

Adoption of Open Innovation in the Internationalization of Knowledge Intensive Firms

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Involvement in different open innovation activities by using inflows and outflows of knowledge becomes the important premise for a successful business. However, on a global scale, open innovation literature does not pay enough attention to the international dimension, which is essential when seeking to increase the performance of overseas firm's activities. Therefore, the paper aims to highlight coherences of open innovation and internationalization by analyzing knowledge intensive SMEs in Lithuania. Referring to case studies approach it is disclosed how much firms are open in performing innovative activities by collaborating, how they share knowledge, what main profiles of national and foreign partners are and how open innovation is applied in internationalizing firm's activity. The research results indicated that while innovating firms were mostly focused on the R&D ecosystem oriented and innovation and entrepreneurship ecosystem oriented networks at the national level. However, when internationalizing firm's activities, the preference to the international value chain oriented innovation network was disclosed. It contributes to the theory of open innovation from the knowledge intensive firms' internationalization point of view, especially in the understanding of open innovation's role in pursuing fast development in foreign markets while providing further knowledge on internationalization of firms originating from Baltic region area.

Keywords: *Open Innovation, Internationalization, Collaboration, National and Foreign Partners, Knowledge Intensive Firms.*

Introduction

Due to trade liberalization in the globalizing world, declining cost of transportation and significant technological innovation, the competition among worldwide businesses is constantly growing. Internationalization has become one of the most important factors, which determines the long-term competitiveness of the enterprise. Studies (Johanson *et al.*, 2009) suggest that internationalization can be defined as a learning process and must be approached as the essence of development. However, in the process of internationalization of knowledge intensive firms they encounter barriers and difficulties such as limited resources and international contacts, unfavorable environmental factors as well as the lack of knowledge and human resources (Khojastehpour, 2014; Sekliuckiene & Maciulskaitė 2013). Internationalization becomes dependent on collaboration and networking processes (Casillas *et al.*, 2014). Research has shown that the most important success determinant in internationalization is how well the firm is connected to foreign partners, customers, and suppliers (Johanson & Vahlne, 2009; Chetty & Stangl, 2010), i.e., how much a firm is open to partnerships. The phenomenon of open innovation is strengthened by growing globalization volumes in research, technologies, and innovations, which are stimulated by new information, communication technologies, new forms of organizations and business models (Lichtenthaler, 2011). Chesbrough *et al.*, (2006) defined the open innovation strategy as “<...> the use of purposive inflows and outflows of knowledge to accelerate internal innovation and expand the markets for external use

of innovation, respectively” (p. 1). While using the strategy of open innovation, firms take part in knowledge networks, which can consist of international partners. Such international relations can help knowledge intensive firms to faster adapt their internal structures in pursuing to conquer foreign markets (Ejler *et al.*, 2012), develop capital of international relations as well as to easier and faster estimate the potential of opportunities provided by the international market. Open innovation strategy enables to attract knowledge flows, which can be located anywhere in the world and that any new product, process, or service can potentially be employed in any geographical context. Research has justified that firms with an open innovation orientation are likely to generate better networking capabilities, which are useful for international expansion (Bianchi *et al.*, 2011). Open innovation (OI) could be used as a tool to reduce the negative factors and, thus, help to accelerate the internationalization (Gassman *et al.*, 2010).

Although open innovation becomes more and more popular direction of innovation management, the research which would be oriented towards small and medium-sized enterprises (SMEs) is missing (Bianchi *et al.*, 2010). In the context of open innovation, the research most often involves multinational companies (MNCs), and manufacturing companies in particular (Chesbrough *et al.*, 2014). Parida *et al.* (2012) state that SMEs can achieve greater benefits from the open innovation than larger firms due to less bureaucracy, increased willingness to take risks, and faster ability to react to changing environments. Furthermore, research has shown that open innovation was a promising mean for SMEs to overcome their challenges and increase

their profitability (Gassmann *et al.*, 2010). Thus, despite the abundant examples of open innovation by multinationals (MNCs) on a global scale, open innovation literature only pays scant attention to the international dimension revealing a remarkable research gap (Chesbrough *et al.*, 2014).

Therefore, within this study, we try to answer the following questions: what modes of open innovation do firms apply? What are the profiles of open innovation partners? How is open innovation approach adopted at knowledge intensive SMEs in Lithuania? The aim of this paper is to provide theoretical and empirical implications on adopting open innovation in the internationalization process of knowledge intensive SMEs.

