Graduate School of Management

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MASTER THESIS

THE RELATIONSHIP BETWEEN INNOVATIONS AND COMPANY'S INTERNATIONALIZATION: THE CASE OF RUSSIAN MANUFACTURERS

Master’s Thesis by the 2nd year student

Concentration - MITIM

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**ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ**

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**АННОТАЦИЯ**

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| Описание цели, задач и основных результатов: | Целью данного исследования является определение взаимосвязи инноваций и интернационализации на примере Российских производителей. Для достижения поставленной цели, на основе предыдущих эмпирических исследований были сформулированы гипотезы. Тестирование модели было проведено на основе многофакторной регрессионной модели. Эмпирическое исследование было основано на выборке из 137 Российских производителей. Регрессионный анализ показал, что имеет место положительная связь между радикальными продуктовыми инновациями, затратами на НИОКР, высокотехнологичностью индустрии, к которой принадлежит компания и экспортной деятельностью организации. Анализ не показал, что имеется связь между радикальными процессными инновациями, количеством сотрудников компании, количеством, выданных патентов за последние 4 годы и экспортом организации. |
| Ключевые слова: | Инновации, интернационализация, экспорт, радикальные инновации, совершенствующие инновации |

**ABSTRACT**

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| Academic advisor’s name: | Joan Freixanet Solervicens |
| Description of the goal, tasks, and main results: | The goal of the research id to determine the relationship between innovations and internationalization of Russian manufacturers. To achieve this aim, several hypotheses were formulated by review of existing studies. Hypotheses were tested using multiple linear regression analysis in the sample of 137 Russian producers. The regression analysis identified the positive correlation between radical product innovations, R&D expenditures, company’s medium and high-tech intensity and firm’s export intensity. Furthermore, the analysis did not reveal the relationship between radical process innovations, number od company’s employees, the number of firm’s patents in four years and organization’s export intensity. |
| Keywords: | Innovation, internationalization, export, radical innovation, incremental innovation |

**LIST OF ABBEVIATIONS**

3I’s – Internationalization, Innovation and Institutions framework

MNC - multinational company

MNE – multinational enterprise

EMNC – emerging market multinational company

EMNE - emerging market multinational enterprise

EMF – emerging markets firm

FDI – foreign direct investments

LE – large enterprises

LLL model (3Ls) – linkage, leverage, learning framework

M&A – mergers and acquisitions

OECD - The Organization for Economic Cooperation and Development

OLI - ownership, localization and internalization framework of internationalization

R&D – research and development

SME – small and medium enterprises

S&T – Science and technology

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# **INTRODUCTION**

The uprising trend of cross-border collaboration as well as the intensified race for technological breakthroughs throughout the world positively (and negatively) affects the way of life of billions of people worldwide. However; not only humans but also domestic, multinational as well as international companies feel the consequences of this growing globalization process. In those times of transition, companies worldwide battle – also across national borders – for the most suitable position in the market. They seek additional growth, knowledge and reputation gain by exporting their products and investing in foreign markets. Lipsey and Weiss (1981) demonstrated that the level of activity of U.S. manufacturing affiliates is positively related to U.S. exports in foreign countries. Additionally, Sertic (2015) showed that a stable macroeconomic environment with an increasing domestic demand is the factors which affect the export performance of the manufacturing industry of the 27 European member states. Nonetheless, there might exist a distinct difference between the primary determinants of internalization activity between developed and emerging countries. Especially due to the breakdown of the Soviet Union, the Russian Federation lags behind in the technological race and has to catch up in order to successfully assert its market position in the future. By implementing an Innovation Strategy plan for the year 2020, the Russian government intends to strengthen company’s position in the world market and be ready for the future challenges of globalization and the digital transformation by emphasizing on innovation expenditures (Gokhberg and Roud, 2012). Therefore, it is worthwhile to precisely examine the effect of the innovation activities of Russian companies for their internationalization process.

*The main goal of the study* is to determine the relationship between innovations and internationalization for the Russian-based manufacturers. Even though many factors can influence the internalization strategy and activity of a company, this paper will mainly focus on the connection between product and process innovation-related aspects and internationalization activity like export intensity. Additionally, this study analyzes which type of innovation, radical and incremental, affects the internationalization-performance of Russian manufacturers.

*The main research question of the paper*: How are innovations and internationalization-related for Russian-based manufacturers?

To reach the main goal, the following steps have been followed:

• Theoretical literature analysis

• Choice of research design

• Data collection

• Data analysis and discussion of the results

• Review findings and implications

Research has been conducted on the relationship between internationalization and innovation (Kafouros et al. 2008, Golovko and Valentini 2011), including also the types of innovation to some extent (Basile 2011; Becker and Egger 2009). Moreover, the relationships between companies’ internationalization, a degree of innovation radicalness and network relationship have been examined (Chetty and Stangl 2010). However, limited studies have considered the effects of a company’s internationalization on different types of innovations: radical and incremental (Azar and Ciabuschi 201; Chiva, Ghauri and Alegre 2013).

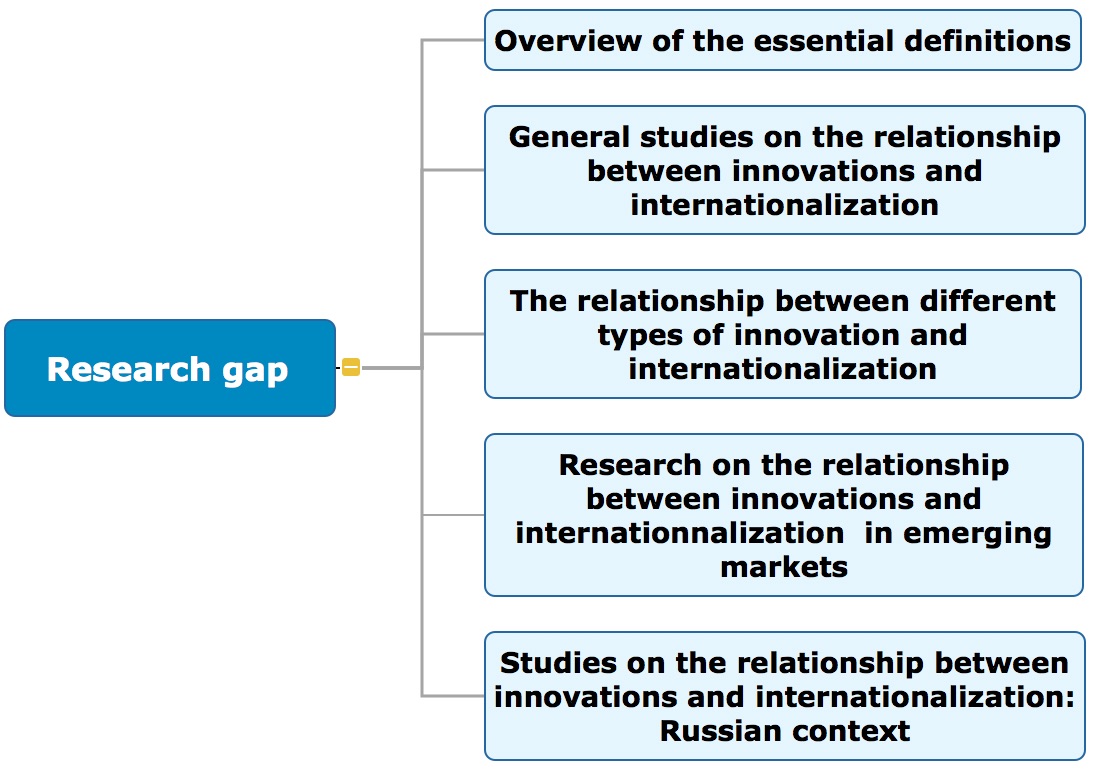
It is crucial to mention that in recent years research on the interplay of innovation and internationalization is becoming highly attractive from the focus of the emerging market (Hwang, Hwang and Dong 2015; Tiwari, Sen and Shaik 2016; Wu et al. 2016). This topic has been investigated from various perspectives, but there are also several papers which distinguished the nature of innovation and its influence on the company’s export activities.

Moreover, there are also a limited number of research papers which describe correlation of innovation and internationalization based on the example of Russian companies (Podmetina et al. 2009; Filippov 2011) Despite the fact several types of research investigate the influence of different kinds of innovations; they did not divide it into independent variables. Moreover, there are only studies based on the R&D based companies or from a broad number of industries, both production, and services, and there is no that one who investigates only the case of the manufacturing sector, which dominated in the Russian export.

To make the conclusion about innovations’ activity influence on company’s internationalization process the multiple regression analysis was conducted in IBM SPSS on cross-sectional data about 137 Russian-based producers. The study showed the correlation between several independent variables of innovation activities and firm’s internationalization activity.

# **CHAPTER 1: INNOVATION AND INTERNATIONALIZATION**

This chapter is dedicated to the review of existing theoretical literature on the global research of correlation between innovations and internationalization. The mentioned topic is pretty well investigated that’s why to find a research gap this review includes an overview of literature which examines the relationship between different types of innovation and export activities. Moreover, cases of Russian-based companies will be studied. A brief outline of the structure of the first chapter is shown in the figure below.



**Figure 1 Structure of the theoretical research**

## Overview of the basic terms

In order to provide a deeper understanding of the researched topic, all basic categories should be discussed first.

Classic internationalization theory is Uppsala model advanced by Swedish economists Johanson and Vahlne. Johanson and Vahlne (1977) Conducting a study of Swedish companies’ international expansion, they concluded that internationalization is a slow and gradual process. According to Johanson and Vahlne (1990, 5) internationalization of the company is “a process in which the enterprise gradually increases its international involvement.” So, firms go abroad in an incremental manner gradually raising their level of commitment. They start out with indirect exports through agents, then establish a sales branch, then they purchase a production facility and finally, invest in their production subsidiary. According to Uppsala model, one of the greatest obstacles to the internationalization process is firms’ lack of knowledge about foreign markets. Filling this gap is only possible through setting up internationals operations, gaining experience and a better understanding of the market, i.e. learning by doing, which reduces the uncertainty and the level of risk for the company and encourages it to proceed with the next steps of internationalization.

Uppsala framework proposes an internationalization pattern. On the initial stages of internationalization, firms tend to expand to neighboring markets similar to the home country regarding culture, institutional development, and business environment. They focus on one country at a time incrementally increasing their recourse commitment in this market, rather than penetrating multiple foreign markets simultaneously. After the similar markets have been explored, firms can embark on internationalizing to countries with greater psychic distance. Uppsala model is a staple in internationalization theory: for decades it is used to interpret internationalization of multinational companies. However, in practice, we observe that often emerging markets multinational corporations leapfrog through several stages of the process. Firm’s which go abroad can invest in acquiring a production facility in a foreign market, choosing high resource commitment and risk entry mode right from the very beginning.

Another classic theoretical framework of internationalization is OLI-model proposed by John Dunning (1988). He suggests that motivations for a firm to go international can be market-seeking, resource-seeking, strategic asset-seeking or cost reduction. The model stipulates that an internationalizing company can enjoy three types of foreign direct investments advantages:

• ownership advantages (firm-specific advantages such as strong brand, technological know-how, managerial practices, that can be extended abroad without losing their effectiveness);

• localization advantages (a firm locates abroad to better reach its foreign consumers or access cheaper labor and materials);

• internalization advantages (benefits from establishing production subsidiary abroad instead of producing via partnership agreements).

The main takeout from OLI-model is that firms engage in FDI to build on their existing competitive advantages that are often based on intangible assets such as brand reputation, advanced technology, and know-how. Dunning’s theory which relies on the experience of American and European multinationals, can perfectly interpret and provide the useful generalization of the internationalization of these companies. But when it comes to EMNCs, OLI framework does not cut it. Firstly, transition economies firms usually do not possess well recognized and respected brands as Triad economies MNCs do. On the contrary, they are offset by the negative country of origin effect coming from developing countries that are not exactly known for excellent quality. On top of that as a rule EMNCs usually lack R&D competencies and advanced technologies. Secondly, emerging market companies seldom penetrate foreign markets to access lower cost production inputs, since they already enjoy these country specific advantages at home.

