

# RESEARCH ON INNOVATIVE ACTIVITIES IN SMALL AND MEDIUM-SIZED ENTERPRISES IN THE CZECH REPUBLIC

Petra Matějovská  
\*Miroslav Žížka

Technical University of Liberec  
Faculty of Economics  
Studentská 2, 461 17, Liberec 1, Czech Republic  
[petra.matejovska@tul.cz](mailto:petra.matejovska@tul.cz)

\* Technical University of Liberec  
Faculty of Economics  
Studentská 2, 461 17, Liberec 1, Czech Republic  
[miroslav.zizka@tul.cz](mailto:miroslav.zizka@tul.cz)

## Abstract

This paper deals with current status and development of innovative activities of small and medium-sized enterprises in the Czech Republic and compares them with results of large companies. The research was aimed at studying the dependence of innovative activity on size of a company, diversity of innovative activities in small, medium and large enterprises and to identify the reasons for limiting the innovative activity of enterprises. From the research results it can be seen that innovative activity grows with the size of enterprises. Small and medium-sized enterprises focus rather on non-technical innovation with organizational and marketing nature. The main limiting factors of innovation performance are the lack of financial and informational resources and their own approach to the innovation.

## Introduction

Innovation is currently considered to be an important assumption of competitiveness of companies. Therefore it is necessary to examine the factors which affect innovation performance and recognize how they develop in the individual companies in terms of their size or line of business. The aim of this paper is to analyse the status of innovative activities of small and medium-sized enterprises in the Czech Republic and determine whether significant changes occurred in the analysed periods 2004-2006 and 2006-2008 in the field of innovation for this enterprise category. The research of innovative activities of enterprises in the Czech Republic is part of the Community Innovation Survey (CIS) which is carried out in the European Union every two years, with a reference period of three years. The first common and harmonised survey on innovations took place in the framework of the EU in 1993 (CIS 1). The Czech Republic first joined the investigation in 1999 within the framework of the CIS 3. The information is used for the needs of the EU institutions in making the common policy of support for innovations and the competitiveness of enterprises and then in the individual Member countries for the formation of the national innovation strategies and rising of competitiveness of national enterprises in the international competition.

As reported by *Parvan*, from the results of the CIS 4 it has ensued that the most important effect of innovative activities is the increase of quality of goods and services, extending the range of goods and services, the acquisition of new markets or increase of the market share. On the contrary, only marginal revenue can be seen by innovations in the field of reduction of

environmental impacts, improving the health and safety and reduction of material and energy per unit output. However, there are considerable differences among the Member States.[1]

In 2006, 38.8% of enterprises in the EU-27 (France is missing from the EU aggregates) were considered as innovative. Germany headed the ranking with 62.6% of its enterprises which were classified as innovative. The proportion of innovative enterprises was above the average of EU-27 only by two of the Member States from the 2004 enlargement (Estonia and Cyprus). On the contrary, the rest of the new Member States (incl. the Czech Republic) together with the United Kingdom, the Netherlands, Italy and Spain were below the EU-27 average.[2]

The focus of the research on small and medium-sized enterprises is based on the fact that in view of total subject number, these category entities are dominating in the national economy. According to the Czech Statistical Yearbook 2009 over 99% of enterprises in the Czech Republic have less than 250 employees.[3] Small and medium-sized enterprises play a key role in creating jobs. They belong to the most vulnerable ones - this fact is given by a number of factors at the same time. Šebestová et al. divides these factors in light of controllability into those arising from the business environment (finance, business support, relationship of public administration), factors resulting from the individuality of the entrepreneur (rational motive of business, cooperation within the member organizations), and the factors affecting the innovation potential. Quoted authors have verified the significance of these factors in the sample of 387 companies in the Moravskoslezsky region.[4]

The research and its results presented in this paper is based on the analysis of more than 8,000 companies in two periods (2006 and 2008). The data were obtained in cooperation with the Czech Statistical Office; however the processing methodology is genuine. On the basis of a previous study of literature the following hypotheses have been laid down and these hypotheses are the subject of more detailed analysis:

H1: The occurrence of innovative activity depends on the company size.

