USING A BASE OF SIMPLIFIED FINANCIAL PLAN FOR DETERMINATION INNOVATIONS’ ECONOMIC EFFECT IN SMALL AND MEDIUM-SIZED ENTERPRISES

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Abstract


Currently, innovations seem to be a crucial process in companies in order to at least maintain or even improve their competitiveness. Strengthening global competition puts the stress on continual improvements in every sphere of business entity’s activities. This way, innovations are the almost only tool to maintain customers, subsequently to keep the place on a market or the market share, and then to sustain the financial performance of a company.

It means that effect of innovations is closely connected with the financial performance of a business entity that can be measured with various methods or approaches while the financial analysis ratios are supposed to be basic ones. In order to interpret the results of these financial ratios, different bases are used when the base of financial plan is one of them.

The objective of this article is to determine the economic effect of innovations on financial performance of small and medium-sized enterprises in the Czech Republic on the base of simplified financial plan. Obviously, starting-point of the financial plan preparation is the plan of sales. Sales represent one of the company’s value generators, and sales projection is constituted as basis of authors’ approach to determination of effect of innovations on financial performance of business entities while basic categorization of companies according to the business branch (CZ NACE), sphere of innovation and innovation’s degree is applied.

financial performance, financial plan, innovation, sales, SMEs

Currently, innovations and innovation activities of enterprises in their essence are necessary condition for survival and development in continuously globalizing markets. In addition, this aspect is far more substantial in the context of small and medium-sized enterprises which are facing the competition of multinational companies, characteristic by both, capital and political force as well (Jurčík, 2007). Even by those facts, it is possible to reason an extending range of scientific studies in the fields of the innovations, innovation potential, management and efficiency of innovations in small and medium-sized enterprises (SMEs).

In general, SMEs are currently accented mainly in connection with their innovativeness and flexibility, which is probably due to the fact that in the strong competitive pressures of large companies, it is just a marginal and unattractive area of markets that remains to SMEs. marginal and for multinational giants relatively unattractive market areas. Within that issue, many authors have already tried to prove that the innovation potential of SMEs is different than the innovation potential of large enterprises, as well as innovation in SMEs are conducted by other means (see e.g. Naver & Slater, 1990; Audrecht, 2001; Verhees & Meulenberg, 2004, Cohen & Klepper, 1996; Avernaete et al., 2003). The conclusions of these studies are not entirely clear, since some of them sounds for and other against SMEs (Forsman & Rantenen, 2011).
According to Wright (2012); “to innovate means to regenerate”. Number of companies fell into decline or recession phase right because they did not regenerate – did not innovate (Wright, 2012). In general, if the innovations are regarded as a tool for survival of SMEs in the continuously intensifying competition, then is objectively expected that innovations will bring economic benefits to a company while these economic benefits can have various forms, either in terms of growth sales, reduction of costs, effectiveness of internal processes, or trade and competitive advantages. Therefore, these economic benefits in any form should be reflected in the performance of business entities.

OBJECTIVE AND METHODOLOGY

Objective of the paper is to determine the economic effect of the product innovations on the financial performance of the small and medium-sized enterprises in the Czech Republic at using the base of simplified financial plan. In order to fulfil this objective, the primary research has been realized on the statistical sample of 100 SMEs, legal business entities providing their activities in the Czech Republic. This statistical sample consists of business entities of different branches. Subsequently, data of these entities have been analysed in smaller subsamples created in accordance with the business branch classified by CZ-NACE in installation of first two figures of the classification. In analysed statistical sample, the branches of significant representation are as follows:

- 13 – Production of textiles (10 per cent);
- 16 – Wood processing (8 per cent);
- 22 – Production of plastics (7 per cent);
- 25 – Steel constructions (17 per cent);
- 26 – Production of electronic equipment (10 per cent);
- 28 – Production of machinery (8 per cent);
- 38 – Wastes processing (8 per cent);
- 49 – Surface transport (8 per cent);
- 71 – Architectural and engineering services (6 per cent).