During the internationalization process companies get through different stages, beginning from exporting activities to other advanced types of internationalization, such as subsidiaries, greenfield investments or joint ventures (Vernon 1966; Johanson and Vahlne 1990). Table 1 shows different stages of internalization based on the level of involvement with foreign markets.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Stage | Exports | Permanent Establishments | Employees Export Department | Internationalization Involvement/Skills |
| 1.Starting/ Passive Exporter | 1-299 | NO |  | Low |
| 2.Regular exporter with little structure | >300 | NO |  | Low-Medium |
| 3.Regular exporter with complete structure | >300 | NO | >3 | Medium |
| 4.Consolidated Exporter with permanent sales or logistic establishments | >2500 | YES | >3 | High |
| 5.Industrial Multinational with production subsidiaries abroad | >2500 | YES | >3 | Very High |

**Table 1 Classification criteria by internationalization stage, based on the level of involvement with foreign markets. Source: (Freixanet, 2014)**

According to these traditional theoretical frameworks, one of the most important internationalization strategies is export, especially for small and medium-sized enterprises. In comparison with all other internationalization strategies, international trade activities have a relatively safe strategy of entering the new market because of low levels of risk.

The crucial role of export activities in the international trade is confirmed not only by practitioners but also by academics (Singh 2009). According to Cavusgil and Zou (1994, 4) export performance is “the extent to which a firm's objectives on exporting a product into a foreign market, are achieved through planning and execution of export marketing strategy.”

The factors which define export activities performance could be divided into two group: internal (company’s management) and external (features of a home and host markets) (Brouthers et al. 2009; Sousa et al., 2008). Azar (2016) also distinguish these groups not only by environmental nature of factor but also by the company’s ability to forecast and manage these circumstances. Azar (2016, 1) argues that “contingency factors are variables exogenous to the focal firm that represent situational characteristics that the corporation is not able to control or manipulate. Response variables are the organizational or managerial actions in response to contingency factors”.

Hence, any company’s internationalization performance is a result of the best combination of a reaction of variables to the contingency determinants. Moreover, the interrelation between external and internal firm’s environment should lead to a company’s export improvement.

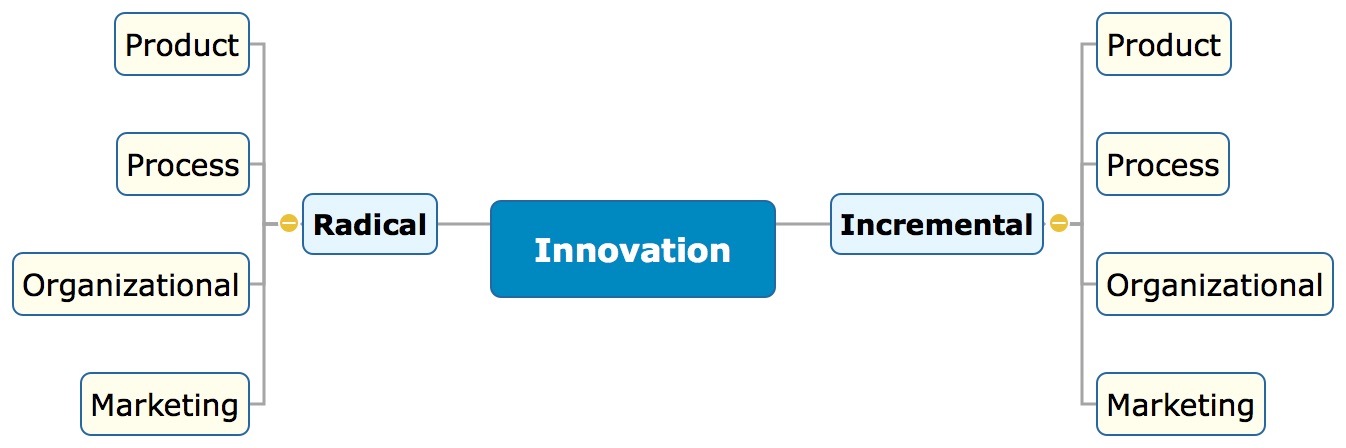
Both any fluctuations in the environment and business cause changes in the company’s strategy. Therefore, to manage the interaction of internal and external forces and to achieve objectives related to enterprise export, a company uses export marketing strategies (Leonidou, Katsikeas and Samiee 2002).

Factors which define export activities performance is an important area to monitor, and not only for scholars but also for practitioners. It is important to emphasize that according to Pla-Barber and Alegre (2007) awareness of internal factors which impact on the export performance, for instance, innovations is controversial and requires further investigation.

The following step is to define term “innovation.” According to Guidelines For Collecting And Interpreting Innovation Data by Organization for Economic Co-operation and Development and Eurostat (2005, 46) innovation is “the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations”. The Oslo Manual offers four types of innovation: product innovation, process innovation, marketing innovation and organizational innovation.

Product innovation represents a good or service “is new or significantly improved with respect to its characteristics or intended uses” (OECD, Eurostat 2005, 47). It includes enhancements in technical aspects, components, and materials, whereas process innovation represents a new method of manufacture or delivery, for instance, software or logistics equipment.

This typology includes marketing innovation which unites any improvements related to product design, packaging and all marketing mix (product design, product placement, promotion, and pricing), while organizational innovations are all improvements related to new methods of the company’s business practices which goals are mainly to cut costs.

**Fig.2 Types of Innovations**

According to Damanpour (1991), Gopalakrishnan and Damanpour (1998) an innovation affects on a company could also be radical or incremental. The main difference between these impacts lies in the degree how this innovation changes products or processes (in an evolutionary or revolutionary way) and, what is more, influences on a company’s risks and competitive advantages. Gopalakrishnan and Damanpour (1998) argues that radical innovations are those that changes company’s activities in a fundamental way, while incremental innovations are mostly updated the existing company’s capabilities.

Both incremental and radical innovation could become an origin of competitive advantage for a Russian-based organization. Nevertheless, what will be more cost-effective and reasonable regarding long-term strategy: gradually implement improvements into a product or/and process innovations or to take high risks and make a revolution change in existing goods or facilities?

## 1.2. Studies of the relationship between internationalization and innovation

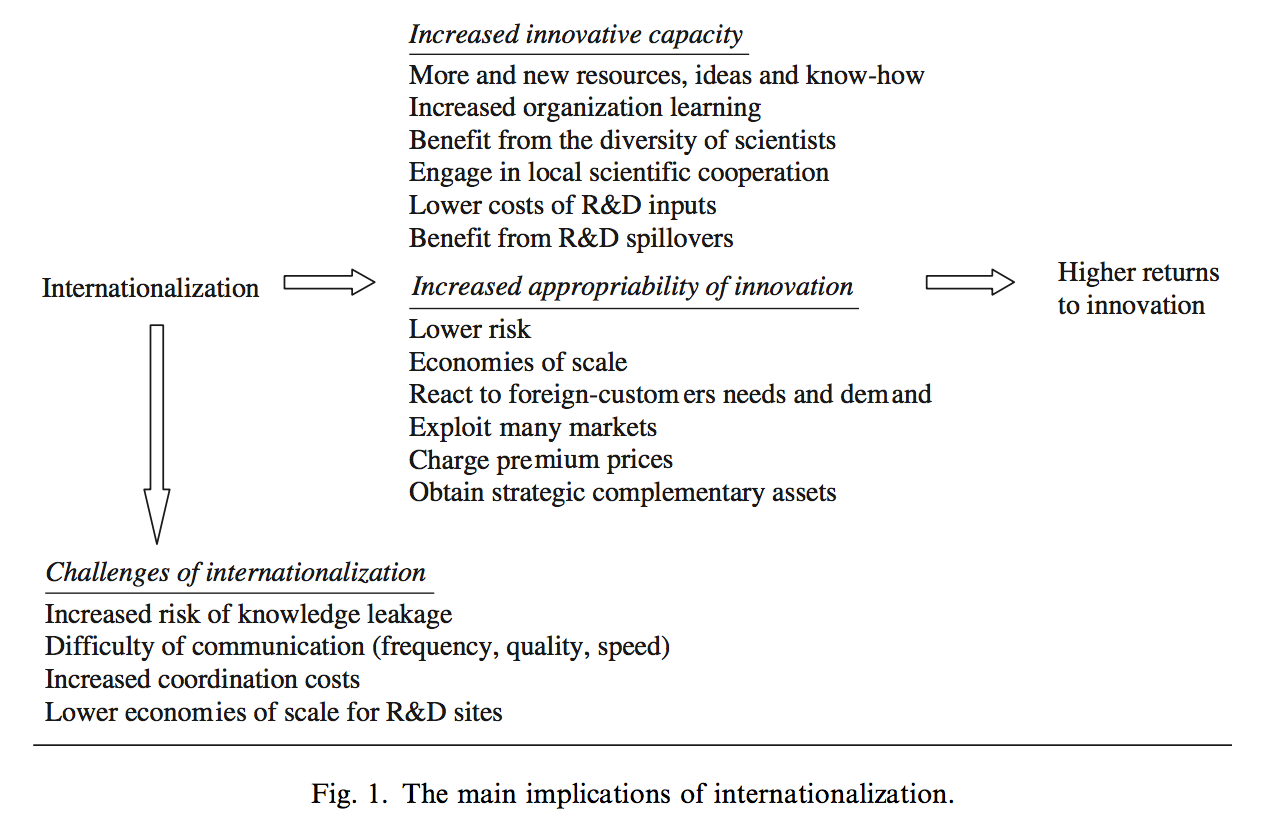
A big amount of research has been done on the general relationship between internationalization process and innovations, both macro and firm-level. There are several approaches which explain why exporters are more productive and innovative than non-exporter.

The most accepted are self-selection hypothesis and learning-by-exporting hypothesis (Arhipova and Alexandrova, 2014). According to self-selection approach, more productive companies tend to be more innovative, to have a well-organized management system and production processes, which implies higher revenues. Therefore, such organizations could afford the costs related to entering foreign markets. In this situation, innovations become one of the factors which let a company increase this probability. The innovative orientation of the enterprise allows creating a competitive advantage associated with a sustainable rise in productivity, which enhances the likelihood of becoming an exporting firm and retaining company’s positions in the national or global market.

Basile (2001) examines the relationship between innovations and other specific factors and internationalization behavior based on the data from Italian manufacturers which operate in different rate regimes in the 1990s (exit of Lira from Exchange Rate Mechanism in 1992). The dependent variable was measured by the ratio of export and sales (export intensity) and the independent variables were measured by company’s R&D strategies (whether a firm implemented product innovation combined with process innovation or only process innovation) and purposes of company’s investment strategies (to improve product quality or product productivity, to develop new product, to reduce the use of raw materials, to employ less labor). Moreover, to examine the heterogeneity among Italian exporters, companies were divided into four categories based on Pavitt’s taxonomy (1984). According to this typology, industries could be split into four broad categories: traditional sectors (e.g. clothing, food), specialized supplier sectors (e.g. machine tools and equipment), scale intensive sectors (e.g. cars manufacturers) and science-based industries (e.g. electronics, pharmaceuticals. The following companies division is on of paper's main advantage. The main conclusions of analysis state that innovation is a very crucial factor in gaining competitive advantage in international activities within different industries. Nevertheless, the substantial currency devaluation could undermine the role of innovation strategies in non-price competition, letting some Italian non-innovative companies entered foreign markets in 1992-1995, but even in this case, the export intensity of innovative enterprises was higher than that of non-innovative companies. Additionally, López Rodríguez and García Rodríguez (2005) state that product innovation, patents and process innovations positively affect the company’s decision to export and export intensity.

Another research by Kafouros et al. (2008) investigates the problematic of the fact that why some studies indicate that innovations have a positive effect on internationalization process, while others fail with the same approach. Authors believe that not every enterprise can gain benefits from innovations and state that the firm’s degree of internationalization is a mediator in the correlation between innovations and performance. More particularly, it is proposed that some threshold of internationalization is needed to overcome in order a company gets access to the benefits of their new products and process.

Authors suggest a framework that shows how internationalization, due to innovative appropriability and capacity, could influence on innovation performance which is shown in Figure 3. To confirm a crucial role of the firm’s degree of internationalization in innovation performance authors checks the sample of 84 UK-based manufacturers with a different level of internationalization for fourteen years period.



**Figure 3 Innovation performance relationship, Source: Kafouros et al. (2008)**

To proxy for the firm’s performance, which was the dependent variable, was chosen company’s revenues, while independent variables were the company’s number of employees, the ratio of R&D expenditures to income, the available capital services for each employee and the ratio of foreign sales to total sales.

The results conclude that depending on the firm’s degree of internationalization, innovation influence on the business performance could be either positive or insignificant. Moreover, authors again emphasize the need to be cautious in ascribing changing in in company’s innovation performance to its size. Authors do not undermine the important role of firm’s size in the innovation performance, but they show that large organizations with a low degree of internationalization do not leave behind their rivals. Additionally, the high level of firm’s internationalization has its drawbacks and risks, such as knowledge leakage due to the decentralization and small level of departments control or substantial costs related to global network maintenance.

