



## INNOVATION CAPACITIES AS THE KEY TO SURVIVAL – A CASE STUDY IN SERBIA

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**Abstract:** *The innovation of companies is of vital importance because it allows them to penetrate markets and provides better connections with emerging markets, which can lead to greater opportunities. Measuring innovation is an important activity both for theoretical and practical tests. This paper presents research on the innovation capacities of small and medium enterprises in Serbia according to the model consisting of 21 dimensions. The observed sample consists of 106 companies, of different sizes, whose activities are grouped into production and service activities. Similarities and differences in the innovative capacities of companies concerning their activity and in relation to their size were analyzed. The results of the research indicate the main problems that small and medium-sized enterprises are facing in order to improve their innovative capacities such as the market horizon, inadequate management systems, short-term planning, and insufficient connectivity with partners and academia.*

**Keywords:** *Innovation, Innovation capacities, Attitude towards change.*

**JEL Classification** O33 · L16

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## 1. INTRODUCTION

Innovation can be seen as a management process with the systematic exploitation of new ideas in an effort to survive in the market and achieve competitive advantages. Since innovation has become a condition for survival in an extremely competitive market, several tools have been developed that companies can use to assess the current state of innovation capacity, for comparison purposes, and to plan necessary changes.

This paper presents the results of the research on the innovation capacities of small and medium companies in Serbia. The main objective of the research was to determine up to which level the innovation capacities of Serbian companies were developed and to reveal the main problems that companies face in order to encourage innovation. Concerning the determinants defined in previous studies, it was assumed that the capacities for innovation development were different in production and non-production activities, and **hypothesis one** was investigated: *there are differences between the levels of innovation capacity in production and service companies.*

Innovation implies constant changes. These changes require different tasks and resources in productive and non-productive activities, which was investigated by proving **hypothesis two**: *the attitude towards change depends on the company's size and activity - production or service.*

In order to determine the companies' innovation capacity level, the specialized diagnostic tool was used to define the innovation management aspects related to innovation capacity.

The research results showed that, when it comes to innovation capacity, there are differences between companies in Serbia, and that these differences are conditioned by the size of the company and the activity the company is engaged in. The main contribution of this research is to provide guidelines for the companies' innovation capacity improvement. At the beginning of the paper, the theoretical framework is given, in order to provide insight into the importance of innovation for overall national economic growth, as well as to indicate the determinants of the innovation capacity measurement. In the continuation, the research methodology is explained. Further, the results of the empirical research are presented, including the sample description, followed by the discussion and conclusion.

## 2. THEORETICAL FRAMEWORK

“In the economic sense, innovation consists of scientific, technical, commercial and financial steps necessary for the successful development of new or improved products, processes or services” (Neely & Hii, 2014, p. 48). Innovation encompasses three broad dimensions: (i) “the renewal and enlargement of the range of products and services and the associated markets”; (ii) “the establishment of new methods of production, supply and distribution”; and (iii) “the introduction of changes in management, work organization, and the working conditions and skills of the workforce” (Neely & Hii, 2014, p. 49). It has been stated that “research is the transformation of money into knowledge, innovation is the transformation of knowledge into money” (Schramm, 2017, p. 5). Different studies have shown that innovativeness enables companies to “improve performance, increasing exports, generating a competitive advantage, and/or contributing to business growth” (Sancho-Zamora et al., 2021, p. 4).

A company's capacity to produce innovation can be seen “as the potential of that firm to generate innovative output” (Neely & Hii, 2014, p 47). The innovation capacity has been defined as the propen-

sity of a company to spot new developments and technologies and use this knowledge and information. A company's innovative capacity is considered to be "a critical factor in the evolution and survival in the current changing environment" (Silva, 2021, p. 395). Other definitions refer to innovation as the "ability to continuously transform knowledge and ideas into new products, processes, and systems for the benefit of the company and its stakeholders" (Silva, 2021, p. 395). Further, regarding the market demands, it is considered that "innovation capacity is a company's capability to progress its resources and take advantage of opportunities to better satisfy customer needs (Mogashoa & Selebi, 2021, p. 3). Innovation capacity is, at that point, "the capacity of an undertaking to effectively actualize and apply new plans to items, administrations, and procedures" (Idewele et al., 2021, p. 2645).

