INFLUENCE OF PRODUCT INNOVATIONS ON FINANCIAL PERFORMANCE OF SMALL AND MEDIUM-SIZED ENTERPRISES IN THE CZECH REPUBLIC

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Abstract

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Objective of this article is to determine possible effect of product innovations on the financial performance of small and medium-sized enterprises in the Czech Republic. The pilot research has been realized on the statistical sample of 100 companies which were categorized into three basic groups; service companies, trade companies, and production companies. As the measure of innovation effect, the authors applied the deviation of production power, i.e. the ration of EBIT to assets, of a business entity from the industry average while the industry average of production power was selected especially in order to reduce the influence of the economy cycles.
In the three categories of companies, different effects of product innovations have been observed. In the service companies and trade companies, the positive effect is limited because of potential simplicity of imitation by competitors. More positive effect of product innovations has been observed in production companies which can protect the products or production processes better then service companies or trade companies where the product innovations are mostly connected with extension of extension of services portfolio offered.
For the conclusion, the authors provide suppositions and designs for their future research in this problem of innovations' effectiveness measurement.

financial performance, INFA, innovation, product innovation, production power

Performance of a business entity, especially in the sense of financial performance is currently quite often accentuated issue, among others in connection of the great economic crisis of the years of 2008 and 2009, but mainly in the context of widening and strengthening of competition. In this implication, performance of a business entity is possible to be regarded and assessed in different views when the term would gather various meanings.

Generally, performance of a business entity is framed as an ability of enterprise to reach certain results which are subsequently the object of comparison in time or in space. In relation to above mentioned widening, strengthening and global competition, performance of a business entity is often connected with its chance on survival on a market that inevitably joined just to innovations. In present, it is just about the innovations as about a critical process without that business entities are not able to maintain the place on a market. Then, business entities spend great amounts of their resources while it is expected that these investments would be gained back in the form of future profits. This way, maintenance of or respectively increase in performance of business entity is anticipated.

OBJECTIVES AND METHODOLOGY

On the most general level, innovation can be determined as something that adds value while

definition or this term or phenomenon is differing in various angles. Nevertheless, the most of these definitions is constructed on the same basis. Definition which is used for the purpose of this article comes out from authors' previous work (for details see Tabas, Polák & Beranová, 2010), while innovation is considered as a change which leads to profit for an individual, for a business entity or for whole society when the profit is seen as economic profit, not accounting profit only. For the purposes of the pilot study whose outcomes are presented in this article, the authors have investigated only the category of product innovations, i.e. innovations of products and services. Other categories of innovations and their influence on companies' performance will be the subject of subsequent research and analyses.

With the above presented definition of innovation the selected approach to innovation effect measurement is connected. In order to quantify the impact of product innovation on performance of a business entity, the indicator of production power, i.e. EBIT/Assets has been applied. This indicator is also the basis of the INFA methodology that spreads this measure in three spheres up to the elementary indicators, and that also enables to calculate the Economic Value Added in equity variant[1].

Objective of the presented paper is to identify prospective influence of product innovations on performance of small and medium-sized enterprises in the Czech Republic. In order to identify this potential effect of product innovations the pilot primary research has been proceeded on the statistical sample of 100 small and medium-sized enterprises where their production power and deviation of this indicator from the industry average were investigated during the five-years period from the year $t–2$ to the year $t+2$ where t is the year of realization of the product innovation. The deviation of production power from the average of industry as the dependent variable was selected especially in order to reduce the influence of the economic cycle. Data of companies in the statistical sample were acquired by the questionnaire in order to identify the year of innovation realization and other data for a company specification.

As already mentioned above, the pilot study was limited only to the influence of product innovations on company's performance. Business entities included in the statistical sample are not limited by one given industry but another variable that is independent here is the business branch according the classification of CZ NACE in installation of first two figures of the classification because different effect of product innovations is supposed in different business branches. Then, significant representations in the statistical sample have the business branches as follows:

- Production of textiles (CZ NACE 13);
- Wood processing (CZ NACE 20);
- Production of plastics (CZ NACE 22);
- Production of electronic equipment (CZ NACE 26);
- Production of machinery (CZ NACE 28);
- Production of parts for automotive industry (CZ NACE 29);
- Surface transport (49);
- Legal and accounting services (CZ NACE 69).