The paper is structured as follows. After the introduction, the following three sections present a literature review on open innovation and internationalization relatedness. The fourth section explains the methodology used to explore Lithuanian knowledge intensive SMEs. The fifth section presents the main results of the empirical study. The final section integrates conclusions of the study followed by the limitations and future research directions.

Open Innovation Modes in the Context of Internationalization

Open innovation is the new paradigm, which defines firms' abilities to commercialize the knowledge present in environments of industries (Chesbrough, 2003). According to Chesbrough (2003), firms can attain a lot of more productive results in developing innovations if they do not limit themselves only to available limited internal resources in their innovative activity. By using the strategy of open innovation, firms become open to the knowledge possessed by external participants. According to Love & Roper (2015), the paradigm of open innovation is applied in order to use organizations' networks and subjects functioning in them (suppliers, buyers, society, private research institutes, universities, other institutions, competitors) through the usage of external knowledge and leveraging. Different market participants can contribute to the strengthening of firm's competitiveness and abilities to apply innovations in its activity (Clausen & Pohjola, 2009) when results of innovative activities are individual for every firm (Wagner *et al.*, 2011). The openness in an innovation development process is the foundation of open innovation. The principles defining an open process are completely inverse for a usual 'closed innovation' model, in which generated ideas and created innovations (which are further developed, commercialized and financed) exclusively are limited within the very firms. In the case of closed innovation, firms exceptionally rely on the performance of their research and development departments only; this is a linear, consistent process taking place within a firm (Marques, 2014). On the contrary, the model of open innovation is dynamic; it integrates different participants. Participants of firms' external environment are very important for this model. Internal development of a firm is attained by collaborating and using external sources of technologies and innovations. Moreover, new possibilities to use the resources, which are not directly adjusted in the activity, or the ideas, which a firm cannot implement without the help of others, emerge.

Three main modes of open innovation, which are defined by directions of knowledge flows' movement, are distinguished (Enkel *et al.*, 2009). In the context of internationalization, the first mode of open innovation is *outside-in innovation*, which can contribute to firms' internationalization by transferring external knowledge to the inside of the company through relationships with different international partners. Collected external information and knowledge of foreign markets can reduce the time of entering into new markets or create favorable possibilities to develop joint research with foreign partners. Meanwhile, open innovation carried out in the principle of *inside-out*, is not directly related to firms' internationalization; however, by invoking these innovations, available technological capacities can be transferred to the external organizations, which have better possibilities to use these technologies and knowledge by developing collaboration relations. Open innovation allows integrating both directions of information flows into *coupled open innovation* by creating information movement in both directions, from one firm to another. This type of innovation manifests through the creation of strategic alliances, which contributes to a higher value added for consumers through common knowledge and value chain integration. In small and medium-sized knowledge intensive firms, the application of open innovation is very important in attracting external information and using it in internal processes. The analysis of this interaction is relevant not only for solving one of the biggest problems of small and medium-sized firms – the shortage of resources - but also helping to ensure the purposeful development of innovative activities in collaborating with the subjects functioning beyond firm's borders. Knowledge flows in both directions most often manifest among collaborating partners, alliances, and joint venture firms, to which collaboration is an essential factor of success (Enkel *et al.*, 2009). Open innovation most strongly manifests in initial stages of product creation and research since, during these stages, the maximum amount of wide spectrum knowledge is required. Besides the stage of product creation, open innovation can also evidence in other value chain activities such as technology development, manufacturing, commercialization (Theyel, 2012). When selling products in the domestic markets only, the need for external information decreases, since firms are familiar with local markets in which they function. When developing the activity to new foreign markets, in which firms do not have any experience, completely another situation manifests. In such cases, the adoption of open innovation strongly contributes to decisions regarding choose of particular foreign markets and entry strategies.

Types of Open Innovation Partners at National and International Level

Firms aiming to effectively create innovations, i.e. to search for the best decisions for the implementation of new projects, reducing the increase of costs, etc., have to look behind R&D performed within their firms and to try to absorb as much as possible new knowledge from participants of the surrounding ecosystem (Chesbrough, 2003).

