globalization of innovation, production and trade. Innovation has been widely recognized as the main driver and first impetus for a sustainable regional or national economic growth, and the main global competency driver, especially for emerging economies, since it's no longer a useful tool for them to depend on international trade or labor-intensive work such as manufacturing (Chen, Viardot, and Brem, 2019).

According to EU strategic documents, innovation is defined as one of the priority goals in general, since it has been recognized as the key factor for achieving smart, sustainable and inclusive economic growth, both on national and regional levels (Beraha and Đuričin, 2020). When it comes to innovativeness, the countries of the Western Balkan region are at a disadvantage in comparison with the European Union member states, although they have undergone significant changes and economic transformations since the beginning of the 21<sup>st</sup> century. Therefore, there is a strong need in Western Balkan Countries, as developing countries, for a systematic promotion and development of innovation culture and innovativeness. In 2005 Innovation Law was introduced in Serbia, followed by several national strategies, which was an important contribution to strategic planning of innovation activities, with the aim to transform Serbia to an entrepreneurial economy, fostering innovation, improving human resources and cultivating a general business environment for innovation. According to several reports on this matter (*Global Competitiveness Report*, *Innovation Union Scoreboard*, and *Global Innovation Index*), innovation is among the undeveloped dimensions of Serbian competitiveness (Lalić, Ćirić, Gračanin, and Anišić, 2019). Nevertheless, the results of a recent research indicate that Serbia also has the accessible islands of excellence, which represent modest but promising achievements for the transition to the innovation-driven economy in the future (Mosurović Ružić, Miletić, and Dobrota, 2021). According to Global Competitiveness Report, which ranks countries based on the Global Competitiveness Index, in 2017 Serbia essentially improved its ranking – it ranked 78<sup>th</sup>, compared to 101<sup>st</sup> in 2013 (Savić, Pitić, and Lazarević, 2018). And according to Global Innovation Index, an indicator for annual ranking of countries by their capacity and success in innovation and innovative activities, during the period from 2009 to 2019 Serbia's ranking progressed from 97<sup>th</sup> to 57<sup>th</sup> place on the rankings (130 in total) (Dašić, Dašić, Atanasković, and Pavićević, 2020). According to the European Innovation Scoreboard (EIS, 2020), which provides a comparative analysis of innovation performance in EU countries, other European countries, and regional neighbours, Southeast-European countries are either modest or moderate innovators, since they consistently innovate below 50% of the EU average. Southeast Europe has been economically falling back while simultaneously politically integrating with the EU (Radojević, 2021). According to the data for the year 2021 (EIS, 2021), Serbia's innovation score in 2021 was below the European Union average, with an index score of 66. Compared with 2014, Serbia's innovation performance relative to the European Union has improved over time (<https://www.statista.com/...>). In regard to this,

Serbia is recognized as Emerging innovator (innovation leader, strong innovator, moderate innovator), with the value of innovation index of 74,52 compared with the highest ranked Switzerland, 162,28, and the lowest ranked Ukraine 33,58 (<https://ec.europa.eu/research...>).

Despite the improvements and the increasing awareness of the importance of innovation development, there is still a need for improvement of innovation practices in Serbia. Therefore, in further development of Serbian innovation potentials, it is crucial to counteract the lack of skilled and specialized workforce in the field of innovation management (Lalić, Ćirić, Gračanin, and Anišić, 2019).

## **2. Theoretical background**

### **2.1. Innovation in the context of economy**

The term innovation was first used by the economist Joseph A. Schumpeter in the 1930s to describe the conversion of ideas and knowledge into new and commercially successful products and services (Schramm, 2017). In this manner, innovation can be considered the processes of implementing problem-solving ideas into use, to sustainable value creation outcomes. In other words, it is the first economic application of a new solution to the problem, which is then spatially and temporally distributed to the market. Innovation means an invention, and it is usually interpreted as the introduction of new and improved ideas, strategies, products, services, and business organization models. It implies the planned application of information, imagination, and initiative in gaining greater value from the existing resources, and includes all the processes by which new ideas are created and converted into useful products, in order to meet the needs and expectations of customers. In regard to this, it can be stated that innovation is the production of new goods or qualities which bring benefits to the company, and are relevant to the market (Medearis, 2009; Sousa, Ferreira, and Vaz, 2020). In recent years, innovations have become the essential source of competitive advantage, establishing companies in an extremely competitive world by providing better connections with emerging markets, and the opportunities to create new innovations (Salam, Senin, Sheeraz, and Zainab, 2020; Massis, Frattini et al., 2016).

Research and innovation are considered to be the most important driving forces of socio-economic development, since they have huge potential to cope with global challenges, including the actual sustainable development goals (Štrbac, Kutlača, and Semenčenko, 2020). According to Geoffrey Nicholson, research is the transformation of money into knowledge; innovation is the transformation of knowledge into money (Schramm, 2017). Innovation is considered an essential driver of economic growth (Hasan, and Tucci, 2010). It is a crucial factor of company's economic performance and competitiveness, and an essential instrument

for business performance improvement and company growth, especially in case of emerging economies and economies in transition. Enhancing innovation potential and innovativeness and keeping up with the fast pace of technological changes is highly recommended in order to increase competitiveness on both macro and micro levels, regarding the national economic growth and competitiveness and business performances of companies, respectively (Lalić, Ćirić, Gračanin, and Anišić, 2019). Both developed and developing countries are trying to build up their national innovation system with the aim to achieve sustainable industrial upgrading and economic growth. According to the analysis, the mainstream model of corporate development has evolved from an effective through a quality and flexible, to an innovative company. Commonly, an innovative company makes a consistent effort to seek new breakthroughs in the area of its specialty to reduce cost, improve quality and flexibility, and provide the market with products of outstanding price, quality and performance (Chen, Viardot, and Brem, 2019). Innovations are realized through improvements in the field of technology, processes (improving the quality of products or services, increasing safety, reducing scrap etc.), work organization (which reduces production and administration costs, increases productivity or utilization of equipment or time etc.), marketing etc. It implies a long-term intangible assets investments, that will generate profits in the future.

The accelerating innovation has significantly influenced the global economy (Malanowski, Tübke, Dosso and Potters, 2021). The national economy's ability to create and implement innovations has become a key determinant of countries' economic progress, and very important for a society's successful adaptation to increasingly rapid scientific, technological and economic changes. The results of the research confirmed the strong connection between the Innovation capacity index and the achieved level of economic development of countries (Cvetanović, Andrejević Panić, and Kostić, 2020). In every society, especially in developing countries, innovation and entrepreneurship is a sign of progress and development as it has an impact on social, cultural, and economic development (Lalić, Ćirić, Gračanin, and Anišić, 2019). Addressing the issue of specialization in the research and development field and innovation is particularly crucial for regions/countries that are not leaders in any of the major science or technology domains. Many would argue that these regions/countries need to increase the intensity of knowledge investments in the form of high education and vocational training, public and private research and development field, and other innovation-related activities (Foray, David, and Hall, 2010). Concerted efforts are being made to induce European enterprises to spend more on research and development field with a view to boosting economic performance through enhanced innovation (O'Sullivan, 2010). The importance of innovation as a factor in the economic development is constantly growing. According to experts, 2/3 of the economic growth of the developed countries should be associated with the introduction of innovations (Oksanych, 2021).