Since the contemporary economy includes the globalization of innovation, production, and trade, innovation has become the essential source of competitive advantage for companies, providing better connections with emerging markets, and for national economies as well. In every society, especially in developing countries, the implementation of innovation in entrepreneurship is considered a precondition for social, cultural, and economic development. "The ability of the national economy to create and to valorize innovations on the market represents its national innovation capacity, which is at the same time a key determinant of countries' economic progress" (Cvetanović et al., 2021, pp. 297). A national innovative capacity is "the ability of a country to produce and commercialize a flow of innovative technology over the long term" (Andrijauskiene et al., 2021, p. 2). Therefore, it is important to establish a valid tool for measuring the innovation capacity of companies, in order to determine the advantages and flaws of innovation management, so it can be improved by developing new management strategies in accordance with national innovation policies.

Measuring innovative capacity provides "important insights on the dynamics of any economic activity, nation or geographical area" (Lukjanska, 2010, p. 43). Despite the importance of innovation capacity, there is no consensus in the literature on its determinants or its measurement. Based on one study analysis and supported by later studies, these seven determinants of the innovation capacity were generated: "transformative leadership, strategic intention to innovate, weight management for innovation, customer and market knowledge, strategic technology management, organizational structure, project management and innovation performance" (Silva, 2021, p. 397). According to another study, the other seven elements of the innovation capability were defined: "capabilities for knowledge exploitation, entrepreneurial capabilities, risk management capabilities, networking capabilities, development capabilities, change management capabilities, and market and customer knowledge capabilities (Mogashoa & Selebi, 2021, p. 4). "A systematic approach to innovation could guide the organization in a better way to identify gaps in its innovation capacity by estimating and evaluating the results of innovation" (Silva, 2021, p. 391).

The results of the previous studies have shown that "innovation management methods affect the innovation capacity of companies, obtained in different contexts, industries and company sizes" (Silva, 2021, p. 391), and demonstrated, as well, the existence of "the relationship between innovation capacity and financial performance" of a company (Walter et al., 2021, p. 2).

### 3. RESEARCH METHODOLOGY

In order to shed light on the innovative capacities of companies in Serbia, empirical research based on the INNOVATE tool was conducted in 2021. INNOVATE is a diagnostic tool for innovative capacities that was created with the support of the ICIP and SECEP projects funded by the European Union. This tool applies to companies of all sizes and stages of development, including micro-enterprises and start-ups. INNOVATE tool gives information about how successful a com-

pany is in managing twenty-one aspects, or “dimensions”, of innovation management, by comparing its existing practices to one of four pre-defined statements. Answers were simply entered through a series of pre-defined “drop-down menus”. The following dimensions of innovative capacities were observed: 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, and Reputation. 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.

For research purposes, the Google questionnaire based on the INNOVATE tool was constructed and sent to 150 companies in Serbia, selected by random choice. 106 companies responded to the request to participate in the research, and they were of various sizes and activities.

The innovation capacities of companies were analyzed in relation to the activity of the company - whether it is a production or service company, and the annual capital turnover. The data was processed with the IBM SPSS Statistics 25 software package.

The descriptive statistical methods were used to display mean values for 21 observed dimensions of innovation management.

Since the first goal of the research was to compare innovation capacities in production and service companies, a statistically Independent Samples t-Test was used to determine statistically significant differences between companies in regard to their activities. The second goal of the research was to determine whether the attitude towards change depends on the company’s size and activity, and a two-way ANOVA statistical method was applied to analyze the impact of the company’s activities and its annual capital turnover on the company’s readiness for change.

The results were prepared in the SPSS and the MS EXCEL 2013 software.

#### 4. Empirical research of innovative capacities of companies in Serbia

##### 4.1. Sample description

The sample consisted of 106 companies engaged in production or service activities (Table 1), which differ in size in terms of the number of employees and the annual capital turnover (Table 2 and Table 3).

**Table 1.** The activity of companies - production or service

		Frequency	Percent	Valid Percent
<b>Valid</b>	<b>Production</b>	45	42,5	42,5
	<b>Services</b>	61	57,5	57,5
	<b>Total</b>	106	100,0	100,0

**Source:** Own elaboration

It can be seen that there are slightly more service companies in the sample, 57.5%, compared to 42.5% of production companies.

**Table 2.** The number of employees

Number of employees	Less than 10	10-49	50-249	250-700	More than 700	In total
Number	45	28	21	7	5	106
%	42.5	26.4	19.8	6.6	4.7	100.0

Source: Own elaboration

Most of the companies in the sample are those with less than 10 employees (42.5%).