Lately, intensification of firms' external knowledge sharing, which influences business growth due to a larger variety of knowledge resources from the outside (Huang *et al.*, 2010), is evident. Openness to the outside can differ depending upon the number of partners and collaboration intensity (Laursen & Salter, 2006; Dahlander & Gann, 2010); in other words, it is possible to estimate the depth and breadth of firm's openness to outside sources of knowledge (Laursen & Salter, 2006; Dahlander & Gann, 2010). In addition, partners' typology is distinguished, i.e. both vertical and horizontal firm's relations (available partners) as well as their influence on open innovation (Chesbrough, 2003; Moller *et al.*, 2008). There is a number of scientific studies on the benefits of collaboration with *customers* (Fritsch & Lukas, 2001; Brockhoff, 2003), *suppliers* (Eisenhardt & Tabrizi, 1995), *competitors* (Nieto & Satamaria, 2007; Belderbos *et al.*, 2004), *science and research institutes, universities, etc.* (Hemmert, 2004; Monjon & Waelbroeck, 2003) on the development of new product and performance. Additionally, partners' typology is distinguished; here the essence lies not only in the variety of actors in the business ecosystem but also on the geography of partners (Lazzarotti *et al.*, 2011).

There is a lot of research (Boschma, 2005; Doloreux & Lorde-Tarte, 2013) on the influence upon organization's openness and activity results made by geographic proximity of external partners. However, the performed research indicates contradictory premises about the influence of geographic proximity upon knowledge sharing and creation of innovation. According to Doloreux and Lorde-Tarte (2013), only geographically close partners (situated in short distances) can effectively share available knowledge due to faster communication and fewer costs of knowledge sharing. In the meantime, other scientists (Hewitt-Dundas, 2011; Laursen & Salter, 2006) contradict this statement by arguing that firms, while collaborating with national partners only, have the possibility to share and get the geographically limited amount of knowledge and technologies. This influences restricted amount of new ideas, which emerge when combining only existing knowledge (Katila & Ahuja, 2002). Although the search for external partners and collaboration beyond home market is a time-consuming process, this can deepen the pool of technological opportunities and positively influences organizational competitiveness (Malmberg & Maskell 2006; Kafouros & Forsans, 2012).

On the other hand, not only geographical proximity but also knowledge localization – the usage of the knowledge created in a certain region – gives the stimulus for innovative activities to occur. Due to technological, institutional and social differences, localization and clusterization of external knowledge play the essential role, distinguish in specificity and vary depending on a region (for instance, Silicon Valley, USA) (Almeida & Kogut, 1999). Referring to Kafouros *et al.* (2008) and Kafouros & Forsans (2012), variations in absorption of different national and foreign knowledge influence the type, significance, and variety of external knowledge, as well as relate to certain variations in performance of firm's activity.

In general, orientations of partners in the open innovation ecosystem can be distributed into four dimensions by considering the both national and international level:

- *(International) R&D ecosystem oriented innovation network* includes R&D and higher education institutions, the authorities (ministries, departments, offices, etc.), research laboratories and centers as well as innovation support organizations (Hemmert, 2004; Monjon & Waelbroeck, 2003; Chesbrough, 2003);

- *(International) value chain oriented innovation network* is the network consisting of clients and customers of private sector, clients or customers of public sector, suppliers, leading clients and customers (requiring innovations) and consultants (Nieto & Satamaria, 2007; Belderbos *et al.*, 2004; Fritsch & Lukas, 2001; Brockhoff, 2003; Eisenhardt & Tabrizi, 1995);

- *(International) innovation and entrepreneurship ecosystem oriented innovation network* includes risk capital funds, high technologies' start-ups, entrepreneurial communities (Start-up weekend, Hackathons, and other events of an innovative community), clusters and members of the cluster, knowledge brokers and networks, common innovation and collaboration spaces (Talentgarden *et al.*), business incubators, technological parks, strategic alliances (Godo *et al.*, 2008; Vanhaverbeke *et al.*, 2013; Chesbrough *et al.*, 2014; Chesbrough, 2003);

- *Community stakeholders oriented innovation network* is the network consisting of public organizations, associations, communities/public groups and consumers' communities (including Internet communities) (Dahlander & Wallin, 2006; Vanhaverbeke *et al.*, 2013; Chesbrough *et al.*, 2014).