Innovations in the analysed business entities were subsequently classified according the amount of resources spent on a given product innovation. Nevertheless, within the analysed statistical sample, influence of this independent variable has been interpreted as statistically non-significant.

In order to reach the objective of this paper, especially the methods of descriptive statistics (means and standard deviations) have been applied as well as the method of deviations analysis.

Review on Approaches to Financial Performance Measurement

Evaluation of innovation effectiveness can be regarded from different angles while approaches to assessment of effectiveness of innovation processes are principally divided into two basic directions which are managerial approaches and financial approaches (for more see Tabas, Beranová & Polák, 2012). In this article, the authors provide complex review on approaches to evaluation of innovation processes while they are focused on the financial approaches, i.e. on evaluation of influence of innovation processes on financial performance of business entities.

A basic tool of evaluation of financial performance of a business entity is financial analysis. Financial analysis, as a system of standard methods of financial assessment of procedures in a company, is constantly an integral part of the company's financial management. Nevertheless, this system is reprehended in many aspects while the most important critics are directed to the fact that traditional approaches of the financial analysis do not respect a range of factors which are supposed as more or less important according to various authors. From these critics new direction of evaluation of company's performance marked as modern measures that press mainly for (Synek *et al.*, 2007):

- Reflection of implicit costs (especially in the sense of cost of equity);
- Preference of cash flow over profit;
- Focus on operating activities while definition of operating activities is not corresponding to definition of operating activities according the Czech accounting standards;

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1   Ministry of Industry and Trade of the Czech Republic. On-line available on: http://www.mpo.cz/cz/infa.html

● Respecting the primary principles of financial management, i.e. time and risk.

In the frame of these modern measures of financial performance of company the most often mentioned are as follows:

● Discounted cash-flow (DCF);
● Cash-flow return on investments (CFROI);
● Return on net assets (RONA);
● Cash return on gross assets (CROGA);
● Market value added (MVA);
● Economic value added (EVA).

Dissection of the measures of DCF and CFROI (e.g. Pavelková & Knápková, 2009; Marinič, 2008) detachedly shows that these measures are based on the dynamic methods of evaluation of investment effectiveness. Then, these measures are also mostly used for evaluation of investment effectiveness in respect of demandingness of their application in evaluation of company's performance. Despite of the fact that business entity as a whole is also a kind of investment, it is an investment that is specific in many aspects, especially in the context of duration of its economic life. Theory of the business entity is based on principle of "going concern" that presupposes infinitive existence of a company. Then, these measures both are based on prediction of cash-flows in a company. In order to be able to evaluate the financial performance of a company by them, it is necessary to make this prediction for the whole existence of business entity while determination of such a prediction is objectively unrealistic, even if these predictions are used in income methods of company valuation when the continuing value is calculated by means of the Gordon's equation or parametric equation (e.g. Mařík et al., 2011; Mařík et al., 2007). On the other hand, application of these of these algorithms has to be verified with a range of analyses and partial calculation. Moreover, company valuation is usually a subject of expert statement. If all these facts are taken into account then, application of DCF and CFROI in practical evaluation of company's performance is non-efficient because costs of data acquisition are much higher than benefits gained.

The measures of RONA and CROGA (e.g. Pavelková & Knápková, 2009) could be marked as standard ratios with regard to their construction. In the context of these indicators, innovation in performance measurement leans mainly on the focus on operating activities. Here, assets both, net assets and gross assets, are defined on the operating-required level. This is the reason why it is not possible to take these figures from the balance sheet because these figures include the assets which are not operating-required on one side, and on the other side, these figures do not include assets which are operating-required, e.g. in the Czech republic it is the property bough by the means of financial lease. It means that assets have to be adjusted and consequently, accounting profit has to be adjusted for the level that is joined with the operating-required assets. Then, potential of application of these indicators is especially in the company's financial management but not in other subjects, e.g. for external analytics or potential investors.

