MOTIVES AND BARRIERS OF INNOVATION BEHAVIOUR OF COMPANIES

Marta Nečadová¹, Hana Scholleová²

¹ University of Economics Prague, Czech Republic, scholl@vse.cz
² University of Economics Prague, Czech Republic, necadova@vse.cz

Abstract

The objective is to compare the development of companies’ view at impulses, goals, motives and barriers to innovations. The evaluation will use both its own research and comparison with data obtained from the United Statistical Organization. We will focus on assessing the business community views on the impact of the crisis on the innovative behaviour of firms. The strength and type of innovative behaviour then depends on the size of firms, the management, capital strength, industry, complexity of innovation in terms of evolutionary and revolutionary solutions to the power of relationship with participating subjects (internal and external), the evolution of society, industry and competitive pressure (especially procedural innovations aimed at cost savings and product innovation in the fast changes).

Keywords: measuring of innovation, incentives of innovation, barriers of innovation, primary research.

JEL Classification: D92, D83, O31, O34, O38.

Introduction

Innovative behaviour of a firm is a necessary condition of long-term prosperity in a highly competitive environment. Gaining competitive advantage may have different symptoms and according to them, innovation is classified. Business innovation is a positive phenomenon, which is reflected in the company’s performance, but also in customer’s satisfaction, employees, government agencies and other stakeholders. The primary research was based on questionnaire survey about current economy difficulties and opportunities for business companies. They answered questions in the form of choosing one possibility from evaluating scale. We use the results of two primary researches – in condition of economic growth (2007) and in condition of economic crisis (2009). To evaluate answers we used the method of comparison and analysis – the data are presented on figures and commented on with the aim of assessing the impact of the firms. The initial aims are: plot attitude of Czech enterprises to innovative activities in conditions of economic growth and crisis, describe barriers of implementing innovations from enterprises’ point of view and compare the results from our primary research and research of Technology Centre ASCR with the barriers of innovation activities which are identified in official government analysis of competitiveness. The empirical research at the Faculty of Business Administration at University of Economics in Prague was done in terms of the solution of research intention MSM 6138439905 “New theory of organizations’ economy and management and their adaptation processes”.

Possibilities of quantifying innovative behaviour of companies

Innovation policy of each company is a very specific issue for which there are no uniform rules or clear instructions. However one can identify the basic determinants of innovation development and monitor their importance for the emergence and development of product and process innovations. There are plenty of possibilities how to quantify innovative behaviour. It is possible to measure the innovative activity on different levels – within a firm, for a branch, national economy or to look for indicators that would globally help to compare pro-innovative behaviour in individual states.

On the level of a company it is possible to monitor innovations by the help of non-financial indicators that are unusable in the wider frame because of impossibility of comparison. It is not only about the number of innovations, but also the age of production schedule, level of progressivity and so on. In the terms of particular companies it is also possible to express the economic impact of innovations by quantification of financial effects of realizing them. But it is very important to assign all cash flows correctly which is not easy in a company with developed potential and the classical method as NPV have undervalue growth built on innovations that is based on firm flexibility. The flexibility is reflected in real options – possible actions, which can be undertaken by management as a reaction on changes in market conditions. These changes can have strong impact on the value and that is why must be added to total value. (Čulík, 2010). On the level of
national economies the innovative activity is usually measured by the help of aggregated indicators which
have a character
a) of input indicators which include e.g. expenses on research and development, number of workers
in research and development (relevancy results from the presumption that human capital and
research work are the most important determinants of innovations’ rise), amount of venture capital
entering to start up and expansion period,

b) of output indicators – number of patents, licences and innovations, bibliometric analysis or by
expression of company’s goodwill through of intangible assets.

Using input indicators is debatable because it automatically supposes effective usage of them which
need not be always fulfilled.

In addition to particular followed indicators, summary values are usually being created as well, which
are not commonly used for evaluation of innovative activity of individual firms, but for whole national
economies (so called innovative indexes). Summary indexes comprise of variously organized indices of both
input and output character, in a discussion a change in their structure occurs in time.