Adoption of Open Innovation in Internationalisation

Usually firms used to rely on their internal resources into the process of new product creation; however, successful commercialization of products to foreign markets requires external knowledge (about the market, its needs, standards, etc.) from the partners working abroad (Simard & West, 2006). For instance, IBM adopted open innovation approach by managing its overseas R&D centers, i.e. laboratories run into the form of collaboration through which the firm can source key external knowledge from external research organizations (such as universities, research institutions, and venture firms) (Chesbrough *et al.*, 2014). International networks are especially important in pursuing identification of possibilities in foreign markets, potential knowledge partners (competitors, suppliers, consultants, associations, etc.) acquiring foreign market knowledge, reducing liabilities of newness and foreignness, and gaining access to other strategic resources (Amal & Filho 2010). In innovative networks, not only knowledge exchange but also learning process and empowerment of knowledge take place. Partners of both local and international networks become important in pursuing to establish firm's contacts. Contacts with a locally based internationalized firm may help firms engage in activities abroad as 'client followers' (Bell, 1995). However, networking is not the only factor for firm's internationalisation in adopting open innovation strategy. Other factors such as mobility of human resources, the quality of university research, the presence or absence of venture capital, and the strength of IP protection

(Chesbrough *et al.*, 2014) also contribute to the emergence of open innovation and vary by geographical regions.

Due to the fast development of technologies, opportunities to integrate consumers or local suppliers into firm's activities have emerged. The development of technologies has also contributed to the reduction of different barriers; R&D knowledge can be conveyed in a faster, more precise and smoother way – this directly contributes to common growths of internationalization scales. However, the increasing need to incorporate external actors, whose resources can help to accelerate internationalization, into the development of firms' activity, has raised new challenges. Firstly, firms open for collaboration with external partners have properly to protect their managed intellectual capital and also to control knowledge flows. R&D, the capacity of knowledge assimilation and open innovation are determinant processes, through which a firm can integrate its knowledge acquired from the external environment. Thus, absorption of external knowledge, in particular, can facilitate the introduction of innovative products into international markets. Innovative products and products' innovation directly influence the intensity of firm's export. According to Rodriguez and Rodriguez (2005), firm's technological capacity, product innovations, patents and process innovations positively and significantly affect both export decisions and export intensity. Furthermore, Castellani and Zanfei (2007) revealed that firms with a high engagement in foreign activities, exhibit better economic and innovative performances.

Research Design

Research method

The aim of the empirical research was to analyze the interface of open innovation and development of activity into foreign markets in the case of knowledge intensive SMEs in Lithuania. This research by its nature is intended for better understanding of the new phenomenon, disclosing and explaining the connection among surveyed variables (Saunders *et al.*, 2007), thus we used *explanatory research design*, methods of qualitative research in order to identify research constructs, to analyse, compare and interpret (Hair *et al.*, 2007). We adopted the case study method as the case analysis is one of the most appropriate research in order to answer the questions formulated in the research, to identify the dynamics of phenomenon's development, unique facts and to cluster the complex information (Yin, 1994). The case analysis is one of the most effective ways in order to achieve deeper insights when in the scientific literature, one can find diverse viewpoints to the same object being analyzed (Eisenhardt, 1989). The case analysis ensures a diverse analysis of the research object, which enables a comprehensive understanding of the phenomenon (Baxter & Jack, 2008). Coordination of primary data analysis with methods of contextual observation and secondary data allowed triangulation of the data (Eisenhardt, 1989) and to guarantee validity and reliability of the obtained results (Hair *et al.*, 2007; Saunders *et al.*, 2007). Primary data were collected by applying the method of semi-structured in-depth interviews. Research instrument with preliminary questions was designed for this method; the sequence of questions could change depending on the interview process,

interviewee answers and other contextual circumstances (May, 1996).

Sampling. According to Vanhaverbeke *et al.* (2012), open innovation differently influences small and medium-sized enterprises and research on open innovation in the context of SMEs is still missing. Therefore, the research was performed in small and medium-sized firms in Lithuanian information and communications technology (ICT) sector. In this sector "network effect" has a great significance because the productivity of technologies rises only when greater technologies' access occurs, i.e. it is necessary that more and more people would be able to use technologies (Kramer *et al.*, 2007). Thus, collaboration in ICT sector has become one of the main business strategies. The firms selected for this research had to meet the following criteria: 1) a firm is categorized as knowledge intensive firm and carries out innovative projects; the main activity is based on intellectual work and the value for consumers is created based on knowledge; intellectual capital is the most important resource of the firm (Swart & Kinnie, 2003); 2) the firm is categorized as small or medium-sized; 3) the firm carries out exporting activities. Five cases were selected. Founders of the company or CEOs of each firm were interviewed (five informants in total). Executives interviewed had an in-depth knowledge of their firms' international operations and innovation process. We carried out several interviews; the questions were related to directions of knowledge flows; firm openness to external partners (e.g. profiles of external partners), partners' involvement in firms' activities, adaptation of in internationalization. In the interview process, the semi-structured open-ended interviews were conducted. This enables asking about the main questions and then makes further, more detail questions (Yin, 1994).