H2: The type of innovation depends on the company size. Because some types of innovation are more expensive and in point of view of the limited resources of financing for small and medium-sized enterprises less available, there was also verified a sub hypothesis (H2a-d) which states that small and medium-sized enterprises show a higher occurrence of innovation activity in the field of marketing and organisation, and large enterprises are more active in the category of product and process innovations.

H3: The main factor limiting the innovative activities of small and medium-sized enterprises is the lack of financial resources (own and outside sources).

The paper consists of three parts. Basic concepts of innovations are explained in the first part. Methodological bases of research are listed in the second part of the paper. The third part shows the results of two researches among companies which have been carried out in 2006 and 2008.

## **1 Characteristics of innovation**

As the founder of the theory of innovation, innovative processes and their interrelationship with economic growth an Austrian economist *Joseph Alois Schumpeter* is considered to have first introduced and clarified the concept of innovation in his writing *The Theory of Economic Development* [5] in 1912. Schumpeter understood the term innovation as any change in the organism of enterprise which leads to a new state. After Schumpeter a number of experts have dealt with the characteristics of the concept of innovation and in literature there can be found a variety of concepts and definitions from the very widely comprised to exactly concrete. Due to limited extent, we only mention selected definitions.

According to OECD innovation is characterised as a creative process where the value added is obtained from understanding, punctually said: Innovation occurs in the heart of economic changes.[6] An innovation is considered to be realized by applying new or significantly improved product (goods or a service) on the market or by using new or significantly improved production technologies.

One of the most famous Czech experts in innovation, professor *František Valenta*, defined innovation as follows: Innovation is any change in the internal structure of the production organism (production unit), so any change from the old status to the new one.[7]

For the purpose of this paper which focuses on innovations we will start from the concept of innovations introduced in so-called Oslo Manual. The reason is the fact that this approach is used by the Czech Statistical Office (CSO) in the analyses of innovation performance of companies in the Czech Republic. According to the Oslo Manual *an innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations.*[6]

CSO divides innovations according to the revised version of the Oslo Manual 2005, therefore differentiates four major types of innovation.

- Innovation of product – represents the implementation of new or significantly improved goods or services with respect to their characteristics and intended use.
- Process innovation – represents the implementation of new or significantly improved production methods or supplier methods. The innovation is typically focused on the reduction of material consumption and wage costs, improving working conditions, reducing energy consumption and diminishing spoilage.
- Marketing innovation – represents the implementation of new marketing methods containing significant design changes or packaging, product location, product support or valuation to increase the sales.
- Organizational innovation – represents the implementation of new organizational methods in the corporate business practices, or in organization of working station or external relations in order to improve the innovative capacity of the enterprise or performance characteristics.[8]

## **2 Methodology of research**

The analysis is based on the specifications of CSO which were obtained in a research of innovative activities of enterprises in 2006 (covered the period 2004-2006) and 2008 (covered the period 2006-2008). To gather the necessary data CSO used a harmonized questionnaire of the EU Member states for collective innovative research of the union called CIS 2006 and CIS 2008. In both cases the selected sample covered 20% of the population. The sample of respondents with at least 10 employees was obtained from the Register of economic entities by combination of areal and stratified random selection in the relevant branches.

In 2006, 8 475 respondents in the business sector were addressed from selected areas of industry and services (codes B to N according to the classification CZ-NACE). The return rate of the questionnaires was 79%. In 2008, 8,638 respondents of the same type were addressed. The return rate was 79% too.

Data for both investigations were analysed in three groups divided by size of enterprises according to the number of employees which are:

- Small enterprises with 10–49 employees,
- Medium-sized enterprises with 50–249 employees,
- Large enterprises with more than 250 employees.[8], [9].

For processing the paper anonymous primary data have been used. The authors of the article processed the results of investigation for the purposes of additional analysis in form of contingency tables.