Regarding study’s weak side, there are some other measures of innovation and performance could be added, the presence of product or process innovation or profitability, respectively. Besides, the research is based on the data from developed country which not allows generalizing the results for emerging multinationals. Additionally, the degree of internationalization was measured by the ratio of foreign sales to total sales which is not the precise estimation. The more accurate proxy would be, for instance, the number of countries where a company operates or some subsidiaries or production facilities abroad.

In another perspective, Becker and Egger (2009) conducted research on the role of product versus process innovation on export activities. The survey is based on panel data of more than 4000 enterprises from Germany.

For the dependent and independent variables were used a lot of proxies. For the former whether a firm has exported over previous six months and for the latter whether a company implement product or process innovations over last six months, an obstacle to innovation activities (e.g. lack of own capital, lack of external capital, extended amortization period, etc.) and their relevance to the firm, sales per employee.

Paper results conclude that product innovations have a dominant effect on the decision to export comparing with process innovation. Nevertheless, companies which obtain both product and process innovation have a higher probability of entering foreign markets than organizations which have none of them. Additionally, research shows that process innovation is necessary for the decision to export only in tight connection with product innovation.

Study’s strengths include the usage of panel data from a significant sample of companies and statement of a lot of independent variables. Moreover, previous researchers did not pay enough attention to the innovations modes and their various possible effect on the firm’s propensity to export. However, Klepper (1996) used cross-sectional data set to test product and process innovation influence through different product lifecycle stages and stated that product innovations prevail at the early stages of the product lifecycle, while the importance of process innovations grows in the later stages.

Lamotte and Colovic (2010) consider the relationship between innovation and internationalization for young entrepreneurial companies. Authors like Becker and Eggers (2009) distinguish between product and process innovations. The survey is based on data from the Global Entrepreneurship Monitor and the World Bank for 64 countries during the 2001-2008 period.

As dependent variable for internationalization used internationalization dummy, where 1 was a situation if at least 25% of the customers come from other countries. Proxies for independent variables used process innovation (where one was if the technology or procedure was required for the product had been available for less than five years), product innovation (where 1 was if a product was new to all or some consumers), the size of the company, number of patents and etc.

The paper validates the point that young entrepreneurial organizations which develop product and/or process innovations favor being internationalized. Additionally, the research confirms Becker and Eggers (2009) conclusions about the dominant impact of product innovation comparing with process innovation. The author states that innovation strategies could provide young enterprises an opportunity to go abroad and gain advantage from there despite the lack of knowledge. Moreover, in these circumstances research concludes that product differentiation strategy (product innovation) would be better approach comparing with process innovation development. Furthermore, the study states that innovations have a greater effect on firm’s internationalization activities for high-income economies than for low-/middle-income economies. The following fact could create potential impediments for low-/middle-income countries willing to enter foreign markets, thereby undermining benefits which a company could gain from innovations. Also, authors consider that owner’s personal characteristics play a significant role in the firm's propensity to be internationalized: they are more likely to be males with a high education. Finally, this research concludes that the company’s size is significant on export activities.

The main advantage of the study that it fills the gap by investigating the relationship between product and/or process innovation in young entrepreneurial companies and their internationalization activity. On the contrary, the primary research drawbacks that some data based subjective data (entrepreneurs had to define the degree of newness of innovation).

According to learning-by-exporting approach, organizations which are already exporters tend to adopt foreign partners experience and expertise in business promotion, product distribution, and innovation development. Companies which have access to international markets have more stimulus and opportunities to develop any innovation which creates the positive effect from exporting experience. For instance, Griffith et al. (2006) point out that both product and process innovations affect in a positive way on company’s productivity. Futhrmore, Filipescu et al. (2013, 1) conclude that the higher company’s previous level of export breadth, the stronger company’s ensuing “R&D intensity and product and process innovation” due to the market knowledge access. Firms which internationalize have a chance in an earlier adoption of any potential innovation from abroad to enhance its domestic and foreign competitiveness. Moreover, authors indicate the fact firm’s age positively correlates with its R&D intensity. However, some studies show that start-ups are eager to acquire knowledge in a more rapid manner (Molero and Buesa 1996).

Additionally, Aw, Roberts and Xu (2011) investigate the linkage between R&D expenditures, exporting and firm’s productivity. Authors conclude that productivity has an endogenous nature and could be affected be several determinants. Based on the sample of Taiwanese electronic producers research shows how company’s productivity level changes if a firm decide to invest in R&D or/and in export. Both, R&D investment and international activities have a positive effect on company’s productivity, the former having the greater impact than the latter. If an enterprise invests in both activities, it has a higher level of productivity. Additionally, paper analyses changing in fixed and sunk costs in R&D and internationalization. It states that for fixed and sunk costs for the former are greater than for the latter resulting in the larger proportion of Taiwanese companies choosing to internationalize.

Pittiglio, Sica and Villa (2009) state that companies which are active exporters more tend to obtain knowledge and innovation than their non-exporters rivals. Authors explain this phenomenon by the two possible facts. First, more internationally involved enterprises tend to accumulate more R&D investments. Second, exporters can benefit from innovation access due to the resources available on the international markets. As a result, authors conclude that to be innovative companies should support their internationalization activities by intensive R&D expenditures.

Kiriyama (2011) in OECD Trade and Agriculture Directorate report defines that innovation is critical to creating new sources of growth. Paper states that there are three main channels through which trade influences on innovation activities: technology diffusion (import, foreign direct investments, and trade in technology), competition and export activities. Both, import and foreign direct investments provide access to external technology which could form the basis for the following product, process, marketing, and organizational innovation. Another important channel of technology diffusion is a trade in technology, in particular licensing. Its impact and role changes through industry and less investigates compared to the other two. The author states that the role of export shifts in the economic literature and also pays attention to different approaches in the linkage between innovation and export. In general, agree with the previous researches that the exporters are more productive than non-exporters and emphasize that there are more works which study “self-selection” approach than “learning-by-exporting.” The author also takes into consideration the fact that company’s technological absorptive capacity could let gain benefits from international technology diffusion. Absorptive capacity depends not only on endogenous factors but also on the business climate and government actions.

Altamonte et al. (2013) conducted cross-country research to investigate interaction among firm-level internationalization, innovation, and productivity across seven European countries. Authors suggest that export is unlikely to lead to sustainable internationalization because internationalization goes beyond export and because, in the medium to long term, internationalization is likely driven by innovation, and recommend internationalization and innovation policies.

The more studies have been made, the more theories appear. Despite the fact that self-selection hypothesis has more empirical studies than the learning-by-exporting hypothesis, there are papers which show that these two approaches have complementary nature. In other words, the most competitive enterprises due to the innovation implementation enter global markets, where they come become more productive thanks to export effect (Van Biesebroeck 2005; Love and Mansury 2009). Filippetti et al. (2011) investigate the dual relationship of R&D and export activities in the sample from 32 European countries and state that innovative companies tend to be more internationalized, and such context leads to more innovation.

Moreover, Esteve-Pérez and Rodríguez (2012) confirm the mutual interdependence between innovation activities and export on a panel data from Spanish companies. Moreover, previous companies’ innovation and internationalization activities enhance current participation in each activity.

Additionally, another approach to the relationship between innovation and internationalization concludes that innovation influence on company’s internationalization through several moderators, for instance, Cassiman and Golovko (2010) investigates the link among product innovations, internationalization through exports and productivity. They conclude that product innovation affects in a positive way on both export activities and productivity. Moreover, product innovations could, directly and indirectly, have an impact on the company’s decision and probability to enter foreign markets. Additionally, product innovations enhance productivity levels which also influence the decision to start export activities. The main strength of this paper is that previous researchers have not explained which determinants make more productive companies get productivity advantages which let them internationalize.

To sum up, most researchers link innovation and internationalization on the basis of self-selection hypothesis (Basile 2001; Becker and Egger 2009; Lamotte and Colovic 2010; Rios-Morales and Brennan 2010), nevertheless there are some which based on the learning-by-exporting hypothesis (Aw et al. 2009; Pittiglio et al. 2009; Altamonte et al. 2013). The former mostly agree on the fact the innovation activities favors firm’s internationalization process. In this perspective scholars also agree that with a higher amount of R&D investments and a big number of patents companies tend to be more innovative; therefore more export oriented (Basile 2001; Becker and Egger 2009; Lamotte and Colovic 2010; Cassiman and Golovko 2011). Plus, as a proxy for innovation activities, researchers usually use R&D expenditures and number of patents. Moreover, the size of a company could play a crucial role in firm’s internationalization process (Becker and Egger 2009; Lamotte and Colovic, 2010). Additionally, the industry where the enterprise operates could affect on its internationalization process (Basile 2001).

Based on the previous research it is assumed that:

*H1: Companies with higher R&D expenses have higher export intensity.*

*H2: Large companies have higher export intensity.*

*H3: Patents have a positive effect on company's export intensity.*

*H4: The high and medium intensity of technology in the industry has a positive effect on export intensity.*

Nevertheless, there are some peculiarities regarding the role of product and process innovation: major part of research concludes that product innovations rather than process innovations positively correlated with internationalization activity, but both cases make even greater contribution for the firm’s degree of internationalization. However, the paper focuses not only on the type of the innovation, product or process, but also on its nature, is it incremental or radical? In the next part the impact of the radical and incremental innovations will be investigated.

## 1.3. Different types of innovations and internationalization performance

Despite the fact that a comprehensive research in the field of innovation-internationalization relationship has been done, few attentions paid to distinguish effects of incremental and radical innovations on the company’s internationalization performance. Most studies consider term “innovation” in general, at best, showing different effects of product and process innovations (Becker and Egger 2009; Lamotte and Colovic 2010). Nevertheless, some researchers who cover this topic directly or indirectly have been found.

Hurmelinna-Laukkanen, Ritala, and Sainio (2013) examine how radical innovations impact differs in domestic and international markets. Authors argue that radicalness of innovation is difficult to define: it could be considered radical from the company’s perspective or country, or its creator. Additionally, the research analyzes different dimensions of radical innovations, for instance, technological radicalness which makes all prior technologies obsolete. In foreign markets, technological radicalness gives more access to knowledge. Other dimensions cover existing markets and consumers: market radicalness, which provides new types of advantages for emerging or new consumers. In international markets, market radicalness is easier to reach comparing with local markets due to the lack of knowledge. In addition to technology and market types, innovation radicalness could be considered in terms of company’s existing business practices.

The main hypothesis of the paper is the internationalized organizations get higher levels of radical innovations than domestic market companies, and it is partially supported. Moreover, in international markets access to various types of knowledge, and different technologies qualitatively increase probabilities of emerging radically new technology. Concerning market radicalness, it seems that this almost has no impact due to the independence of home and host markets.

Chetty and Stangl (2010) discuss how network relationships are used in the innovation and internationalization performance of SMEs and develop a matrix which includes such dimensions as incremental internationalization and innovation and radical internationalization and innovation. Authors (Chetty and Stangl 2010, 1731) define that a company has a gradual internationalization when it internationalizes in a period of “more than three years, has less than five international markets and 20 percent or fewer sales in their international markets”. A radical internationalization, respectively, is when a firm “internationalizes within three years of inception, have 80 percent or more global sales and operate in more than 20 markets worldwide”.

So, this study explores not only the relationship between innovation and internalization performance in general but also tries to identify which types of network relationships uses in different kinds of innovation and internationalization. Authors designed a matrix of these interactions and defined four various groups.

Ten software New Zealand-based companies are analyzed by in-depth qualitative study for research. The first group of businesses (radical innovation/radical internationalization) is that which process of internationalization develops fast due to firm’s radical innovations and in its turns evolve network relationships. The main point for practitioners here that they should monitor any changes in network relationships dynamics.

The main features of the second group of companies (incremental innovation/radical internationalization) that they tend to evolve their R&D before they start internationalization process. The companies’ dominant markets’ presence and commitment mode are in the so-called Anglo-Saxon cluster (Australia, the UK, and the USA). Financial relationships are very crucial for this group thus an implication with incremental innovation is needed to be planned strategically.

The third group of companies relates to radical innovation and incremental internationalization. Organizations cannot internationalize with enough pace to gain an advantage from radical innovation because of quickly changing technology and a shortage of capital. Managers of such type of companies should create various network relationship to maintain informational flux about any technological updates. In such state social networks plays a crucial role for such small and medium enterprises. Managers of these organizations

The fourth group of firms relates to incremental innovation and incremental internationalization. These companies are among the youngest and smallest and, moreover, have fewer network relationships. Additionally, these young firms are in their early internationalization process. Due to its nature, i.e. being focused on the local market these companies are more dependent on their social relationship than more internationalize one. In such state social networks plays a crucial role for such small and medium enterprises. If companies of this group want to grow or even enter foreign markets, they need to diversify their network relationships.

