

## **EXTERNAL AND INTERNAL FACTORS AFFECTING THE PRODUCT AND BUSINESS PROCESS INNOVATION**

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**Abstract.** *The competitive advantage of a company strongly depends on its possibility to benefit from innovational activities. Understanding the factors that affect product and process innovation and their effects is necessary for deciding on an innovation strategy that is one of the core factors of an innovation success. We research the influence of nine external and internal factors on product and business processes innovation. For the analysis of important relations and conclusions, beside theoretical literature, we use the results of several studies.*

**Key Words:** *product innovations, business processes innovation, industry maturity, customer needs, demand, technological opportunity, investment attractiveness, company size, export orientation*

### INTRODUCTION

Innovations are one of the main sources of a competitive advantage and they are essential for a company growth. Fast technology development, combined with the globalisation and fast changes in customer demand, implies that a competitive advantage of a company can be only temporary. Companies put great effort in beating the competition and improvement in the market game by introducing innovations. On the macro level, innovations have a vital influence on economic development of a country. Thus, it is not a surprise that innovations are more and more present in research, business and governmental circles both in developed and developing countries that wish to grow fast and become developed.

Innovations differ among themselves. If we simply categorize companies as innovative or non-innovative, we risk to aggregate different types of innovators in a way that can hide some important relations. Among different innovations' categorizations developed by researchers the most important are: classification according to the type of innovation, to degree of innovativity and to a trajectory of sustainability.

According to the degree of innovativity, innovations can be classified as incremental, semi-radical and radical innovations (Davila et al 2006). Radical innovations potentially offer huge profits and competitive advantage, but demand considerably higher risk level, company effort and resource engagement. Incremental innovations have more modest returns, but demand lower risk level, level of efforts and resources and are generally more successful. Semi-radical innovations are somewhere between the two of them.

According to trajectory of sustainability, innovations can be sustaining and disruptive (Christensen 2003). According to an innovative degree, sustaining innovations can be placed in the whole range from incremental to radical and disruptive are either semi-radical or radical. Sustaining innovations are those that improve existing product or process, disregarding the degree of improvement. Disruptive innovations create a huge growth offering a new trajectory of performances which has, even if it is inferior from the start comparing to existing technologies' performances, a potential to become superior.

The subject of this work is in connection with product and business processes innovations. Product innovations are improvements of existing products and development and commercialisation of new products. These innovations have a strong market focus. Business processes' innovations are improvements of existing processes and development and implementation of new processes. Process innovations have primarily internal focus, require developing new competences and routines. This is true for process innovations that are led primarily by effectiveness. Beside them, companies can introduce process innovations that improve process effectiveness which includes compliance of the process with customer demand, as well as compliance of the process with the strategy, processes between themselves and with other components of a business system. Process innovations can also help product innovations. Product and process innovations can be new to a market or new to a company.

In their innovational efforts, companies can choose only product innovations, only process innovations or a combination of product and process innovations. Specialisation for a certain type of innovations has its advantages. Companies are advised to accept what is best for their situation and design innovational processes, develop aptitudes, allocate resources and form partnerships in compliance to that decision. Combining process and product innovations tend to benefit from both types of innovations. The combined approach offer better possibilities than specialised approaches but it is more complex and demand more time, energy and knowledge for its mastering.

Understanding differences between product and process innovations and the influence of different factors and effects on business lead to more successful strategic planning and establishing innovative strategies. The work explores the influence of the factors on product and business process innovations and offers certain conclusions that help relevant decision-makers in companies to choose the best options in relation to innovations.

#### COMPREHENSIVE APPROACH CONSIDERING FACTORS ON PRODUCT AND PROCESS INNOVATIONS

Many external and internal factors can affect product innovations, business process innovations or their combination. In this work, we focus our attention on the following factors: industry maturity, customer needs and expectations, technological opportunities,

investment attractiveness, intensity of competition, company size, origin of ownership and export orientation.