In comparison on micro level, which means during monitoring innovative activities of individual firms
it turns out that there is a positive relationship between the size of a company and R&D activities, but this
relationship is not linear – generally it increases up to a particular point with increase in the company’s size.
If the company in still increasing, the extent of R&D activities does not change, in some case it even
declines. In consequence of imperfection of capital markets, small enterprises are handicapped in ensuring
financing of R&D activities. Large companies dispose of easier access to external financial resources, at the
same time they have got an advantage in diversification of risk connected with innovations. They can use
economies of scale while putting the innovations into the production process as well.

“Even in financial markets that are characterized by zero spending on gaining information and
realization of transaction, creditors will require higher the interest rate, the lower the initiatory property
equipment of the debtor is (with assigned quality of projects), or if you like it happens that poorer
participants’ capital projects of relatively higher quality will stay non financed, while richer participants’
projects of relatively lower quality will be financed”. (Gočev, 2010)

If a comparable capital project is presented to a bank by a small and a large company, then usually
small firm requires higher rate of return on investment, because it has got worse conditions for gaining
external financial resources. It result is implementation of less effective projects by large companies which
have got easier access to external financial resources e.g. because they are able to provide a pledge to the
creditor and act upon the creditor in other ways in order to increase his trust. The creditor is willing –
especially in case of share of the debtor in project’s financing – to require a lower interest rate and to settle
for lower quality of the project.

An option to gain external financial resources is derived from managers’ motivation while managing
the company. If the company follows the target to maximize the long-term flow of future earnings, then it
has to grow on a long-term basis – the growth of the firm is determined by efficiency of its investments (and
innovations). This growth is undoubtedly determined by the possibility of gaining financial resources from
external sources mentioned above. According to managerial theories the growth of the enterprise also
correlates with basic needs of managers which include: salary, status and power. (Pošta, 2006).

According to the theory of X-non-efficiency innovative activities can be weakened in large companies
with separating managerial and ownership functions in connection with bureaucratization within the firm and
also in connection with the intensity of competitive pressures.

The less the competitive pressure on managers is, the higher the non-efficiency. With the growth of
the enterprise, spending on research and development increases, but their efficiency generally decreases also
due to the loss of motivation of R&D workers in a big organization. The reason why the motivation lowers
can be the bureaucratization of implementing innovative activities and as a result undervaluation of
innovative workers as well. In small enterprises, the engine of innovative activities is expected monopoly
profit connected with innovation. If we accept the assumption that high market concentration means low
intensity of competition and high market power, then higher innovative activity can be seen in branches with
stronger competitive pressures. On the basis of empiric data it was found out that if the market share of four
largest companies in the branch was lower than 55%, then intensity of R&D measured by number of R&D
employees increased, while a higher market share it declined.

Explanation of this relation is connected with divergence of impacts of competition on firms while a
different market concentration. Competition increases the probability of firms’ bankrupt and encourages
managers in innovative behaviour. At the same time, competition means lower companies´ profit and therefore lower ability and willingness to innovate. For this reason innovative activities “culminate” in a certain level of market competition or if you like market concentration.

**Reasons for and barriers of innovative behaviour**

Basic reasons for pro-innovative behaviour of enterprises are obvious – gaining long-term effects on markets is concerned. In year 2007 (therefore before the crisis yet) an extensive questionnaire research (252 large Czech firms) which found out impulses, targets and barriers of innovative activities was done at University of Economics. In the terms of suggested answers, more possibilities could be chosen (which was used by the firms) and at the same time they could fill in other reasons, targets and barriers (which did not happen).

On the figure 1 there are impulses of innovative activities divided into four groups according to how they are aimed – on a customer (markets), product, environment and organization of the production and the largest part of companies claim that the greatest impulse for them are customers´ needs. Figure 2 shows targets of innovative activities, they are again graphically divided into same four main groups of targets.