**Table 3.** The annual capital turnover

Annual capital turnover (in 1000 EUR)	Less than 10	10-200	200-500	500-1000	More than 1000	In total
Number	11	22	32	12	29	106
%	10.4	20.10	30.2	11.3	27.4	100.0

Source: Own elaboration

The annual capital turnover in regard to the company's activity - production or service, is shown in Table 4 and Table 5.

**Table 4.** The annual capital turnover of production companies in EUR

Annual capital turnover <sup>a</sup>					
Thousands Euro	Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	Less than 10	4	8,9	8,9	8,9
	10 - 200	7	15,6	15,6	24,4
	200 - 500	11	24,4	24,4	48,9
	500 - 1000	6	13,3	13,3	62,2
	More than 1.000	17	37,8	37,8	100,0
	Total	45	100,0	100,0	

<sup>a</sup> Activity = Production

Source: Own elaboration

**Table 5.** The annual capital turnover of services companies in EUR

Annual capital turnover <sup>a</sup>					
Thousands Euro	Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	Less than 10	7	11,5	11,5	11,5
	10 - 200	15	24,6	24,6	36,1
	200 - 500	21	34,4	34,4	70,5
	500 - 1000	6	9,8	9,8	80,3
	More than 1.000	12	19,7	19,7	100,0
	Total	61	100,0	100,0	

<sup>a</sup> Activity = Services

Source: Own elaboration

It can be seen that the sample includes a slightly higher percentage of production companies with an annual turnover of over one million EUR (17%), compared to service companies (12%).

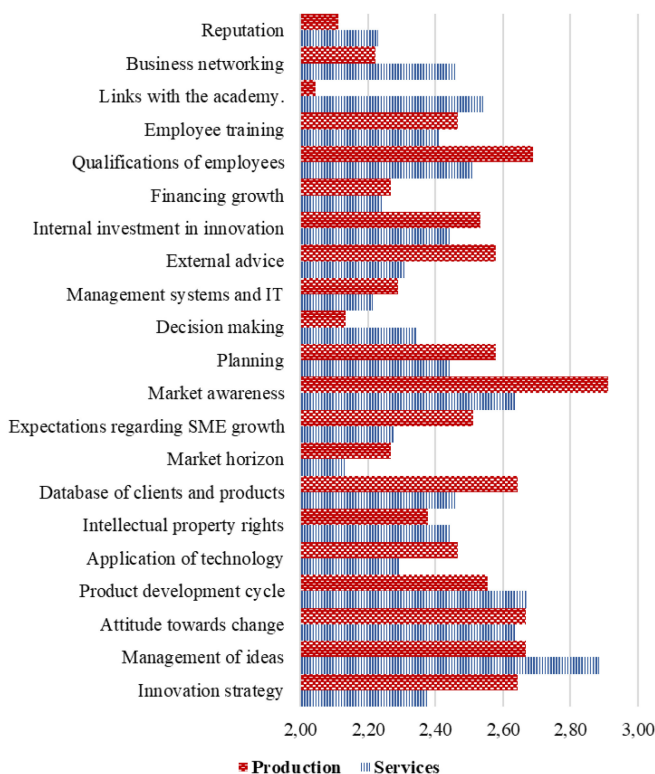
## 4.2. Research results

In order to test hypothesis one, the 21 dimensions of innovation capacities of production and service companies were observed, and the obtained results indicated the differences in the levels of innovation capacity in regard to the activity of the company(Figure 1). It is shown that there is a significant difference in innovative capacities between production companies and service companies.

On a scale from 1-4, the obtained mean values of the innovation capacities dimensions are in the range between values 2 and 3. The smallest differences in the levels of innovation capacities among production and service companies were obtained for the dimension “Attitude towards change”, while the biggest was obtained for “Links with the academy”.

The highest values of innovation capacity in production companies were obtained for “Market awareness”, while in service companies for “Management of ideas”.

The lowest values of innovation capacity in production companies were obtained for “Links with the academy”, and in service companies for “Market horizon”.



**Figure 1.** Innovation capacities of production and service companies

**Source:** Own elaboration

By applying the Independent Samples t-Test, the 21 dimensions of innovation capacities were observed in order to determine whether there is a statistically significant difference between companies engaged in production activities and companies engaged in service activities. Statistically

significant differences in favor of service companies were obtained for the “Links with the academy” innovation capacities dimension (Sig:=0.046<0.95), as shown in Table 6 and Table 7. Since the t-Test is very sensitive to variance differences, with Levene’s Test for Equality of Variances showing that the condition of Equal variances was not met, the second row with adjusted values was observed for the case when Equal variances were not assumed.