**Industry maturity.** One of the main ideas in theories of industry evolution is that the base of competitiveness moves from a product to a process innovation as a business matures. According to the basic model, suggested by Utterback and Abernathy (1975), soon after the birth of a new industry companies compete according to the product differentiation and strongly invest in new product development. As a market matures and customer needs become defined in a better way, companies transfer the focus of their competition to expenses and economy of range, investing more in business processes in order to make them more effective and more efficient. Klepper (1996) emphasises that in mature industries companies pay more attention to business process innovations than to product innovations.

Empirical researches confirm the influence of industry maturity on type of innovation. Researching Swiss civil-engineering cluster Vock (2001) realised that only 29% of construction companies from Swiss civil-engineering cluster consider product innovations that are important for their economic success. Despite the importance of both types of innovations for the economy of a country, Swiss construction companies emphasise considerably higher economic importance of process innovation than product innovation. This, as well as the data gathered in the research show that within the cluster innovations that are new to an industry present a clear signs of a sector maturity.

The main innovation model and development level help managers to understand what types of innovations and strategies they should consider in different periods of their development and different competitive surroundings. However, this model is not universal. Utterback (1994) points out that it is more important for production (than for services) where some dominant standards and product designs show up in time and where competitiveness then moves to the price. New discontinuous technologies can also disrupt this cycle and it restarts (Tushman and Anderson 1986). According to Christensen (2003) even the best companies, some time after the appearance of disruptive innovations, can fail because management practices that made the companies leaders in an industry cannot be implemented in new circumstances and because some different aptitudes that the companies should developed are needed.

**Customer needs and expectations.** Customer needs and expectations (hereafter: needs) are essential for process innovations that improve process effectiveness. Orientation to customers and their satisfaction are well-known concept in the field of a Total Quality Management. The companies oriented to customers are responsive to final customer needs, measure their satisfaction level and improve the processes in order to satisfy customers.

In the context of product innovation, Hippel's (1988) approach based on customer needs emphasises that companies, in their innovative efforts, have to turn to users' needs. The author introduced an important term to management theory and practice, so called "leading users". It is a special class of users that can give us the biggest knowledge about future needs. According to this author, the leading users face the needs that will appear in the market months and years after others. They also have the aptitude to express future needs as the function of their experience (Hippel, 1988). This way, companies collect valuable information that helps them discover latent needs.

Christensen (2002) emphasizes that focus on existing customers can limit a company aptitude to innovate because managers are not keen on serving new users. However,

focusing on existing customers is not the same as to be completely market oriented. Slater and Narver (1999) call companies oriented only to existing customers and their current needs "led by a customer" and give arguments in favour of the fact that if you want to be market oriented it is considerably more than to be led by a customer. Market oriented companies beside existing customers, also focus on potential customers and beside current needs on latent customer needs. It is done by collecting and assessing the market information anticipatively.

Definitely, it is very hard to obtain and small companies especially have limited possibilities to enhance their innovative efforts beyond existing customers. Verhees et al. (2004) carried out a research in Holland on the role that customers have regarding radical product innovations in small companies. They proved the hypothesis that expressed needs of existing customers for radical product innovations influence positively on radical product innovation acquisition in small companies. However, in the case of expressed needs of potential customers the hypothesis has not been proved. In compliance with Slater and Narver's terminology small tested companies cannot be defined as really market oriented in terms of radical product innovations (Verhees et al. 2004).

**Demand.** The point of view that market demand presents the main factor of innovations comes from Schmookler (1962). In his work on determinants of technical changes, the author gives arguments that demand determines the rate and activities of an invention because each rational company that tends to make profit is responsive to economic stimuli. According to Schmookler, demand growth is prior to the growth in innovative activities, i.e. market requests guarantee stimuli for companies to innovate and take up new technologies. This concept is popularly called "market pull" in a sense that a market pulls innovations.

Although the author's empiric research showed that demand played the main role in introducing innovations (Schmookler, 1966), later researchers did not come to such a conclusion. Empiric evidence during the following decade has not identified demand as a key factor of innovation (Cohen, 1995).

Demand undoubtedly affects innovation activities. Benefits that innovations bring are proportional to the market size. Companies can rather decide to take up innovations if they assess that selling potential is high enough. The most important characteristics of the demand that a company should consider are: selling potential, demand growth, demand length, demand indefiniteness and demand elasticity.

