

## EVALUATION OF INNOVATION POTENTIAL

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### Abstract

Analyzes the international competitiveness of the Czech Republic emphasize the need to redirect growth model and the competitiveness of Czech companies towards growth based more on innovation. With this is also consistent source of competitive advantage theory, which says that it is necessary to establish a competitive advantage on the resources companies that meet the basic characteristics of potential, scarcity, difficult imitation and substitution. In other words, it says that it is necessary to build a competitive advantage based on intensive innovation activities. Innovation activities of the company is a prerequisite for competitive advantage and long-term existence of the company. Competitive advantage of the whole economy, of course, depends on the competitiveness of companies. Innovation is an increasingly important tool for companies to maintain long-term competitive advantage, therefore discussions about the appropriateness of possible instruments for measuring innovation potential are intensifying. There is no consensus on what data are needed to assess the best innovation performance. There are scales on transnational, national, sectoral and enterprise levels. Generally, both the input pointer (assumptions) and output pointers (results) are used in the evaluations. The aim of this article is to focus on finding potential scales so as to be applicable directly and for all players in the innovation process.

**Key words:** innovation potential, measure of innovation, competitiveness

**JEL Code:** M21, O31

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### Introduction

Innovation is the driving force of the economy both at corporate and national level. The ability to create added value is affected by the ability to innovate a business model (Špaček, Štěpán, 2013), but also by the position of the company in Global Value Chain (Rojíček, 2012). This leads to two fundamental effects. At the microeconomic level, the company has resources for further development and thereby increase the value. At the macroeconomic level, there is GDP growth and higher fiscal deductions and also other state interests are

affected as higher employment, support for science and research and education, increase living standards or international competitiveness (Nečadová, Soukup, 2013). Therefore, there is a direct interest in supporting innovation, which leads to the need to assess the status and progress in this area and subsequently to the creation of measurement tools at all levels.

The most widely used measure at transnational level is the Summary Innovation Index, further SII (Innovation Union Scoreboard, 2014), which is regularly evaluated and published. SII processing is fast and precise and is based on multi-criteria evaluation clearly defined and well measurable indicators. SII allows individual states to determine not only the current situation but also position in comparison with other countries and the shift of individual criteria with respect to the previous period. On a similar basis, the Global Innovation Index is created, further GII (The Global Innovation Index, 2014). The advantage of the GII is that in comparison enters 143 countries around the world, not just Europe and the developed regions. Rankings focused on competitiveness is also dealing with innovation and their measurement, because there is a direct link (Soukup, 2013). At the national level, innovative corporate behaviour is tracked mainly by regular statistical survey. This statistical surveys are ordered by national statistical organizations in developed countries and within Europe there is the effort to unify the indicators monitored and evaluation methodology (CZSO, 2015). Results include: the detection of innovation barriers, the shift in the innovation behaviour of companies and the ability to adjust the system of state support for the most effective impact. From the foregoing it is clear that the scale should be used not only passively but actively. Scales should be used to further decisions about the future path. The question is how to measure innovative behaviour at the company level, so that the management has brought a similar decision support.

## **1 Measuring the innovation behaviour of companies**

When looking at the global and national scale, it is possible to see the fundamental trend: the shift from objectivity to the necessary information capability with a focus on further decisions. Global scales include mainly indicators that are general assumptions or outcomes of innovative behaviour, are current and well and objectively measurable. Measurements conducted by statistical authorities at the national level already measure how hard indicators (How much % of sales are from innovative products? What are the costs of innovation with respect to revenues?), but also soft indicators, which sometimes may be distorted by personality (What is the biggest obstacle to innovation? Who is the most important element of

co-innovation process?). These soft indicators are more relevant for setting the state support, but they are harder to detect. At microeconomic point of view, it is not essential to objectively compare all the companies in the world for the company. It is important to fulfill its objectives, self-assessment is a way to find out if they are met. It is possible to use both hard and soft indicators for self-assessment.

### 1.1 Hard indicators of the innovation behaviour of companies

In case companies evaluate barriers of innovation, financial barriers are most frequently mentioned (Nečadová, Scholleová, 2011). Innovations are directly linked to competitiveness, therefore innovation scales and competitiveness scales may overlap (Scholleová, Čámská, 2015). Based on this, extensive survey of Czech innovative companies was conducted (Scholleová, Čámská, 2015). Indicators for predicting resource for innovative behaviour were designed in this investigation as well. These indicators reflect assumptions of innovative behaviour in financial field. The selected indicators are shown in Tab. 1: These are factors that should influence the value of the company in advance of 3 years significantly.