**Table 6.** Independent Samples t-Test - Links with the academy

		Levene’s Test for Equality of Variances		t	df	Sig. (2-tailed)	Mean Diff.	Std. Error Diff.	95% Confidence Interval of the Difference	
		F	Sig.						Lower	Upper
		<b>Links with the academy</b>	EVA						4,93	0,03
EVNA				2,02	100,41	0,05	0,50	0,25	0,01	0,98

EVA-Equal variances assumed, EVNA-Equal variances not assumed

**Source:** Own elaboration

The obtained results showed that service companies are more open to collaboration with the academy than production companies, which is an important piece of information in the assessment of innovation and which confirmed hypothesis one, that there are differences in innovation capacities among companies in regard to the activities they are engaged in.

**Table 7.** Links with the academy - Descriptive

Activity		N	Mean	Std. Deviation	Std. Error Mean
<b>Links with the academy</b>	<b>Services</b>	61	2,54	1,336	0,171
	<b>Production</b>	45	2,04	1,186	0,177

**Source:** Own elaboration

In order to test hypothesis two, the statistical method of two-factor analysis of variance was applied. The company’s attitude towards change was observed in relation to the company’s activity - production or service, and the company’s size, in terms of the annual capital turnover. Attitude towards change was considered as a dependent variable, and two independent variables - the company’s activity and the annual capital turnover, as predictors. The obtained results showed that the annual capital turnover significantly affects the company’s attitude towards change (Sig=0.019<0,05), while the company’s activity (Sig.= 0.615) and the combination Activity \* Turnover (Sig=0.761) do not affect the company’s attitude towards change significantly (Table 8).

Furthermore, it was shown that the company’s attitude towards change, for both production and service companies, depends on the company’s size in relation to the annual capital turnover, but the activity the company is engaged in proved to be irrelevant for its openness to change.

The previous results (Figure 2 and Independent Samples t-test) showed that the company’s activity, in terms of whether it is production or service, does not affect the propensity to change, and in the two-factor analysis of variance, it is shown that the combination of company activity and annual turnover does not affect the propensity to change, as well.

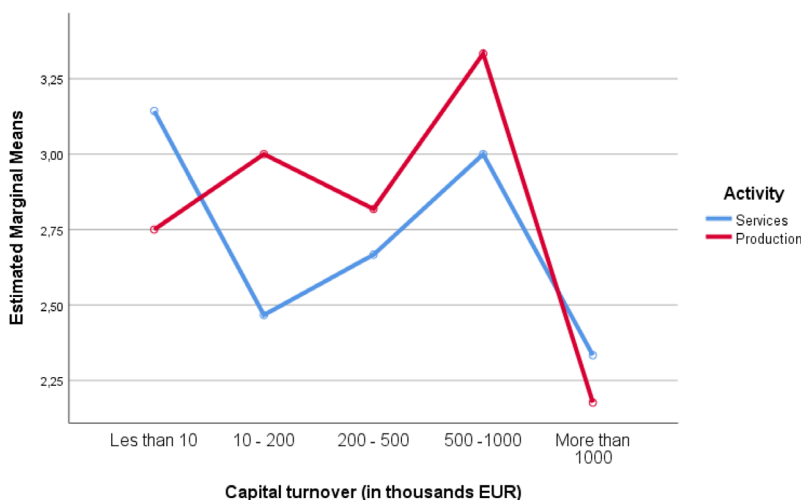
It was demonstrated that the company’s attitude toward change depends on the company’s annual capital turnover, Figure 2.

**Table 8.** Tests of Between-Subjects Effects, Dependent Variable: Attitude towards change  
**Tests of Between-Subjects Effects**

Source	Attitude towards change							
	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>b</sup>
<b>Corrected Model</b>	11,971 <sup>a</sup>	9	1,330	1,875	0,065	0,149	16,872	0,795
<b>Intercept</b>	630,219	1	630,219	888,231	0,000	0,902	888,231	1,000
<b>Activity</b>	0,180	1	0,180	0,254	0,615	0,003	0,254	0,079
<b>Turnover</b>	8,813	4	2,203	3,105	0,019	0,115	12,421	0,796
<b>Activity * Turnover</b>	2,161	4	0,540	0,761	0,553	0,031	3,046	0,237
<b>Error</b>	68,114	96	0,710					
<b>Total</b>	825,000	106						
<b>Corrected Total</b>	80,085	105						