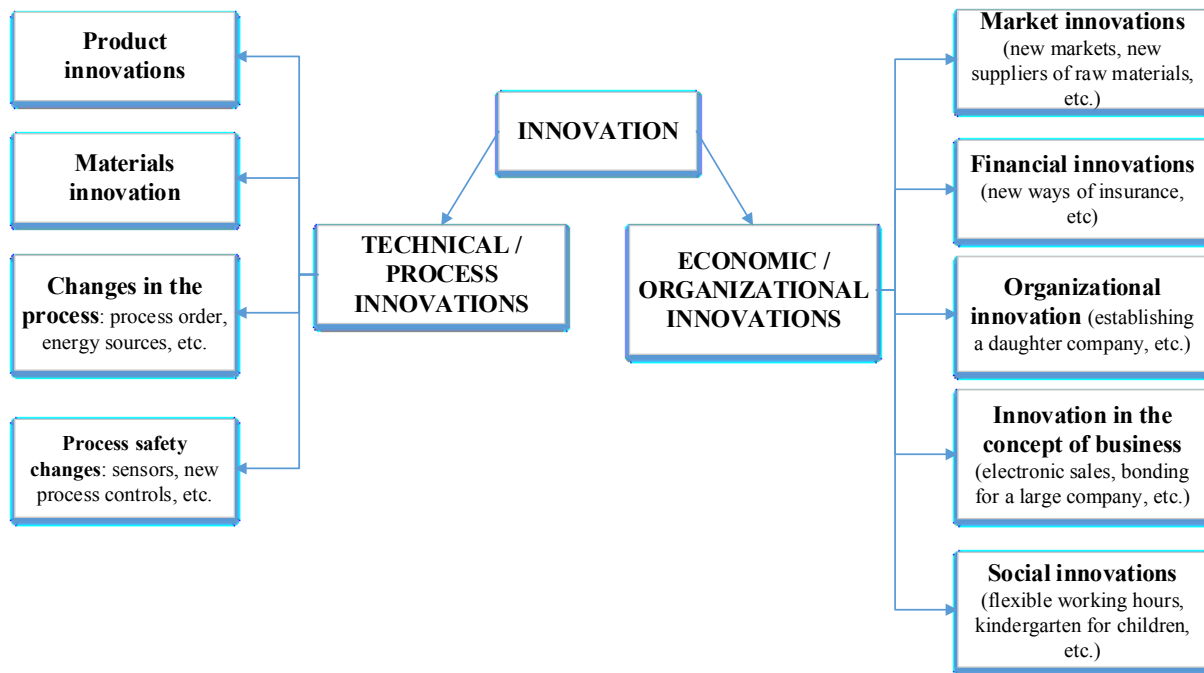
## 2.2. Innovation management

After WWII innovation was generally considered to be essential to the economic and technological survival of nations and companies alike, which led to an increasing scientific research into innovation management and its widespread use. Innovation management implies the new methods of developing plans, systems, and procedures that transform the tasks of leaders, and include other employees and staff of the organization. In order to complete the transformation of idea to market value, innovation management needs careful design in terms of strategy, organization, resource and culture (institution), which means the organizational reconstruction and regularization of management activities are interacted to continuously promote the evolution of the company (Chen, Viardot, and Brem, 2019). However, it has been shown that different socio-economical contexts demand different approaches to the innovation management. The increasing importance of innovation has been forcing companies to improve their innovation management (Ortt, and Van der Duin, 2020). It has been shown that the global economy, combined with the uncertain global stock markets, has already started to erode many of the traditional views of organizational and strategic management practices. The innovative management practices include a complex decision-making process, which combines top-down with bottom-up approaches, centralized with decentralized decisions, and relevant degrees of information asymmetry between management and employees involved in technical functions (D'Andria, and Savin, 2018). According to the Green Paper on Innovation from the European Commission (EIS, 1996), the concept of successful production, assimilation, and exploitation of novelty, is structured around three pillars: the renovation and enlargement of the range of products and services and the associated markets; the creation of new methods of production, supply, and distribution; and the introduction of changes in management, work organization, and skills of the workforce, in a word—organizational innovation (Sousa, Ferreira, and Vaz, 2020).

Organizational innovation means applying new principles to the production of goods and services, new structures and processes, and introducing the new values, attitudes, and mindsets. It refers to new management models and work organization forms, but also to the development of skills and the creation of knowledge, with the aim to increase effectiveness and efficiency of work, cooperation and coordination within the company, and the company's ability to adapt to changes. There are some additional factors of the same importance: employees training, organization of work, the involvement of people in the innovation process, and how the company learns and shares knowledge (Sousa, Ferreira, and Vaz, 2020). In the economic system, entrepreneurship is the most obvious instance of a knowledge-based institution (Stichweh, 2018). In the light of changes toward a knowledge-based economy, where intangible assets and human capital play an increasingly major role, the innovative practices are considered of a great importance (D'Andria, and Savin, 2018). The development of information technology have changed the economic development model,

and theories based on knowledge development are becoming increasingly important. This is why creation of a knowledge-based economy determines the growth of interest in innovations and the possibility of using them as a tool for building a competitive advantage (Oksanych, 2021). The knowledge management is considered highly relevant to innovation in companies today because of its importance for the economy development, since it forms a basis for innovation and underpins effective decision making within contemporary organizations. There is the derived focus out of information and knowledge towards innovation and collaboration across boundaries. The most important factors for establishing a successful knowledge-for-growth base, particularly those relevant for developing countries, include: institutional quality, financial market sophistication and macroeconomic stability; well functioning local product markets; international openness through foreign trade; the implementation of new technologies and ICT availability and use; education and human resource development, the quality of education and training; innovation capacity drivers, such as university-industry links, IPR protection (Veugelers, and Mrak, 2010).

Many researchers acknowledge the positive impact of innovation on the company (Salam, Senin, Sheeraz, and Zainab, 2020). The success of the innovative practices implementation and innovative culture development in a company can be conditioned by the company's internal factors, such as the size of the company, the workforce knowledge, and the structure of the company (Sousa, Ferreira, and Vaz, 2020). Methods for evaluating innovative ideas and innovations in companies must include technological and economic criteria. In order to be useful, an innovative idea must be effective, and it has to solve a particular problem or to satisfy a particular need. Innovation can improve the development of original concepts and the innovative company provides proactive, confident attitude to take risks and do the activities necessary for the realization of new ideas. The results of the research on the sustainable industry practices in Serbia showed the importance of innovative practices implementation (Mosurović Ružić, Miletić, and Dobrota, 2021). The various types of product-service innovations are illustrated in Figure 1.



**Figure 1.** Product/service innovation.

### 3. The innovation measuring

The innovation measuring is an important activity both for theoretical and practical tests. The purpose of innovation measuring is to balance previous achievements with predictive measurements of potential outcomes of innovation through corporate capabilities. The evaluation of the performance of the innovation process has a number of very specific characteristics. The problem is how to manage different perspectives when it comes to radical and incremental innovations, which can ensure financial profitability in the short term. Some experts recommend three types of criteria for measuring success in innovation: technical, economical and others. The innovation capacities managing in practice relates to the understanding of how to gain access and collect data and information necessary to enable the learning and decision-making on the optimal innovation management. Important aspects or critical innovation factors such as ideas, knowledge, motivation, etc. cannot be measured directly because of their intangible nature. It was shown that companies rarely follow the information they need to systematically collect and evaluate innovation ideas, even those with very different methods and perspectives, and this makes it difficult to compare and measure the performance of innovations between companies and organizations. The evolution of the measurement of innovation is presented in Table 1.