Company valuation is also a required basis for MVA calculation. But market value of a company is objectively not identifiable variable neither in the case of public traded companies because there the product of market value of shares and of number of shares issues is not the value of a company as of a whole but the result is market capitalization only (Mařík et al., 2007). Use of the MVA measure is generally problematic and in the sphere of financial management of a company also ineffective then.

Last two approaches to evaluation of company's financial performance, EVA and INFA methodology, in comparison with those mentioned above, are relatively easy to use, even if EVA calculation in circumstances of the Czech Republic is joined with some problems as well. But these problems are not weighty enough to cause ineffectiveness of EVA application at evaluation of company's financial performance when these problems are in overruling process.

INFA methodology is then one of possible ways to EVA calculation. At the same time, it is also the pyramidal decomposition of the production power indicator. In general, application of pyramidal decompositions requires deeper analytical skills and deeper knowledge. But when these two prerequisites are fulfilled, use of pyramidal decompositions is very effective for discloser of weak points in business economics and this way, very effective for company's financial management as well. This approach, i.e. INFA methodology and its top indicator of production power (EBIT/Assets), is subsequently used for determination of possible influence of product innovations on the financial performance of business entity while economic value added will be applied in designated future analyses.

For measurement of innovation effectiveness, various authors (e.g. Dvořák, 2009; Hauschildt, 2004; Acs & Audretch, 1992) suggest application of the methods which are ordinarily used in evaluation of investment effectiveness. Nevertheless, contrary to the real investments, evaluation of innovation effectiveness is characterized by a range of specifics while the basic one of them is immateriality that is typical for each innovation until a certain moment, i.e. it is typical for product innovations as well, and for some innovations, the materiality would never be reached.

RESULTS AND DISCUSSION

Product innovations are usually joined with presumption of their material character, except the innovations of services that would also never gain the materiality. In business entities where their economic activities are classified into the category of services (29 companies of the statistical sample),

the innovations are characterized with decrease in value of production power in the year of innovation realization while in previous years (*t*–2 and *t*–1), the deviation of production power value in average was 6.06 per cent point (p.p. in the following text) below industry average with the standard deviation of 1.32 p.p. In the year or innovation realization the deviation of production power value in average decreased for 9.92 p.p. below industry average with the standard deviation of 1.72 p.p. In the next year, i.e. in the year *t*+1, a substantial improvement was observed while the production power of all business entities analysed has increased above the industry average. The average value of deviation of production power value was 4.38 p.p. with the standard deviation of 3.34 p.p. But this effect, again in all business entities analysed, is limited because in the year *t*+2 the value of production power decreased below the industry average. In average the deviation is 0.24 p.p. below the industry average while in following years, in companies (13 business entities) where data are available for this period, the value of deviation from the industry average was continuously decreasing up to 2 p.p. below the industry average.

Segregated sphere of business here is the trade companies (25 companies of the statistical sample) where the value of production power starts to develop positively gauge to industry average already in the year of product innovation realization. In previous years (*t*–2 and *t*–1), values of the EBIT to assets ratio were differing for –13.86 p.p. In the year *t*, the average deviation was already 5.50 p.p. below the industry average. Following years show a similar course as in the service companies. This way, in the year *t*+1, performance of all trade companies analysed increased over the industry average. The average deviation was 2.18 p.p. above industry average with the standard deviation of 1.13 p.p. In the year *t*+2, value of production power of all these companies decreased below the industry average while the average value of the deviation is 0.56 p.p. below the industry average, and in following years, in companies (16 companies) where data are available for this period, the deviation of production power from the industry average is still deepening up to 1.25 p.p. below industry average. When the results of service companies and trade companies are summarized, it is possible to partly conclude that even if the value of their production power decreased below the industry average again already in the year *t*+2, and in following years, in the companies where data are available for this period, is henceforward decreasing gauge to industry average, in none of the companies analysed the production power decreased below the level observed before realization of the product innovation, i.e. in the years of *t*–2 and *t*–1. This way, the limitation innovation effect on the company's performance is relative only.

