Evaluation of the Innovation Performance of Business Networks

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Abstract

Due to intensive competition on the market small and medium-sized enterprises must look for new ways how to increase their profitability and improve their overall performance. A business will succeed if it innovates and improves its products and this way gains competitive advantage. Innovation is a frequently brought up topic when the possible future directions of business development are being discussed. Due to the fact that SMEs have lower capital and lack experience, they establish alliances, groupings, business networks and clusters. The establishment of business networks proves to be an efficient form of cooperation in which businesses support each other and improve their own ability to innovate. A business network is an important microeconomic factor influencing the development of the involved businesses. What is more, these networks also develop the region where they were established. The question of how to measure the innovativeness of these networks is an important one. In the following paper we will deal with this theoretical and methodological issue.

Key words: innovation, innovation performance, measuring of innovation performance, business network

JEL Classification: L14, L26, O31

1 Introduction

Small and medium-sized enterprises are an important part of market economies. Their importance in national economies lies in the fact that they are the main driving force of economic development due to their flexibility in adapting new, cutting-edge innovative technologies and owing to the fact that they create new jobs. A key pillar of prosperous economies is an efficiently functioning business sector, in which sole traders, entrepreneurs, and SMEs play the most important role (Mura, 2012).

With a view to the fact that Slovakia is an EU member state, it is important to look at legislative measures regulating business activities. Business activities in Slovakia are equally regulated by Slovak law and by Community law (Funta – Nebeský – Juriš, 2014). The main goal of the European Union in business policy is the establishment of the so called Enterprise Europe, which

should lead to the maintenance of sustainable economy, which is based on knowledge and innovation.

Businesses today find themselves in a complicated and always changing business environment. Adaptability and flexibility are of key importance in this environment, which means that they have to adapt to their ever changing environment and must develop their products and services to meet the the increasing needs of their customers. The question of why it is necessary to implement innovation has been dealt with by Kuratko, Covin and Hornsby (2014).

Innovation is a topic often discussed by scholars and those directly involved in business alike. Best practices from developed economies should inspire Slovak businesses too. It might seem that large corporations innovate most; however, it is not the case. The figures of the Small Business Agency (2014) show that it is SMEs who innovate most. There are several reasons for this: high flexibility, ability to change quickly, flexibility in meeting changing customer and market needs, simplified decision-making due to the fact that the owner is usually the manager too.

Long-term experience shows that only those businesses can succeed in the current super-competitive environment which constantly improve their products and services and actively improve their business and production processes. This has been pointed out in several papers, such as in the ones of Hajdu, Andrejkovič and Mura (2014) and in the one of Matisková and Šebej (2011).

The aim of this paper is to present some models, which were elaborated to measure the innovation potential of SMEs. We also deal with how to measure the innovation performance of business networks. Our analysis was based on field research and desktop research too. Our field research was conducted in the framework of a VEGA research project. In our desktop research we worked with papers and books published by renowned scholars from abroad and from Slovakia.

2 Result and discussion

Theoretical approaches toward the evaluation of innovation performance
SMEs are the driving force of European economy. They create new jobs, and enhance business mind and innovation in the EU, thus they largely contribute to increasing competitiveness and job creation. In business life SMEs often have to face difficulties in acquiring capital and getting loans, and that mainly at the time of starting up the business. On the other hand, businesses prefer investing into new technology and innovation rather than spending the same amount of money on paying taxes. This is not a typical Slovakian phenomenon, but is practised worldwide (Haufler – Norbäck – Persson, 2014).

Thus, new technologies and innovations are introduced with much higher difficulties in financial respect (Matisková, 2012). For this reason, the supporting of SMEs is one of the priorities of the European Commission to promote economic growth, the creation of new jobs and economic and

social cohesion. On the other hand, due to their high flexibility and the fact that they easily carry out changes, SMEs are in a more advantageous position than large corporations.

The European Union's commitment to help create an environment in which businesses, industry and innovation can develop has officially been affirmed in Article 157 of the Treaty establishing the European Communities. In doing so, the European Union focuses on three key policy areas: small and medium entrepreneurship, innovation and competitiveness, including the advantages and benefits arising from the single market. The aim of this support is to strengthen the innovation capacity of SMEs and of their contribution to the development of new products based on new technologies and new markets by providing them assistance in outsourcing research. The EU will support the increasing of their research efforts, the extending of their networks and the better use of their research outputs and acquired technological know-how.