**Table 1.***The evolution of innovation measurement*

<b>The first generation Input indicators (1950-1960)</b>	<b>The second generation Output indicators (1970-1980)</b>	<b>The third generation Innovative indicators (1990)</b>	<b>The fourth generation Process Indicators (2000 plus emerging focus)</b>
<ul style="list-style-type: none"> <li>• Research and development expenditures</li> <li>• Scientific and technical personnel</li> <li>• Capital</li> <li>• Tech intensity</li> </ul>	<ul style="list-style-type: none"> <li>• Patents</li> <li>• Publications</li> <li>• Products</li> <li>• Qualitative changes</li> </ul>	<ul style="list-style-type: none"> <li>• Innovation surveys</li> <li>• Indexing</li> <li>• Benchmarking innovation capacity</li> </ul>	<ul style="list-style-type: none"> <li>• Knowledge</li> <li>• Intangibles</li> <li>• Networks</li> <li>• Demand</li> <li>• Clusters</li> <li>• Management techniques</li> <li>• Risk/return</li> <li>• System Dynamics</li> </ul>

Source: <http://www.tiec.gov eg/backend/Reports/MeasuringOrganizationInnovativeness.pdf>, 2011, p. 10.

### **3.1. INNOVATE: an innovation assessment tool**

The assessment of innovation allows the company to understand its overall general innovative potential and identify the eventual business risks in the future. Another possibility provided by modern tools is the comparison of performance with respect to other similar companies. INNOVATE is an innovation diagnostic tool that encourages businesses to improve their innovation management in order to improve their competitiveness. It was created with the support of the CIP (<https://ec.europa.eu/cip/>; The Competitiveness and Innovation Framework Program) and SECEP (<https://www.eubusiness.com...>; Support to Enterprise Competitiveness and Export Promotion) – the projects funded by the European Union. It was used within the project of the European Entrepreneurship Network in which the consortium of Serbia also participated. The INNOVATE tool was designed to achieve two goals:

1. To assist the owner/manager of the company in assessing the current position of the company in relation to the 21 dimension of innovative management,
2. To improve the decision-making process on how to take the company to a higher level.

The way a company perceives innovation is considered to be one of the key factors of the innovative practices implementation and development (Aleksić Mirić, Petrović, and Aničić, 2019). For the research purposes, the 21 dimensions of innovation management were identified, regarding the innovation strategy of the company, the ideas management, the attitude towards change, the product development strategies, the technology application levels, the intellectual property rights, the customers and products data collecting, the horizon of the market, the growth expectations, the awareness of the situation on the market, planning methods, the decision making process, the general management and the information technology application (IT), the external advice acceptance, investment in innovation and growth, the employees qualifications and training, the links with academia, networking in business and the issues related to the reputation of the company. The aim of the research was



to investigate the level of the innovation capacities in Serbian companies. In regard to the aim of the research, the following hypotheses were defined:

- H1: The innovation capacities dimensions are equally represented in Serbian companies.
- H2: The implementation levels of certain innovation capacities dimensions in Serbian companies vary depending on the characteristics of the company.
- H3: The expectations regarding company's growth are correlated with the level of innovative capacity dimensions.
- H4: The expectations regarding company's growth depend on the characteristics of the company.

#### **4. Methods**

The empirical research was conducted in 2021, on a sample of 106 companies of different size and activity, Table 3. For the purposes of the research, the specialized questionnaire was constructed based on the 21 innovation management dimensions, with the aim to examine the levels of the innovation strategies implementation in Serbian companies. The questionnaire was divided in two parts. The first part covered 6 questions concerning the general information of the company (the number of employees, the annual capital turnover, the activity, year of establishment, the ownership structure and headquarters). The second part of the questionnaire consisted of 21 questions directly related to the 21 dimensions of innovation management. The innovation capacities of the companies were first observed through the examination of the levels of the innovation management dimensions implementation in practice, then the differences between the innovation management dimensions implementation in practice, shown by the examination results, were observed in relation to the number of employees and the annual capital turnover.

The data was processed with the IBM SPSS Statistics 25 software package. The results were prepared in the MS EXCEL 2013 software. The following 21 variables were considered in regard to the 21 dimensions of innovation capacities, which were presumed to affect the innovative capacity of companies according to INNOVATE diagnostic tool: Innovation strategy, Management of ideas, Attitude towards change, Product development cycle, Application of technology, Intellectual property rights, Database of clients and products, Market horizon, Expectations regarding the growth of the company, Market awareness and perception, Planning, Decision making, Management systems and information technology (IT), Acceptance of external advice, Internal investment in innovation, Financing growth, Qualifications of employees, Training of employees, Relationships with the academic environment, Business networking, Reputation, shown in Appendix. The assessment was carried out on a scale from 1 to 4, where 1 indicated the lowest level of the evaluated variable,

and 4 the highest level. As we worked with nominal and ordinal variables, the median was chosen as a measure of central tendency, and a statistical non-parametric method of variance analysis Kruskal-Wallis test was used to test the hypotheses.

**Table 2.**  
*The characteristics of companies*

<b>Number of employees</b>	<b>Number</b>	<b>%</b>
Less than 10	45	42.5
10-49	28	26.4
50-249	21	19.8
250-700	7	6.6
more than 700	5	4.7
In total	106	100.0
<b>Annual capital turnover (in thousands EUR)</b>	<b>Number</b>	<b>%</b>
Less than 10	11	10.4
10-200	22	20.8
200-500	32	30.2
500-1000	12	11.3
More than 1000	29	27.4
In total	106	100.0

The annual capital turnover of companies in relation to the number of employees is presented in Table 3.

**Table 3.**  
*The annual capital turnover of companies in relation to the number of employees*

<b>Number of employees</b>	<b>Annual capital turnover (in thousands EUR)</b>					<b>Total</b>
	<b>Less than 10</b>	<b>10-200</b>	<b>200-500</b>	<b>500-1000</b>	<b>More than 1000</b>	
Less than 10	10	16	14	5	0	45
10-49	0	4	12	4	8	28
50-249	0	2	3	3	13	21
250-700	0	0	2	0	5	7
More than 700	1	0	1	0	3	5
Total	11	22	32	12	29	106

## 5. Results and discussion

### 5.1. The innovation capacities of Serbian companies: the 21 innovation management dimensions value analysis

In order to test H1, the median value was observed, as the measure of central tendency, for the 21 dimensions of innovation management in Serbian companies, Table 4.

**Table 4.***Median of the innovative capacities dimensions (range 1-4)*

Innovative capacities dimensions	N	Median
Innovation strategy	106	2,00
Management of ideas	106	3,00
Attitude towards change	106	3,00
Product development cycle	106	3,00
Application of technology	106	2,00
Intellectual property rights	106	2,00
Database of clients and products	106	3,00
Market horizon	106	2,00
Expectations regarding the growth of the company	106	2,00
Market awareness and perception	106	3,00
Planning	106	2,00
Decision making	106	2,00
Management systems and IT	106	2,00
Acceptance of external advice	106	2,00
Internal investment in innovation	106	2,00
Financing growth	106	2,00
Qualifications of employees	106	2,00
Training of employees	106	3,00
Relationships with the academic environment	106	2,00
Business networking	106	2,00
Reputation	106	2,00

The highest value was obtained for the following variables: Market awareness and perception (3 – We investigate market opportunities and threats every year; Management of ideas (3 – We collect and review the ideas of all employees and all clients); Attitude towards change (3 – We actively strive for change in the way we work); Product development cycle (3 – We measure time to market exit for most of our new products and services); and Employee training (3 – We have training programs for several selected individuals from our firm). The obtained value for the other variables was 2 (1-4), descriptively presented in Appendix. According to the obtained results, H1 was not confirmed, meaning that the 21 dimensions of innovation management are not equally represented in Serbian companies.

## **5.2. The 21 innovation management dimensions implementation levels, in relation to the size of the company in terms of number of employees and the annual capital turnover**

Due to the modern technological changes which have enabled the emergence of companies with a small number of employees and large capital turnover, we observed the level of linear correlation for the size of the company, in relation to the number of employees and capital turnover.