The rest of 18 per cent of the statistical sample consists in the branches which are represented individually here, e.g. agriculture, production of parts for automotive industry, production of chemicals, advertising services etc. This way, the CZ NACE classification has been applied especially in order to find the branch averages of the rate of growth which are necessary for removal of the impact of economic cycle from the companies’ data. Consequently, the statistical sample has been divided into two primary sub-groups; production companies (57 per cent) and service companies (43 per cent). Because of very limited identifiability of product innovations in trade companies, these companies were not included in the analysed statistical sample of 100 small and medium-sized entities.

Simplified financial plan for each company has been prepared based on the entities’ results in the years before the product innovation realization. Methodological resource of this simplified financial plan preparation was the prognosis of sales that has been projected at conjoined application of the regression analysis in time series and the average rate of company’s growth in the past. This average rate of growth has been calculated as a geometric mean of annual growth of a company in the previous periods.

At application of the regression analysis, dependence of operating profit on the sales has been modelled as well as the dependence of the operating cash flows on sales and on operating profit, while the operating cash flow here is defined as sum of operating profit and depreciation of fixed assets. The operating profits analysed were also reduces for the costs and revenues which are recognized as operating in accordance to the Regulation No. 500/2002, but which cannot be considered as a part of common operations of a business entity in fact. Typical examples of such items are sales of fixed assets and material and net book value of fixed assets and material sold, and other operating revenues if they are in abnormal amounts.

Then, for the objective of this paper, the simplified financial plan is defined as the projection of sales, net operating profit and operating cash flow. This simplified financial plan has been prepared for the three years period, from the year that is the year of the product innovation realization, to the year of t + 2. In this projected period, the deviation of the prediction from the real results reached have been observed and analysed. The basis of simplified financial plan is also used here in the context of a range of definition of the term “innovation” which conditional innovation upon its introduction into the practice, respectively introduction to the market (for more see Tabas, Polák and Beranová, 2010) that subsequently leads to the effects to economics of innovating company.

In order to relevant interpretation of the analysed data and the results reached, the rate of growth of each company analysed has been observed in five years period, from the year t – 2 to the year t + 2, where t is the year of product innovation realization again. This rate of growth on the company level was analysed in the context of the average rate of growth in the branch, primarily in order to eliminate the influence of economic cycle from the data entering the analyses.

1 Regulation No. 500/2002 which explains some rules given by the Accounting Law No. 563/1991
In order to relevant analyses realization, the statistical method of dependence analyses, i.e. especially time-series analysis and regression analysis, simple and multiple regression, were applied. Consequently, the methods of descriptive statistics and analysis of deviations are applied as well. With regard to the scope of the statistical sample, the results reached are partial results which will be developed in order to be able to generalize them.

Financial Plan for Measurement of Economic Effect of Product Innovation

The plan of sales is considered as one of the starting points of the financial plan preparation. Then, this plan of sales has to be necessarily connected to the marketing plan and the marketing strategy of a company (Marek et al., 2009). Financial plan itself plays the integrating role in the system of the company's plans. This way, financial plan reflects each partial plan. In general, financial plan consists of planned balance, planned profit and loss statement and planned cash-flow while the starting point is just the preparation of planned profit and loss statement based on the plan of sales.

Prediction of company's future sales is objectively the most difficult part the financial planning because afterwards, the projection of fixed and variable costs is relatively simply derived from real costs, or by modelling of cost at using the methods of cost functions construction, coming out right from the scope of production, or from the sales in the long-term period (Beranová and Martinovičová, 2010). Based on the sales, it is also possible to predict the operating profit this way. Then, if it is supposed that whole sales would be changed into the positive cash flows in the long-term period, and every cost would be changed into the negative flow of cash, it is also possible to project the operating cash flow of a business entity as the sum of operating profit and the fixed assets depreciation which is also the method that is quite often used in the process of cash flows planning in order to evaluate an investment effectiveness.

Innovation is possible to be also seen as a specific form of investment. Due to this point of view, a wide range of authors, in order to measure the economic effectiveness of innovations, propose the same methods which are usually employed in evaluation of investment effectiveness. But innovations are differing from standard investments in many characteristics, and this way, standard methods of investment effectiveness evaluation do not seem to be appropriate, respectively their application in evaluation of innovation effectiveness becomes disputable (Tabas, Beranová and Martinovičová, 2012).