In summary, authors propose the following (Chetty and Stangl 2010, 1731):

1. Companies with a radical innovation and diverse network relationships are more likely to obtain radical internationalization.

2. Companies with an incremental innovation and financial relationships are more apt to get radical internationalization.

3. Companies with a radical innovation in a rapidly changing technological environment and those lack financial relationships are more likely to internationalize incrementally.

4. Companies with incremental innovation that are small, young and have few network relationships are more apt to expand gradually.

Research findings argue that companies with finite network relationships possess incremental internationalization and innovations, while companies with diversified ones - have radical internationalization and innovations. The research paper results point out that network relationships have a great impact on SME’s future and sustainability. But this research paper has its drawback: because this is an in-depth qualitative study, the paper finding can only be used for analytical generalization.

One of the latest research is by Azar and Ciabuschi (2016) and investigates the idea that how different types of innovations influence on export performance. The study differs from its antecedents that have its advantage of covering not only technological innovation effect to a company’s internationalization process and vice versa but also organizational innovation impact which has been underestimated by scholars.

Authors agree with their antecedents (Damanpour and Aravind 2012) that in order to have a positive impact of innovations on internationalization performance a company is better to possess a well-balanced technological and organizational innovations portfolio. Still, previous studies mainly concentrated on technological innovations (Roper and Love 2002; Hortinha, Lages and Filipe Lages 2011; Wang, et al. 2013), rather than on organizational innovations and its impact on internationalization performance. Such fact could be explained by more precise technological innovation relation to export performance.

Also, both technological innovations are considered through their radicalness and extensiveness, where the former is the degree to which innovations diverge from present structural and technical principles (Damanpour and Aravind 2012), and the latter is an amount of innovations that any company accepts during some period (Damanpour 1991). To have a better understanding of the relationship between organizational and technological innovation the research examines organizational innovations’ impact on the radicalness and extensiveness of technological innovations, and according to Azar and Ciabuschi (2016) whether these two distinct dimensions may influence export performance in different ways.

The results indicate that:

- By sustaining technological innovations, organizational innovations have positive impact on export performance both directly and indirectly;

- The relationship between technological innovation radicalness and internationalization (export) performance is non-significant, while its’ extensiveness enhances performance.

It's mainly explained by some core internalizations theories and radical innovation studies. According to Johanson and Vahlne (2009), the basis of internationalization process model lies in the company’s gradual, incremental behavior. Such relation is explained by authors and supports by previous researchers by the fact that “if a firm’s internationalization process is characterized by small incremental steps, then the innovation strategy may also mimic this process by developing and introducing several small incremental innovations (instead of fewer radical ones) into a new market. A higher number of incremental innovations introduced to aid market entry via exports also fits well with another core aspect of the internationalization process model, that is, learning and adaptive behaviors, which are typically characterized by trial-and-error and slow learning (Johanson and Vahlne 1977; Forsgren 2002).

The extensiveness of technological innovations is more important than technological innovations radicalness. This conclusion is supported by previous studies which state that radical innovations “often requires major market changes and requires longer periods than incremental innovation to gain market acceptance and generate significant returns. This finding also suggests that it is more difficult for a firm to overcome market uncertainty related to new market entry with a strategy based on radical innovation, which is also highly uncertain in nature.

Nevertheless, the study has its drawbacks which mostly connected with the approach used. Plus, the research results are based on data from 218 Swedish export ventures, i.e. companies from developed markets (not from emerging markets). Moreover, the composition of the sample is focused only several industries, such as forestry, fishing, etc.

One of the most comprehensive research in the field of the link of radical and incremental innovations and company’s internationalization has been made by Chiva, Ghauri, and Alegre (2013). Authors propose a dynamic theoretical model that has mutual causality between organizational learning, innovation, and internationalization. Author divide companies into two types: the incremental complex adaptive system model and the global complex generative system model. The former model is characterized by adaptive learning, incremental innovation, and low internationalization; and the latter system is characterized by generative learning, radical innovation and global internationalization. Therefore, it could be concluded the more radical nature of innovations the more company is internationalized, and the more company obtain incremental innovations, the lower degree of internationalization.

The effect of radical and incremental nature of innovation and their impact on enterprise internationalization activity is not investigated thoroughly (Chetty and Stangl 2010). The limited research has made, concludes that more radical innovation the more company’s degree of internationalization (Chiva, Ghauri and Alegre 2013; Azar and Ciabuschi 2017).

Previous research analysis on the different impact on product and process innovations on company’s internationalization state that product innovations rather than process innovations positively correlated with internationalization activity (Basile 2001; Becker and Egger 2009; Lamotte and Colovic 2010). Additionally, it has been investigated that scholars have no universal solution on the impact of incremental and radical innovations on firm’s internationalization. However, the majority (Chetty and Stangl 2010; Chiva, Ghauri and Alegre 2013; Hurmelinna-Laukkanen, Ritala and Sainio 2013) conclude the more radical nature of innovations the more company is internationalized, and the more company obtain incremental innovations, the lower degree of internationalization.

Based on the previous research it is assumed that:

*H5: Companies that focus on radical product innovations have higher export intensity*

*H6: Companies that focus on radical process innovations have higher export intensity.*

Nevertheless, it is important to pay attention not only to studies which have been made by scholars from developed countries but also to researchers appeared in emerging markets in order to understand peculiarities of innovation and internationalization activities.

## 1.4. Innovations and internationalization in emerging economies

Two trends lie behind the growing interest in emerging markets (Ramamurti, 2016). Firstly, emerging economies, with 85% of the globe population, provide two-thirds world GDP growth during last fifteen years, while Triad region suffers from growth reduction. Secondly, Singapore, China, Hong Kong, and India develop their local management school which is succeeding in scientific research regarding innovation and internationalization phenomena throughout local context and trying to develop frameworks which applicable for the context of emerging markets.

Emerging market firms differ significantly from the leading players regarding culture, institutional development, and business practices; they are much better off following internationalization strategies tailored specifically for them instead of using the same approaches that companies from advanced countries do (Guillen and Garcia-Canal 2009). These special conditions mean that conventional theories of internationalization such as Uppsala internationalization process model and ownership, localization and internalization framework (OLI), that were developed to interpret the experience of Western multinationals, may not apply to the emerging market companies. Some researchers have been focusing on exploring internationalization processes of emerging market enterprises to provide appropriate theoretical frameworks that generalize firms’ international expansion methods and practices. Emerging market multinationals’ expansion and increased foreign direct investments inflow in the transition economies go hand in hand with economic growth and substantial improvement of living standards in those countries.

The rise of emerging market firms despite their disadvantages competing with the leading MNCs was possible due to low trade barriers, economic liberalization, technological advancements, accelerated capital flows. These global economic changes allowed transition economies firms to go international, grab a fraction of the global value chain and build on that. Even though nowadays only a small number of EMNCs (such as RUSAL from Russia in aluminum production) take up leading positions in their industries, dozens of companies from developing markets are considering going global and establishing themselves as significant global players across different sectors. Thus, international business researchers are making attempts to understand the principles of effective internationalization of EMNCs, motives for international expansion, best entry modes and challenges they may face.

One approach that aims at covering this inconsistency between theory and practice concerning EMNCs internationalization was developed by Luo and Tung (2007). According to them, EMNCs pursue international expansion to acquire strategic assets they lack to develop or enhance their competitive advantages in home and host markets. “Luo and Tung (2007, 484) state that “EMNEs systematically and recursively use international expansion as a springboard to acquire critical resources needed to compete more effectively against their global rivals at home and abroad.”EMNEs penetrate foreign markets to gain access to strategic assets rather than to exploit their firm-specific advantages, as traditional OLI-model states.

Springboard perspective suggests that before going international, emerging market firms have enjoyed inward investments that allowed them to dominate home country markets. Joint ventures with established global players, MNEs from developed countries, allowed EMNCs to gain international experience, technology, know-how, knowledge about business processes and best managerial practices.

Since EMNCs are late globalizers, they have to enter new markets very fast to keep up with their developed countries counterparts. Unlike MNEs, they usually penetrate several markets at the same time, and the entry modes they chose (M&A, greenfield investment) are the high level of commitment and risk. Often EMNEs do not go through different stages of internationalization gradually increasing their recourse commitment. They prefer to go big or go home: massive investments acquiring a plant or building wholly owned subsidiaries, which carry high risks but allow for higher level of control. When it comes to market selection on the initial stage of internationalization, EMNEs are not bound to choose countries that have small psychic distance with their countries of origin, as conventional approach suggests. These countries are less risky to penetrate, as they are very similar culturally to the environment a firm operates in. It is not uncommon for EMNCs to jump straight to developed markets such as the US or Europe which are significantly different and harder to understand.

To explain the rapid rise of multinationals from newly industrialized countries the so-called “Dragon multinationals” in the early 2000s, the LLL model was put forward by Mathews (2006). Like the OLI-model, it was developed to shed light on the factors that determine effective internationalization of firms. Mathews made an attempt to design theoretical framework that reflects the experience of emerging market multinationals.

Three Ls represent three factors: linkage, leverage, learning. These factors shape the internationalization strategies of EMNCs. While Dunning’s eclectic paradigm focuses on internal factors, the LLL framework advances external factors. A linkage is a tool of critical importance for EMNEs that helps them to cope with uncertainty and diversify risks in the foreign markets. Emerging market firms can exploit their networks to compensate for their backwardness regarding technology, R&D capabilities, and strong brand name. They build relationships with their advanced counterparts forming strategic alliances and joint ventures. Partnerships agreement is an effective entry mode, as, besides the transfer of knowledge, EMNCs get to mitigate their financial risks in the markets. Leverage refers to the accessibility of resources via the linkages with foreign incumbent firms. EMNCs should focus on resources with high transferability and imitability. Learning reflects company’s ability to reproduce linkage and leverage processes. Mathews suggests that when companies learn from their technologically advanced competitors, the process of internationalization is very fast. According to LLL framework, companies from emerging market do not even need firm-specific or country-specific advantages as OLI-model claims to go international. Thanks to their strong network they can go where the necessary resources and capabilities are.

However, Kumar, Mudambi and Gray (2013) state that ongoing global competitiveness and rapid growth of EMFs in both home and host markets are results of three intertwined phenomena:

- fast-moving internationalization of EMNCs into developing and developed markets,

- companies from emerging markets are more likely to focus on knowledge-intensive process and innovation,

- regular enhancement of emerging markets’ institutions, especially regarding market liberalization.

According to 3 I’s view (internationalization, innovation, and institutions change) shed light on what mainly influences on the transformation in the global presence of EMNEs. Authors confirm that technology development facilitates internationalization process of companies all over the globe, particularly from emerging markets. Moreover, emerging markets are increasingly becoming stronger at generation innovations and creating global R&D networks. Therefore, firms from developing economies cannot be considered only as a hub for manufacturing. Furthermore, institution reforms play a significant role in support of emerging market companies.

Interestingly, Wu et al. (2016) argue that not only an institutional development of home country may affect the EMNEs performance, but also an institutional development of host country. Moreover, study shows the institutional context in which foreign subsidiaries operate have a great impact on emerging market parent. Furthermore, innovation activity of parent company shows higher performance if it enters host market with stronger institutional development. Nevertheless, authors state that in the case when the host country degree of institutional development is small, company’s innovation performance could be improved due to the high level of state ownership in EMNCs. Besides, Peng (2012) claims that Chinese government plays a vital role in encouraging and subsidizing local companies’ internationalization.

Tiwari, Sen, and Shaik (2016) in comparison to Kumar, Mudambi, and Gray (2013) conclude that SMEs from emerging markets tend to look at internationalization process as one of the major strategic step in resource and capabilities acquisition due to the shortage of propriety resources. Authors also state that SMEs from emerging economies may encounter various obstacles, such as company’s newness and foreignness and, of course, country-of-origin effect because of lack of branding, cutting-edge technologies, and branding. As a result, EMNCs use joint ventures as one of the crucial strategic tools to penetrate foreign markets. Based on the linkage, leverage and learning framework proposed by Mathews (2006), research shows emerging market SMEs use strategic alliances in order to organize a linkage “with a wider network of globally connected firms to get access to requisite resources and capabilities” (Tiwari, Sen and Shaik 2016, 355).

While Li et al. (2012) mediate between previous authors ideas: they do not disclaim that companies exporting are a potent source and channel for international knowledge acquisition. Although, R&D investments both in internal and external knowledge have a positive influence on product innovation, evolving absorptive capacity.