The relationship between the size of the company expressed in terms of number of employees and capital turnover was investigated using the Pearson linear correlation coefficient. The coefficients of correlation are most often interpreted by Cohen (1988): if  $r$  is between 0.1 and 0.29, it is a weak the correlation; if  $r$  is between 0.3 and 0.49 it is a correlation of mean strength, and if  $r$  is between 0.5 and 1.0, it is a strong correlation.

In the observed case, a strong positive correlation was obtained between the two variables,  $r = 0,550$ , with a large number of employees following a large turnover of capital.

### 5.2.1. The innovation capacities dimensions in relation to the number of employees: Kruskal-Wallis test

In order to test H2, the innovation capacities of companies were examined in relation to the number of employees. In regard to the number of employees, companies were grouped into micro (less than 10), small (10-49), medium (50-249), large (250-700), and very large enterprises (more than 700). According to the statistical non-parametric method of variance analysis, Kruskal-Wallis test, in relation to the number of employees the statistically significant differences were obtained for the following variables: Attitude towards change, Database of clients and products, Market horizon, Market awareness and perception, Planning, Internal investment in innovation and Financing growth, Table 5. The descriptions of the innovation management dimensions for which the statistically significant differences were obtained are presented in Appendix.

**Table 5.**

*Kruskal-Wallis Test: The innovation capacities dimensions in relation to the number of employees*

Kruskal Wallis Test, Grouping Variable: Number of employees							
	Attitude towards change	Database of clients and products	Market horizon	Market awareness	Planning	Internal investment in innovation	Financing growth
Kruskal-Wallis H	14,912	9,565	10,101	11,402	11,781	9,384	15,698
df	4	4	4	4	4	4	4
Asymp. Sig.	0,005	0,048	0,039	0,022	0,019	0,052	0,003

Depending on the number of employees, statistically significant differences were obtained for the following dimensions of innovative capacities: Attitude towards change, Database of clients and products, Market horizon, Market awareness and perception, Internal investment in innovation, and Financing growth. The nature of these differences is presented in Table 6.

**Table 6.**

*The innovation capacities dimensions characteristics differences in relation to the number of employees*

<b>Number of employees</b>	<b>Planning</b>	<b>Market horizon</b>	<b>Market awareness and perception</b>	<b>Internal investment in innovation</b>	<b>Financing growth</b>	<b>Attitude towards change</b>	<b>Database of clients and products</b>
Less than 10, n = 45	Every 12 months we make a plan for the next year (2)	The market for our products or services will cover Serbia (2)	We examine market opportunities and threats every year (3)	We work on the development of new products/ services based on commercial contracts (2)	Our growth is tied solely to our profits (1)	We actively strive for change in the way we work (3)	We will offer products and services to many customers (3)
10-49, n = 28	We look 2-3 years ahead in making the annual plan (3)	The market for our products or services will cover Serbia (2)	We examine market opportunities and threats every year (3)	We regularly co-finance research and development projects (3)	We will use limited loans (debt refinancing) to enable growth (3)	We actively strive for change in the way we work (3)	We will offer products and services to many customers (3)
50-249, n = 21	We look 2-3 years ahead in making the annual plan (3)	The market for our products or services will cover Serbia (2)	We examine market opportunities and threats every year (3)	We regularly co-finance research and development projects (3)	We will use limited loans (debt refinancing) to enable growth (3)	We know we need to change but we don't know how (2)	We will offer two/ three products to selected customers (2)
250-700, n = 7	We look 2-3 years ahead in making the annual plan (3)	We will focus on meeting the needs of our local market (1)	We rely on customer feedback to maintain market awareness (2)	We regularly co-finance research and development projects (3)	We use various forms of financing for innovation, including risk capital (4)	We know we need to change but we don't know how (2)	We will offer two/ three products to selected customers (2)
More than 700, N = 5	We have a lot of work to do and we don't have time to plan ahead (1)	We will focus on meeting the needs of our local market (1)	We rely on customer feedback to maintain market awareness (2)	We work on the development of new products/ services based on commercial contracts (2)	We are considering new ways to finance company growth (2)	We know we need to change but we don't know how (2)	We will offer two/ three products to selected customers (2)

In the case of micro companies, with less than 10 employees, of which 42.5% are in the sample, market awareness and perception is very good, since they state to examine market opportunities and threats every year, as well as the attitude towards change, because it is easier to see the need for change and make changes when it comes to fewer employees. They have very good developed database of clients and products, and they intend to offer

products and services to many customers. At the same time, these companies have struggles with financing growth, since the company growth is tied solely to the profits of the company. They make plans only for one year ahead, and they work on the development of new products/services based on commercial contracts.

The companies with 10-49 employees, of which 26.4% are in the sample, showed fairly high assessment levels for the observed dimensions of innovative capacities, except market horizon, since it was predicted that the market for the company's products or services will only cover Serbian market. They look 2-3 years ahead in making the annual plan, examine market opportunities and threats every year, regularly co-finance research and development projects, and actively strive for change in the way they work. They plan to use limited loans (debt refinancing) to enable growth and to offer products and services to many customers.

In companies with 50-249 employees, of which 19.8% are in the sample, the implementation levels of some innovation capacities dimensions were assessed as fairly high, such as Planning, Market awareness and perception, Internal investment in innovation, and Financing growth. These companies state to look 2-3 years ahead in making the annual plan, examine market opportunities and threats every year, and regularly co-finance research and development projects. When it comes to the growth financing, they plan to use limited loans (debt refinancing) to enable growth. The dimensions Attitude towards change, Database of clients and products and Market horizon are at a lower level, since these companies, although aware of the necessity to change, don't know how to do it, and they plan to offer only two/ three products to selected customers on the market that will cover Serbia.

In the case of companies with 250-700 employees, of which 6.6 % are in the sample, Financing growth dimension showed the highest assessment values, and these companies state to use various forms of financing for innovation, including risk capital. Internal investment in innovation is also very high assessed, since these companies regularly co-finance research and development projects, as well as Planning, as they state to look 2-3 years ahead in making the annual plan. On the other hand, Market horizon dimension assessment value is at the lowest level, and these companies only plan to focus on meeting the needs of the local market.

The overall innovation capacities dimensions implementation levels in companies with more than 700 employees, of which 4.7 % are in the sample are lower than in the previous cases. Planning and Market horizon dimensions assessment were at the lowest level, since these companies stated to have a lot of work to do and don't have time to plan ahead, and focus on meeting the needs of the local market solely. The other innovation capacities dimensions showed low assessment levels. These companies rely only on customer feedback to maintain market awareness, work on the development of new products/services based on commercial contracts, and plan to offer only two/three products to selected customers. They are considering new ways to finance company growth, and they are aware of the fact that they need to change, but they don't know how.

The nature of the differences in the dimensions of innovative capacities, for the variables for which statistically significant differences were obtained by the Kruskal-Wallis test, presented as mean ranks, are shown in Table 7.

**Table 7.**  
*Number of employees – Kruskal-Wallis Test: Ranks*

	<b>Number of employees</b>	<b>N</b>	<b>Mean Rank</b>
<b>Attitude towards change</b>	Less than 10	45	60,00
	10-49	28	60,34
	50-249	21	44,29
	250-700	7	26,50
	More than 700	5	33,20
<b>Database of clients and products</b>	Less than 10	45	60,49
	10-49	28	56,50
	50-249	21	45,36
	250-700	7	31,93
	More than 700	5	38,20
<b>Market horizon</b>	Less than 10	45	56,86
	10-49	28	57,86
	50-249	21	53,60
	250-700	7	39,93
	More than 700	5	17,50
<b>Market awareness and perception</b>	Less than 10	45	62,74
	10-49	28	53,00
	50-249	21	45,83
	250-700	7	32,79
	More than 700	5	34,30
<b>Planning</b>	Less than 10	45	45,46
	10-49	28	65,30
	50-249	21	56,21
	250-700	7	65,14
	More than 700	5	32,10
<b>Internal investment in innovation</b>	Less than 10	45	44,63
	10-49	28	64,25
	50-249	21	59,00
	250-700	7	59,14
	More than 700	5	42,10
<b>Financing growth</b>	Less than 10	45	41,19
	10-49	28	63,89
	50-249	21	58,69
	250-700	7	75,21
	More than 700	5	53,90

It can be concluded that the attitude towards change is the most prominent in companies with less than 50 employees, which could be expected, given that it is easier to manage activities that require change, if they involve a smaller number of people. These companies have the highest level of dimension market awareness and perception, as well as the customer and product database. Market horizon is showed to be is the highest in companies with less than 250 employees. The best planning strategies are showed in category of companies with less than 50, and 250-700 employees. The companies with 10-49 employees proved to have

the largest internal investment in innovation. Financing growth is most prominent in companies with 250-700 employees.