To study the dependence between two categorical variables there was used a chi-square test of independence in a contingency table.

The strength or intensity of contingency was measured by using the Cramer and Pearson coefficient of contingency. It is valid that the more referred coefficients come near to 1, the stronger the dependence is.

To determine the main limiting causes of the innovation performance of enterprises the factor analysis was used. Factor analysis is used to explain dispersion of observed variables using lower number of latent variables - so-called factors. It is ranked among the multidimensional statistical methods. In short, the purpose of factor analysis is to isolate factors from the correlation matrix of the actual variables which simply explain the observed dependence.

All calculations are performed in a statistical programme Statgraphics Centurion XVI.

### **3 The research results**

In the first phase assumption H1 -- that the occurrence of innovative activity depends on the size of the enterprise -- was validated. The introduced presumption is based on knowledge from literature stating that the motive powers of innovation are particularly small and medium-sized enterprises. Therefore, it can be supposed that the innovative activity should be stronger by the category of small and medium-sized enterprises. The sample of investigated companies was divided into two groups – enterprises with innovative activity and enterprises without innovative activity (non-innovative).

According to the updated methodology of Eurostat from 2010, vide [9] among innovative enterprises are considered those enterprises which in that period introduced either innovation of product or process innovation or which had ongoing or broken innovative activities (technical innovation), or else introduced marketing or organizational innovation. Basically introduce at least one type of innovation.

The number of innovative and non-innovative enterprises in the Czech Republic in both analysed periods, or distribution of absolute frequencies in each size group, is given in *Tab. 1*.

Tab. 1 Comparison of innovative activities of enterprises by size in years 2004-2006 and 2006-2008

Enterprises	Number of enterprises with innovative activity		Number of enterprises without innovative activity		Total number of enterprises	
	2004-2006	2006-2008	2004-2006	2006-2008	2004-2006	2006-2008
<b>Small</b>	1,356	1,207	2,249	1,485	3,605	2,692
<b>Medium-sized</b>	1,001	1,342	844	1,059	1,845	2,401
<b>Large</b>	996	894	361	324	1,357	1,218
<b>Total</b>	3,353	3,443	3,454	2,868	6,807	6,311

Source: own processing

Origin: Czech Statistical Office, 2009

For the purposes of statistical test it was necessary to formulate a null hypothesis that is the opposite of the assumption above. The null hypothesis says that the innovative activity does not depend on the size of the enterprise. To find whether the hypothetical dependency exists there was implemented the chi-square test and the null hypothesis was verified.

The test of independency in a contingency table examines whether the size of company affects the innovativeness of enterprises. It determines whether to reject the presumption that rows and columns are independent on each other. From the Tab. 2 the value of a test criterion for both analysed periods is evident. On the basis of the results we can reject the null hypothesis on the 5% confidence level for both analysed periods, so that rows and columns are independent on each other. This means that the size of the company affects its innovative activity.

Tab. 2 Independency test

Test	Sample 2004-2006	Sample 2006-2008
<b>Chi-square</b>	530.329	278.739
<b>P-Value</b>	p < significance level	p < significance level

Source: own processing

In the next analysis phase the direction and intensity of independence were measured by *Cramer's* and *Pearson's* coefficients (see Tab. 3). On the basis of the calculated values we can state there is a relative weak direct dependence of both quantities. This means that innovative activity grows with the size of the company. Original presumption that says innovative activity will be stronger for small and medium-sized enterprises is not valid.

Tab. 3 Intensity of independence

Statistics	Sample 2004-2006	Sample 2006-2008
<b>Pearson's Coeff.</b>	0.2688	0.2057
<b>Cramer's V</b>	0.2791	0.2102

Source: own processing

Comparing the results of innovative activities of enterprises in the period 2004 to 2006 and in the period 2006 to 2008, we will find out that in both periods the innovative activity was growing with the size of the company. Intensity of this dependence in the second period was a somewhat weaker. This is because of the improvements of innovative activity in the category of small business. While in the period 2004-2006 the share of innovative small enterprises was less than 38%, so in the period 2006-2008 the share increased to almost 45% (the difference is statistically significant on the 5% confidence level). In the category of medium-sized and large enterprises the share of innovative enterprises was in the same level (approx. 55% in medium-sized enterprises and 73% in large enterprises). From the results it can be

concluded that small enterprises are gradually more conscious of the importance of innovation in order to maintain its competitiveness.