The interviews took place in March – April 2016. Each interview lasted between 60 and 90 minutes; the interviews were recorded. The recorded interviews were coded. In order to ensure the reliability of the research, a database with interviews' transcripts, secondary sources, and other available documents was built. Transcripts and notes from the interviews were analyzed by applying the categories created from the theoretical developments outlined above.

Research Findings

The case firms function in ICT sector and develop different technological activities; all enterprises develop product's innovations. Firms' main activities are related to the application of the Internet technologies and infrastructure of communication media. The case firms are established between 2011 and 2015. The average number of employees in the case firms was 9. Those firms are governed by the executives, the experience of who's in business sector range among 3–15 years. The firms are oriented to global markets. Since the firms have been established, most of them started to run their businesses abroad. Foreign sales make a larger part of case firms' sales, i.e. 80-90 percent from total sales; this shows a clear export orientation of the case firms (see Table 1). The informants were coded as Firm A, Firm B, Firm C, Firm D, and Firm E for reference. Firms A, B, D, and E carry out sales in more than 10 foreign markets; Firm C – in 4 different countries.

Table 1

Characteristics of Case Firms

Firm Indicator	Firm A	Firm B	Firm C	Firm D	Firm E
Main activity	Digital art technologies and products development	ICT service platform for business	Crowdfunding platform to fund Business Projects	Software for investors	Game development and interactive solutions
Year established	2013	2011	2015	2015	2013
No. of employees	12	5	3	3	16
First export	from inception	3–4 months from establishment	2 months from establishment	2 months from establishment	from inception
Export ratio (%)	~ 90 %	over 80 %	~ 30 % during the first stage	95 %	80 %
Top export markets	USA, UK, Belgium	UK, USA, France, Germany	Latvia, Estonia, Poland	USA, India, Europe	Europe, USA
Ratio of external R&D expenditure	~20 %	40 %	~10 %	5-10 %	5 %

The activity of Firm A and Firm E has started from the global trade. The employees of the Firm A have already had personal experience acquired in other projects; thus the activity of a new firm has been substantiated by earlier acquired experience in foreign markets. The local market for the case firms was chosen for the creation of conception and testing of a product’s prototype during the first months of the establishment, and only afterward it was applied globally.

The research on knowledge flows (inside-out; outside-in, coupled) disclosed that all firms unexceptionally use coupled innovation mode while collaborating. This mode enables not only the sharing of firms’ accumulated knowledge but intercepts necessary knowledge from external partners as well (see Table 2). Firms performing the same or similar activities are named as coupled innovation partners. It can be assumed that the case firms

are mostly willing to exchange knowledge with direct and indirect competitors. Consumers giving recommendations for improvement of a product, technology suppliers providing all essential information about technology use as well as specialists in different fields (e.g., legal information) conveying information necessary in firm’s activity are named as outside-in innovation partners.

One of the case firms (Firm E) pointed out the partners, to whom they provide firm’s accumulated knowledge; however, they did not use partners’ knowledge. This firm consults start-ups and shares its knowledge with the university community; firm’s employees conduct seminars, lectures. Firm C and Firm D started developing their activity a year ago, thus it is vitally important for those firms to absorb external knowledge from external partners (“as yet a young firm, we accumulate knowledge from external partners”).