The ability of businesses to take risk is a factor that limits the increasing of their innovation potential (and this is even more true for SMEs). Decision making at the times of risks is a special challenge for business managers, mainly in terms of their social psychological capacities and their ability to handle stress. Risk management should not be underestimated either when innovations are introduced in firms (Bujna – Kotus – Čičo, 2013).

Companies establish business networks because they are looking for ways to jointly maintain some corporate processes or carry out business activities. Not only does this form of cooperation involve knowledge sharing, ideas are also confronted and contacts are also shared etc. It is the choice of the participating businesses which form of cooperation they choose and how closely they want to collaborate. Thus, we can talk about different forms of cooperation ranging from business networks and strategic alliances to very close cooperation forms such as mergers and acquisitions. Rice, Liao and Niegel (2012) have analysed these in details. The disadvantage of close cooperation is that the participating firms lose their own corporate and legal identity since the two companies merge.

Business networks and clusters are flexible enough to make firms be able to deal with competition together on local and global level. The development of ICT significantly contributed to the development of network based business models. As a result, new forms of business cooperation appeared. Business networks join businesses that complement each other and can coordinate their joint activities.

Fewer scholars deal with in the analysis of the innovation potential of business networks (e.g. Pavelková et al., 2009; Danilina - Mingaleva, 2013) than with the analysis of innovation in general. The innovation potential of businesses should not be analysed exclusively from business perspective but from a wider range of perspectives. These are mainly local development and regional development, which together create the absorption capacity of regions in terms of the activities of innovative SMEs. Developments in economically developed countries show that these aspects closely influence each other. This mutual influence has been dealt with by a number of foreign scholars such as Pokorný (2008), Luisa - Oltra (2013), Mayer - Baumgartner (2014) etc.

2.1 Methodological-quantitative approaches to the evaluation of innovation performance

The evaluation of the innovation potential of business networks is a process that is influenced by many factors. The methodology of the above mentioned evaluation must be elaborated accordingly. First of all, the factors must be divided into two groups: internal factors (such as corporate factors and network factors) and external factors.

On the basis of our research the internal factors are the following:
- nature of the innovation,
- strategic management of the business activities,
- ability to manage innovation in a flexible way,
- potential of human resources,
- functioning of knowledge management within the company,
- sharing of new information and ideas coming from the direct environment of the company.

On the basis of our research the external factors are the following:
- cooperation with consultants and experts,
- availability of external financial resources**,**
- access to databases and information sources,
- (un)willingness of external entities to take part in innovation.

When evaluating innovation potential we mainly focus on the identification of advantages or benefits, which are brought along by innovation in businesses. Here we talk about a firm's added value. Not only does this added value increase the overall value of the business, it also brings along development and competitive advantage. The implication that increasing innovation in individual enterprises interested business network there is a synergistic effect of increasing innovation capacity and performance across the business network. Multiply so the overall effect and benefits for the entire network.

The degree of innovation potential is influenced by several factors, which most often are the following: research and development, flexibility toward customer needs and requests, production capacities of the business, business strategy, and differentiation of customer needs from different target markets.