In the next phase dependence of a specific type of innovative activity at the enterprise size was surveyed. It is true that product and process innovation are more costly than marketing and organization innovation. Due to the weaker capital strength of small and medium-sized enterprises it is supposed that they prefer a less costly innovation just in the areas of marketing and organization.

First, it was examined whether the type of innovation depends on size of enterprise (H2) in general. The used methodology was the same as for testing the hypothesis H1. The null hypothesis says: The type of innovation is independent on the size of the enterprise.

*Tab. 4 Number of enterprises by type of innovation – comparison of periods 2004-2006 and 2006-2008*

Enterprises	Innovation of product		Process innovation		Organizational innovation		Marketing innovation	
	2004-2006	2006-2008	2004-2006	2006-2008	2004-2006	2006-2008	2004-2006	2006-2008
<b>Small</b>	582	412	679	522	923	721	503	781
<b>Medium-sized</b>	544	629	592	719	755	939	376	823
<b>Large</b>	650	571	723	632	810	667	422	535
<b>Total</b>	1,776	1,612	1,994	1,873	2,488	2,327	1,301	2,139

*Source: own processing; Origin: Czech Statistical Office, 2009*

For both investigated company samples the P-value is less than 0.05. This means that on the significance level of 5% we reject the null hypothesis of the independence of an innovation type on the size of enterprise. Therefore we can accept the alternative hypothesis that the type of innovation depends on the size of the company.

*Tab. 5 Independency test*

Test	Sample 2004-2006	Sample 2006-2008
<b>Chi-square</b>	19.657	86.985
<b>P-Value</b>	0.0032	0.0000

*Source: own processing*

Intensity of independence was measured by Cramer's and Pearson's coefficients. The calculated values are statistically significant, however the dependency is relatively weak (see *Tab. 6*). Slightly stronger dependence has been discovered in a sample of enterprises from 2006-2008 which is consistent with the values reported. It can be concluded that in the time it was leading to stronger differentiation of enterprises in term of conducted innovative activities.

*Tab. 6 Intensity of independence*

Statistics	Sample 2004-2006	Sample 2006-2008
<b>Pearson's Coeff.</b>	0.0509	0.1040
<b>Cramer's V</b>	0.0361	0.0740

*Source: own processing*

On the basis of the finding that the type of innovation depends on the size of enterprise, individual innovation activities were further analysed in term of the size of the company. For verification of these sub hypotheses (H2a-d) we applied the test of difference of proportions.

**a. Hypothesis test for organizational innovation (H2a)**

The share of small and medium-sized enterprises in the total number of enterprises with organizational innovation was 0.6744 in the first sample (2004-2006). In the second sample (2006-2008) it was 0.7134. The share of large enterprises with organizational innovation is 0.3256 and 0.2866. The null hypothesis says that the share of small and medium-sized enterprises with organizational innovation is equal to the share of large enterprises. An alternative hypothesis asserts that the share of small and medium-sized enterprises with organizational innovation is greater than 0.3256 and 0.2866.

The computed P-Value is almost zero in both samples. It means that at significance level alpha of 5% we reject the null hypothesis and can say that organizational innovation is dominated by small and medium-sized enterprises.

**b. Hypothesis test for marketing innovation (H2b)**

The share of small and medium-sized enterprises in the total number of enterprises with marketing innovation was 0.6757 in 2004-2006. In the second period 2006-2008 it was 499. The null hypothesis is derived from a share of large enterprises with marketing innovation, i.e. 0.3243, and 0.2501. Alternative hypothesis then says that the share of SMEs with marketing innovation is higher than 0.3243, and 0.2501. The computed P-Value is almost zero in both analysed samples. Therefore at significance level alpha of 5% we reject the null hypothesis. Presumption that the marketing innovation is mainly implemented by small and medium-sized enterprises has been confirmed.