On the issue what is an innovation activity of company, and how company's innovativeness could be measured, a range of different studies already exists (see e.g. Bhaskaran, 2006; Avermaete et al., 2003; Johannesson et al., 2001; Kotabe & Swan, 1993; etc.). But another question is how the economic effect of innovation can be determined. In this sense, it is possible to find e.g. the measure of sales, respectively the share of sales of a new product in total sales (e.g. Dvořák, 2009; Hauschildt, 2004). Nevertheless, not every category of innovation could be joined with the sales, while it is clear that mutual relations between single categories of innovations exist, and any innovation is not possible to determine as a "pure" innovation of a sole type. Relations between the types (categories) of innovations are described e.g. by Gurkov (2005) who, among other, points out that product innovations very often leads necessarily to innovations in technologies, and requires also innovations to marketing or human resources management. Then, it is indispensable to determine other criteria of evaluation of innovation impact on the business entity economics. Here it is possible to meet approaches which are based on measurement of changes in market share, in profitability, in labour productivity etc. (Oksanen and Rilla, 2009). But all these aspect would always lead to occurrence of deviations from existing development of a business entity that can be modelled in the financial plan, and the economic effect of innovation could be defined as the difference (deviation) between the projected and real results reached at respecting the influence of economic cycle.

RESULTS AND DISCUSSION

With this research the authors follow their previous work (for more information see Tabas, Beranová and Martinovičová, 2012) where they have investigate the influence of product innovations on production power measured with ratio of EBIT/Assets, i.e. the profitability of total capital employed in gross general value (Marek et al., 2009). In the frames of their previous research, the authors have proved the positive effect of product innovation on financial performance of SMEs in the Czech Republic, which is but limited in time, i.e. consistently with the Schumpeter's theory (1934) of limited innovation profit. Based on the current research, it is possible to extend the previous results for new aspects.

As it is already mentioned above, besides the basic variable of the financial plan, the rate of growth of analysed companies has been observed in the five years period from t - 2 to t - 2. In this consequence, for all the companies analysed it is possible to assume together that the product innovation there has been realized after substantial decrease in the annual rate of company's growth, the influence of the average growth in the branch excluded. In both, in production companies and service companies, the decrease in rate of growth has been significant; in the production companies it has been for 10.28 per cent points (p.p.) in average, and in service companies, the average decrease has been for 12.34 p.p. comparing to their rates of growth in the past. It means that these companies have entered the stage
of recession. At this place, it is necessary to point out again that the negative development of analysed companies cannot be ascribed to the negative development of the whole economy because the effect of economic cycle is excluded within the data adjustments. Moreover, the five years period is not defined by strictly given years because for the purpose of research, the year of product innovation realisation ($t$) is relevant, and this year differs from company to company. Subsequently, it is possible to say that after realisation of product innovation the rate of company’s growth starts to increase again in both, production companies and service companies as well. In production companies, in the year $t$ the rate of growth has been higher for 4.44 p.p. in average than their average rate of growth in previous years, while in the year $t-1$ it has been already higher for 15.98 p.p. in average. In the year $t-2$ the positive difference starts to decrease again, it has been the difference for 5.72 p.p. in average. As of the group of service companies, in the year $t$ the rate of their growth has been still below the average of previous years for 2.55 p.p. in average. In the next year $t-1$, the rate of growth was already for 7.41 p.p. higher than previous long-time average, and in the year $t-2$ the deviation has decreased again while its average value is 4.77 p.p. above the previous average rate of growth.

In this context, it is possible to suppose the decrease in rate of growth to be a significant motivation factor of realization of product innovation in the SMEs. The observed swing in the rate of growth of analysed companies is presented in Fig. 1.

In the frames of simplified financial plan, at application of the regression analysis the prediction of sales for the period from the year $t$ to $t+2$ has been made based on the data of previous years and the past rate of growth. In dependence on the sales, the predictions of operating profit and operating cash flow have been made as well. In defined three years period, the percentage deviations between the predictions and real results reached by a company have been investigated for the three basic variables of the financial plan.