**Tab. 1: Indicators of significant value creation for the company in the next 3 years**

Indicator	Formula	Short
Share of Operating Expenses on Operating Revenues	OE/OR	OE/OR
Annual growth of Value Added	$VA_n/VA_{n-1}$	I(VA)
Annual growth of operating revenues	$S_n/S_{n-1}$	I(S)
Annual growth of Total Assets	$TA_n/TA_{n-1}$	I(TA)
Annual growth of Personal Expenses	$PE_n/PE_{n-1}$	I(PE)

Source: modified according to ( Scholleová, Čámská, 2015)

31 indicators were monitored in total (Scholleová, Čámská, 2015). In the table we see that the growth and dynamic indicators are significant.

### 1.2 Soft indicators of the innovation behaviour of companies

Theory (Kelley, Littman, 2005) says that the human factor is an essential factor for setting the companies in innovation, as well as the method of decision for internal resources of the company and cooperation with external sources of innovation (Tidd, Bessant, Pavitt, 2007). According to (CZSO, 2015), external sources of innovation consist primarily of customers

and suppliers. The questionnaire has been created (Tidd, Bessant, Pavitt, 2007), we tried to simplify the questionnaire and adapt to the needs of Czech companies and conducted a pilot survey.

Companies responded to questions in the following areas:

1. conceptual activities - plan of development, innovation, collaboration with external entities,
2. method of monitoring reality of innovations - monitoring of financial resources, technical trends, monitoring of completed projects,
3. sources of innovation - qualified staff, technical resources, information resources,
4. management infrastructure - the definition of procedures, steps, competence, involvement of people, project management, documentation
5. operational management - documentation, planning, management, risk management, feedback and feedforward
6. assessment of innovations - the financial results.

## **2 Methods of assessing the innovation behaviour of companies**

Group of companies selected for the pilot survey and comparison of presentation of soft and hard measures included a companies focused on technical production and clearly on products (not services): engineering firms 58 %, companies linking electrical engineering and other fields 25 %, others 17 % (food companies, textile and porcelain).

The pilot survey was to determine:

- a) The validity of the questionnaire in terms of differential and completeness of soft assessment.
- b) The validity of using hard indicators in comparing companies as well as comparison of outputs using hard indicators and outputs of soft assessment.

Descriptive statistics and summary comparisons were used to evaluate soft indicators companies. Other methods were not used because of the low number of respondents and at that time unclear validity of the questionnaire. The above defined indicators were used to evaluate hard indicators focusing on the financial assumptions. Additionally, indicators from the perspective of the average termination capabilities are evaluated. In conclusion, the results of the hard and soft rating scales are compared according to the success of individual indicators.

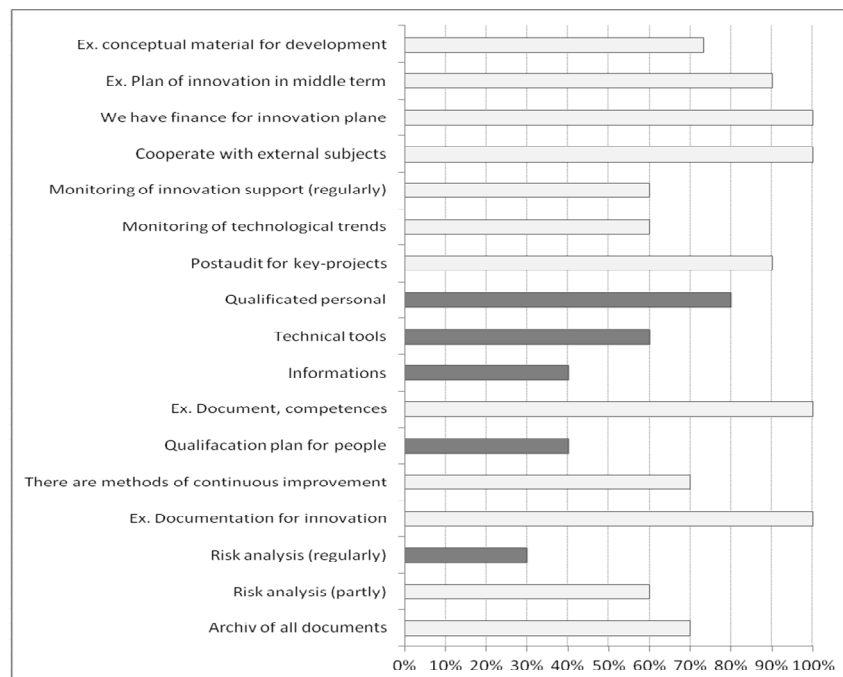
### 3 Results and discussion

Evaluation of indicators in hard and soft areas held separately. This was followed by a comparison of the two parts.