**c. Hypothesis test for innovation of product (H2c)**

We are testing the hypothesis that large companies are dominating in innovation of product. From the data in *Tab. 4* it can be calculated that in 2004-2006 the share of large companies was 0.3660 in innovation of product and in 2006-2008 it was 0.3542. The null hypothesis is based on the share of SMEs with innovation of product which in the first analysed period was 0.6340 and in the second period it was 0.6458. Alternative hypothesis says that this share is higher. The computed P-value is near to one in both samples. At significance level alpha of 5% we do not reject the null hypothesis. We cannot claim that innovation of products is made especially by large companies. This fact is evident even from *Tab. 4*. In 2004-2006 large enterprises participated in product innovation by 37% or in 2006-2008 by 35%. The share of small enterprises on product innovation was 33% and 26%, and the share of medium-sized enterprises was 31% and 39%. In the first analysed period the highest share of innovation of product was by large companies (however, do not significantly), in the second period the highest share was by medium-sized enterprises.

**d. Hypothesis test for process innovation (H2d)**

Also for this type of innovation we expect more significant share of large enterprises. In the first period the share of large enterprises on process innovation was 0.3626 and in the second period 0.3374. The null hypothesis asserts that this share is the same for SMEs, it means 0.6374 and 0.6626. The computed P-value is near to one in both samples. Therefore at significance level alpha of 5% we do not reject the null hypothesis. Conclusion is similar to the previous type of innovation. We did not confirm the presumption that process innovation is usually realized by large enterprises. From *Tab. 4* it is evident that the share of various categories of companies with process innovation is similar. In 2004-2006 the proportion was 34-30-36% and in 2006-2008 the proportion was 28-38-34%. It means that in the first period there was the highest share of large companies with process innovation (differences are not statistically significant) but in the second period the share decreased in favour of medium-sized enterprises. Development of process innovation trends product innovation as a copy.

On the basis of the hypotheses testing H2a-d we can confirm that the type of some innovations depends on the size of a company. Small and medium-sized enterprises are

slightly more active with organizational and marketing innovation. In case of product and process innovation there are no significant differences in terms of the size of the company.

In addition factors limiting the innovative activity of enterprises were examined. Possible motives for the limitation of innovative activities were classified into 11 main categories. At the same time it was examined to what degree these factors express themselves by each size category of enterprises, and whether, in this aspect, there are statistically significant differences among the company categories. The enterprises evaluated the significance of the factor in the range of "high" to "no effect". The factor was considered to be restrictive when the company qualified it with a high or medium significance. We can generally assume that SMEs suffer from a lack of capital and cannot afford to pay for highly skilled and specialized workforce. SMEs are also often more limited in access to loans and other external sources of financing. It means that it can be assumed that the main cause of innovative activity for limiting SMES should be the lack of funds (H3). Conversely, large enterprises often do not like to risk and therefore uncertain demand for innovative products may discourage them from innovating.

For the determination of the main causes of limiting innovative activity factor analysis has been used which tries to reduce the original number of 11 motives into fewer common factors while retaining the greatest possible extent of the information contained in the original categories.

Limiting motives of innovation activity were divided as follows:

- 1) lack of funds in a company,
- 2) lack of finances from sources outside the firm,
- 3) too high innovation costs,
- 4) absence of qualified workforce,
- 5) lack of information about technology,
- 6) lack of information about markets,
- 7) difficulties in finding a cooperating partner,
- 8) market dominated by established companies,
- 9) uncertain demand for innovative goods or services,
- 10) no innovation due to previous upgrades,
- 11) innovation was not required.

Analysis was performed for both periods.

#### e. Analysis of factors

Input database for 2004-2006 contained information about 11 above mentioned indicators for 6,807 enterprises in the Czech Republic (from that was 5,450 small and medium enterprises). For 2006-2008 it was 6,311 enterprises (from those 5,093 SMEs). Significance of various causes is listed in *Tab. 7* and *Tab. 8*.