The question of customer needs and demand are closely connected. In last decades, customer needs have been a subject of many researches. However, although customer needs can serve as a good forecaster of innovation, demand should be examined, too. If a company estimates that sale potential is small and that a considerable growth cannot be expected, it can influence a great deal on innovation decision.

In a recent Canadian study, Astebro and Dahlin (2005) introduced and empirically proved three important hypotheses: a) the higher clients' needs and more positive recognition of an invention, the bigger possibility of its commercialization (i.e. realization of innovation); b) the bigger expected demand for an invention, the bigger possibility of commercialization and c) the effects of needs and users' preferences are in compliance with the effects of expected demand for probability of invention commercialization.

The relation between demand, users' sophistication and product and process innovation was researched by Guerzoni (2007). By analyzing market size, the author argues that, when mass markets are in question, companies find it profitable to invest in

process innovation. These markets can be mass markets for consumer goods, but they can also present markets for standardized products such as personal computers. Due to a low level of sophistication it is more profitable for companies to implement process innovations and use the market size than to follow the strategies of differentiation.

On the other hand, in market niches, an innovation is oriented towards creation of variety. Small sizes of such markets do not allow considerable investments in process innovations because the number of output units is not big enough to overcome high fixed costs. Besides, the users are conscious of their needs and frequently help producers in the process of design, giving an important feedback or even suggesting some innovative solutions. That is why the possibility to realize incremental product innovations, specified for a market niche, is high. Despite of small market size, there could be some radical innovations since the consciousness about users' needs reduces indefiniteness of potential demand. In that way, the company gets knowledge necessary for innovations.

**Technological opportunity.** The debate on the importance of technological opportunity against market demand dates back to the time of Schumpeter (1934). He emphasizes that entrepreneurs are led by technological opportunities. Contrary to Schmookler's position, this approach, well-known in literature as "technology push", suggests that the direction and rate of technological change is defined, not by demand, but by appropriateness of technology in special industrial usage. Researchers and empirical evidence support this approach (Cohen, 1995, Goldenberg et al, 2001, etc.).

Dimensions of technological opportunity are: technological importance – what is the expected technological contribution of an invention, technological performances – the level on which an invention works better than alternatives or fulfills some functions that have not been previously provided and technical feasibility – the possibility of technologic correctness and completeness of an invention. Astebro and Dahlin (2005) introduced one more dimension – technological indefiniteness that presents a possibility that future planned actions of a research and development will solve the existing problems.

Innovations are closely related to a scientific base and scientific knowledge growth. A strong scientific base focuses innovational activities in the most productive direction. This basis can provide a conjunction of potential technologies, which enhances the possibility of finding technological efficiency in connection with some specific company objectives (or objectives of an industry). Besides, a strong scientific base is important for enhancing a set of company's objectives (or objectives of an industry) and a set of problems with possible solutions. Seen from perspective of a national economy, it is clear that the economies of those countries that have strong scientific and technological potentials are in a big advantage over those whose economies do not have such potentials.

Technology development can lead to radical and disruptive innovations (frequently completely independent of demand) and this topic is very interesting for entrepreneurs, business circles and innovation researchers. The topic is very attractive because such innovations can bring very high returns (for example, Viagra by Pfizer or at one time nylon by DuPont). Nevertheless, in a real business world, these innovations are not very frequent. Companies can benefit a lot in long terms if they continuously introduce incremental and semi-radical (sustaining) product and process innovations.

In product innovation research, carried out by Astebro and Dahlin (2005), the results show that technological opportunity has the effects that are 80% bigger comparing to market demand which is in compliance with the former research evidence (realized by

Schumpeter). The authors come to another important conclusion – the effects of technological opportunity and demand do not cancel each other. This has an implication that approaches of technology push and market pull should not stand against each other. Innovative strategy in practice often contains to certain extent a balanced approach between science and technology on one side and demand on the other (Johnson et al 2008).

Technological opportunity emphasizes the importance of organized activities of Research and development (R&D) in companies. Baldwin and Sabourin (1999) in their detailed study of the factors that contribute to innovational activities in Canadian food industry, beside other things, research the question of whether and to what extent R&D department is necessary for innovations. The authors found that companies that have such departments have better probability to be innovators comparing to those that do not have them (the ratio is 85%:53%). Although R&D is not enough for a success of an innovation, the authors found that the probability rises for 60% in the case of its existence.