There are also studies regarding the linkage between company’s internationalization activity and product and process innovation for emerging markets firms. Hwang, Hwang, and Dong (2015) use panel data of Korean companies to estimate the relationship between firm size, innovation type, and export performance with different time spans. Authors state that the effect of innovation activities on export performance would be significant for the LEs over the long-term, while it would be more likely to appear in the short-term for SMEs. Moreover, the paper proposes that companies which implement both product and process innovations are more apt to have higher export performance, which confirms conclusions of researchers made for developed economies (Basile 2001; Lopez Rodriquez and Garcia Rodriguez 2005; Becker and Egger 2009; Lamotte and Colovic 2010).

Also, Pino et al. (2016) analyze the impact of organizational and marketing innovations on the export performance of companies from South America. Authors conclude that the former have more influence than the latter on company’s international activity. According to the research, organizational innovations provide the basis for any other type of innovation.

## 1.4. Innovations and internationalization in the Russian context

Even in the emerging markets context Russian international trade and innovation activities have its specifics (World Bank, 2013). The first point, Russia’s trade performance has a narrow product base with oil and gas taking a dominant part in Russia’s export. Despite the fact that export of goods brought $340.5 billion in 2015 ("Russia - Export of Goods 2005-2015 | Statistics Portal" 2017), Russia has difficulties in export diversification (Figure 4).



**Figure 4 Decomposition of export growth, 2000-2009. Source: World Bank, 2013**

Second, according to World Bank Russia’s product space map, which shows how many countries' products has gained a relative competitive advantage, has a low number of such products which can compete worldwide. Moreover, most of these products located in the periphery of the product space map, which states that they have limited linkage with other industries. As a result, to get the competitive advantage in an entirely different industry will require a development of unexciting capabilities which complicate future trade growth (Figure 5).



**Figure 5 Comparative advantage and the product space in the BRICs, 2006–2009. Source: World Bank, 2013**

Additionally, Russian exporters suffer not only while penetrating international markets but also keeping a presence there. Figure 6 show the survival rate of the companies from BRIC economies. Again, Russian enterprises have the lowest level of sustainability.

**Figure 6 Export in BRIC. Source: World Bank, 2013**

Finally, regarding R&D investment by the source of funds Russia still mainly depend on governmental support, which completely the opposite for developed economies (Figure 7). Moreover, the public sector is not only the leading investor but also the chief R&D executor.



**Figure 7 R&D expenditures for selected countries by source of funds. Source: MSTI OECD, 2009**

Concerning theoretical research about the relationship between internationalization and innovation companies from developed countries mainly investigated (Chetty and Stangl, 2010; Cassiman and Golovko 2011; Azar and Ciabuschi 2016). However, in the recent years, more works are being developed regarding the link between innovation activities and internationalization process in emerging markets (Li et al. 2012; Hwang, Hwang and Dong 2015). For enterprises from emerging markets the most crucial factors are becoming: an ability to obtain knowledge (Tiwari, Sen and Shaik 2016), institutional development of host-country (Wu et al. 2016) and home country (Peng 2012; Kumar, Mudambi and Gray 2013).

Roud (2007) study states that for Russian context such aspect like administrative support is one among having the high impact. Additionally, the research investigates country specifics of the link between innovation and productivity for R&D based manufacturing sector based. Research is conducted based on the firm-level data and analyses interplay of innovation input, innovation output, and productivity. Authors argue that Russian enterprises innovative capacities and capabilities are limited by the shortage of investments, which rise thanks to the public sector support. Moreover, it is constrained by the ability to obtain external knowledge, for instance, from inward FDI, rather than the development of internal knowledge due to the lack of human resources.

However, Filippov (2011) and Filippov and Settles (2011) investigate the roles of technology and innovation, as ownership advantages, in the internationalization of Russian-based organizations, meaning that the primary goal of Russian-based companies to enter foreign markets is knowledge acquisition. The study focuses on three main groups of different companies —medium-technology manufacturing enterprises, software and IT companies, and state corporations.

Research defines different roles of innovation in the process of internationalization among these group of businesses and provides examples. First, medium-technology manufacturing firms are more likely enter foreign market led by technology-seeking motives. Second, companies in the emerging IT and software sectors expansion could be driven by innovation and using their competitive advantage. Third, state corporations participate in international operations, too, and the role of innovation differs. This internationalization may be either technology-driven or technology-seeking.

In search of more comprehensive approach which could define what particular determinants, both internal and external, influence on the EMFs and makes their internationalization process differ from developed markets, Mihailova and Panibratov (2012) propose the coherent framework which illustrates the role of macro- and firm-level determinants in forming EMNEs internationalization activities. Research results confirm that the following factors influence on the emerging market companies’ internationalization strategy: firm-level, industry-level, and institutional. Moreover, authors conclude firms’ internationalization strategy has common patterns for similar types of industries regarding such determinants as state impact and capital and infrastructure requirements. Although, even in these patterns some deviations could occur. Additionally, Panibratov (2016) explore the role of government in the internationalization process of Russian MNEs. The author states that depending on the degree of government interest (high or low) in the industry the effect of control could be either positive or negative which directly reflects on the competitive position of Russian firms. Important to mention that both approaches could bring advantages and disadvantages for the companies. For instance, if a company operates in the industry which is out of the scope of government interest, from one side such firm may face difficulties due to the lack of public investments when going abroad, and from another side, it is free from any obligations and industry restrictions and could pursue more independent strategies.

Podmetina et al. (2009) investigate innovations and internationalization of R&D oriented companies in Russia. The main results of the research represent the impact of innovation activities, competition and new product development on export intensity.

The study tests Russian companies but under several clusters in order to reveal patterns. There are four groups:

1. Non-exporting innovators, which possess R&D, but do not do any export activities;

2. Non-innovating exporters who export but have no R&D;

3. Non-exporting non-innovators, which have no both R&D and export activities;

4. Exporting innovators, which both export and have R&D.

Authors test a relationship between innovation and internationalization, in particular considering Russian companies. Results show that export performance in Russian companies performing in high technology intensity industries is influenced by product innovations, R&D investments, and the firms’ size. However, the number of patents which organization obtains do not show a direct impact on export activity.

Research strengths lie in the data collection and the number of independent variables which do not prevail in the investigation of the relationship of innovations and internationalization in the Russian context.

Additionally, Väätänen, Podmetina, and Aleksandrova (2007) study the role of FDI for the Russian based companies, both foreign and domestic, in the development innovation capacities. Authors conclude that there is no significant difference in the innovation performance of foreign and local firms. Furthermore, Podmetina (2011) investigated the opportunities and challenges for Open Innovation for the Russian context. The research results state that companies with international operations, high internal knowledge development tend to use Open innovation more regularly both for technology acquisition and commercialization. Also, high-tech sectors tend to have a positive impact on the Open Innovation usage.

On the contrary, Gonchar, Kuznetsov and Golikova (2013) explore the role of internationalization on innovation activity for the Russian manufacturers. Authors state that company’s propensity to invest in R&D activities correlates with the firm’s previous international experience, mainly export and import. Interestingly, that import activities tend to have a greater impact on learning effects than export. Although, government or foreign ownership does not show any significant impact on firms’ innovation activities.

Besides, there are only a few researches which analyze two-sided nature of innovation and internationalization for the Russian-based companies. Arkhipova and Aleksandrova (2014) state that innovation activities allow companies to expand its sphere of influence, to move from local to national markets, and, moreover, to international markets. The probability of the latter is extremely low for the Russian enterprises due to the high entry barriers and low comparative advantage of Russian goods. In contrast, the hypothesis about learning-by-exporting effect has not been confirmed through the study, which opposes to the conclusion of Gonchar, Kuznetsov, and Golikova (2013).

To conclude, it is important to understand that despite Russian firms being a sort of emerging market companies, they have their peculiarities as well. Additionally, there are some conclusions about Russian enterprises performance in the international arena which supports previous studies on the relationship between innovation and internationalization for developed and developing economies, but there are some which contradict the primary path and require further research.

## 1.5. Summary of Chapter 1

*The main goal of the study* is to determine the relationship between innovations and internationalization for the Russian-based manufacturers. Even though many factors can influence the internalization strategy and activity of a company, this paper will mainly focus on the connection between innovation-related aspects and internationalization activity like export intensity. Additionally, this paper analyzes which type of innovation, radical and incremental, affects the internationalization performance of Russian companies, taking into consideration industry specifics.

*The main research question of the paper:*How are innovations and internationalization related for Russian-based manufacturers?

Research has been conducted on the relationship between internationalization and innovation (Kafouros et al. 2008, Golovko and Valentini 2011, Chiva, Ghauri and Alegre 2013), including also the types of innovation to some extent (Azar and Ciabuschi 2016). Moreover, the relationships between companies’ internationalization, the degree of innovation radicalness and network relationship (Chetty and Stangl 2010) have been examined, and few studies have considered the effects of a company’s internationalization on different types of innovations: radical and incremental (e.g., Azar and Ciabuschi 2016). Moreover, there are only several research papers which investigate relationship between innovation and internationalization on the example of emerging (Li et al. 2012; Hwang, Hwang and Dong 2015; Tiwari, Sen and Shaik 2016; Wu et al. 2016) and Russia (Podmetina et al. 2009; Filippov 2011, Panibratov 2016).

Based from the literature review the following hypotheses have been stated:

*H1: Companies with higher R&D expenses have higher export intensity.*

*H2: Large companies have higher export intensity.*

*H3: Patents have a positive effect on company's export intensity.*

*H4: The high and medium intensity of technology in the industry has a positive effect on export intensity.*

*H5: Companies that focus on radical product innovations have higher export intensity*

*H6: Companies that focus on radical process innovations have higher export intensity.*

Thus, a greater understanding of the connection between product and process innovation-related aspects and internationalization activity like export intensity. Additionally, this paper analyzes which type of innovation, radical and incremental, affects the internationalization performance of Russian manufacturers will address *a gap in the literature.*

# **CHAPTER 2: RESEARCH METHODOLOGY**

## 2.1. Overview of the research methodology

This chapter is dedicated to the description of the research methodology of this paper.

The literature review in the first chapter has shown up a greater understanding of the relationship between company’s innovation and internationalization activities.

As previously stated, the major research question of this study is “How innovations and internationalization are related in Russian-based manufacturers?”

Despite to the fact that the nature of this research is rather exploratory (due to the limited amount of inquiry made for Russian context) than explanatory, rising from research question quantitative analysis method have been chosen.

The research design of this study will be based on the primary data collection and includes analysis of quantitative data. A more detailed description of the methodology will be introduced further on in this chapter.

## 2.2. Justification of the suitability of a survey as a research method

For this paper, the quantitative analysis method is used, which was designed in the natural sciences to study natural phenomena. Different types of this approach, such as surveys, laboratory experiments, econometrics, mathematical modeling, etc., are now well used in social sciences. This research design method is more suitable when your goal is to obtain a large sample size what, logically means that objective of your research to investigate a particular topic across many companies or people (Myers 2009). To analyze received data various statistical techniques could be used.

Survey research provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population.

According to McDonald and Gan (2015, 294) “the entrepreneurship research is dominated by the survey process.” One of the most popular types of the study is a self-completion questionnaire which could also be named as a self-administrated questionnaire. Bryman and Bell (2015, 254) state that self-completion questionnaire implies that respondents answer questions by completing the survey themselves. The self-completion questionnaire could be done in various forms, such as mail or postal questionnaire.

According to Bryman and Bell, comparing with structured interviews, self-completion questionnaires have their advantages, such as:

- fewer open questions which mean an easier answer for respondents;

- easy-to-follow designs;

- could be more cost-efficient;

- ability to be distributed in a bid amounts at the same time;

- the absence of so-called interviewer effects where the desirable outcome could be dominated;

- convenience for respondents.

At the same time there are some drawbacks:

- there is no any support for respondent in case having a difficult to answer;

- the challenge in asking many questions;

- the absence of ability to collect additional data;

- greater risk of missing data;

- lower response rate.

Therefore, all mentioned above advantages and disadvantages should be taken into consideration while interacting with respondents.

Several factors should be considered in order to overcome method limitations. First of all, all survey questions should be framed and phrased thoroughly. Moreover, the process of results interpretation should be followed the facts about data representation and limitation.

The purpose of this survey research is to generalize from a sample to a population in order make characteristics about population. For our research Russian-based producers is needed including both Russian companies and foreign company subsidiary with production facilities on the territory of Russian Federation. Moreover, a manufacturer could be any type of ownership, having and not having innovations and any degree of internationalization.

Survey questionnaires can be used in the cases when you need to collect:

- biographical information (age, gender, education, etc.)

- behavior habits (preferences, tastes, etc.)

- opinions (about any topic or problem)

- attitudes.

For the conducted research survey questionnaire is the most preferred type of data collection due to the economy of design and ability to get a fast turnaround.

The study includes cross-sectional and longitudinal studies using questionnaires or structured interviews for data collection, with the intent of generalizing from a sample to a population.

