The role of absorptive capacity in the relationship between firm internationalization and innovation: evidence from Russia*1

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The various advantages firms may obtain from their international activities have been a topical issue in the management literature in the last few decades. Scholars report a positive influence of export on various performance outcomes such as productivity, efficiency or innovativeness. However, it is likely that different contexts will entail differences in the innovation outputs stemming from the international activity. This study aims to reveal the role of the absorptive capacity in the relation between internationalization and innovation in the context of Russia. We argue that the relationship between internationalization and innovation outputs is not always straightforward and that the firm's absorptive capacity can enhance its innovative capacity through internationalization. By means of a survey, we collected 135 questionnaires and tested our hypotheses on this sample by using a SEM (structural equitation modeling) method.

1. Introduction

The benefits of exporting on firm performance have been extensively studied in the last few decades (Bouquet et al. 2009; Hennart 2011; Kirca et al. 2011), given the growing internationalization of firms' activities. Exporters have been found to be more capital-intensive than are non-exporters (Fernandes/Isgut 2015), more productive and efficient (Hitt et al. 1997; Cassiman/Golovko 2010) and more capable to survive in economic downturns (Puig et al. 2014).

Whereas the question of exporters' higher competitiveness than that of non-exporters is hardly intriguing anymore, there is still debate about whether com-

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panies benefit from exporting in terms of knowledge and learning. Some studies have concluded that firms' international sales enable them to access new knowledge and technology, consequently improving their performance (De Loecker 2007; Delgado et al. 2002), through the mechanism called "learning-by-exporting" (LBE) (Salomon/Shaver 2005). On the other hand, other evidence suggests that there is not a direct link between export activity and learning (Clerides et al. 1998; Bernard/ Jensen 1999).

In the perspective of this debate, the study of the moderating factors in the LBE effect takes on its full sense, as pointed out in the calls for further research by previous studies (Li et al. 2010; Garcia et al. 2012). Generally, the prior literature assumes that export markets provide a variety of knowledge spillovers and information on product characteristics as well as technologies and know-how (Golovko/Valentini 2014). However, there is a variance in learning outcomes across firms, which might be explained by different factors, including a firm's absorptive capacity.

Absorptive capacity (AC) has been acknowledged as being essential to the development of firms' innovative capabilities (Cohen/Levinthal 1990), and is defined as an ability of a firm to recognize the value of new, external information, assimilate it, and apply it for commercial ends (Cohen/Levinthal 1989). In line with the LBE tenet, we claim that AC is not only crucial for international competition (Ren et al. 2015), but it also mediates the relationship between internationalization and innovation of firms.

Russian firms are relative latecomers in terms of outward, foreign direct investments, though they have substantial experience of trade with foreign countries. A particularly good development was observed with neighboring and former USSR countries (Panibratov 2012). At the same time, Russian firms faced, in the last few decades, increasing competition, as these markets opened up to the rest of the world after the USSR period. In order to be competitive, Russian companies must learn how to operate in the new environment and offer better products to their customers.

The sanctions imposed on Russia by some countries have created a specific environment for exporters: on the one hand, Russian firms have an additional impulse to increase their domestic sales thanks to the import substitution policy. On the other, the Russian government started to actively promote exports in order to increase the competitiveness of Russian firms and their innovative capabilities, as well as decreasing their dependence on the national market (Panibratov 2016). This had, overall, a variety of effects on firms' strategies and performance.

In this paper, in order to provide empirical support for an inductively developed theoretical framework, we use the Russian context. There are several reasons be-

hind this choice. First, over the last two decades, Russia had not only high FDI (Foreign Direct Investment) records, but it also has significantly increased export operations to other emerging economies (Panibratov/Ermolaeva 2017). Second, Russian firms with international operations are not only seeking them for purely financial results, but also aim to accumulate knowledge to be able to catch up with their global and more innovative competitors (Latukha 2016). Third, Russia is one of the least-examined economies in the emerging market literature, and this paper would enhance the knowledge of the specific features of Russian exporters in the context of their innovation and knowledge development prospects.