In order for us to proceed to evaluate the innovation performance of a network, it is necessary to assemble components and performance-alone model. Graphically it is a graph of the first
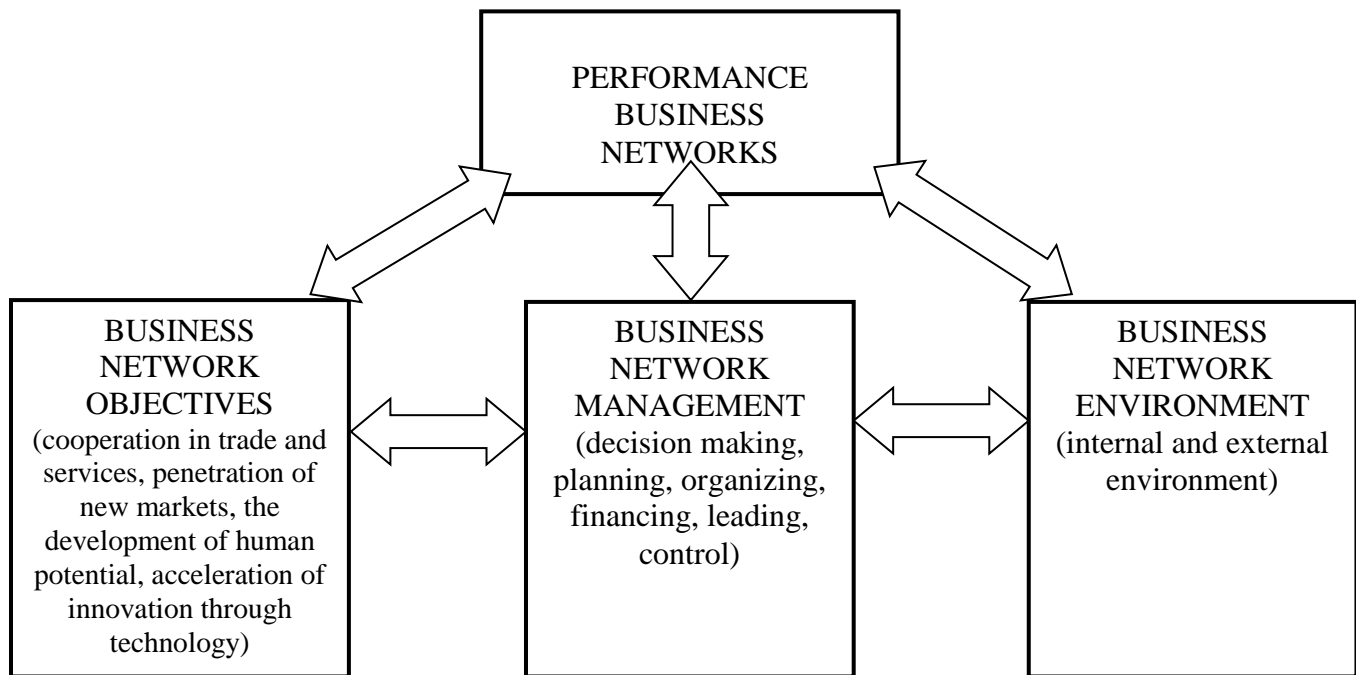
Fig. 1 Components of performance-model business network
Source: own processing

In Figure 1 we can observe the different components of the model performance-business networks and their interdependence. On the performance of business networks affect essentially three separate but closely linked components. The objectives of the business network are derived from the strategic objective and vision of the business network. The partial aim of the cooperation in trade and services, penetration of new markets, acquiring new market segments at home and abroad, the development of human potential, acceleration of innovation through technology. Managing business networks requires accurate identification of business processes, prompt decision-making and ensure managerial functions (planning, organizing, leading, control) by the provision of funding this activity. On the performance of business networks in many impacts the environment in which business operates a network. Formed by the internal environment (managers, participating businesses, goals and values grouped enterprises, human resources, equity) and external environment (the current legislation, the economic policy of the state, competitors, suppliers, customers). Individual determinants in the performance model help to understand how business networks are formed and evolve and develop.

The methods which can be used to evaluate the innovation performance of business networks can be divided into three groups:
- Logical-cognitive methods, whose advantage is that they are not difficult to draw up; however, they are less precise. As an example, we would like to present the following relations on the input and output side:

INPUT	OUTPUT
new ideas	receipts in the form of turnover
actively managed costs	economic efficiency
resources	returns to scale

- Advanced methods of evaluation. By using these methods a deeper analysis can be conducted. As an example, benchmarking could be mentioned. It is a method, which is a part of strategic management. Benchmarking should not exclusively involve the process of analysing and the copying of competitors. In the framework of this method mainly the processes and methods of businesses and business-networks should be compared with each other. Benchmarking helps entities to identify and improve their own market position on the basis of comparing themselves with competitors. Businesses must focus on the improvement of their own deficiencies, on the utilisation of their own strengths and on learning from their competitors. Benchmarking is an evaluation process, which significantly contributes to acquiring competitive advantage.

- Sophisticated quantitative methods. Innovation performance can also be measured by using quantitative analysis tools under certain circumstances providing a deeper analysis of the effectiveness of innovative performance. These tools are for example the DEA (data envelopment analysis), the SFA (stochastic frontier analysis) and OLS (ordinary least squares). When efficiency is measured with the help of the above mentioned methods, it is necessary to mention that during their use several criteria have to be met in order to get objective results. This might make the measuring of efficiency difficult or even impossible.