Several factors should be taken into account to overcome method limitations. First of all, all survey questions should be framed and phrased thoroughly. Moreover, the process of results interpretation should be followed the facts about data representation and limitation.

Questionnaire for the present paper was conducted together with the scientific advisor in order cover not only topics related to company’s innovations and internationalization activities but also to get information about companies’ awareness about export promotion programs and its usage by organizations. An example of the questionnaire is provided in Appendix 1.

## 2.3. Data collection

To test our research hypotheses, firm-level data were collected via questionnaire starting from December 2016. Finally, 137 Russian-based producers took participation. The sample was drawn from organizations which are manufacturers and represent any type of ownership, company’s size and industry (Table 3). Enterprises that produce good were chosen because Russian products export is dominant over the export of services. Data mostly collected by two ways: GSOM corporate partners emailing and personal interviewing during industry exhibitions. They represent Russian-based manufacturers from the biggest cities which population is over 1 million, such as, Moscow, Saint-Petersburg, Kazan, Novosibirsk, Yekaterinburg, Nizhny Novgorod, Kazan, and others.

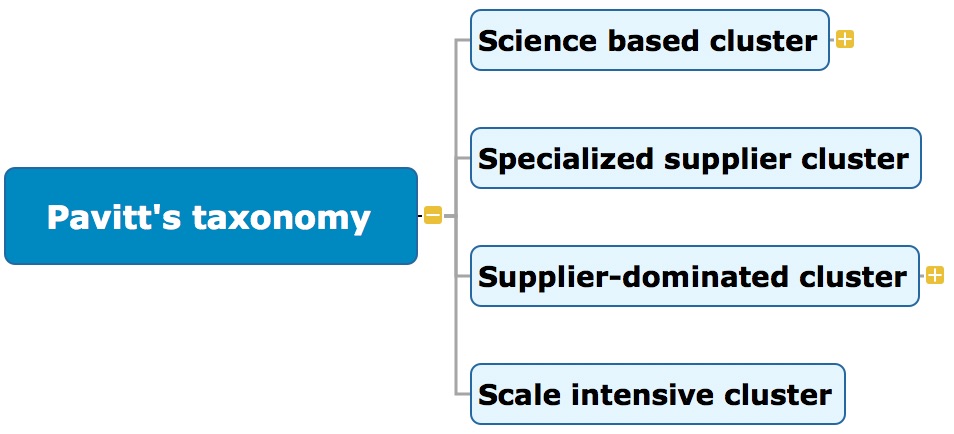
**Table 3. Companies’ description**

|  |  |  |
| --- | --- | --- |
| Firm’s Characteristics | Categories | Overall Percentage |
| Exporters | Yes | 79.56 |
| No | 20.44 |
| Innovators | Yes | 92.70 |
| No | 7.30 |
| Size (number of employees) | ≤50 | 35.77 |
| >50 - ≥200 | 41.61 |
| >200 | 22.63 |
| Activity sectors (technology intensity) | Low-medium | 45.99 |
| Medium-high | 54.01 |

For our research, for the dependent variable have been chosen internationalization. Company’s level of internationalization measured through export intensity. For the independent variables have been selected several indicators which are connected with firm’s innovation activities (Table 4). They are R&D expenditures of a company, firm’s propensity to implement radical product innovations, company’s propensity to use significantly new production processes, the number of firm’s personnel, number of patents, and the company’s type of industry which had been classified based on on Pavitt’s taxonomy (1984) and which is used by OECD. Firm’s usage of any export support programs is used as control variable due to the fact that for emerging market firms governmental support plays a crucial role in company’s overall development and especially in foreign trade (Peng 2012; Kumar, Mudambi and Gray 2013; Wu et al. 2016).

|  |  |  |
| --- | --- | --- |
| **Table 4 Definition of Variables** | | |
| **Dependent variable:** | | |
| EXI | Export intensity | Percentage of export to total sales volume |
| **Independent variables:** | | |
| PRODINN | Product radicalness | 0 - a company focuses on radical product innovations,  1 - a company focuses on incremental product innovations  2 - a company has no innovations |
| PROCINN | Production processes radicalness | A company’s propensity to use new or significantly improved production processes (Likert scale) |
| RDCOSTS | R&D expenses | Percentage of total sales spend on R&D |
| NUMEMPL | Number of employees | 0 - less than 200 employees (small and medium-sized companies)  1 - 200 or more employees (large sized companies) |
| PATENTS | Number of patents | Number of patents obtained by a company for the last four years |
| EXSUPPORT | Firm’s usage of any export support program | 0 – does not use  1 – use at least once |
| INDUSTRY | Fim's division by industries | 1- Science-based companies  2- Specialized suppliers  3- Supplier dominated  4- Scale-intensive |

This taxonomy has the following types of industries; science-based, specialized suppliers, supplier dominated, and scale-intensive. For the science-based companies, for instance, from pharmaceutical or electronics industries, essential criteria for the high performance are availability and access to fundamental researches and connection with public research institutions. Also, the following businesses are closely connected with high R&D – and patent-intensive. For specialized industries, such as the production of machinery or tools, computer hardware, and software, the primary focus is R&D intensity, product innovation and strong connections with customers and users. For supplier-dominated sectors, for example, agriculture or forestry) is necessary to establish the network with suppliers on whom mainly based any technology changes. Finally, for scale-intensive sectors, such as consumers’ durables or bulk materials, is crucial to maintaining relationship with technical institutes with developing research on their own.



**Figure 8 Pavitt’s companies’ industry taxonomy**

The operational model of a relationship between company’s export intensity and its predictor variables can be expressed in the following form:

EXI=β0+β1\*ProdInni+β2\*ProcInni+β2\*RDCostsi+β4\*NumEmpli+β5\*Patentsi+β6\*\*Industryi+εi

## 2.4. Summary of Chapter 2

The second Chapter describes the primary research methodology which is a survey, more specifically, a self-completion questionnaire about organization’s innovation and export activities.

The research design of this study is based on the collection of primary data from 137 Russian-based manufacturers.

Moreover, dependent and independent variables have been chosen. The former is export intensity, and the latter are R&D expenditures of a company, firm’s propensity to implement radical product innovations, company’s tendency to use significantly new process innovations, the number of firm’s personnel, the number of patents, and the company’s type of industry. As a control variable have been chosen an organization’s usage of any export support programs.

The multiple regression analysis was run to predict export intensity from innovation activities variables.

# **CHAPTER 3: RESULTS OF EMPIRICAL RESEARCH**

The studies goal is to define the relationship between innovation and company’s internationalization. In the first chapter main hypotheses were stated based on the previous research in this field. They are the following:

*H1: Companies with higher R&D expenses have higher export intensity.*

*H2: Large companies have higher export intensity.*

*H3: Patents have a positive effect on company's export intensity.*

*H4: The high and medium intensity of technology in the industry has a positive effect on export intensity.*

*H5: Companies that focus on radical product innovations have higher export intensity*

*H6: Companies that focus on radical process innovations have higher export intensity.*

In order to make quantitative research 137 Russian-based companies were polled. They represent Russian-based manufacturers from the biggest cities which population is over 1 million, such as, Moscow, Saint-Petersburg, Kazan, Novosibirsk, Yekaterinburg, Nizhny Novgorod, Kazan, and others.

To check in what way innovation activity influences on firm’s internationalization for the dependent variable have been chosen company’s export intensity in percentage of export to the total sales, and for the dependent variables the following: product innovations (radical or incremental), process innovation (radical or incremental), R&D expenditures, number of employees, number of patents obtained in the last 4 years, and industry. Company’s usage of any export support programs has been chosen as a control variable.

## 3.1 Statistical results of the study

Multiple regression analysis in IBM SPSS was run to predict EXI from PRODINN, PROCINN, RDCOSTS, PATENTS, EXSUPPORT and INDUSTRY. In order results perceived several reliable requirements should be met (Field, 2013; Leard Statistics, 2015). The data have been checked on the independence of observations, homoscedasticity of residuals, absence of perfect multicollinearity, approximate normal distribution of residuals, the absence of significant outliers, high leverage points, and high influential points.

Appendix 2 shows that correlation coefficients which indicated that there was no multicollinearity of variables. Appendix 3 indicates that there were no studentized deleted residuals greater than ±3 standard deviations, leverage values had less than 5% values greater than 2 and lower than 2.5, and values for Cook's distance above 1. The assumption of normality was met, as assessed by Q-Q plot (Appendix 4). Appendix 5 shows that there was homoscedasticity, as determined by visual inspection of a plot of studentized residuals versus unstandardized predicted values.

Table 5 shows that there was the independence of residuals, as assessed by a Durbin-Watson statistic of 2.024, R2 for the overall model was 55.8% with an adjusted R2 of 53.4%, a large size effect according to Cohen (1988).

**Table 5 Model Summary**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Model Summaryb** | | | | | |  | | | | | |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | | Durbin-Watson |
| R Square Change | | F Change | df1 | df2 | Sig. F Change |
| 1 | .747a | .558 | .534 | 1.86361 | .558 | | 23.245 | 7 | 129 | .000 | 2.024 |
| a. Predictors: (Constant), INDUSTRY, PRODINN, RDCOSTS, PROCINN, NUMEMPL, PATENTS, EXSUPPORT | | | | | | | | | | | |
| b. Dependent Variable: EXI | | | | | | | | | | | |

Table 6 shows the statistical significance of overall model. The multiple regression model statistically significant predicted EXI, F(7,129)=23.245, p < .0005, adj. R2= .534.

**Table 6 Statistical significance of overall model**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ANOVAa** | | | | | | | | | | | | | |
| Model | | | Sum of Squares | | df | | Mean Square | | F | | Sig. | |
| 1 | Regression | 565.118 | | 7 | | 80.731 | | 23.245 | | .000b | |
| Residual | 448.021 | | 129 | | 3.473 | |  | |  | |
| Total | 1013.139 | | 136 | |  | |  | |  | |
| a. Dependent Variable: EXI | | | | | | | | | | | | | |
| b. Predictors: (Constant), INDUSTRY, PRODINN, RDCOSTS, PROCINN, NUMEMPL, PATENTS, EXSUPPORT | | | | | | | | | | | | | |

Table 7 shows there was no evidence of multicollinearity, as assessed by tolerance values greater than 0.1 and VIF values were not greater than 10 for all predictor variable as well.

**Table 7 Collinearity Statistics**

**Coefficientsa**

|  |  |  |  |
| --- | --- | --- | --- |
| Model | | Collinearity Statistics | |
| Tolerance | VIF |
| 1 | (Constant) |  |  |
| PRODINN | .964 | 1.037 |
| PROCINN | .955 | 1.047 |
| RDCOSTS | .778 | 1.286 |
| NUMEMPL | .930 | 1.075 |
| PATENTS | .857 | 1.167 |
| EXSUPPORT | .857 | 1.167 |
| INDUSTRY | .905 | 1.105 |

1. Dependent Variable: EXI

Table 8 shows the results of multiple regression analysis. Not all variables added statistically significantly to the prediction, p < .05.

**Table 8 Multiple regression model**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Coefficientsa** | | | | | | |
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | | 95.0% Confidence Interval for B | | Correlations | | |
| B | Std. Error | Beta | Lower Bound | Upper Bound | Zero-order | Partial | Part |
| 1 | (Constant) | 1.248 | .681 |  | 1.833 | .069 | | -.099 | 2.594 |  |  |  |
| PRODINN | .917 | .305 | .179 | 3.007 | .003 | | .314 | 1.521 | .143 | .256 | .176 |
| PROCINN | -.052 | .057 | -.054 | -.903 | .368 | | -.164 | .061 | .086 | -.079 | -.053 |
| RDCOSTS | .221 | .040 | .364 | 5.481 | .000 | | .141 | .301 | .525 | .435 | .321 |
| NUMEMPL | -.020 | .333 | -.004 | -.061 | .951 | | -.679 | .638 | .081 | -.005 | -.004 |
| PATENTS | .032 | .019 | .105 | 1.660 | .099 | | -.006 | .070 | .270 | .145 | .097 |
| EXSUPPORT | .391 | .053 | .468 | 7.392 | .000 | | .287 | .496 | .616 | .545 | .433 |
| INDUSTRY | -.355 | .147 | -.149 | -2.416 | .017 | | -.645 | -.064 | -.198 | -.208 | -.141 |
| 1. Dependent Variable: EXI | | | | | | | | | | | | |

## 3.2. Discussions of the results

Based on the previous research conducted in the first chapter seven hypotheses introduced which define the influence of innovation activity to company’s export intensity. These hypotheses were tested by multiple regression analysis using IBM SPSS, and some hypotheses added statistically significantly to the prediction, some not.