Table 2

Open Innovation modes

Sub-category	Quotes
Inside-out innovation partners	Start-up companies “they have an idea; we find the technical implementation of this idea. We collaborate with universities by conducting seminars, lectures” (Firm E)
Outside-in innovation partners	Paysera, Sorainen – “experts in their fields” (Firm C) “We really collaborate with customers a lot, <...> we got a lot of feedback” (Firm D) Producers of software “complements” (Firm E)
Coupled innovation partners	“You go to the university and look for the colleague, who knows the solution” “we even help to develop the study programs” (Firm A) “These are the above-mentioned ICT service provision firms. We exchange generic knowledge with all partners and particular one if they ask” (Firm B) “Based on discussions, we really exchange and return what we have already accumulated, found out, < > these are different firms, different people” (Firm C) “American company that creates similar products, thus we actively share the knowledge” (Firm D) “Cluster and association firms, which perform similar activity and are named as colleagues, but not as competitors”(Firm E)

In order to identify types of national and foreign partners, the analysis of firm’s openness for collaboration was performed by assessing the number of partners, frequency of collaboration and geography of partners. The analysis of case firms showed that enterprises, while seeking to collaborate with national partners, mostly focus on the creation of the R&D ecosystem and innovation and entrepreneurship ecosystem oriented innovation networks (see Table 3). The knowledge intensive SMEs are willing to join into clusters, collaborate with higher education institutions, the authorities, mutual spaces of innovation and collaboration (e.g., Startup Lithuania).

The partners’ network oriented to R&D and entrepreneurship ecosystem shows that the firms are innovative, pursuing constant excellence and breakthrough ahead by combining science with entrepreneurship. The analysis of national partners’ number revealed that constant communication took place with 2–10 partners. As the case firms state, communication with these partners takes place constantly, in some cases once every few months (“2–3 times per half-year submitting projects for funding or assessments”) or even once or several times per week (“we constantly work, at least once per week we consult”).

Table 3

Profiles of Main Partners

Sub-category	Firm A	Firm B	Firm C	Firm D	Firm E
Type of national partners	Kaunas University of Technology, Vilnius Academy of Arts, Vytautas Magnus University, Energy Institute of Lithuania	Customers (programming service firms), “Startup Lithuania”	State institutions, the Bank of Lithuania, Ministry of Finance, Ministry of Economy, experts of finance, management, ICT	Investment site having consumers’ base, which it will share with firm’s consumer base	Firms functioning in the cluster
No. of national partners	4	30+, constantly 5–7	5-10	2	5
States of foreign partners	UK	Latvia, Estonia, Poland, Ukraine, Romania, Serbia, UK	UK, Baltic states, Poland	UK	USA, Latvia, Denmark
Type of foreign partners	Bormin University (UK), firms-customers in USA, Belgium, Spain and UK	Over 100 suppliers in Eastern Central European countries	Services firms, experts possessing specific knowledge	International software for investors firms	Software creators, firms offering similar solutions.

When analyzing *foreign partners* and their profile orientation of case firms towards *the international value chain oriented network* emerged, i.e. firms maintain relations with customers, suppliers, competitors in foreign countries, and integrate into international value chains. Geography of firms’ innovation partners almost matches the geography of firm’s export markets; this means that the firms not only collaborate with the partners of those countries in creating innovations, but also they have internationalized their business there. As Table 3 shows, the network of 3 out of five case firms’ partners localizes in the European region, in most cases in geographically close countries to Lithuania (Poland, Latvia, Estonia, Romania, and England). On the other hand, two case firms have partners in the geographically distant country - USA; however, the ones possessing knowledge clusters (e.g. Silicon Valley). The number of foreign partners is similar to the national partners, in some cases even exceeds (e.g., Firm B has up to 100 foreign partners). In all the cases, collaboration intensity with external partners is high, i.e. they communicate very often: every day (“*We communicate with our clients every day, make decisions on projects*”) or

several times per week or month (“*we communicate 1–2 times per month*”; “*Among 10–20 firms, there is constant contact every week, with others every month, but those firms inter-exchange*”).

The research results showed that, although national partners’ network was oriented to scientific activity and research as well as creation of business ecosystem, the case firms named the foreign partners as the most important generators of ideas in implementing innovative projects in both local and foreign markets (“*Foreign partners are more important in the sense of ideas’ generation, development insights*”; “*the profit would be similar, but considering knowledge, we receive more help from foreign partners*”). The analysed firms pursue to get information about the particularity of foreign markets from foreign partners (“*The experience of foreign partners on functioning in global markets is important*”); planning and organizing foreign sales (“*Foreign partners are meant for direct activity of sales, and national ones – more for public relations’ activities*”). The involvement of both national and foreign partners in firms’ activities is presented in Table 4.