*Tab. 7 Motives limiting innovation activity of enterprises and their presence in the various categories of companies in 2004-2006*

Enterprises	Limiting cause										
	1	2	3	4	5	6	7	8	9	10	11
Small	40 %	20 %	33 %	28 %	11 %	12 %	14 %	32 %	27 %	18 %	33 %
Medium-sized	37 %	21 %	36 %	28 %	13 %	13 %	13 %	33 %	29 %	19 %	31 %
Large	36 %	20 %	40 %	36 %	19 %	18 %	15 %	38 %	36 %	20 %	25 %

*Source: own processing; Origin: Czech Statistical Office, 2009*



Tab. 8 Motives limiting innovation activity of enterprises and their presence in the various categories of companies in 2006-

Enterprises	Limiting cause										
	1	2	3	4	5	6	7	8	9	10	11
Small	47 %	27 %	39 %	26 %	13 %	14 %	16 %	38 %	33 %	21 %	36 %
Medium-sized	46 %	29 %	43 %	28 %	16 %	16 %	17 %	39 %	37 %	25 %	36 %
Large	48 %	28 %	48 %	35 %	20 %	21 %	16 %	43 %	39 %	22 %	30 %

Source: own processing; Origin: Czech Statistical Office, 2009

These 11 indicators in both samples were consistently reduced to 3 factors which explain almost 62% and 63%, respectively, of the variability of original data, see Tab. 9. Factors were extracted by the method of major components. Number of factors was selected on the basis of criteria of their own number. Furthermore, there was considered a criterion of percentage variance, so that the factors explain at least 60% of the variance where this boundary is considered to be satisfactory in social science, see [10]. The size of dispersion described by this factor is called communality. To make factor structure simpler, the rotation of factors was made by the Varimax method.

Tab. 9 Overview of factors

Factor	Own number		Percentage variance		Cumulated percentage variance	
	Sample 2004-2006	Sample 2006-2008	Sample 2004-2006	Sample 2006-2008	Sample 2004-2006	Sample 2004-2006
1	<b>4.225</b>	<b>4.243</b>	38.412	38.575	38.412	38.575
2	<b>1.413</b>	<b>1.476</b>	12.845	13.422	51.257	51.998
3	<b>1.139</b>	<b>1.192</b>	10.353	10.840	<b>61.610</b>	<b>62.837</b>
4	0.812	0.867	7.381	7.884	68.991	70722
5	0.669	0.665	6.084	6.044	75.075	76.766
6	0.567	0.518	5.161	4.712	80.236	81.478
7	0.511	0.477	4.649	4.335	84.885	85.813
8	0.462	0.433	4.202	3.940	89.087	89.753
9	0.415	0.403	3.776	3.666	92.863	93.419
10	0.405	0.377	3.684	3.424	96.547	96.843
11	0.380	0.347	3.453	3.157	100.000	100.000

Source: own processing

Furthermore, it was necessary to assess factor loadings representing the measure of independence between original indicator and its factor. It is valid: the higher size of factor load is, the more important by interpretation of factor matrix it is. Sufficiently important as boundary is  $\pm 0.50$ . The last thing is to name the factors that belong to creative activity.

In Tab.10 it is evident that the results of factor analysis are practically identical in both analysed periods. Factor No. 1 is especially characterised by indicators No. 1, 2, 3, 8 and 9

relating to the costs, in particular. Therefore it was named as financial limitation factor. Factor No. 2 is mostly influenced by indicators No. 4, 5, 6 a 7 regarding the sources of information. It was named as factor of the lack of information sources. Last factor No. 3 is influenced mostly by indicators No. 10 and 11 related to reasons for innovation. Therefore this factor was named as the firm's approach to innovation.