#### 5.2.2. The innovation capacities dimensions in relation to the annual capital turnover: Kruskal-Wallis test

For further testing of hypotheses H2, the innovation capacities of companies were examined in relation to the annual capital turnover. In regard to the annual capital turnover, the following classification was made: companies with small annual capital turnover (< 10.000 EUR), medium annual capital turnover (10.000-200.000 EUR), moderately large annual capital turnover (200.000-500.000 EUR), large annual capital turnover (500.000-1.000.000 EUR), and very large annual capital turnover (1.000.000 < EUR). According to the statistical non-parametric method of variance analysis, Kruskal-Wallis test, in relation to the annual capital turnover the statistically significant differences were obtained for the following variables: attitude towards change, database of clients and products, and relationships with the academic environment, Table 8.

**Table 8.**

*Kruskal-Wallis Test: The innovation capacities dimensions in relation to the annual capital turnover*

<b>Kruskal Wallis Test, Grouping Variable: Annual capital turnover</b>			
	<b>Attitude towards change</b>	<b>Database of clients and products</b>	<b>Relationships with the academic environment</b>
<b>Kruskal-Wallis H</b>	12,975	20,336	13,052
<b>df</b>	4	4	4
<b>Asymp. Sig.</b>	0,011	0,000	0,011

The nature of the differences in the dimensions of innovative capacities, for the variables for which statistically significant differences were obtained by the Kruskal-Wallis test, presented as mean ranks, are shown in Table 9.

It can be concluded that the attitude towards change is the most prominent in companies with the annual capital turnover in the category of 500.000-1.000.000 EUR, of which 11.3% are in the sample, and these companies also proved to have the database of clients and products at the highest level. The best relationships with the academic environment are shown in companies with the annual capital turnover in the category of 10.000-200.000 EUR, of which 20.8% are in the sample.



**Table 9.***The annual capital turnover: Kruskal-Wallis Test: Ranks*

	<b>Capital turnover (EUR)</b>	<b>N</b>	<b>Mean Rank</b>
<b>Attitude towards change</b>	< 10.000	11	64,00
	10.000-200.000	22	53,48
	200.000-500.000	32	56,11
	500.000-1.000.000	12	70,63
	More than 1.000.000	29	39,57
<b>Database of clients and products</b>	< 10.000	11	68,41
	10.000-200.000	22	53,43
	200.000-500.000	32	62,00
	500.000-1.000.000	12	64,92
	More than 1.000.000	29	33,79
<b>Relationships with the academic environment</b>	< 10.000	11	45,36
	10.000-200.000	22	68,36
	200.000-500.000	32	55,38
	500.000-1.000.000	12	32,63
	More than 1.000.000	29	51,88
	<b>Total</b>	<b>106</b>	

It can be concluded that the obtained differences in the level of innovative capacities are different when the size of the company is observed through the number of employees and through capital turnover, although these two characteristics are highly correlated. From the above, it can be stated that hypothesis H2, according to which the implementation levels of certain innovative capacities dimensions in Serbian companies vary depending on the characteristics of the company, was confirmed.

### **5.3. The growth expectations in relation to the innovation capacities dimensions levels**

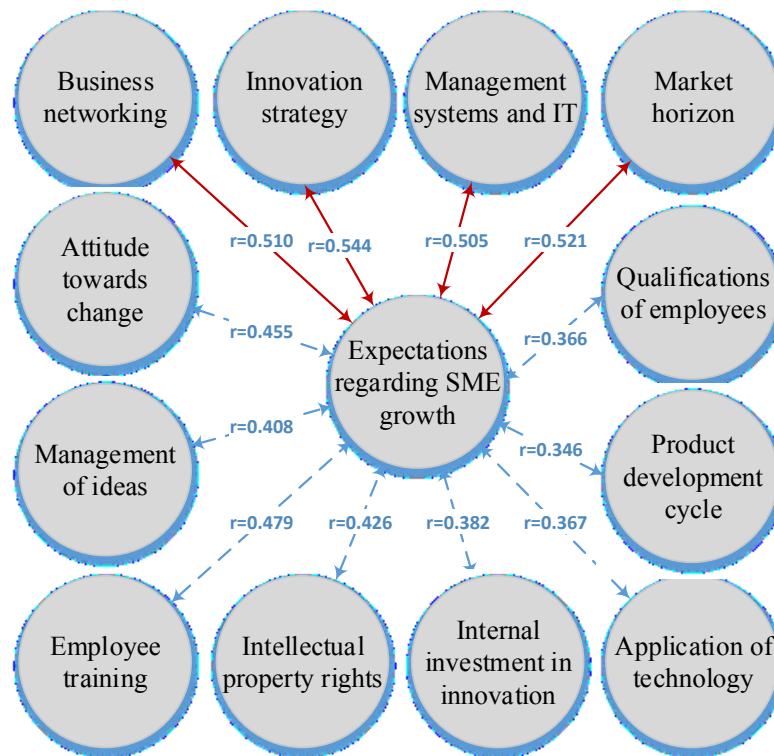
In order to test H3, the correlation of the expectations regarding the growth of the company and the innovation capacity dimensions was examined. The coding regarding the growth expectations of the company was carried out as follows: 1 – We do not expect the growth of the company; 2 – We expect a modest business growth; 3 – We planned and allocated a budget for a gradual increase in business; and 4 – We expect our business to grow rapidly. Pearson's correlation was observed ( $r$ ), Figure 2. According to Cohen (1988), a strong positive correlation was obtained between the variable “Expectations regarding company growth” and the following variables:

- Management systems and use of IT ( $r = 0.505$ ).
- Business networking ( $r = 0.510$ ).
- Innovation strategy ( $r = 0.544$ ).
- Market horizon ( $r = 0.521$ ).

A positive correlation of mean strength was obtained between the variable “Expectations regarding company growth” and the following variables:

- Attitude towards change ( $r = 0.455$ ).
- Management of ideas ( $r = 0.408$ ).

- Training of employees ( $r = 0.479$ ).
- Intellectual property rights ( $r = 0.426$ ).
- Internal investment in innovation ( $r = 0.382$ ).
- Application of technology ( $r = 0.367$ ).
- Product development cycle ( $r = 0.346$ ).
- Qualifications of employees ( $r = 0.366$ ).



**Figure 2.** The strong correlations between the innovation capacity dimensions.

The obtained results showed that the companies which expect their business to grow in the future have a developed innovation strategy. Their market horizon transcends the local and regional markets, and these companies show tendencies to expand their business to the international level. In accordance to this, these companies have established a quality management system and developed business networks. In addition to this, a strong positive correlation was obtained between the variables Database of clients and products and Attitude towards change,  $r = 0.591$ , which is explained by the company's flexibility to respond to different market demands.

The existence of a strong and moderate correlation between growth expectations and the dimensions of innovative capacities, hypothesis H3, according to which the expectations regarding the company's growth are correlated with the level of innovative capacity dimensions, was confirmed.