R Squared = ,149 (Adjusted R Squared = ,070); Computed using alpha = ,05

Source: Own elaboration



**Figure 2.** The attitude towards change depends on the annual capital turnover for production and service companies

Source: Own elaboration

The highest level of attitude toward change was obtained in production companies with an annual turnover of around one million Euros. For service companies, the highest readiness for change was obtained in companies with the lowest annual capital turnover. The surprising result is that production companies whose annual capital turnover is between 10 thousand and one million Euros are more open to change than service companies, as shown in Figure 2 and Table 9. For companies with an annual turnover of fewer than 10 thousand Euros, which are assumed to be beginners in business, service companies showed more readiness to change. It was also unexpected that the initial readiness to change service companies dropped significantly when the turnover of companies increased. The results showed that both service and production companies with higher annual capital turnover (over one million Euros) show the lowest level of attitude towards change.



According to the results, hypothesis two was only partially confirmed, since no significant dependence of attitude toward change was obtained in relation to the company's activity, but a significant dependence of attitude towards change was obtained concerning the company's turnover.

**Table 9.** Attitude towards change - Descriptive

Thousands Euro	N	Mean	Std. Dev.	Std. Error	95% Confidence Interval for Mean		Min.	Max.
					Lower Bound	Upper Bound		
< 10	11	3,00	0,775	0,234	2,48	3,52	2	4
10-200	22	2,64	0,848	0,181	2,26	3,01	1	4
200-500	32	2,72	0,888	0,157	2,40	3,04	1	4
500 - 1000	12	3,17	0,577	0,167	2,80	3,53	2	4
1000 <	29	2,24	0,872	0,162	1,91	2,57	1	4
<b>Total</b>	106	2,65	0,873	0,085	2,48	2,82	1	4

**Source:** Own elaboration

## 5. DISCUSSION

The research aimed to give a clearer and more complete answer to the question “Why do companies differ?”. The research results showed that, in general, production companies have the weakest innovative capacities related to connection with the academic community, reputation, and decision-making methods. The most developed proved to be innovative capacities related to market awareness, employee qualification, attitude towards change, product innovation cycle, management of ideas, and innovation strategy. In service companies, in general, the lowest level of innovation capacity was obtained for the market horizon, and the highest level of innovation capacity was obtained for idea management, market awareness, attitude towards change, and product development cycle. It was also demonstrated that the company's attitude towards change is not significantly affected by its activity, but that it is significantly dependent on the company's size, in regard to the annual capital turnover, and that the production companies with annual capital turnover lower than one million Euros are most open to change. Generally, it was shown that companies with a large annual capital turnover are less ready for change. These findings are in consent with the results of the previous studies that have shown that the innovation capacity depends on the company's size and activity (Silva, 2021, p. 391), as well as the company's financial scope (Walter et al., 2021, p. 2).

## 6. CONCLUSION

Most of the scientific research on the innovations of small and medium-sized enterprises has approached the topic in a general way, without a deeper analysis including the company's features. In this paper, the difference between the innovation capacities of companies, small and medium-sized, was observed concerning their activity - service or production, and size, in regard to the annual capital turnover.

The research results indicated that the levels of innovation capacities differ between companies engaged in production and companies engaged in services and that the most significant difference is related to the links with the academic environment, where service companies proved to have better collaboration with academia. It can be concluded that, in order to increase innovation capacity, production companies should improve their relations with academia.

When it comes to the attitude towards change, it was shown that the company's attitude towards change depends on the company's size in relation to the annual capital turnover, but the activity the company is engaged in proved to be irrelevant to its openness to change. The companies with high annual capital turnover showed the lowest level of attitude towards change. It can be concluded that to increase innovation capacity, companies with high annual capital turnover should be more open to change.

It is to be stated that there were some limitations of the research, first of all regarding the research sample, since not all of the contracted companies agreed to participate in the research. This should be taken into account for future research. The contribution of this research should be observed primarily regarding the innovation capacity improvement strategies in accordance with the national innovation policies. Due to the importance of innovations for the development of a country, national development strategies must take into account and support companies' development, in order to improve the national economy. Future research on innovations should examine the structure of the company's activities in more detail, to shed light on the aspects important for improving the innovation of specific activities.

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