According to this study (Baldwin and Sabourin 1999) organized R&D activities are more important for product innovations. For this type of innovations, the probability that the companies with R&D departments will introduce innovations is 59%, while the probability for process innovations is 37%. For companies that do not have R&D departments the probability that product innovations will be introduced is 37% comparing to 22% for process innovations. For combined product and process innovations the results were similar to those for product innovations (59% in the case of companies with R&D and 37% in the case of companies without R&D).

These are expected results. Process innovations require the presence of people that take part in the process, since they practically know best the existing processes and the way they function. The programs of process innovations insist upon staff participation which has become a part of organizational culture of many companies and has been included in international standards. Surely, and for a product innovation success very important is cooperation between different functions (that includes forming of teams of inter-crossed functions) as well as connecting to other companies (customers, suppliers, business partners, innovators, institutes, faculties, government, standardizing bodies, independent experts, etc.).

**Attractiveness for investments.** The capability of controlling and benefiting from innovations plays an important role for investment into innovations. Only if a company does expect to benefit from innovations, it will have an intention to innovate. For a purpose of this analysis, telling the difference between product and process innovations will be important if one of the two types of innovations might be assessed as a more "innovative" comparing to the other or if one of them has more failures in the market.

According to Oxera Consulting (2005) two main questions to consider are:

- What type or innovation is more innovative, i.e. which of these types of innovations might generate more innovations?
- Do these types of innovation face different market failures and to what extent?

Generally speaking, both product and process innovations offer potentials for innovation. The main difference is that product innovations have a direct influence on users' welfare, while process innovations appear due to some special attempts to improve efficiency and/or process efficiency or in order to help a product innovation. Researchers have not developed a mathematical apparatus up to now nor any empiric research has confirmed that one of the two types brings more innovations. It cannot be concluded which of the two types of innovations is more innovative (Oxera Consulting 2005).

In terms of market failures, process innovations generate more dispersion compared to product innovations. Process innovations are connected to the way of organizing core processes and processes of support, systems of management, methods of work that a company uses (operative policy, procedure and instructions), technology changes and many different changes of business system components. The knowledge acquired with the help of process innovations has been implicit in a considerable part; it is incorporated in staff and can be difficult to explicate (in documentation, software), which makes the effects of dispersion more probable. From the other hand, the products that are delivered to a market are very visible, while the processes stay hidden in a company. Products can be much easier replicated comparing to processes and they can require certain protection measures such as patent rights. According to Gentle and Contri (2005) a positive side of process innovation is that it does not resemble product innovations which are visible in the market and can be easily copied. Competitive advantage realized through process innovation stays within the company and competitors cannot repeat it easily.

In literature, there are many researches that point out that investors prefer process innovations but this empirical material is very limited. We want to mention a Portuguese study (Bartzokas 2000) according to which institutional investors (banks) prefer process innovations. The author points out that it is bigger possibility that bank will finance process than product innovation. With one exception, the respondents in the mentioned research consider that, from the perspective of a bank, process innovations' financing is easier. Projects of product innovation are considered to be less definite, with more freedom and smaller commercial performance.

However, it is necessary to be very careful while estimating the success of process innovation. Many organizations carry out incremental and to a less extent semi-radical innovation of business processes. However, these programs or projects can ignore wider questions such as structure, system and technology. These particular questions present real causes of many problems resulting in poor performances that companies face. Partial and incremental process innovations can contribute to performance improvement of a subsystem or provoke a sub-optimization of a system as a whole.

From the other hand, programs of radical business process innovation are very complex. The higher level of business process that is affected is, the bigger is the influence on other business system components that are in connection with business processes, which means that they also have to endure changes. This leads to considerable complexity of the problem of process innovation, includes huge investments (in process and informational technology, organizational changes, training programs, consultant services, etc) and present huge demand for change and program management. Although such programs potentially offer extremely high performances, they can also lead to big disappointments and failures. Empiric researches in connection with applied reengineering business processes programs in the first part of 1990s showed a high failure rate. According to Caron et al (1994) the failure rate is 50% and to Murphy (1994) it is 70%. The failures caused organizations to be more careful related to innovativity level and process initiative range.