- The main disadvantage of SFA is the necessity to formulate the shape of the production frontier and to determine the initial conditions for the probability distribution of data and random components. SFA analysis can identify efficient scale somewhat lenient compared to DEA analysis. It is believed in her special shape of the production function (usually logarithmic or exponential). The advantage is that SFA analysis can take into account the random differences between the compared entities in the survey sample. Just that its properties can be attributed to the fact that it does not interpret any deviation from the boundaries of the production possibilities set by DEA analysis as inefficiency. Does this mean that the SFA analysis is respectful compared DEA analysis on the issue of inefficiency.

- In OLS analysis it is problematic to obtain data for the statistical estimation of reduced parameters and it is not possible to conduct a direct mathematical-statistical verification of the structural parameters of the model. When compared to SFA analysis, we find that the OLS analysis is in contrast to the SFA based on assumptions about the shape of the production function, and considers the relationship between inputs and the results of the linear. Identify the highest, but only moderate effectiveness. Any deviations interpreted as a departure from the average efficiency of the analyzed subjects in the survey sample.

- On the basis of the above described facts data envelopment analysis seems to be the most appropriate method. This method for the quantification of innovation performance

eliminates the above described deficiencies. Data envelopment analysis is a statistical method for the measuring of efficiency, which uses the methods of linear programming. Due to its advantages data envelopment analysis is becoming more and more used, and efficiency can be quantified with it in different economic sectors. In DEA analysis can identify points that lie on the border ie "Packaging" of data. Also represent entities that are most effective in reshaping the cost of innovation. All bodies lying below the line joining the most efficient operators have room for improvement. Can achieve better results with the same inputs, or equal scores save the cost of innovation. In the chart below we present a model example of a comparison of different methods of analysis.
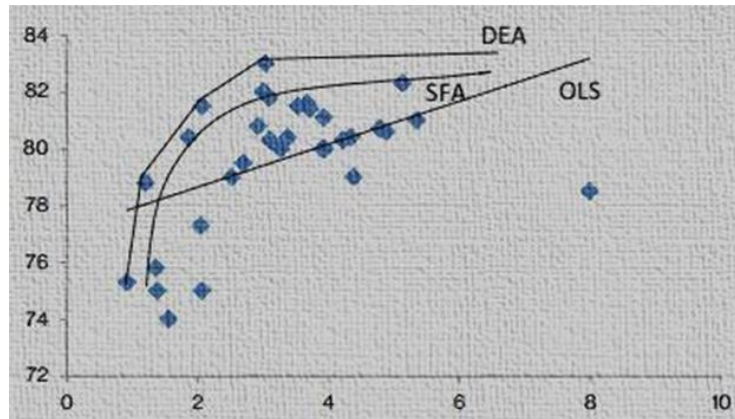

Figure 2 Comparison of different methods of analysis
Source: Output from statistical software

Note: axis x - the cost of innovation in thousands of Euros, y axis - the expected outcomes in innovation

In addition to these groups, there are other possibilities for evaluating innovation performance. One of the following applies, the European Commission called European Innovation Scoreboard. This assessment tool was part of the so-called. Lisbon. This method focuses on the comparative evaluation of the innovation performance of Member States of the European Union. This model evaluates the facts on the basis of a block diagram consisting of five parts:
- Drivers of innovation,
- Creation of knowledge,
- Innovation and entrepreneurship,
- Applications
- Intellectual property.

3 Conclusions

Businesses have an important role in all developed economies, which are based on the idea of competition, on different forms of ownership as well as on competition between businesses of different sizes. They are a logical and basic component of each national economy. Their existence is vital and they are necessary for globalisation and scientific and technological development. Their innovation capacity arises from these facts. SMEs are generally considered to be the initiators of a substantial part of innovations, and they are also very flexible in changing

with the ever changing market environment and make up a significant segment of regional economic growth.

The present paper focused on the analysis of the potential theoretical and methodological approaches to the assessment of the innovation performance of business networks. Among others, Gadzhiev and Buchaev (2014) have also pointed out the need to deal with this topic.

The methods for the quantitative analysis of innovation potential enable us to obtain a comprehensive, sophisticated view on this subject matter, which is frequently discussed nowadays. The aim of this paper was to present some models for the evaluation of the innovation potential of small and medium-sized enterprises. We believe that the main benefit of our paper in particular is the selection and presentation of specific quantitative methods, since the previously published papers in Slovakia focused only on theoretical approaches to the problem without any deeper analysis. It turns out that the mere implementation of innovations in production and logistics processes, without the identification of their actual benefit to the business, would be insufficient, particularly in relation to the economic and technical efficiency of those innovations.

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