![Figure 1. Impulses to innovative activities (primary research of F3)](image1)

![Figure 2. Targets of innovative activities (primary research of F3)](image2)

It turns out that although companies mention customer’s needs as their main impulse, from the targets we can gather that firms think that the customer’s priority need is the price. Lowering material costs is mentioned most often as a target. Typical direct costs are considered, whose reduction can result in increase in firm’s profit or it will be possible to reduce the selling price. Figure 3 shows most frequent barriers of innovations, which were mentioned by enterprises in the same questionnaire research. The chart of the problems is led by financial and personnel problems (wrong equipment is a problem directly resulting from the lack of capital). Very similar results are also proved by the research of Czech Statistical Organization, where enterprises are divided into innovating and non-innovating and important differences can be found between these two groups. While innovating companies see the main problem in the area of personnel ensuring and internal communication, non-innovating enterprises see the greatest problem in the lack of their financial possibilities (Czech Statistical Organization, 2010).
The reason for the differences is probably:

a) the fact that non-innovating enterprises perceive finance as a barrier because they did not get to a stage when they had them and could started innovation, even then they could find out that they have problem with personnel ensuring.

b) non-innovating enterprises have problem determined by the attitude of people in risk obverse top management, and therefore the setting of corporate culture in the way that there is unwillingness to innovations in whole, capital is then the main reason, why there is no sense in changing that.

Figure 3. Barriers of innovative activities (primary research of F3)

Impacts of economic recession on innovative activity of companies

In the terms of quickly questionnaire research we asked enterprises in year 2010 (primary research of VŠE) how the economic recession took shape in different areas of business activities.

Figure 4 shows respondents´ answers to the question „How the situation for you enterprise changed in mention areas in the third quarter 2009 in comparison to the same period of the year 2008?“

According to the respondents the crisis has got a positive impact in the form of understandable increase in employees´ interest in enterprise’s future, increase in unemployment then means an improvement in quality and amount of potential employees in labour market. Evaluation of employees´ attitude to innovations suggests increased press on employees and at the same time about increased interest of workers in maintaining competitive position of the firm in market - 40 % states an improvement. Acording to the expectation the efficiency of investments worsened in connection with - 34 % of respondents stated deterioration. In case of other factors, respondents did not find any important change.

Figure 4. Impacts of crisis on a firm in % of respondents (primary research of UE in Prague)

In following table possible steps against crisis are evaluated by managers of the firms. Representatives of the firms answered this question through a choice from the evaluation: Which steps will you probably accept in nearest period (end of the year 2009 and 1.Q 2010)?
### Table 1. Steps against crisis realized by firms

<table>
<thead>
<tr>
<th>Step</th>
<th>Definitely yes</th>
<th>Rather yes</th>
<th>I don’t know</th>
<th>Rather no</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction of investments</td>
<td>18</td>
<td>29</td>
<td>15</td>
<td>30</td>
<td>8</td>
</tr>
<tr>
<td>Gaining new employees</td>
<td>13</td>
<td>20</td>
<td>14</td>
<td>35</td>
<td>18</td>
</tr>
<tr>
<td>Innovations of higher levels</td>
<td>18</td>
<td>30</td>
<td>22</td>
<td>24</td>
<td>6</td>
</tr>
<tr>
<td>Change in enterprise’s strategy</td>
<td>7</td>
<td>30</td>
<td>14</td>
<td>32</td>
<td>17</td>
</tr>
<tr>
<td>Strengthening mergers, acquisitions or by property entering</td>
<td>6</td>
<td>14</td>
<td>3</td>
<td>35</td>
<td>32</td>
</tr>
<tr>
<td>Change in marketing strategies</td>
<td>9</td>
<td>33</td>
<td>14</td>
<td>35</td>
<td>9</td>
</tr>
<tr>
<td>Extending product portfolio</td>
<td>18</td>
<td>36</td>
<td>16</td>
<td>27</td>
<td>3</td>
</tr>
<tr>
<td>Change in employees’ motivation, new instruments of stimulation</td>
<td>14</td>
<td>29</td>
<td>26</td>
<td>27</td>
<td>4</td>
</tr>
<tr>
<td>Change in organizational structure</td>
<td>9</td>
<td>26</td>
<td>19</td>
<td>35</td>
<td>11</td>
</tr>
</tbody>
</table>

Prevailing strategy of the firm is gaining customers by the way that the product portfolio of the enterprise is extended (54 % of respondents). An extended product portfolio should be reached according to the respondents by implementing innovations of current products or services (48 % of questioned). With regard to the average size of answering company (according to the number of employees and turnover), 67 % of respondents expressed themselves negatively in the case of possibility to strengthen the competitive position in the market by implementing a merger, eventually an acquisition. Because the enterprises gave notice mainly to workers with lower qualification and agency, they do not consider the change in structure of employees as a priority (alternative not was chosen by 53 % of respondents). As well the change in organizational structure of the enterprise is not considered as a measure of high importance (alternative not was chosen by 46 %).