According to Oxera Consulting (2005) it is not clear from theoretical and empirical perspectives whether market failures are more connected to process or product innovations. For investors, it can be hard to assess the risk and forecast returns from product innovations since the final result depends on market demand. Although failures can look bigger in the case of product innovations, there has been little empiric evidence that can grant such

conclusion. Thus, those that decide on investments have to consider some other elements in connection with the possibility of failure that can face product or process innovation. The conclusion is that product vs. process dimension cannot be crucial while determining which innovation type will possibly fail.

**Intensity of competition.** In theoretical literature there are a small number of works on the theme of intensity of competition and the choice between product and process innovation. The literature mostly considers overall innovation activities (that is, the sum of product and process innovation). Schumpeter (1943) emphasizes that market concentration is a stimulus to innovation. Arrow (1962) challenges this view and establishes the reverse proposition that more competitive environments would give a greater incentive to innovate.

Later researchers introduce a game theory, considering one or two competition regimes: Courton – where companies compete in quantity (output levels) and Bertrand – where the competing base is a price. One of the latest works on this topic, by Bonanno and Haworth (2008), introduced a model that included both regimes. According to these authors, if the question is between product or process innovations and the innovator is a company that delivers high-quality products, in the case of a different choice, Courton competitor chooses a process innovation and Bertrand competitor chooses product innovations. It is completely different for companies that deliver poor quality level. In that situation, in the case of different choice, Courton competitor chooses product innovation while Bertrand competitor chooses process innovation.

Although this and similar models are supported by strong mathematics, they are very general by nature. If such models were richer in their structure, they would not be so general. For practical guides that would show managers the strategic effects of different types of innovations according to the competition intensity, some empirical evidence is needed.

Baldwin and Sabourin (1999), in the research in Canadian food industry, show that in the case of a modest competition (number of competitors 6-20) the possibility of product innovations will grow comparing to the situation with small number of competitors (five or less), or that with an intensive competition (more than 20 competitors). The possibility of introducing product innovation only is 58% for companies with modest competition, comparing to 48% in the case of high competition and 38% for small competition. However, for process innovations, the possibility of innovations is the highest in the group with the biggest number of competitors. Companies that are present in a highly-competitive market introduce 12% more business process innovations comparing to the companies that are present in markets that are not very competitive.

According to Baldwin and Sabourin (1999), modest competition influences most on product innovations and combined product and process innovations while intensive competition influences process innovations. In the case of a poor competition, innovative activities are the poorest for both types of innovations when introduced individually. Of course, much wider research evidence is needed in order to come to relevant conclusions.

**Company size.** Returns on process innovations grow proportionally with company size while returns on product innovation remain constant. That is why, product number growth has to have bigger positive effect on process innovations than product innovations causing the organization to turn from product to process ones. Accordingly, as a company grows, it decides on business process innovations. In the case of product innovation, considering only a company size, it cannot be predicted whether smaller or bigger companies will be more innovative (Cohen and Klepper 1996, Petsas and Giannikos 2005).



An extensive research has been carried out in Ireland (Forfás Innovation Survey, 2006). It included 6177 companies. The period considered was between 2002 and 2004. According to the research, 531 companies introduced product innovations only, 825 process innovations while 1811 companies introduced combined product and process innovations – the total of 3222 companies. The study shows that 2955 companies were not innovative. The study classifies three types of firms according to the number of employees: small sized firms (between 10-50 employees), medium-sized firms (between 50-249 employees) and big firms (above 250 employees). The data of the study are presented in the table 1. Production sector and service sector are given separately.

Table 1. Company size and product and process innovation – Ireland 2002-2004

Forfás Innovation Survey – Ireland			
Production sector	Big companies	Middle companies	Small companies
Product innovation	72,6%	64,6%	40,7%
Process innovation	84,3%	64,7%	41,5%
Service sector	Big companies	Middle companies	Small companies
Product innovation	35,2%	27,9%	27,5%
Process innovation	48,4%	36,5%	35,2%

According to the table, the difference is convincing for the benefit of big companies. The study also found that the companies in industries in which production presents a primary activity are considerably more innovative than the companies in service sector.