At the same time, it is clear that the resultant factors are similar to the original groups in the questionnaire. The first three limiting motives (No. 1, 2, 3) are related to the costs (cost factors), next four motives (No. 4 to 7) are related to information and knowledge (knowledge factors), motives No. 8 and 9 are related to the market environment (market factors) and the remaining motives No. 10 and 11 are evocated by enterprises which have no need to invest (reasons not to innovate).

According to the results of this analysis we can accept defined hypothesis that says a major factor limiting innovation activities of SMEs is lack of funds (own and outside sources).

*Tab. 10 Estimated factor matrix after the rotation by Varimax method*

Indicator	Factor 1		Factor 2		Factor 3	
	Sample 2004-2006	Sample 2006-2008	Sample 2004-2006	Sample 2006-2008	Sample 2004-2006	Sample 2006-2008
1	<b>0.8301</b>	<b>0.8335</b>	0.1475	0.1475	-0.01800	-0.0209
2	<b>0.7564</b>	<b>0.7618</b>	0.1475	0.1664	0.0266	0.0274
3	<b>0.7771</b>	<b>0.8025</b>	0.2343	0.1978	0.0561	0.0416
4	0.3270	0.2800	<b>0.6149</b>	<b>0.6636</b>	0.0028	-0.0114
5	0.1240	0.1193	<b>0.8259</b>	<b>0.8193</b>	0.0701	0.0504
6	0.1438	0.1708	<b>0.8001</b>	<b>0.8006</b>	0.0591	0.0595
7	0.2975	0.2916	<b>0.6263</b>	<b>0.6471</b>	0.0994	0.0970
8	<b>0.5741</b>	<b>0.5878</b>	0.3865	0.3906	0.1615	0.0783
9	<b>0.5277</b>	<b>0.5436</b>	0.3888	0.3994	0.2620	0.1874
10	0.1039	0.1105	0.0887	0.0914	<b>0.8376</b>	<b>0.8513</b>
11	0.0255	-0.0077	0.0557	0.0357	<b>0.8601</b>	<b>0.8758</b>

*Source: own processing*

## Conclusion

On the basis of this analysis concerning innovative activities of small and medium-sized enterprises in the Czech Republic in comparison with large companies we can state that the occurrence of innovative activities of small enterprises (i.e. up to 50 employees) is very low. Based on survey done in 2008, 55% of small enterprises were identified with no innovative activity. In the category of medium-sized enterprises (up to 250 employees), it was 44% and in the category of large companies (more than 250 employees) only 27%, respectively. Original hypothesis which was defined at the beginning of the research was not confirmed. It says that motive powers of innovative activities in the Czech Republic are small and medium-sized enterprises. On the contrary, from the results of analysis we can see that occurrence of innovative activities grows with the size of the company. As a positive fact, we can consider that in the category of small enterprises occurred the most distinctive increase of innovative

activities comparing to the year 2006. The share of non-innovative small enterprises has decreased in two years about 7%. The share of non-innovative medium-sized and large enterprises remained practically the same. In the category of medium-sized enterprises, they did not realize any innovative activity approx. 44% in the period 2006-2008 (in comparison with 45% in the period 2004-2006). In large enterprises, the share of non-innovative enterprises in both periods was at the same level of 27%.

The main causes of low innovative activity of small enterprises we can see mainly in the lack of capital and information about the technologies and markets. A significant proportion of small firms (36%) suppose that innovation is not needed. One can ask a question whether these enterprises do understand the conception of innovation in a right way. We opine that it can be caused by the focus on the solution of operational problems, the absence of vision and business strategy of small enterprises is the most common cause of low or no innovative activity. This is a presumption that will be the subject of further research. From a long-term point of view this approach leads to a loss of competitiveness of businesses and termination of its activities. From this perspective, it is positive that in the reference period there was the most pronounced increase of innovative activity by small enterprises. It indicates that the owners of small enterprises realise the importance of innovation for maintaining the competitiveness of business.