#### 3.1 The results of assessment by soft indicators

In the conceptual activity of firms, especially general questions showed satisfactory results. Objectivity of the response is influenced by the fact that companies know very well which answer is the "correct". Management knows that it is good to have documentation for innovation, develop cooperation, have managerial control systems, etc. Management also knows that everything should be reviewed and updated, so the answer using the scale yes - not is always "yes". The weaknesses showed up in the detailed elaboration of the question, if such - for example, all companies collaborate and monitor the cooperation or at least cooperate with external entities, but only 60% of companies have a responsible person designated to cooperate. Results are summarized in the graph in Fig. 1. Dark areas are marked in the Fig. 1. These dark areas indicate questions where the answers differed across companies and which therefore can assume greater relevance of answers. The success of individual companies in these areas will be compared with hard indicators.

**Fig. 1: Ratings group of companies with a questionnaire on soft indicators**



Source: own processing

Low differences in the evaluation of companies were affected by the fact that these were companies that actually deal with innovation and primarily builds on its competitiveness, but as already mentioned, the questionnaire includes questions on which it is known, what should be the right answer. Frequently, respondents are physically forced to the expected response at low scalability (yes - no). And this is why all companies had score between 26 and 33 of the 35 possible points. It was possible to see differences and potentials for improvement in detail phrased questions only.

### 3.2 The results of assessment by hard indicators

Indicators defined in Tab. 1 were calculated for evaluating the success of monitored companies in the financial assumptions. The indicators were calculated on the basis of publicly available data. It is summarized in Tab. 2.

**Tab. 2: Indicators of significant value creation for the companies in year 2013**

Indicator	Averagea	Standard deviation	% of firms with negative position of indicator
OE/OR	88%	0,08	0%
I(VA)	1,12	0,329	17 %
I(S)	1,07	0,229	17 %
I(TA)	1,05	0,151	25 %
I(PE)	1,07	0,210	25 %

Source: own processing

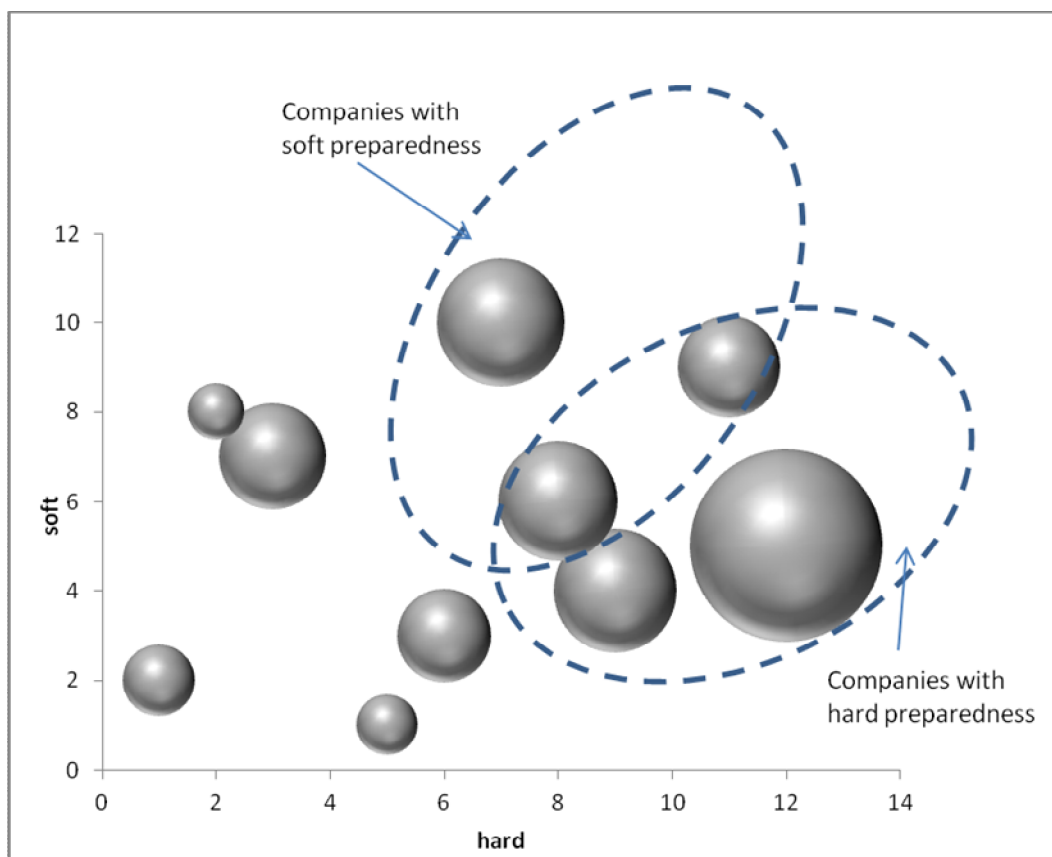
Average values and values of the majority of monitored innovative companies show sufficient space for profit making (the relationship between operating costs and revenues) and the growing trend in key indicators.