In this study our goal is to reveal whether internationalization contributes to the development of radical innovations in Russian firms, and to understand whether a firm's absorptive capacity affects these relationships.

The data collected are analyzed by surveys of Russian manufacturing firms. Overall, 135 replies were obtained from different firms by size and industry. Structural Equation Modeling (SEM) was chosen as the method to analyze the data.

Our results indicate that there is a negative relationship between export and radical innovations, though a firm's absorptive capacity can mitigate this relationship and enhance the firm's ability to create radical innovations. Moreover, if a firm has developed other forms of international presence, it increases its absorptive capacity and fosters radical innovations.

The paper proceeds as follows: First, internationalization and organizational learning theory is introduced and the hypotheses are developed. Then, the methodology and data analysis results are presented. We conclude our study with a discussion of results and managerial implications.

2. Theory and hypotheses

2.1. Internationalization and organizational learning

The LBE phenomenon has attracted substantial interest in the last decade from both economics and management scholars (Golovko/Valentini 2014). The literature in this field has argued that firm exposure to the international markets results in knowledge spillovers that then translate into higher performance, as measured by productivity (Loecker 2007; Lileeva/Trefler 2010; Garcia et al. 2012), or by the innovation output (Bernard et al. 2007; Salomon/Jin 2008; 2010; Bindroo et al. 2014; Filipescu et al. 2013). The motivation behind the choice of innovation as a learning outcome is that there may be an important time-lag between the reception abroad of the new knowledge and technology, its integration into the firms' manufacturing processes, and its translation into a significant growth of productivity. Instead, the novel technological information will

reflect first in innovation outputs, hence making them a less noisy indicator for the LBE effect (Golovko/Valentini 2014).

Previous research has found external knowledge to be an important determinant for innovation performance (Allen 1977; Bogers/Lhuillery 2011), particularly in cases when it comes from different countries. The information emanating from foreign users (Von Hippel 1988, 2005; Bogers et al. 2010), suppliers (VanderW-erf 1992), and especially from customers and competitors (Ericson/Pakes 1995; Klette/Griliches 2000), may potentially result in enhanced innovation. The interaction with these foreign agents may allow exporters to have access to novel information on products and processes knowledge which allows for the reduction of costs and improving quality (Li et al. 2010). This goes together with a higher level of competitive pressure, which pushes the firm to improve the products (Root 1987).

On the other hand, the country's specific economic, legal and institutional context can also impact the extent of the LBE effect. The presence of institutions supporting innovativeness, appropriate infrastructures and a legal system that protects intellectual property may also influence the willingness of firms to undertake an innovation process (Trott 2012). The existence of market intermediaries and other supporting instruments, such as technological availability, may facilitate the flow and recombination of knowledge, experience, and resources (Duysters/Lokshin 2011; Shin et al. 2012).

Earlier research has indicated that innovation is a heterogeneous concept that includes different types of business initiatives that may entail totally different, and sometimes opposite, effects (Hüsig 2014; Kim/Oh 2002; Madrid-Guijarro et al. 2013). According to the Oslo Manual (OECD 1997), innovation is the iterative procedure initiated by the development of new products and processes or of significant improvements in current products and processes. Two innovation activities ensue from this definition: those aimed at launching improved-differentiated goods (product innovation) and those meant to enhance quality or efficiency and, thus, decrease prices (process innovation). In most cases, process innovation is less visible, but it plays a relevant role, especially for buyer-supplier transactions (Filipescu et al. 2009). On the other hand, depending on the degree of newness of each innovation type, we may distinguish between incremental or radical innovations. The former consist of changes, adjustments or extensions, while preserving the primary essence of the product (or process). The latter, although subject to various categorizations (Hüsig 2014), may be defined as discontinuous events (Freeman/Perez 1988), as fundamental changes that involve revolutionary technological advancements (Dewar/Dutton 1986), or as substantial changes in meaning and design language (Verganti 2008).