A significant factor limiting innovative activities of small and medium-sized enterprises is the lack of sources of financing, whether own or outside ones. Small and medium-sized enterprises mostly focus on non-technical innovative activities in the area of organization and marketing. We expect that the reason for the orientation of small and medium-sized enterprises in the area of non-technical innovation is due to lower costs of these innovations in comparison with the technical innovations. However, this presumption is necessary to verify in further research.

In conclusion, despite of improvements in innovative activities by small and medium-sized enterprises the existing situation cannot be considered as satisfactory. At the same time processed research outlined further questions (e.g. cooperation with external partners in research and development, public support of innovation, international comparison of innovative performance, etc.) which are the subject of research in the next period.

This paper was processed as a part of a unique academic research.

## Literature

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## **VÝZKUM INOVAČNÍCH AKTIVIT MALÝCH A STŘEDNÍCH FIREM V ČESKÉ REPUBLICE**

Cílem příspěvku je zmapovat aktuální stav a vývoj inovačních aktivit malých a středních podniků v České republice a porovnat je s výsledky velkých podniků. Výzkum byl zaměřen na zkoumání závislosti inovační aktivity na velikosti podniku, rozdílnosti inovačních aktivit malých, středních a velkých podniků a na zjištění příčin omezujících inovační aktivitu podniků. Z výsledků výzkumu vyplynulo, že inovační aktivita roste s velikostí podniků. Malé a střední podniky se přitom orientují ve větší míře na netechnické inovace organizační a marketingové povahy. Hlavními omezujícími faktory inovační výkonnosti jsou nedostatek finančních a informačních zdrojů a vlastní přístup podniku k inovacím.

### **ANALYSE DER INNOVATIONSAKTIVITÄTEN DER KLEINEN UND MITTLEREN UNTERNEHMEN IN TSCHECHIEN**

Der Artikel hat das Ziel, den aktuellen Zustand und die Entwicklung der Innovationsaktivitäten der kleinen und mittleren Unternehmen im Vergleich zu großen Unternehmen in der Tschechischen Republik zu analysieren. Die Forschung wurde auf folgende Untersuchungen gerichtet: die Abhängigkeit der Innovationsaktivitäten auf Unternehmensgröße, die Differenzen der Innovationsaktivitäten zwischen kleinen, mittleren und großen Unternehmen und die Feststellung der beschränkenden Ursachen der Innovationsaktivitäten unter Unternehmen. Aus den Forschungsergebnissen ergab sich, dass die Innovationsaktivität mit der Unternehmensgröße wächst. Die kleinen und mittleren Unternehmen orientieren sich vor allem auf nichttechnische Innovationen in den Bereichen Organisation und Marketing. Als die wichtigsten Beschränkungsfaktoren der Innovationsfähigkeit wurden der Mangel an Finanz- und Informationsquellen und die eigene Orientierung eines Unternehmens auf Innovationen bezeichnet.

### **BADANIE INNOWACYJNYCH FORM DZIAŁALNOŚCI W MAŁYCH I ŚREDNICH PRZEDSIĘBIORSTWACH W REPUBLICIE CZESKIEJ**

Artykuł ma na celu wskazanie aktualnej sytuacji i rozwoju w zakresie innowacyjnych form działalności wprowadzanych przez małe i średnie przedsiębiorstwa w Republice Czeskiej oraz ich porównanie z wynikami osiąganymi przez duże przedsiębiorstwa. Badania ukierunkowano na analizę zależności działań innowacyjnych od wielkości przedsiębiorstwa, analizę różnic w działaniach innowacyjnych podejmowanych przez małe, średnie i duże firmy oraz na stwierdzenie barier ograniczających działania innowacyjne przedsiębiorstw. Wyniki badań wskazują na to, że działalność innowacyjna wzrasta wraz z wielkością przedsiębiorstwa. Małe i średnie przedsiębiorstwa są natomiast bardziej zorientowane na innowacje nietechniczne o charakterze organizacyjnym i marketingowym. Do podstawowych czynników ograniczających efektywność innowacyjną należy niedobór zasobów finansowych i informacyjnych oraz samo podejście przedsiębiorstwa do innowacji.