Table 9 summarizes the conclusion from regression analysis table. There can be seen the slopes coefficients with “+” meaning the slope coefficient has a positive correlation and “-” has a negative correlation, respectively. “Not proven” states that hypothesis have not been proved or unproved with multiple regression analysis.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table 9 Proved and unproved hypotheses** | | | | |
| **H** | **Description** | **Results** | **Influence** | **Level of Significance** |
| H1 | Companies with higher R&D expenses have higher export intensity. | Proven | + | \*\*\* |
| H2 | Large companies have higher export intensity. | Not proven | | |
| H3 | Patents have a positive effect on company's export intensity. | Not proven | | |
| H4 | The high and medium intensity of technology in the industry has a positive effect on export intensity. | Proven | - | \*\* |
| H5 | Companies that focus on radical product innovations have higher export intensity | Proven | + | \*\*\* |
| H6 | Companies that focuson radical process innovations have higher export intensity. | Not proven | | |
| \*\* coefficient significant at the .05 level  \*\*\* coefficient significant at the .01 level | | | | |

The multiple regression analysis showed that firms with a higher degree of R&D expenditures are more tend to have higher export intensity. This hypothesis is proved by a significant number of researchers, both from developed (Kafouros et al. 2008; Pittiglio, Sica and Villa 2009; Aw, Roberts and Xu 2011; Golovko and Valentini 2011) and emerging economies (Podmetina et al. 2009; Li et al. 2010). This relationship is statistically significant (p = 0.000), and implies that there is a strong link between innovation activities and export performance of the firm.

However, the multiple regression analysis has not proved the correlation between company’s size and its export. Perhaps it could be explained by the sample limitation or the fact that in general Russian companies, on average, larger than the average European and Central Asian enterprises, and still have lower volumes of export, meaning that the corporation’s size does not assume its productivity (World Bank 2013). Also, Roud (2007) state that of the biggest troubles of Russian manufacturing industry is the excessive size of organizations inherited from the Soviet Union.

Also, multiple regression analysis identified that there was no relationship between patents company obtained and its export intensity. Despite the fact that previous studies in developed markets reveal a strong positive connection between firm’s number of patents and export intensity, there is some research that also does not confirm this hypothesis (Podmetina et al. 2009). Moreover, some studies identify that number of patents as a proxy for innovation is not that comprehensive because sometimes quantity of innovations not always means that they enhance company’s performance or even will be useful in future.

The multiple regression analysis determined that corporations which belong to high and medium technology industry are more likely to have higher export intensity level. Despite the fact that major part of Russia’s export is based commodities (gas, oil, and other mineral resources), companies even from Russian could compete in the market of high and medium technologies. Additionally, Basile (2001) showed that on company’s export intensity influence its innovation’s capacities and conclude that there could exist heterogeneity in export behavior among various firms depending on the industry.

The multiple regression analysis identified that enterprises that implement radical product innovations are more likely to have higher export intensity. Despite the fact most Russian multinational companies operate in resource-based, low-tech sectors where the need for innovation and new product development is limited, our research made the following conclusions (Filippov 2011). Innovation in a low-tech industry primarily takes the form of concrete problem-solving, according to customer requirements and within certain pre-defined budget constraints; that can be viewed as incremental innovation. Overall, innovation in these companies is rarely perceived as a source of competitive advantage, but radical innovation is used as a competitive advantage facilitating internationalization only in specific sectors (such as IT and software development) and mostly in the neighboring CIS countries (Filippov 2011). At the same time, innovation-seeking ‘global’ internationalization emerges as the primary form of this nexus. Russian firms increasingly acquire technology-intensive assets abroad (in advanced markets). Moreover, the subsequent research does not specify which particular type of radical innovation a company uses: developed from the internal knowledge or through the external knowledge acquisition. Among emerging markets, Russia takes the place of the second largest outward investor (Kalotay and Sulstarova 2010).

However, correlation between radical process innovations in the company and its export intensity was not proven. Lamotte and Colovic (2013) showed that product and process innovation do have impact on firm’s export intensity. Additionally, Becker and Egger (2009) came to the conclusion that product innovation is a key factor for a successful entry into the market. Process innovations, in turn, help to ensure the market position of the firm, taking into account the unique features of the delivery of the product. According to the authors, both innovative models, they believe, will raise the firm's inclination to export, but product innovation is relatively more important in this regard. So, even despite the fact that company could use radical process innovation our research has not shown such interdependence with export intensity. The fact the hypothesis has not proven doe not state that process innovation does not play an important role in company’s development, competitiveness, and internationalization process. Probably, cross-sectional data cannot show the whole picture and correlation because the economic effect of the implementation of innovative activities may occur after a period of time.

## 3.3. Theoretical and managerial implications of the study

This paper contributes bot for theoretical and managerial context.

From the theoretical point of view, this study commits to the understanding of the role of different types of innovation, radical and incremental, in internationalization process for the Russian-based producers. For the analysis have been chosen such variables like export intensity, as a dependent variable, and products and processes radical nature, R&D investments, a number of patents obtained, productivity, as independent variables. Firms with more radical products and higher R&D cost have demonstrated higher export intensity. Moreover, through the internationalization process the type of industry turned out to be crucial: medium-high technology companies tend to have higher export intensity than low-medium enterprises.

Understanding the effects of incremental and radical innovations on companies’ export performance, particularly, in developing economies, is important to realize because of the increasing global presence of emerging and transitional multinational enterprises. Due to the fact that most of the companies from transitional economies are latecomers into the world markets, it is essential for them to obtain some sustainable competitive advantages in order to survive among corporate giants from developed countries. R&D incentives and innovation development could be a solution for them.

Concerning managerial implications, this research contributes too. Exporting companies and those who intend to be internationalized and their managers should bear in mind that if they want to expand the degree of internationalization, they should focus on organizations’ technological capabilities and innovations.

Despite the fact that research model concluded that radical product innovations had a positive influence on companies’ export intensity and showed that there was no correlation between radical process innovations and export intensity, companies should pay attention not only to the degree of product or/and process radicalness, blindly following the principle “the more the better”, but also take into consideration the industry where the enterprise operates, and the customers expectations and motives.

Moreover, Russia has a slightly contradictory situation regarding S&T sector: there are enough researchers in Russia to sustain and grow innovation, but they can only rely on small budgets to carry out their research (World Bank, 2013). Furthermore, the government is still the leading R&D investor and executor. So, the reason for low usage of innovation as a competitive advantage for Russian companies on international markets does not lie in the shortage of talented and educated personnel, but in the process of commercialization. A lot of highly potential ideas remain only concepts due to the fact that enterprises break down to commercialize them and to gain from it as a competitive advantage, in particular on the foreign markets. Inability to compete globally is because of a weak institutional environment and implementation of laws, corruption and excessive government intervention in the economy (Gokhberg and Roud 2012, 45).

Innovations define the exports of high technology. Importance for Russia of export diversification with higher added value is evident in the current macroeconomic situation. The Russian Federation registers relatively modest exports of high-tech products: it is at $ 7.095 million, about half of the exports of smaller countries, such as Spain ($ 13,378 million), representing 0.4% of the world's total, accounting for only 1.03 % of total exports from middle-income countries (Freishanet and Khrustalev 2016, 5). Thus, the given data allow considering that Russia lags behind regarding the possibilities of using and developing innovative potential. Therefore, it is critical to creating a national system that would stimulate innovation as a key to the future competitiveness of Russian products, both on domestic and global markets. Creation of systems which will include unit R&D centers, universities directly with businesses and will simplify knowledge transfer will be the base for future prosper of radical innovations because there is a huge gap between these two counterparts. The government should be a mediator which establish appropriate terms and conditions, such as subsidiaries on R&D development, both for small and medium-sized enterprises, protection of intellectual property, establishment and maintenance of dynamic universities. However, even authorities should provide any possible support for innovation development, R&D activities cannot be enforced from the top of the political system, they must be embraced by businesses themselves.

## 3.4. Limitations of the study and discussion on further research

The research has some limitations.

Regarding the data collection and methodology used there could be some limitations. First, the survey was based only on cross-sectional data. It could be a substantial factor affecting on the study’s results because innovations implementation is a long and complicated process, so it takes time to gain real results from it. There could be a space for further research because some studies from developed economies show that there are different motives for obtaining and financing in R&D for LEs and SMEs (Hwang, Hwang and Dong 2015). The former tends to get for the long-term advantage, and the latter are eager to look for innovation in the short-term, respectively. In this perspective it would be a promising gap to fulfill and to explore are there any differences and peculiarities for LE and SME based in Russia in the question of developing radical and incremental innovations for both, products and processes. Second, the sample included companies only from the biggest Russian cities which provide the basis for a higher level of firms’ innovativeness (Podmetina et al. 2009). Moreover, the research covered only firm-level data, to generalize the results more reliable, future study should obtain data from all regions. Plus, the industry type was limited to the manufacturing sector, it did not cover cases in the service sector; as a result, it may not be applicable for other economy sectors due to its heterogeneity nature.

There are some limitations from the model application as well. The model does not take into account external and some internal factors of business environment, such currency exchange or company’s type of ownership or cooperation with stakeholders. Due to the limited access to information, the abovementioned aspects were not taken into account, and the research focus was primarily based on internal factors. Moreover, according to Jean et al. (2016, 484) for a lot of studies could appear the problem when “the main explanatory variable sometimes may be reversely caused by the dependent variable, or related to a third variable that in turn partially explains the variation of the dependent variable.” Authors state the endogeneity is a research scenario wherein the explanatory variable is correlated with the error term or an unobservable random disturbance. The relationship between innovations and internationalization studies through the mediator factor productivity (Cassiman and Golovko 2010). This drawback could also be fulfilled by the future studies.

In general, future research on the interconnection between companies’ innovation policy and internationalization activities could provide the basis for the deeper understanding of what type of innovation, radical, incremental, or even both, would be the half of the battle in gaining access to the foreign markets and sustainable competitive advantage. A great number of factors, internal and external, should take into consideration: the nature of increasing knowledge (inward or outward), firm’s participation in innovation promotion programs, etc.

Finally, the organization based in emerging markets could also provide a potential for scholars. These companies can not base their strategies on the previous research of developed countries. Firms from emerging markets operate in entirely different circumstances which by major scholars perceived as a drawback while entering into developed economies and by some as positive edge while entering even less developed countries (Cuervo-Cazurra and Genc 2008). They require the unique approach in defining what particular innovation-related factors should take into account through firm’s internationalization process to find, keep and maintain competitiveness in host markets.

**CONCLUSION**

Both exports and innovation are key factors for the growth of firms and economies. Understanding the effects of incremental and radical innovations on companies’ export performance, particularly, in transitional economies, is important to realize because of the increasing global presence of emerging and transitional multinational enterprises. Because most of the companies from transitional economies are latecomers into the world markets, it is essential for them to obtain some sustainable competitive advantages to survive among corporate giants from developed countries. R&D incentives and innovation development could be a solution for them.

*The primary goal of the study* is to determine the relationship between innovations and internationalization for the Russian-based manufacturers. Even though many factors can influence the internalization strategy and activity of a company, this paper will mainly focus on the connection between innovation-related aspects and internationalization activity like export intensity. Additionally, this study tries to analyze which type of innovation, radical and incremental, affects the internationalization performance of Russian companies.

*The main research question of the paper*: How are innovations and internationalization related for Russian-based manufacturers?

To check in what way innovation activity influences on firm’s internationalization for the dependent variable have been chosen company’s export intensity in percentage of export to the total sales, and for the dependent variables the following: product innovations (radical or incremental), process innovations (radical or incremental), R&D expenditures, number of employees, number of patents obtained in the last 4 years, and industry. Company’s usage of export support programs was chosen as a control variable.

Multiple regression analysis in IBM SPSS was run for the sample of 137 Russian-based manufacturers.

The research has demonstrated that companies which have radical product innovations and a higher ratio of R&D expenditures are more likely to have a higher export intensity. Besides, that exists heterogeneity in export behavior among various companies depending on the industry (medium and high technology intensive industries are more likely to have higher export intensity). Also, the study has shown that control variable, usage of any export support program, has statistically significant results, meaning that there is the impact of governmental support for Russian manufacturers.

However, the study has illustrated that there is no correlation between radical process innovations, firm’s size, the number of patents and export intensity. Such results could be partly explained by the same results of the previous studies and research limitations.

With regards to managerial implications of the research, it is recommended to take into account not only radical nature of product or process innovations but also bare in mind specifics of the industry to which an enterprise belongs. Moreover, it is stated that it is necessary to develop networking between R&D centers and universities and companies to enable innovations to develop from the down to top, and not, vice versa, how it works right now. The government should provide support which facilitates R&D activities and eventually export diversification.