The research carried out in upper Austria (Kaufmann A., Tödting F., 1999) shows that big companies are the most attractive process innovators – 84% of them introduce process innovations comparing to 58% of small and medium-sized companies of a specially tested sample and 39% SMEs of controlled sample. According to this study, the difference in product innovations are 6% bigger in big companies comparing to SMEs of specially tested sample and 24% comparing to SMEs of controlled sample. Specially tested sample refers to participants in selected programs and to companies located in technological centres while the controlled sample encompasses SMEs in the most important branches in upper Austria. In this research, combined product/process innovations were not taken into consideration.

These researches confirm the theory in connection with the relation between a company size and business process innovations – the possibility of introducing business process innovations grows with the company size. Results of these studies are same in the case of product innovations – big companies are the most active in innovative while small companies are on the bottom. The reasons for this can be limited financial, human and technical resources of small companies, but also some other factors that would require some additional research.

**Origin of ownership.** There are little empirical evidence about the influence origin of ownership (domestic/foreign) on the product and process innovation. With theoretical point of view multinational companies should play a leading role in process innovation, in comparison with domestic companies, in regard to technological and organizational capabilities. This view supports the claim that multinational firms are important conduits for transferring technological knowledge in the form of process innovations (Caves, 1982).

A Canadian study on food industry innovations (Baldwin и Sabourin 1999) examines to what extent domestic or foreign ownership influences the innovation type. The research shows that the ownership is important only for business processes' innovation which is in compliance with the theory. According to the research, 42% of foreign companies introduce only process innovations comparing to 29% of companies that are in Canadian ownership. With foreign ownership, the possibility that companies will introduce process innovations is 50% bigger. For product innovations and combined process/product innovations the result is identical for both categories (foreign and Canadian companies both introduce these types of innovations equally).

**Export orientation.** In recent years, the subject of huge interest of academic, scientific and governmental institutions in many countries has been a research of the connection between export and innovations. One of the crucial questions for researchers is which innovation type has more influence on export decisions. Two studies, British and German, are trying to explain this very important subject.

In British study, Higon and Driffield (2007) research relation between the inclination of SMEs to export and product and process innovation. The research shows that more than 43% of SMEs that operate in foreign markets introduce product innovations comparing to only 26% of companies that are not exporters (that operate only on internal market). Comparing to it, 27% of export companies introduce process innovations comparing to 19% of those that do not export. In these results, the authors include companies that introduce combined product and process innovations and the companies that introduce process or product innovation exclusively. The percentage of export companies that introduce only product innovations amounts to 28.4%, those that combine product and process innovations to 20.9% and only 10.2% export companies introduce process innovations exclusively.

In the research, carried out by Becker and Egger (2007) that includes 1537 companies, there were similar results. According to their research, 61.96% of export companies innovate products and/or processes (comparing to those that do not do that 38.4%). Among the exporters, 23.57% introduce product innovations only, 67.50% introduce combined product and process innovations and only 8.93% introduce process innovations only. Regarding export, the results emphasize the importance of product innovations and combined innovations of products and processes. According to the authors, there has not been an evidence that process innovations encourage company to export unless it is combined with product innovations.

## CONCLUSION

The companies in new industries compete more with the help of product innovations comparing with mature industries dominated by process innovations. This is not a universal rule and there are many exceptions. For instance, those in connection with economy sector, country development and discontinuity of the vary innovation. Companies can seek their chance to break this cycle with the help of disruptive innovations and get an excellent result which is a popular topic among entrepreneurs and innovation researchers (however, disruptive innovations are not very frequent).

Customer needs and expectations are very important for product innovations and process innovations that aim to process effectivity. Organisations should consider not

only existing customers but also potential ones and not only current needs but also latent ones. Customer needs also get a lot of attention in business and research circles. One of important topics is leading customer pursue and trying to find out not only their current but also their latent needs.

Demand is unavoidable factor of product and process innovations. An organization should determine sales potential, growth and other characteristics of request. When we talk about market niches (small markets) product innovations are better choice for organization than process innovations. In the case of mass markets, organizations can benefit a lot thanking to process innovations.