Table 4

Partners’ Involvement in Firms’ Activities

Sub-category	Quotes
Product development	“ <i>In activities of product creation, it is searched for the specialist, possessing specific knowledge, who helps implement projects</i> ” (Firm A) “ <i>Product’s creation, development</i> ” (Firm D)
Technology development	“ <i>Technical development of the platform</i> ” (Firm E)
Funding search	“ <i>We constantly collaborate with Vilnius Academy of Arts through common projects to get different funds</i> ” (Firm A)
Commercialization	“ <i>We collaborate by distribution, sales, then start commercialization</i> ” (Firm D) “ <i>Commercialization is one of the few activities that we perform together with our partners</i> ” (Firm B)
Distribution of orders Projects division	“ <i>Really, such firms that are not able to carry out large or specific orders often emerge; thus they very willingly send us their consumers</i> ” (Firm B) “ <i>While talking about cluster, namely orders; as we are perhaps five firms, <> and all with different competencies, so we simply share projects in order to be able to produce any innovative order</i> ” (Firm E)
Foreign market entry	“ <i>Foreign partners, suppliers are one of the main movers, which allow us to step into new markets</i> ” (Firm B) “ <i>These are foreign partners, who know local markets, involve us in their activities, help us to build there, to develop own activity as well</i> ” (Firm C) “ <i>Contribution was of the partners because primary sales took place only because that they had their customers. Without them, it would be harder to start expansion</i> ” (Firm D) “ <i><...> through colleagues. Somebody knows about us; somebody looks for us; ask the people; so they refer to us and then consumers from abroad appear</i> ” (Firm E)

All analyzed firms pointed out the creation of a product/service as the essential activities carried out with the partners. In activities of product creation, firms search for specialists possessing specific knowledge, who would help to create or upgrade products.

When estimating volumes of the products created with external partners or by knowledge sources, it became evident that 4 (Firms A, B, C, D) out of five firms have from 70 to 90 % of all products created with help of external partners (“Probably around 90 percent of the products are created together with external partners”; “it is likely that around 70 percent of initiatives will be from the outside”). During technology development activities, 2 out of five firms that took part in the research use experience and knowledge of external partners; the firms strive for much higher quality and diverse services (“<> as we are perhaps five firms, <> and all with different competencies, so we simply share projects in order to be able to accomplish almost any innovative order”). During commercialization activity, 3 out of five case firms include their partners in the process, and 4 firms collaborate with external partners while entering foreign markets in order to facilitate the entry process.

Active collaboration takes place with universities as generators of external knowledge. Higher education institutions are employed in order to achieve other profits, e.g., for sponsorship search, planning of tenders for joint projects to carry out, employees’ search.

All case firms confirm the importance of external knowledge sources and R&D in developing innovative activities: “Partners are very important because we do not possess either legal or technological knowledge to develop our activity alone”; “<> profit is huge”. Knowledge and information about the features of foreign markets and customers’ needs, financial and public relations benefits when a firm does not need to advertise by own resources because the partners recommend each other and so new customers are involved. Technologies obtained from the partners were indicated as the most important advantages of open collaboration.

Open collaboration in international activities is presented in Table 5. The analysis revealed that foreign or national firms operating in the same industry helped and supported 3 out of five case firms to develop their activities in foreign countries.

Table 5

Open Collaboration in International Activities

Sub-category	Firm A	Firm B	Firm C	Firm D	Firm E
Partners helping to develop abroad	Present customers	Ukrainian firms - partners.	Services firms - Paysera, Sorainen, other experts in their fields	TAS Professional, NexChange – experts in the same field.	Members of a cluster and association, other firms functioning in the same field, present customers.
The part of development that depends on partners	“Our firm’s critical mass is in the first place; we have to make efforts, invest into quality, team, product, image”	“Organic expansion when partners’ help makes around 25 percent of involvement is important for us”	“Exactly half”	“Our input to the contribution was that we might find the partners. All other input was of the partners”	“Foreign partners find out about us through colleagues, thus they contribute to international activities”
Innovation’ partners working in the countries where sales take place	All partners	Partners from Central and eastern Europe	Partners from the Baltics	All partners	All partners

Such results reveal the importance of collaboration with direct or indirect competitors. It should be distinguished that, when internationalizing activities, the case firms more rely on foreign partners as knowledge and innovation sources than national ones. Existing and former customers, who attract new ones from abroad by their recommendations, and companies working in related industries, specialists of specific knowledge contribute to development in foreign markets. The majority of case firms (4 out of 5) accepted significant partners’ contribution by assessing it from 25 % to 100 %. Moreover, almost all partners of firms’ innovations and knowledge sourcing as well as R&D are in the countries, where the case firms carry out export activities, i.e. export markets coincide with markets of knowledge assimilation. This confirms the importance of external partners for firm’s early internationalization. Thus it can be argued that innovations created by knowledge intensive SMEs in collaboration initiatives are preconditions for sustainable business growth in foreign markets.