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# **https://upload.wikimedia.org/wikipedia/ru/f/fb/%D0%92%D1%8B%D1%81%D1%88%D0%B0%D1%8F_%D1%88%D0%BA%D0%BE%D0%BB%D0%B0_%D0%BC%D0%B5%D0%BD%D0%B5%D0%B4%D0%B6%D0%BC%D0%B5%D0%BD%D1%82%D0%B0.gifAPPENDIX 1. Questionnaire example**

**Innovation and Exports**

Thank you for answering this brief questionnaire. It will take you only about ten minutes.

**Confidentiality**: all the answers will be treated with strict confidentiality. The results of the study will be published only in group, and no single answer will be published separately.

In the multiple choice questions, mark the one that in your opinion better reflects your situation.

1. Does your company launch **new products**, or significantly improve its products?

Really Constantly

Very rarely (more than 1 every month)

0 1 2 3 4 5 6 7 8 9 10

1b) Which kind of product innovation does your company develop?

1. We rather center our efforts on Improvements on existing products
2. We rather launch radically different products (regarding their technology, their uses and their appearance).
3. Our company has no innovation activity

2. Does your company use **new production processes** or significantly improve the existing ones?

Not at all Incremental Radical

0 1 2 3 4 5 6 7 8 9 10

3. Which % of your total sales does your company spend in **R&D**?

|  |  |
| --- | --- |
| Answer |  |

4. How many employees in your company have as their main task to innovate or work in R&D?

|  |  |
| --- | --- |
| Answer |  |

4b) How would you classify the degree of concentration of your firm’s R&D?

1. We prefer to concentrate our R&D efforts in few areas (fields)

10) We prefer to divide the research in many different areas.

0 1 2 3 4 5 6 7 8 9 10

5. How many new **patents** has your company obtained in the last 4 years?

|  |  |
| --- | --- |
| Answer |  |

Internationalization

6. In relation with the importance of exports for your company, could you tell us the percentage export (sales outside of the Russian Federation) represent as to the total amount of sales?

|  |  |
| --- | --- |
| Answer |  |

7. What % of your exports are outside of CIS Countries?:

From 0 to 20% 21 to 40% 41 to 70% + than 70%

8. Has your company offices**/** **sales subsidiaries** in other countries? Yes No

How many? And production subsidiaries? Yes No How many?

How many of these production subsidiaries are in non CIS countries?

9. As to the following export promotion programs, which ones do you know and which do you use?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **PROGRAM/ Service** | **Know** | **Use** | With which **frequency**? | | | | |
| Commercial promotion: |  |  | Very Rarely | Few times | Normal | Often | Cons-tantly |
| \* Support to booth in international fairs |  |  |  |  |  |  |  |
| \* Commercial missions and visit to fairs |  |  |  |  |  |  |  |
| **Financial support of exports by Roseximbank** |  |  |  |  |  |  |  |
| **Export Insurance Agency of Russia (EXIAR)** |  |  |  |  |  |  |  |
| Courses/ training seminars on how-to-export |  |  |  |  |  |  |  |
| **Services from the Foreign Trade Offices** |  |  |  |  |  |  |  |
| Direct Economic financial assitance |  |  |  |  |  |  |  |
| Others (please write any EPP you know or use and is not on the list)…………………………………………………………… |  |  |  |  |  |  |  |

10. Here is a list of aspects that may be important in order to export.

Please indicate to which extend your company has attained them.

|  |  |  |
| --- | --- | --- |
| Not Applicable | | Not Entirely  attained attained  0 ι ι ι ι 5 ι ι ι ι 10  0 ι ι ι ι 5 ι ι ι ι 10  0 ι ι ι ι 5 ι ι ι ι 10  0 ι ι ι ι 5 ι ι ι ι 10  0 ι ι ι ι 5 ι ι ι ι 10  0 ι ι ι ι 5 ι ι ι ι 10  0 ι ι ι ι 5 ι ι ι ι 10  0 ι ι ι ι 5 ι ι ι ι 10  0 ι ι ι ι 5 ι ι ι ι 10 |
| - Obtaining Information on the market  - Obtaining Financing  - Obtaining New Sales Leads  - Adaptation of the Product Specifications  - Obtaining Financial Information on Clients  - Realisation of Promotion Actions (catalogues, fairs, advertising...)  - Obtaining Knowledge on how-to-export  - Managers’ Motivation to export  - Creation of a Network: Agents, Distributors, joint-ventures…. | N/a  N/a  N/a  N/a  N/a  N/a  N/a  N/a  N/a |

11. In general, do you think your exports are more or less profitable than your sales in Russia?

Much less profitable Much more profitable

0 1 2 3 4 5 6 7 8 9 10

11. Overall, would you say your company is a profitable company?

a) Not profitable at all Very profitable

0 1 2 3 4 5 6 7 8 9 10

b) Total sales:

|  |  |
| --- | --- |
| Answer |  |

12. Actually, to what extend your company carries out a formal planning of the internationalization process?

Complete We plan even

Improvisation the last detail

0 1 2 3 4 5 6 7 8 9 10

13. How many employees work in you company?

14. How many employees work in your Export Department/ International Division?

15. How many years has your company been exporting?:

15. Company’s name:

# **APPENDIX 2. Correlation coefficients**

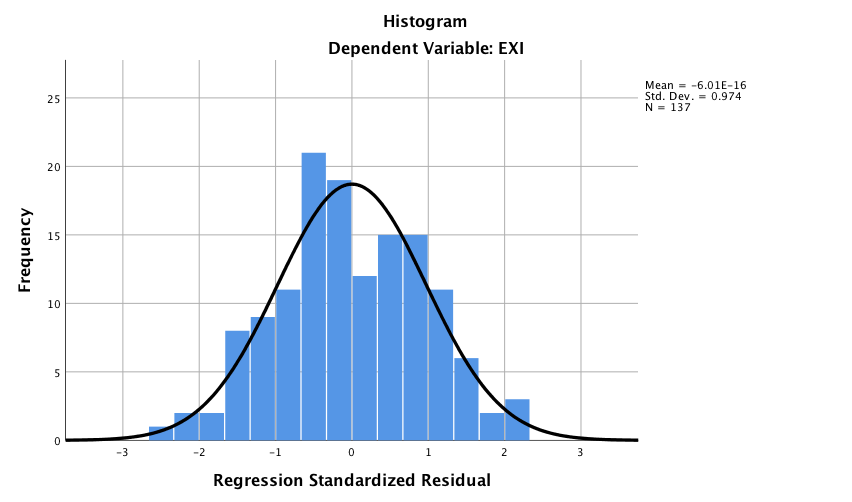
|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Correlations coefficients** | | | | | | | | | |
|  | | EXI | PROD | PROC | RDCOSTS | NUMEMP | PATENTS | EXS | IND |
| Pearson Correlation | EXI | 1.000 | .143 | .086 | .525 | .081 | .270 | .616 | -.198 |
| PRODIN | .143 | 1.000 | .068 | .004 | -.029 | -.163 | -.027 | .030 |
| PROCIN | .086 | .068 | 1.000 | .170 | .055 | .086 | .098 | -.074 |
| RDCOSTS | .525 | .004 | .170 | 1.000 | .201 | .287 | .326 | .080 |
| NUMEMPL | .081 | -.029 | .055 | .201 | 1.000 | .128 | .062 | .151 |
| PATENTS | .270 | -.163 | .086 | .287 | .128 | 1.000 | .160 | -.134 |
| EXSUPPORT | .616 | -.027 | .098 | .326 | .062 | .160 | 1.000 | -.158 |
| INDUSTRY | -.198 | .030 | -.074 | .080 | .151 | -.134 | -.158 | 1.000 |
| Sig. (1-tailed) | EXI | . | .048 | .159 | .000 | .172 | .001 | .000 | .010 |
| PRODIN | .048 | . | .214 | .483 | .369 | .028 | .377 | .362 |
| PROCIN | .159 | .214 | . | .023 | .260 | .158 | .126 | .196 |
| RDCOSTS | .000 | .483 | .023 | . | .009 | .000 | .000 | .175 |
| NUMEMPL | .172 | .369 | .260 | .009 | . | .068 | .235 | .039 |
| PATENTS | .001 | .028 | .158 | .000 | .068 | . | .031 | .059 |
| EXSUPPORT | .000 | .377 | .126 | .000 | .235 | .031 | . | .033 |
| INDUSTRY | .010 | .362 | .196 | .175 | .039 | .059 | .033 | . |
| N | EXI | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 |
| PRODIN | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 |
| PROCIN | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 |
| RDCOSTS | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 |
| NUMEMPL | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 |
| PATENTS | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 |
| EXSUPPORT | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 |
| INDUSTRY | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 |

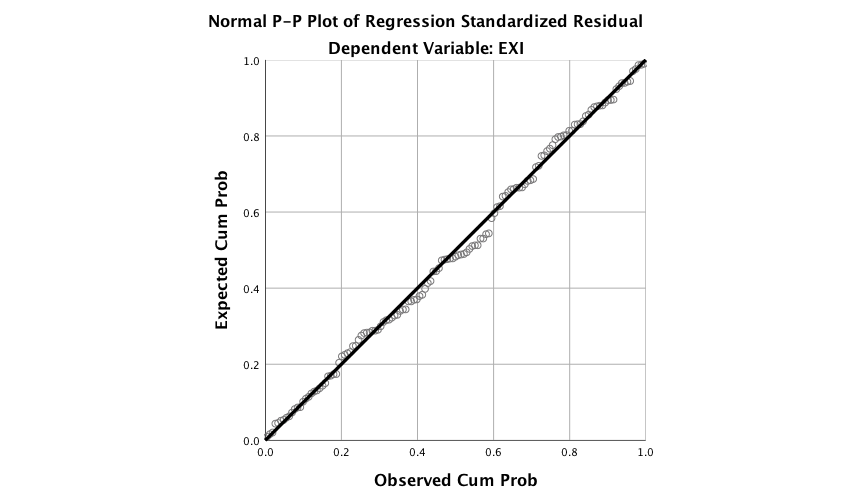
|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Collinearity Diagnosticsa** | | | | | | | | | | | |
| Model | Dimension | Eigenvalue | Condition Index | Variance Proportions | | | | | | | |
| (Constant) | PROD | PROC | RDCOST | NUMEMP | PATENT | EXS | IND |
| 1 | 1 | 5.475 | 1.000 | .00 | .01 | .00 | .01 | .01 | .00 | .01 | .00 |
| 2 | .920 | 2.440 | .00 | .04 | .00 | .01 | .00 | .66 | .00 | .01 |
| 3 | .505 | 3.291 | .00 | .04 | .00 | .00 | .66 | .03 | .04 | .00 |
| 4 | .391 | 3.740 | .00 | .20 | .00 | .19 | .00 | .25 | .32 | .01 |
| 5 | .276 | 4.452 | .00 | .00 | .00 | .74 | .04 | .02 | .42 | .01 |
| 6 | .261 | 4.579 | .02 | .64 | .04 | .03 | .09 | .00 | .04 | .14 |
| 7 | .132 | 6.433 | .00 | .02 | .48 | .00 | .01 | .03 | .08 | .41 |
| 8 | .039 | 11.786 | .97 | .04 | .47 | .01 | .00 | .01 | .08 | .43 |
| a. Dependent Variable: EXI | | | | | | | | | | | |

# **APPENDIX 3. Residual Statistics**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Residuals Statisticsa** | | | | | |
|  | Minimum | Maximum | Mean | Std. Deviation | N |
| Predicted Value | -.1952 | 9.3882 | 3.3526 | 2.03845 | 137 |
| Std. Predicted Value | -1.740 | 2.961 | .000 | 1.000 | 137 |
| Standard Error of Predicted Value | .278 | 1.099 | .433 | .124 | 137 |
| Adjusted Predicted Value | -.2054 | 9.5070 | 3.3593 | 2.03575 | 137 |
| Residual | -4.38290 | 4.30259 | .00000 | 1.81501 | 137 |
| Std. Residual | -2.352 | 2.309 | .000 | .974 | 137 |
| Stud. Residual | -2.531 | 2.375 | -.002 | 1.007 | 137 |
| Deleted Residual | -5.07797 | 4.55145 | -.00667 | 1.94269 | 137 |
| Stud. Deleted Residual | -2.587 | 2.419 | -.002 | 1.013 | 137 |
| Cook's Distance | .000 | .133 | .009 | .018 | 137 |
| Centered Leverage Value | .015 | .340 | .051 | .045 | 137 |
| a. Dependent Variable: EXI | | | | | |

# **APPENDIX 4. SPSS results checking for normality**





# **APPENDIX 5. SPSS results checking for homoscedasticity**