### 3.3 Comparison of position of companies in the field of soft and hard indicators

Finally, the preparedness of companies to innovate has been evaluated as a whole, on the basis of soft and hard indicators. This evaluation was done for all companies with full and relevant data base. As mentioned above, only the data selected on the basis of previous analysis was used to assess the soft preparedness (dark areas marked in the Fig. 1). The

preparedness of companies in different areas has been complemented their current ROA values (Return on Assets = EBIT / Assets) as an illustration of the current success.

**Fig. 2: Companies and their position in the group in the field of soft and hard indicators of innovation activities**



Source: own processing

On the horizontal axis of the graph there is the ranking of companies in the average value of hard indicators, on the vertical axis there is the position of companies in the average performance of soft indicators, the size of the bubble is an adequate amount of ROA (for the sake of completeness we should add that the lowest ROA was 6%, which in itself is positive information). Companies that are closer to the horizontal axis have focus on creating hard indicators, companies that are closer to the vertical axis have focus on creating soft indicators. The more is bubble of the company from the intersection of the axes, the better is company working in the area of innovation assumptions.

### **3.4 Discussion**

When looking at the monitored group of companies, better results have those companies that focus more on hard indicators. This can have several causes. As was mentioned at the beginning, we followed mainly purely technically oriented company and management is more technically oriented in these companies. Also, they are based on far more conservative method of financing and stable growth (Kislingerová, 2014), which are exactly the same indicators that are significant for long-term growth based on competitive advantage. Another cause may be a way to evaluate soft assumptions through a pilot questionnaire. Above all, the low level of scaling can be a significant problem. Most of the basic questions were degraded to a positive response in this way. In some cases it appears that the problem is more complicated than it is able to provide a simply structured questions and answers.

### **Conclusion**

Corporate innovation are important both for creating long-term competitive advantages of companies and countries and the global economy. In accordance with the fact that what is to be developed, it should be managed and what is to be managed, it must also be measured, many metric system to measure innovate on is generated. The aim is to be objective and focused into the future. Therefore, the so-called assumptions are followed, no results. Assumptions may have a different character. It is necessary to monitor the readiness of companies not only in hard assumptions, but also in soft assumptions. Soft assumptions are usually difficult to measure and are peculiar to each company - relationship management system, corporate culture, ways of managing innovation projects, setting risk management systems, etc. In the area of global measuring and comparing the states must be completely objective scales. In the field of measurement and evaluation of innovation companies it is not needed, the measurement is to serve companies for further development. Therefore, it is necessary to work with soft assumptions that we are trying to develop through a questionnaire evaluated in this conference paper. Based on the pilot survey questionnaire will be more structured, extended and deepened, and scaling will be extended. Assumptions innovative behaviour of companies as the basis for measuring innovation should serve primarily to companies, so it is also possible to perceive the evaluation questionnaires based on the principle of self-assessment, which can help companies improve work primarily with difficulty measurable way, but the secondary is manifested in the basic business indicators of



long-term success. The systematic creation of soft and hard assumptions which have been assessed, affects the growth of company value.

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