However, earlier research has acknowledged that developing radical innovations involves considerable obstacles. In the first place, increasing the level of new-

ness entails greater risks and requires more resources for the development of the products (Danneels/Kleinschmidt 2001; O'Connor/Veryzer 2001). Second, the market often experiences difficulties in understanding and appraising radical innovations, given their novelty regarding the technology and benefits offered (Reinders et al. 2010). Consequently, firms may be required to invest additional resources for their communication and promotion.

At the same time, exporting requires considerable investments in aspects such as market research, international trips, additional promotion or translations, particularly in the initial internationalization stages (Freixanet 2012). Therefore, companies that strategically choose to focus on international markets will have to neglect other growth strategies that also require considerable resources. This is the case of radical innovations, which usually demand a high level of investment in both the development and the promotion phase. Hence, we assume a negative relationship between these two strategic options.

Hypothesis 1:   A firm's export level is negatively associated with the development of radical innovations.

2.2. The LBE effect and absorptive capacity

Recently, some scholars have examined whether some companies are better suited than others to learn from their international sales and, more interestingly, have begun to analyze the firm's specific characteristics, such as size, age or sector, which may exert a moderating role in the LBE effect (Serti/Tomasi 2008; De Loecker 2007; Golovko/Valentini 2014; Salomon/Jin 2008). From this research stream, a few studies have focused on the role of a firm's resources and capabilities and, specifically, that of the firm's ability to recognize, assimilate and exploit new knowledge, called "absorptive capacity" (Cohen/Levinthal 1989; Dyer/Singh 1998; Zahra/Georges 2002).

Absorptive capacity (AC) is considered a dynamic capability that allows firms to create value and to gain and sustain a competitive advantage by means of external knowledge (Camison/Fores 2010). AC has been applied as a determinant in a number of fields, including innovation and international strategy (Laneet al. 2006; Volberda et al. 2010; Fabrizio 2009). Firms with a higher AC have a better chance to make use of knowledge acquired from foreign markets (Zahra/Georges 2002). On the other hand, firms with a limited AC can hardly benefit from knowledge different from their prior experience or existing knowledge (Lane/Lubatkin 1998; Phene et al. 2006). In summary, AC confers upon the firm the ability to detect the utility of external knowledge and use this knowledge to increase its innovation output (Salomon/Jin 2010).

The influence of AC in the LBE effect is particularly important for emerging markets' firms, which often lack this ability to absorb knowledge from abroad

and can remain as copycats if they fail to transform the information received into new knowledge (Latukha 2016). The investments in research and development (R&D), market research and product improvements can thus help these firms to create their own differentiation-based competitiveness. In line with the previous arguments, we expect, in general, and especially for firms from emerging markets, AC to positively impact the LBE effect on radical innovation.

Hypothesis 2:   *The relationship between exports and radical innovation is positively mediated by a firm's absorptive capacity.*

Furthermore, according to Cohen and Levinthal (1989), a firm's. AC is directly connected to its prior experience. We therefore expect the firm's exporting experience to contribute to AC development and increase its effect on a firm's innovativeness. Hence:

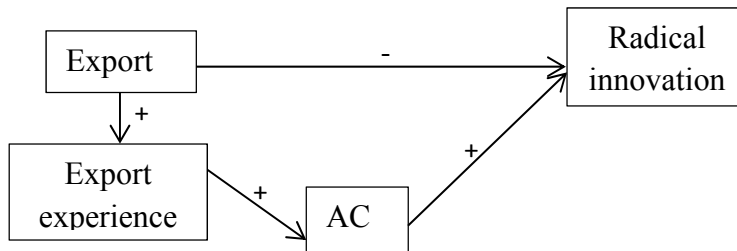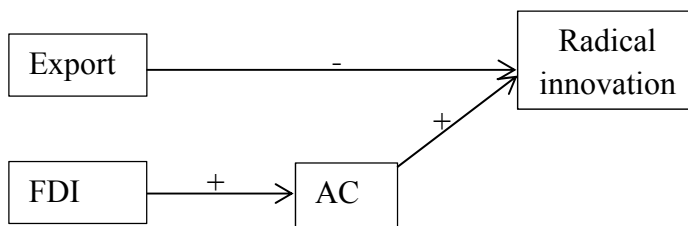Hypothesis 3:   *A firm's export experience positively associates with the firm's absorptive capacity.*