Another course has been observed in production companies (46 companies of the statistical sample).

Nevertheless, overall curves of the average deviations of production power would have the same waves only with stronger fluctuations. The average deviation of production power of production companies before realization of innovation was 2.26 p.p. below industry average with the standard deviation of 5.70 p.p. In the year *t*, this average deviation gained the value of 7.19 p.p. above industry average with the standard deviation of 10.38 p.p. while the difference between the average production power of analysed companies an industry average is decreasing again in following years.

In the results of the sample of production companies, the important variable is the business branch according the CZ NACE classification, when the most significant differences from the above presented overall course of deviations of average production power of analysed companies from the industry average were observed in:

● Production of textiles;
● Wood processing;
● Production of electronic equipment.

Production of textiles is throughout characterized with negative effect of innovation on the deviation of production power from the industry average. Before realization of the product innovation, the average difference was about 3 p.p. above industry average, in the year *t*, the average deviation was 3.61 p.p. below industry average. Even if all textiles production companies got above the industry average with the value of EBIT to assets indicator in the years *t*+1 and *t*+2 when the average deviation is at the level of 0.26 p.p., none on these companies has reached the performance level before the innovation realization, neither in following years in companies where data are available for this period.

In companies of wood processing, effect of innovation is visible already in the year *t*, where the change in average value of production power deviation from the industry average was nearly 23 p.p.; it has changed from 11.84 p.p. below industry average to 10.75 p.p. above industry average. In the year *t*+1, the deviation has continuously increased to average value of 12.85 p.p. above industry average while in the next year (*t*+2), the deviation slightly decreased for about 1 p.p., and in following years, in companies where data are available for this period, financial performance, respectively the production power of these companies remains more or less constant.

Companies producing electronic equipment are again characterized with decrease in production power gauge to the industry development in the year *t*. Avery change of the deviation of average production power of these companies from the industry average was –2.2 p.p. but in the year t+1, their production power is already much better when the average value of the deviation has changed from 11.85 p.p. below industry average to 1.3 p.p. below industry average. The positive effect of
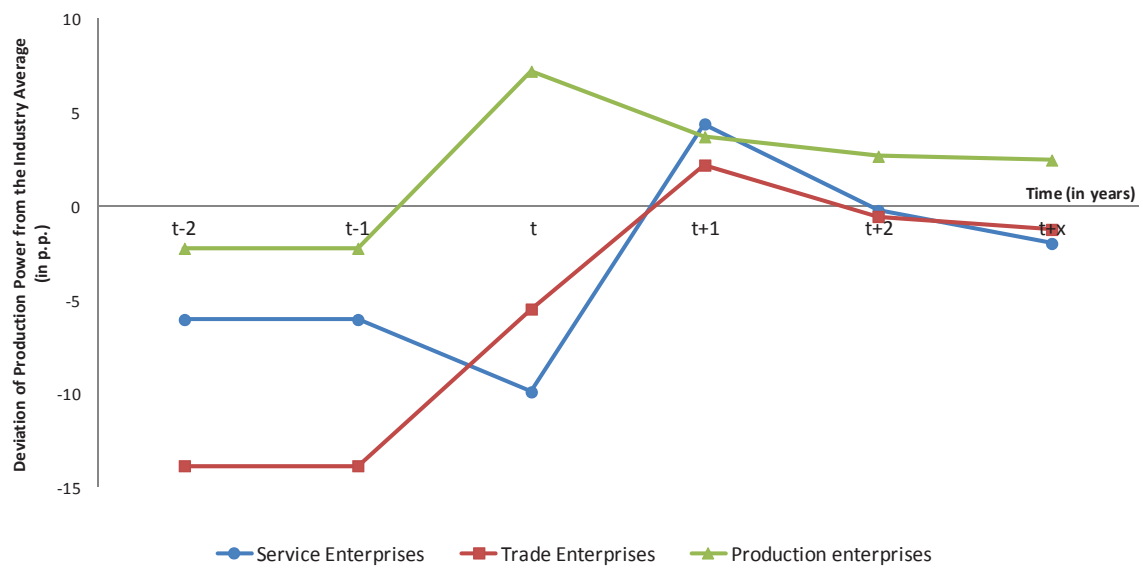
1: *Effect of product innovation on financial performance of small and medium-sized enterprises*

innovation realized continued also in the year of t+2 when the average deviation of production power of these business entities from the industry average had the value of 1.37 p.p. above industry average with the standard deviation of 0.68 p.p. In following year, in the companies where data are available for this period, the average deviation of EBIT to assets measure remains also more or less constant.