If we divide the companies of processing industry according to the technological exigency and evaluate the importance of barriers to implementing innovations we come to following conclusions:

a) In industries with lower technological exigency the main barrier of innovation activities is the lack of financial resources, which can result from high financial intensity of innovations in this group.

b) In industries with higher technological exigency the lack of human resources was perceived as a burning issue.

It can be expected that in connection with economic crisis the influence of insufficient financial resources strengthens and the importance of the lack of human resources slightly declines. A decline in demand and increase in companies’ financial problems in the period of recession lead to a change in business strategies. Firms above all try to lower their costs. Because investments into R&D and other innovative activities are not important for short-term survival of firms in the market, while an intermediate reaction of firms to the economic decline therefore their reduction happens. If we would compare in a long-term way the development of firms’ investments to R&D and development of GDP, we come up to a solution of correlation of both indices.

On the level of enterprises we can follow two different types of firms’ strategies of investments to innovative activities:

a) reduction of investments into projects with a longer term (which means R&D and innovation projects),

b) reduction of operational costs (e.g. re-organization) and acceleration of investments into innovation projects with the aim to stabilize the competitive advantage to the future.

It results from the research done by Technological centre of Science Academy of the Czech Republic (Pazour, Mráček, Kucera, 2009) that firms active in R&D will primarily lower operational cost, mainly administrative expenses (50 % of respondents). Lowering these expenses is a priority for all enterprises with no regard to their size structure. In case of decreasing investments in production (40 % of respondents) there is an obvious difference between the group of small enterprises and middle and large enterprises. Middle and large enterprises put lowering of investment expenses on the second place according to the importance; small enterprises prefer reduction of wage expenses and expenses on education. Enterprises under foreign control put a greater stress on lowering administrative expenses (75 %) in comparison domestic (40 %). Overall it can be stated that companies lower expenses on knowledge-demanding activities after reducing administrative, investment and wage costs. From this conclusion it results that firms regard expenses on
R&D as strategically important from the point of view of competitive advantage and therefore they lower them after exhaustion of other alternatives.

Enterprises were also questioned in the research about factors which restrict their activities R&D on long-term basis. These factors showed themselves to be the most above all (in the sequence from the most important): economic factors – difficult access to external financing, economic risks and cost on R&D, insufficient flexibility of the legislature, market barriers – customer resistance to new products, low dynamic and innovative market, lack of information about markets, lack of qualified workers and technical equipment (large enterprises feel it more importantly), inflexibility of business organizational structure and insufficient spaces.

In the terms of the questionnaire enterprises also evaluated measures of the state with the aim to moderate impact of the economic crisis on R&D activities, in the sequence from the measures with largest contribution: lowering of social and health insurance, because it enables to lower wage costs, tax allowance on purchased research (positively evaluated mainly by small enterprises), accelerated depreciation of equipment and machinery (positively evaluated mainly by medium and large enterprises), providing soft loans and subsidized vouchers for purchasing smaller studies.

Mentioned measures offered by firms are in a direct connection to weaknesses of the whole republic, which impedes strengthening the competitiveness based on knowledge (Klusáček at all, 2005). These weaknesses involve above all: low interest of R&D institution in commercial usage of outputs of their work, low level of enterprises’ cooperation of with R&D institutions, unsatisfactory legislative and fiscal conditions for founding spin-off firms and using venture capital, absence of system instruments of support to business incubators and scientific-technical parks, insufficient institutional ensuring and quality of services of technologies’ transfer and so on and intellectual property (e.g. low knowledge and interest in protection of intellectual property).