Interesting facts are coming out of the analyses of deviations in sales and in operating profits when the results are confronted together. In the group of production companies, the real sales differ from the prediction for 5.22 per cent in average, while the real sales are lower than prediction. Lower than the prediction are also the sales in the year $t+1$, when this average difference is 2.36 per cent. In the year $t-2$, the real sales of production companies are already higher than prediction, and the average deviation here has the value of 10.85 per cent. These relatively low deviations between sales predicted and real sounds also for the quality of regression models made. Their coefficients of determination have the average value of 0.9650. But in this respect, the more important is that from the viewpoint of the facts observed, while the prediction functions for the operating profits have also very high determination of 0.9272 in average, the deviations between real operating profits and their predictions are much more higher and positive. It means that real operating profits in production companies are higher than predictions event if the sales are lower. In the year $t$, the operating profits here were higher for 4.37 per cent in average, and just significantly higher in next years; in $t+1$ for 38.09 per cent higher than prediction and in $t+2$ for 34.43 per cent higher.

Deviations in results of the service companies are even higher than in production companies. Nevertheless, the determination coefficients of regression functions here have the average value of 0.8612 which is quite good result again. In the year $t$,
the real sales of service companies were lower for 17.63 per cent in average, in the year t+1 it was for 23.26 per cent less, and in the year t+2 the average negative difference was 32 per cent in comparison to the prediction. But on the other side, the deviations of operating profits are highly positive, when in the year t, the operating profits were higher for 34.51 per cent in average comparing to the prediction, and in next years it was for 46.52 per cent more, respectively for 49.89 per cent more than the prediction. Then it is obvious that production innovations realized in these companies were not focused primarily on increase in sales, but objective of these innovations was to decrease the operating costs in business entities. Contradictory trends in development of deviations in sales and in operating profits are shown in the Fig. 2 as follows.

As of the third variable observed, i.e. the cash flow calculated in its “quick” variant as a sum of operating profit and fixed assets depreciation, the differences between real results and their predictions do not show any significant trends that would be possible to use in order to make a sound conclusion, even if outcomes of analyses made in the production companies could be potentially used to set some hypotheses directed especially to amortization methods applied. But based on data which are currently available in the frame of this research, it is possible neither to prove nor to refuse these assumptions, or to elaborate them to a depth.

Nevertheless, the results gained within the analyses of sales and analyses of operating profits prove in some extent the assumption about caution of the SMEs because the product innovations aimed at increase of sales are usually joined with higher level of risk in a sense of potential failure of introduction of new product on a market. Moreover, these innovations are also usually connected with substantial marketing costs. This way, product innovations realized with the objective to reduce production costs are more secure way how to survive on a market and to keep or improve the competitiveness of SMEs.

CONCLUSION

Objective of this paper was to determine the economic impact of product innovations on the financial performance of SMEs in the Czech Republic, on the basis of a simplified financial plan, where the impact of these innovations was analysed by application of elementary variables included in the financial plan. From the results of elaborated analyses revealed that the product innovations implemented in SMEs do not positively affect the sales of these business entities, but have a significant impact to the operating profit of these companies. Hence, it leads to that product innovations in SMEs are mainly focused on reducing the production costs. If this conclusion is then related to the analysis of the product innovations impact on operating cash flow of SMEs which are production companies, it would be possible to suppose that these product innovations are also connected with improvements in production technologies. Depreciation of these technologies as of the fixed assets is affecting an increase in operating cash flow. Nevertheless, neither except the fact that this phenomenon has not been observed in the group of the service companies, this statement could be neither confirmed nor to be otherwise to evolved in other aspects.