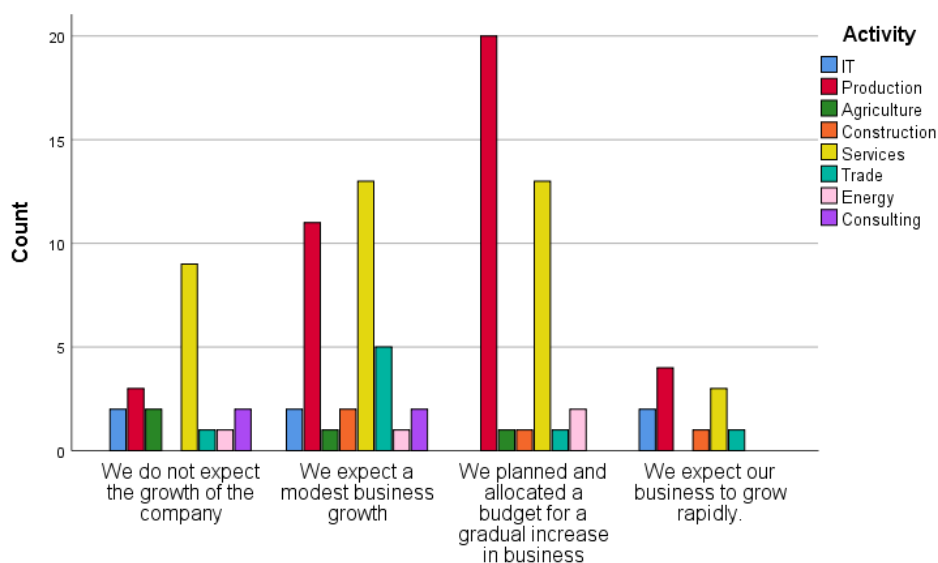
### 5.4. The growth expectations in relation to the characteristics of the company

In order to test H4, the growth expectations in relation to the characteristics of the company were examined. First, the central tendency measure for the company's expectations regarding its future growth by activities was observed. Since these are nominal and ordinal variables, the median was chosen as a measure. The results showed that the differences in expectations regarding the future growth of the company depend on the activity the company is engaged in, Table 10. It can be noticed that the distribution of companies by activities is not uniform, and this should be considered when interpreting the results.

**Table 10.**  
*Median for the company's expectations regarding its future growth by activities*

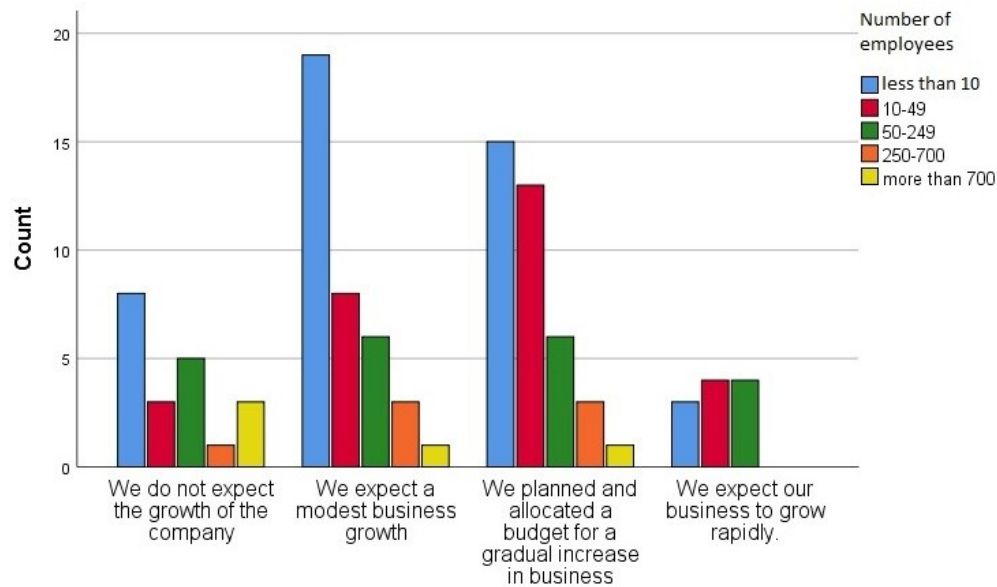
Activity	N	Median
IT	6	“We expect a modest business growth”
Production	38	“We planned and allocated a budget for a gradual increase in business”
Agriculture	4	Between “We do not expect the growth of the company” and “We expect a modest business growth”
Construction	4	Between “We expect a modest business growth” and “We planned and allocated a budget for a gradual increase in business”
Services	38	“We expect a modest business growth”
Trade	8	“We expect a modest business growth”
Energy	4	Between “We expect a modest business growth” and “We planned and allocated a budget for a gradual increase in business”
Consulting	4	Between “We do not expect the growth of the company” and “We expect a modest business growth”

Then, the growth expectations levels were examined in relation to the activity the company is engaged in. The results showed that the expectation of rapid growth is present in companies whose activities are related to production, services, trade and construction, Figure 3.



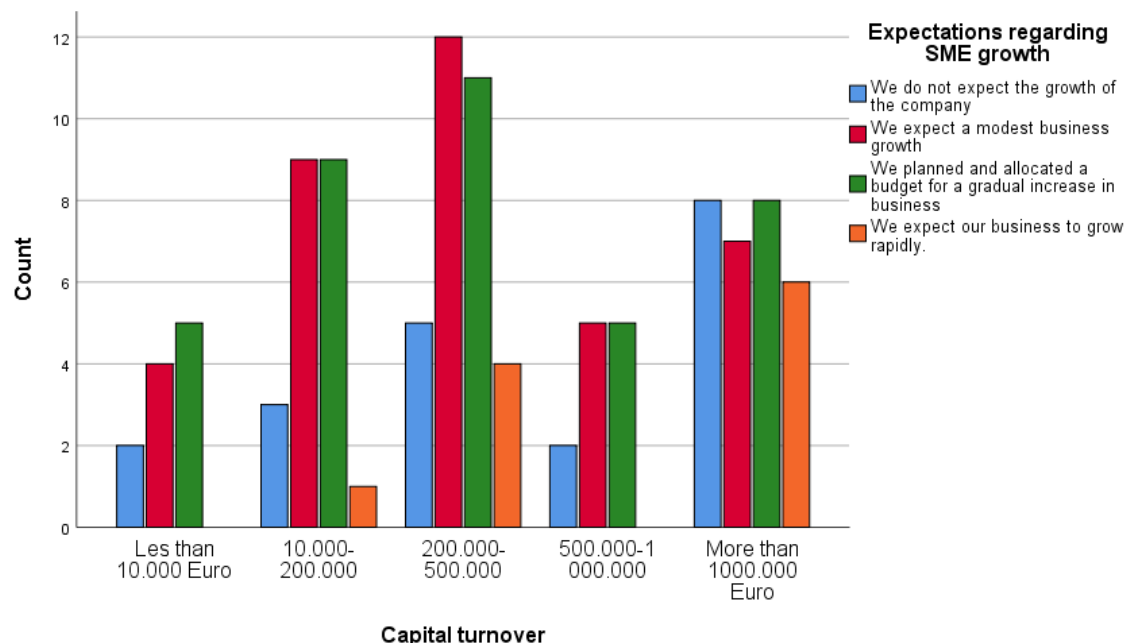
**Figure 3.** The expectations regarding company growth by activities.

When it comes to the growth expectations levels in relation to the number of employees, it is shown that the expectation of rapid growth is present in companies with less than 250 employees. Generally, the largest number of companies expect a modest business growth, Figure 4.