In the Czech Republic the innovative performance is still lower that the European average (Innovation Union Scoreboard, 2011), because industries with higher technological exigency prevail, in which the share of firms with innovative activities is globally lower. In the period of economic recession firms are confronted mainly with insufficient demand and increasing financial problems. Firms’ management react to the created situation by searching and choosing appropriate short-term and long-term measures. On the short-term basis, firms above all try to economize on costs which are not key for maintaining the firm in the short run. During the decision making process about reduction of the costs, the right choice of optimization, which will stimulate the long-term competitiveness of the firm, is basic. Therefore from the research of TC AV ČR (Pazour, Mráček, Kučera, 2009) results that large firms try to maintain the level of expenses on R&D with regard to future market position of the enterprise and to successful overcoming of the recession’s results. While lowering expenses firms prefer decline in administrative costs, costs on production investments and wage costs. They come up to a decrease in costs on R&D after exhaustion of other possibilities, while the tendency to maintain qualified workers is obvious and therefore to create an assumption for implementing innovative activities, which are the presumptions for maintaining the competitive advantage.

**Innovative environment after crisis and also in a long-term context of economy development in the Czech Republic**

The article deals with innovative potential of the Czech Republic and it marks barriers of innovations in the context of firms’ behaviour. Not even in the connection with economic recession great changes did not happen and both firms and researches declare that they deal with innovations and will deal. Yet in the context of definition of the term innovation we should probably differ which innovations are the prevailing ones. While a regular discussion of experts with the (these topical rounded tables happen on our department once a month) prof. Souček opposed the claims of ing. Švejda (director of TC AV CR), that firms innovate and he expressed three basic thoughts that we allow to quote here:

1) there are enough innovations, but these are not innovations of higher levels, which are the moving power of the economy, but mainly the marketing innovations which are only a source of higher profits,
2) environment of whole society is very negative to innovations of higher levels, mediatisation often even leads to condemnation of scientists for the reason that their preparation in clinical tests proved less that had been expected and so on, incompetent decide about important things in the area of science and on the basis of ideologies instead of knowledge and decision-making process according to information.
3) applied research can not do without basic research, but it has to continue on it, the education should be measured by quality, not quantity.

<table>
<thead>
<tr>
<th>Time impact</th>
<th>Technical a process innovations</th>
<th>Technical innovations of higher levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>long</td>
<td>Needed inputs: Qualified and well motivated personnel</td>
<td>Needed inputs: Professionally qualified personnel</td>
</tr>
<tr>
<td>short</td>
<td>marketing, process innovations and Technical innovations of lower levels</td>
<td>Pro-innovative culture</td>
</tr>
<tr>
<td></td>
<td>Needed inputs: capital, technical equipment, stable employees of common professions</td>
<td>Capital</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Local</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space impact on markets</td>
<td></td>
</tr>
</tbody>
</table>

Figure 5. Innovations in time and space

Accordingly to these comments we state that it is necessary to move from short-term innovations on small space (of the market) to perspective innovations on long-term basis and with global impact (see figure 5). While for innovations with a short-term impact on local markets it is enough to increase capital inputs and devote to more precise choosing and educating of the enterprise’s labour force, then for technical innovations of higher level other changes in the area of other generations’ education of whole society will be needed, when actually the tertiary education is being critically followed with regard to this, but particularly in technical and nature sciences a problem with basic education starts. In this sense it is necessary to change context of innovations in whole society, so that they could have an impact on whole society.

Conclusion

Innovating companies see the main problem in the area of personnel ensuring and internal communication, non-innovating enterprises see the greatest problem in the lack of their financial possibilities. In our opinion the reasons for the difference are the following: non-innovating enterprises perceive finance as a barrier because they did not get to a stage when they had them and could have started innovation, even then they could not find out they had a problem with personnel ensuring. Due to economic crisis, the influence of insufficient financial resources strengthens and the importance of a lack of human resources slightly declines. The following sequence of factors (according to importance from firms point of view) is a result of our primary research and the research of Technologic centre ASCR: economic factors – difficult access to external financing, economic risks and cost on R&D, insufficient flexibility of the legislature, market barriers – customer resistance to new products, low dynamic and innovative market, lack of information about markets, lack of qualified workers and technical equipment (large enterprises feel it more significantly), inflexibility of business organizational structure and insufficient spaces.

References


838