If the conclusions presented in this article are then related to the previous research of the authors (see Tabas, Beranová and Martinovičová, 2012), a positive effect of product innovation on performance of SMEs in the Czech Republic can be generally confirmed. In order to prove the effect of product innovation on the financial performance of SMEs, the authors have used the indicator of gross production power, i.e. the ratio of EBIT to assets in their previous work. In this regard, the production companies showed much less, but longer lasting positive effect of product innovation on performance of the company than it was observed in service companies which production power in the year t+2 significantly decreased again. Reduced effect of product innovations in production companies, measured by the change of production power can be also derived from the mathematical point of view, because simultaneously with the
growth of operating profit are likely to grow the volume of invested capital, i.e. the denominator of the ratio. This is also the reason for that in the case of the outcomes of this subsequent research, the effect of product innovations were stronger in deviations of operating profits of services companies where these profits are not negatively affected by increased depreciations that comes out from potential of operating profits of services companies where of product innovations were stronger in deviations the outcomes of this subsequent research, the effect the ratio. This is also the reason for that in the case of volume of invested capital, i.e. the denominator of growth of operating profits are likely to grow the

Also in this sense, it is obvious that elaboration of subsequent analyses is necessary together with the analyses of the resources of financing of realized innovations. As it comes out from presented analyses, motivation to realization innovations of products in statistical samples of observed SMEs was probably substantial decrease in their growth. Moreover, the time periods between company's start-up and realization of product innovation was 13.2 years in average. In this context it is possible to assume that these are companies with good access to external financial resources.

From the outcomes of elaborated analyses, it is also clear that, especially in production companies, the product innovations are very difficult to be separate from technological innovations. This aspect is also pointed out by Gurkov (2005) in his study. With regards to the mutual relations among the three basic variables of financial plan, in the case of production companies, it is possible to suppose that the effect of technological innovations is likely much more higher than the effect of product innovations. In this point of view, subsequent research of the issue of innovations influence on the SMEs' financial performance will be elaborated in future.

**SUMMARY**

Currently, innovations and innovation activities of enterprises in their essence are necessary condition for survival and development in continuously globalizing markets. In general, if the innovations are regarded as a tool for survival of SMEs in the continuously intensifying competition, then is objectively expected that innovations will bring economic benefits to a company while these economic benefits can have various forms, either in terms of growth sales, reduction of costs, effectiveness of internal processes, or trade and competitive advantages.

Objective of the paper is to determine the economic effect of the product innovations on the financial performance of the small and medium-sized enterprises in the Czech Republic at using the base of simplified financial plan. In order to fulfil this objective, the primary research has been realized on the statistical sample of 100 SMEs, legal business entities providing their activities in the Czech Republic. Simplified financial plan for each company has been prepared based on the entities' results in the years before the product innovation realization. Methodological resource of this simplified financial plan preparation was the prognosis of sales that has been projected at conjoined application of the regression analysis in time series and the average rate of company's growth in the past. Then, for the objective of this paper, the simplified financial plan is defined as the projection of sales, net operating profit and operating cash flow in the period of t to t+2. The results of pilot observation have shown that a significant decrease in the company's rate of growth preceded the realization of product innovation in the SMEs. In the group of production companies, the real sales differ from the prediction for 5.22 per cent in average, while the real sales are lower than prediction. Lower than the prediction are also the sales in the year t-1, when this average difference is 2.36 per cent. In the year t-2, the real sales of production companies are already higher than prediction, and the average deviation here has the value of 10.85 per cent. The deviations between real operating profits and their predictions are much more higher and positive. It means that real operating profits in production companies are higher than predictions even if the sales are lower. In the year t, the real sales of service companies were lower for 17.63 per cent in average, in the year t+1 it was for 23.26 per cent less, and in the year t+2 the average negative difference was 32 per cent in comparison to the prediction, respectively in comparison to the simplified financial plan. But on the other side, the deviations of operating profits are highly positive, when in the year t, the operating profits were higher for 34.51 per cent in average comparing to the prediction, and in next years it was for 46.32 per cent more, respectively for 49.89 per cent more than the prediction.

From the results of elaborated analyses revealed that the product innovations implemented in SMEs do not positively affect the sales of these business entities, but have a significant impact to the operating profit of these companies. Hence, it leads to that product innovations in SMEs are mainly focused on reducing the production costs. If this conclusion is then related to the analysis of the product innovations impact on operating cash flow of SMEs which are production companies, it would be possible to suppose that these product innovations are also connected with improvements in production technologies.
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