**Figure 4.** The expectations regarding company growth in relation to the number of employees.

In relation to the annual capital turnover, the highest growth expectations levels were obtained in companies with the annual capital turnover in the range 10.000-500.000 EUR, and over 1.000.000 EUR, Table 13 and Figure 5.



**Figure 5.** The annual capital turnover and the expectations regarding company growth crosstabulation.

The obtained results showed that the expectations regarding company growth depend on the characteristics of the company: the size of the company and the activity the company is engaged in. This confirms H4.

## 6. Summary

The research results showed that companies in Serbia differ in regard to the innovation capacities depending on the size of the company, in terms of number of employees and the annual capital turnover, which is in accordance to the results of the previous research (Sousa, Ferreira, and Vaz, 2020). According to the number of employees, the micro companies are very well aware of the situation on market. They are open to changes and they intend to collaborate with many clients in the future. But due to the modest capital turnover, these companies are facing struggles with financing growth.

In the case of small companies, all the innovation capacities dimensions are at an intermediate level, except market horizon, since they are oriented only on domestic market. Compared to micro companies, they show much better results in regard to financing growth.

The medium-sized companies are less open to change compared to small companies, and instead of collaborating with many customers, they plan to offer only two/ three products to selected customers on domestic market. At the same time, they are very engaged in growth financing and the innovation investments.

The large companies showed exceptional results in regard to financing growth, better than in any other company category. They also invest in innovation and make plans for several years ahead, but these companies only plan to focus on meeting the needs of the local market, as well as the very large companies, which can be seen as a little unexpected.

The very large companies do not plan ahead, because they feel that the amount of work they currently have does not require planning. Other dimensions of innovation capacity are lower, which was not expected. It can be speculated that they create a kind of monopoly on the local market for certain, sought-after products.

Generally, in relation to the number of employees, it was shown that the category of companies with the biggest disproportion of innovation capacities implementation levels is the category of large companies, with 250-700 employees, which have the highest innovation capacities when it comes to growth financing, and the lowest when it comes to market horizon, compared to other categories of companies. The biggest difference in some innovation capacity dimension implementation levels among companies was obtained for the Financing growth, which achieved the highest result in large companies, and the lowest result in micro companies, with less than 10 employees. Market horizon also showed the lowest implementation levels in large companies, as well as in very large companies, with more than

700 employees, together with Planning. The large companies generally showed the lowest innovation capacities implementation levels, compared to other categories of companies. It can be concluded that smaller companies, in regard to the number of employees, are more open to changes. They have good market horizon and awareness, planning strategies and clients and products database, and they invest in innovation. The larger companies have more advantage when it comes to financing growth, but they also showed to be very engaged in planning.

The innovation capacity dimensions in relation to the annual capital turnover significantly differ when it comes to the attitude towards change, clients and products database and the relationships with the academic environment. The results showed that the companies with the annual capital turnover in the category of 500.000-1.000.000 EUR, are most open to changes, but they also show the least links with academia. In the case of companies in the category of over 1.000.000 EUR, the attitude towards change is the least represented, and they also have the less developed clients and products database. The companies in range of less than 10.000 EUR have the clients and products database at the highest level. The best collaboration with the academia is shown in companies with the annual capital turnover in the category of 10.000-200.000 EUR.

When it comes to the growth expectations in relation to the innovation management dimensions implementation levels, the obtained results showed that companies which expect their business to grow in the future implement an advanced innovation strategy, especially in the fields of market horizon and business networking, and well-developed management systems with the accent on IT sector. The results also showed that the growth expectations depend on the characteristics of the company. The rapid growth is expected in companies whose activities are related to production, services, trade and construction, with less than 250 employees, and with the annual capital turnover in the range 10.000 – 500.000 EUR, and over 1.000.000 EUR.

## References

1. AleksićMirić, A., Petrović, M., and Aničić, Z. (2019). Organizational Innovativeness: Factors that Drive Innovations in Social Enterprises in Serbia. *Management: Journal of Sustainable Business and Management Solutions in Emerging Economies*, 24(3), pp. 47-58. DOI: 10.7595/management.fon.2019.0014.
2. Beraha, I., and Đuričin, S. (2020). Istraživanje potencijala za razvoj inovativnog ženskog preduzetništva u Srbiji. *Ekonomika*, 66(1), pp. 93-104. doi:10.5937/ekonomika2001093B.

3. Chen, J., Viardot, E., and Brem, A. (2019). Innovation and innovation management. In: J. Chen, A. Brem, E. Viardot & P.K. Wong (Eds.), *The Routledge Companion to Innovation Management* (pp. 3-16). DOI: 10.4324/9781315276670-1.
4. Cohen, J.W.(1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.
5. Cvetanović, S., Andrejević Panić, A., and Kostić, A. (2020). National innovation capacity and economic progress of countries. *Economic themes*, Vol. 59(3), pp. 297-314. DOI 10.2478/ethemes-2021-0017.
6. D'Andria, D., and Savin, I. (2018). A Win-Win-Win? Motivating innovation in a knowledge economy with tax incentives. *Technological Forecasting and Social Change*, Vol. 127, pp. 38-56. <https://doi.org/10.1016/j.techfore.2017.05.030>.
7. Dašić, P., Dašić J., Atanasković, D., and Pavićević, N. (2020). Statistical Analysis and Modeling of Global Innovation Index (GII) of Serbia. *Lecture Notes in Networks and Systems (LNNS)*, Vol. 128. Proceedings of 6<sup>th</sup> International Conference "New Technologies", Sarajevo, Bosnia and Herzegovina, 25-27 June 2020, pp. 515-521. Doi:10.1007/978-3-030-46817-0\_59.
8. Economy of the European Union. In European Commission, Directorate-General for Research and Innovation. *Knowledge for growth: Prospects for science, technology and innovation* (pp. 35-39). Publications Office. <https://data.europa.eu/doi/10.2777/47564>.
9. Evidence. *Research Policy*, Vol. 39(10), pp. 1264-1276. DOI: 10.1016/j.respol.2010.07.005.
10. Foray, D., David, P.A., & Hall, B. (2010). Smart Specialization: The Concept. In European Commission, Directorate-General for Research and Innovation. *Knowledge for growth: Prospects for science, technology and innovation* (pp. 20-24). Publications Office. <https://data.europa.eu/doi/10.2777/47564>.
11. Hasan, I., and Tucci, C.L. (2010). The Innovation–Economic Growth Nexus: Global.
12. Lalić, B., Ćirić, D., Gračanin, D., and Anišić Z. (2019). The Importance of Education in Enhancing the Innovation Capacity in Serbia. In: J. Reis, S. Pinelas, N. Melão (Eds.), *Industrial Engineering and Operations Management II. IJCIEOM 2018. Springer Proceedings in Mathematics & Statistics*, Vol. 281, pp. 63-71. Cham.: Springer, [https://doi.org/10.1007/978-3-030-14973-4\\_6](https://doi.org/10.1007/978-3-030-14973-4_6).
13. Malanowski, N., Tübke, A., Dosso, M., and Potters, L. (2021). Deriving new anticipation-based policy instruments for attracting research and development and innovation in global value chains to Europe. *Futures*, Vol. 128, pp. 1-12. <https://doi.org/10.1016/j.futures.2021.102712>.
14. Massis, D.A., Frattini, F., Kotlar, J., Petruzzelli, M.A., and Wright, M. (2016). Innovation Through Tradition: Lessons From Innovative Family Businesses and Directions for Future Research. *Academy of Management Perspectives*, Vol. 30(1), pp. 93-116. <https://doi.org/10.5465/amp.2015.0017>.