Technological opportunity is the most important factor of product and process innovations. For large organizations, this means that they should have an organizational research and development department. Such a unit has central role in product innovations, in cooperation with other functions in an organization and outer stakeholders. For small organizations, partnerships and networks present the best way of avoiding limitations (due to the lack of R&D department, resource and other limitations). In the case of process innovations, the role of R&D department is a bit smaller but the participation of employees in the process that is the subject of change is greater.

From the point of view of investment attractiveness, there is no empirical evidence that would prove that product innovation is less successful than process innovation and vice versa. This is a very important conclusion for investors – only according to the innovation type they can judge the success of it. In that sense, the degree of innovation is more reliable. Incremental innovations of both products and processes have better rate of success, while radical ones are more risky but have excellent returns in the case of success.

The influence of the intensity of competition on product and process innovation is not researched enough. According to Baldwin's and Sabourin's research (1999) the high intensity of competition contribute to higher levels of process innovation, and moderate competition stimulate product and combined product and process innovation. This finding is closer to Arrow's viewpoint that intensive competition has a strong influence on innovation, on the contrary to attitude of Schumpeter that less competition stimulate innovation.

Big companies innovate more in processes than small companies, which is in compliance with the theory. Researches show that big companies innovate more in products. However, the very product innovations are a great chance for small companies. The reasons for greater innovativity of big companies regarding products can be resources, knowledge and skills of staff, organization, developed R&D, mastering the process of innovation, etc. But even small companies can master some of these aptitudes and partially compensate the lack of resources and undeveloped R&D by forming partnerships and networks. After all, if the question is not about new companies in the field of high technology and if they do not have strong research and development capacities, small companies can follow the approach of "market pull" and introduce product innovation based on customer demands and needs.

Foreign ownership has a relevant influence on process innovation. Companies with foreign ownership (particularly multinational companies) are more likely to undertake process innovation than domestic companies. However foreign ownership is not significant for product innovation.

A connection between export and product and process innovations was researched in this work. Two European researches emphasize clearly the importance of product innovations for exporters. Process innovations, in that sense, are important only if they are combined

with product innovations. This conclusion is important for both individual companies that wish to enter foreign markets and governments that try to enhance total export of their countries.

This work has its limitations. Firstly, there are some more factors that have to be considered. Some of important outer factors that are not included in the analysis are the influence of outer stakeholders and institutional environment. Inner factors that can be the subject of analysis include the personality, orientation and attitudes of relevant innovation decision makers (owners/managers), availability of resources, costs, etc. Secondly, the work bases on European and Canadian studies. Researches in Serbia would show how much results in our environment differed as well as samples of these differences.

Generally speaking, the problem issue of this work is important not only for individual companies but also for industries and national economy as a whole. Understanding the influence of different factors on product and business process innovation and effects on business is important for designing national innovational policy. State and economic institutions that support small and medium-sized companies, try to enhance economy competitiveness and promote export have a key tool for their plans in innovations. The work also emphasizes the importance of scientific and technological base of a country and a need of its constant development.

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## **EKSTERNI I INTERNI FAKTORI I NJIHOV UTICAJ NA INOVACIJE PROIZVODA I POSLOVNIH PROCESA**

**N. Zakić, A. Jovanović, M. Stamatović**

*Kompetitivna prednost snažno zavisi od sposobnosti preduzeća da postigne benefite od inovativnih aktivnosti. Poznavanje faktora koji utiču na inovacije proizvoda i procesa i njihovih efekata je neophodno za oblikovnje inovacione strategije koja je jedan od ključnih činilaca uspeha inovacije. U radu istražujemo uticaj devet eksternih i internih faktora na inovacije proizvoda i poslovnih procesa. Za analizu važnih relacija i izvlačenje zaključaka, pored teorijske literature, koristimo i rezultate više studija.*

**Ključne reči:** *inovacije proizvoda, inovacije poslovnih procesa, zrelost privredne grane, potrebe kupaca, tehnološka mogućnost, intenzitet kompeticije, privlačnost za investiranje, veličina preduzeća, izvozna orijentacija.*