Effects of production innovations of the three basic groups of business entities, i.e. of service companies, trade companies and production companies, are then presented in the Fig. 1.

CONCLUSIONS

The objective of this article was to identify a possible influence of product innovations on financial performance of small and medium-sized enterprises in the Czech Republic. From the presented results, the positive effect of these innovations is visible. Nevertheless, the results presented are the outcomes of a pilot study within that, deviations of companies' performance from the industry average were investigated mainly. It is obvious that additional analyses are needed especially in the sense of complex financial analysis of each business entity, calculation of the economic value added included. As opportune the authors consider also the application of different benchmark basis. As it was presented, for the purpose of the

pilot study, the industry average has been selected. Nevertheless, for extended analysis the averages of four categories of companies would be applied as the bases for comparison. These categories correspond with the INFA methodology, and they are as follows:

- Companies generating value, where ROE > cost of equity (re);
- Profitable companies, where ROE > risk-free interest rate (rf);
- Profitable companies, where 0 < ROE < rf;
- Unprofitable companies, where ROE < 0.

The future research will also be focus on the other categories of innovations in small and medium-sized enterprises in the Czech Republic and their effect on the financial performance of these companies.

From the presented results of the pilot study, it is also evident that continuous innovations are necessary also in respect to character of the innovation. In some branches, typically in the service companies, imitation is much easier for competitor then in production companies, e.g. in companies producing electronic equipment, among others because of possible patents or other form of intellectual property protection. Then, in the environment of globalization increasing pressure on competitiveness it is evident that innovations are a key to maintain the place on a market based on on-going competitiveness.

SUMMARY

Generally, performance of a business entity is framed as an ability of enterprise to reach certain results which are subsequently the object of comparison in time or in space. In relation to above mentioned widening, strengthening and global competition, performance of a business entity is often connected with its chance on survival on a market that inevitably joined just to innovations.

Objective of the paper is to identify possible influence of product innovations on performance of small and medium-sized enterprises in the Czech Republic. In order to identify this potential effect of product innovations the pilot primary research has been proceeded on the statistical sample of 100 small and medium-sized enterprises where their production power and deviation of this indicator from the industry average were investigated during the five-years period from the year $t-2$ to the year $t+2$ where t is the year of realization of the product innovation. The financial performance of these companies is measured with the production power indicator, i.e. EBIT/Assets. The deviation of production power from the average of industry as the dependent variable was selected especially in order to reduce the influence of the economic cycle.

Companies in the statistical sample are divided into three basic groups; service companies, trade companies and production companies, while differing effects of product innovations are observed there. The influence of product innovation on financial performance of a company can be generally assessed as positive, but the effect is different in dependence on a business branch. In service companies, where competitors are able to imitate the range of services offered relatively easy, the innovations have almost immediate effect but this effect is limited with quite short period. Mostly the same results are characteristic also for the trade companies where innovations are based mainly on additional services. The greatest effect of product innovations has been observed in production companies, where the positive average stable change in production power in comparison to the bases, i.e. industry average, was nearly 10 p.p. while before innovation realization, financial performance of all analyzed production companies has been below the industry average. After realization of the product innovation, performance of all these companies has increase above the industry average, and contrary to service and trade companies it has stabilized above the industry average.

From the results of the pilot study, it is evident that continuous innovations are necessary. The future research will be based on extended analyses; individual financial analysis of all companies in the statistical sample, and use of the averages of four categories of companies according to the INFA methodology as the benchmark bases. The future research will also be focus on the other categories of innovations in small and medium-sized enterprises in the Czech Republic and their effect on the financial performance of these companies.

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