15. Medearis, J., and Schumpeter, A.J. (2009). Fourth volume in the "*Major Conservative and Libertarian Thinkers*" series. UK: Continuum International Publishing Group.
16. Mosurović Ružić, M., Miletić, M., and Dobrota, M. (2021). Does a National Innovation System Encourage Sustainability? Lessons from the Construction Industry in Serbia. *Sustainability*, 13(7), 3591. DOI: 10.3390/su13073591.
17. Oksanych, O. (2021). Innovation strategy and its impact on the company's competitive position. *Organization and management*, Vol. 2(54), pp. 125-140. DOI: 10.29119/1899-6116.2021.54.8.
18. Ortt, R., and Van der Duin, P.A. (2020). The evolution of innovation management towards contextual innovation. In: R. Ortt, P.A. Van der Duin (Eds.), *Contextual Innovation Management: Adapting Innovation Processes to Different Situations* (pp. 522-538). DOI: 10.4324/9781315687131-1.
19. O'Sullivan, M. (2010). EU's R&D deficit. In European Commission, Directorate-General for Research and Innovation. *Knowledge for growth: Prospects for science, technology and innovation* (pp. 10-12). Publications Office. <https://data.europa.eu/doi/10.2777/47564>.
20. Radojević, N. (2021). Innovating (a Lot) With a Little: High-Tech Innovation in Southeast Europe. *Management: Journal Of Sustainable Business And Management Solutions In Emerging Economies*. doi: 10.7595/management.fon.2021.0033.
21. Salam, S., Senin, A.A., Sheeraz, M.I., and Zainab, S.S. (2020). Innovation Management: A Bibliometric Analysis. *Journal of Public Value and Administration Insights*, Vol. 3(4), pp. 169-182. DOI: 10.31580/jpvai.v3i4.1656.
22. Savić, N., Pitić, G., and Lazarević, J. (2018). Innovation-driven economy and Serbia. *Ekonomikapreduzeća*, 66(1-2), pp. 139-150. DOI: 10.5937/EKOPRE1802139S.
23. Schramm, L. (2017). *Technological innovation*. Berlin: De Gruyter.
24. Sousa, M.J., Ferreira, C., and Vaz, D. (2020). Innovation Public Policy – The Case of Portugal. *Management and Economics Research Journal*, Vol. 6, pp. 1-14. DOI: 10.18639/MERJ.2020.962097.
25. Stichweh, R. (2018). The Knowledge Production of the Future. In: S. Mair, D. Messner & L. Meyer (Eds.), *Germany and the World 2030. What will change. How we must act* (pp. 216-221). Econ.
26. Štrbac, D., Kutlača, Đ., and Semenčenko, D. (2020, September, 20-23). *Open science policy in Serbia as an aspect of responsible research and innovation* [Paper presentation]. XLVII Symposium on Operational Research, Belgrade, Serbia.
27. Veugelers, R., and Mrak, M. (2010). Catching-up Member States and the Knowledge.



## Appendix

21 innovation capacity dimensions implementation levels:

1. Innovation strategy
  1. We do not have an innovation strategy
  2. We need to introduce innovation as part of our company's strategy
  3. We have an innovative strategy that our management understands
  4. Our innovative strategy is an integral part of the company's overall strategy, and employees, customers and suppliers have a clear picture of it.
2. Management of ideas
  1. We do not have any official method for generating and evaluating ideas.
  2. Our ideas are generated by a research and development group.
  3. We collect and review the ideas of all employees and all clients.
  4. We have introduced a systematic process for collecting and managing new ideas, from multiple internal and external sources, including suppliers, customers and users.
3. Attitude towards change
  1. We hesitate to change anything in case it goes wrong.
  2. We know we need to change but we don't know how.
  3. We actively strive for change in the way we work.
  4. We expect to be involved in the process of constant change.
4. Product development cycle
  1. We do not monitor or measure the time required to develop a new product or service.
  2. We monitor the development time of a new product or service in relation to the plan.
  3. We measure time to market exit for most of our new products and services.
  4. We measure the time to market and the time to start making a profit for all our products and services.
5. Application of technology
  1. Our products and processes are based on traditional technology.
  2. We embrace new technologies when they prove successful.
  3. Our company is one of the technological leaders in our sector.
  4. We are responsible for the development of new technologies in our field.
6. Intellectual property rights
  1. We do not use trademarks, patents or design rights in our company.
  2. We are looking for a way to legally protect our technology, know-how and reputation.
  3. We expect our business to be protected through several different types of intellectual property.

4. Our technology and reputation is already protected by approved patents and registered trademarks.
7. Database of clients and products
  1. Our business will depend on one product/customer.
  2. We will offer two/ three products to selected customers.
  3. We will offer products and services to many customers.
  4. We will have a wide range of products and a large customer base.
8. Market horizon
  1. We will focus on meeting the needs of our local market.
  2. The market for our products or services will cover Serbia.
  3. We will mostly do business with clients from Europe.
  4. We will mostly do business with clients from developed countries all over the world.
9. Expectations regarding the growth of the company
  1. We do not expect significant turnover growth.
  2. We expect a modest increase in business.
  3. We have planned and allocated a budget for gradual business growth.
  4. We expect our business to grow rapidly.
10. Market awareness and perception
  1. We do not try to analyze the market and its trends.
  2. We rely on customer feedback to maintain market awareness.
  3. We examine market opportunities and threats every year.
  4. We constantly pay attention to market opportunities and threats.
11. Planning
  1. We have a lot of work to do and we don't have time to plan ahead.
  2. Every 12 months we make a plan for the next year.
  3. We look 2-3 years ahead in making the annual plan.
  4. We do strategic planning for 5 and more years.
12. Decision making
  1. All major decisions are made by the owner of the company.
  2. The owner seeks advice from employees when making key decisions.
  3. Our company is run by a small team of directors.
  4. Our board consists of executive directors and directors who do not have executive power.
13. Management systems and information technology (IT)
  1. There is no management system in our company.
  2. We are aware of the need for a Plan/Implementation/Verification/Action to improve performance as well as the use of information technologies.
  3. We strategically use management and IT systems to ensure the implementation of the tasks required to achieve commercial goals.

4. We use management systems and IT as part of a strategy in search of continuous improvement and development of innovations.
14. Acceptance of external advice
1. We rarely ask for external help.
  2. We occasionally use the services of local business support services.
  3. We used the expert advice of some experts.
  4. We often seek advice from experts in business or technology.
15. Internal investment in innovation
1. We do not have a budget for innovation.
  2. We work on the development of new products/ services based on commercial contracts.
  3. We regularly co-finance research and development projects.
  4. Every year we reinvest some percentage of sales revenue in certain innovative projects and activities.
16. Financing growth
1. Our growth is tied solely to our profits.
  2. We are considering new ways to finance company growth.
  3. We will use limited loans (debt refinancing) to enable growth.
  4. We use various forms of financing for innovation, including risk capital.
17. Qualifications of employees
1. Our employees do not have recognized qualifications.
  2. Most of the employees have professional qualifications.
  3. A small number of employees have diplomas or professional qualifications.
  4. Most employees have university degrees/professional qualifications.
18. Training of employees
1. There is no need for our employees to attend any courses.
  2. Some employees go to trainings if a suitable course is indicated.
  3. We have training programs for several selected individuals from our company.
  4. Appropriate training programs are available to all our employees.
19. Relationships with the academic environment
1. Our company is not affiliated with colleges or universities.
  2. We have contact with the local college.
  3. We are trying to connect with the university.
  4. We have established strong ties with academic institutions.
20. Business networking
1. We are not members of any business or technology network.
  2. We have some contacts with business/technology networks.
  3. We are active in numerous business/technology networks.
  4. We are leading participants in the development of the business/technology network.

## 21. Reputation

1. We did not try to promote the activities of our company.
2. We try very hard to promote the activities of our company.
3. Our company is well known in our business sector.
4. Our company is recognized worldwide.