Conclusion, Limitations, and Future Research

This study contributes to the theory of open innovation from the knowledge intensive SMEs’ internationalization point of view, especially in the understanding of the open innovation’s role in pursuing fast development in foreign markets while providing further knowledge on internationalization of knowledge intensive small and medium-sized firms originating from Baltic region area. The results revealed that the firms most often applied a couple of open innovation modes, during which they pursue to acquire new and to share their knowledge with the external partners. These results confirm Torok and Toth (2013) study, founding that mutual – rather than one-way exchange – relationships significantly raise the probability that SMEs experience a substantial benefit from contributing to other firms’ new product development projects.

The analysis of firms’ activities, into which open innovation partners are involved, revealed that all firms that took part in the research invoke partners for product development. Commercialization, distribution of incoming orders, and foreign market entry are also very significant.

These results slightly differ from previous studies arguing that collaboration for SMEs is more important in the commercialization stage than other stages such as ideation, and R&D (van de Vrande *et al.*, 2009; Hemert *et al.*, 2013) or the study of Chaston and Scott (2012) arguing that for SMEs, open innovation is less effective for innovations than for sales. However, as commercialization of the analyzed firms is mostly carried out in foreign markets, and partners' support in the process of entering the foreign market was also mentioned as significant, this proved close relatedness of open innovation and internationalization.

The analysis of profiles of firms' partners disclosed that national partners are mostly focused on the network of R&D ecosystem (including customers' knowledge) and on the network of innovations and entrepreneurship ecosystem. In the meantime, during internationalization process, the firms are focused on value chain oriented networks in the case of open innovation (suppliers, consultants, partners in overcoming industrial barriers). The obtained results support the study of Sachwald (2009), which indicates that companies tend to keep their R&D activities domestic if the country of origin is specialized in the company's activity sector. The orientation of the case firms towards international business chains substantiates internationalization since the great part of total sales is oriented to export. One of the potential avenues for the SMEs to reach global markets is to enter MNCs' networks and value chain (Gabrielsson & Kirpalani, 2004). Thus the firms that pursue fast development in foreign markets face one of the most effective strategies – integration into value chains of large firms; this reduces industrial and institutional barriers to penetration into foreign markets and guarantees successful entry modes. The obtained results are in line with the research, which has found that collaborations with external partners such as suppliers and customers positively influence innovativeness and performance (Nieto & Santamaria, 2007).

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The results show that the firms collaborate with both domestic and foreign partners. Such results differ from previous research in stating that some entrepreneurs rather see local players as their competitors and have little confidence or interest in their local network (Legendijk & Oinas, 2005; Puffer & McCarthy, 2011). However, the obtained results confirm the “balanced approach” implying that companies should seek equilibrium between local and global partners for best results defined by Koch and Strotmann (2006). It should be emphasized that the number of constant partners (regular collaborators), does not exceed 10 in general; this shows that due to the shortage of resources and other limitations, SMEs are not able to maintain numerous networks. Therefore, their skills in maintaining few relevant networks are essential for open innovation activities.

Our research has several limitations, which indicate directions for future research. Firstly, a limitation of this study is that it focuses on a single industry and a single target country: the results of the qualitative multi-case study might not be fully generalized. What is more, as small and medium-sized knowledge intensive firms of Lithuania took part in the research, the results should not be generalized for the aggregate sample of knowledge intensive firms because, in the case of large firms, strategies of open innovation and solutions on geographical development can differ. In order to achieve the research range, the analysis of different knowledge intensive sectors' firms, as well as comparative analysis with knowledge intensive SMEs of other countries, could be directions of further research. Future research could involve analysis of open innovation process and complementarities of internationalization process by specifically focusing on synergizing elements. The research could also focus on the topic of internationalization speed in the context of open innovation.

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