2.3. Foreign direct investment (FDI)

According to the internationalization theory (Johanson/Vahlne 1977), exporting is usually the first step for firms seeking to internationalize their sales (Luo/ Tung 2007). Exporting involves less commitment and risk does than the creation of production subsidiaries (FDI) and requires less country-specific information and management skills (Johanson/Vahlne 1977; Root 1987). Firms with production subsidiaries are therefore likely to develop a larger capacity to process and exploit knowledge from the foreign market.

Additionally, Salomon and Shaver (2005) suggest that even though exporting entails an information flow from the foreign market, it does not do so sufficiently enough to produce a complete LBE effect for all innovation types. A more involved presence in the foreign country, such as that enabled by FDI, may be required for companies to fully recognize and assimilate the knowledge from abroad. Hence:

Hypothesis 4:   *Exporters that also invest abroad have a higher absorptive capacity.*

We intend to test two empirical models to examine separately relations between two types of internationalization (export and FDI) and radical innovations. Both models are introduced in Figures 1 and 2.

Figure 1: Conceptual model 1

Figure 2: Conceptual model 2.

3. Empirical study

3.1. Data collection

The survey was disseminated among Russian firms involved in manufacturing activity. The initial sample consisted of 1478 firms, and included the name of the firm, its email address and the name of the CEO and/or the export manager. A questionnaire was developed by reviewing the literature related to the topic, and it was pre-tested with seven managers from different industries. The questionnaire included 18 questions, either requiring an answer using a Likert-type scale, or writing a specific figure (as further described in the next section). In a first round, we forwarded an online questionnaire to all the managers, asking them to fill it out by email, and obtained a response rate of about 6%. In a second round, we asked managers to fill out the printed questionnaire during industrial exhibitions and other events. Survey fieldwork was undertaken from January 2016 until March 2017. Overall, 135 usable answers were obtained. Nonresponse bias was assessed through a comparison of sample statistics with known population values (annual sales).

3.2. Measures

Dependent variable. Innovation

As our aim is to examine the link between a firm's. export and radical innovation, we only focus on one dimension of innovativeness identified in previous literature (Benner/Tushman 2003; Sheng/Chien 2016). The respondents were

asked whether their firm focused on the improvement of existing products, or if it sometimes launched radically different products. The answers regarding radical innovations were the ones used for the analyses.

Mediating variable. Absorptive capacity

Based on the exploratory factor analysis (EFA), we found that the AC construct is formed by three dimensions of innovativeness in terms of product, process and R&D intensity. Previous literature very often operationalizes AC as R&D expenditure, though several scholars have argued that R&D expenditure does not fully capture the whole phenomenon of absorptive capacity (e.g. Hurtador-Ayala/Gonzalez-Campo 2015), and it may well be that firms that do not invest a lot in R&D nevertheless possess the capacity to absorb knowledge.

Absorptive capacity has been measured by using Likert scales based on diverse indicators of its dimensions, as suggested by specific authors (Zahra/George 2002, Lane et al. 2006), such as knowledge acquisition, assimilation, transformation and exploitation. Some authors focus their scale on internal capabilities of firms (Szulanski 1996; Ritala/Huermelinna 2013), while others focus on the source of external knowledge (Jansen et al. 2005; Liao et al. 2012). In our study, we attempt to capture a firm's ability to acquire and assimilate knowledge measuring it by R&D intensity, and its capacity to transform and exploit new knowledge, measuring this by a firm's innovativeness related to product and processes. Similar measurements were used and validated by Hurtador-Ayala and Gonzalez-Campo (2015).

Independent variables.

Export. EFA showed that three constructs sufficiently constitute export: export intensity, export sales and export out of CIS (Commonwealth of Independent States). Each construct was measured by a 10-point scale (Appendix 1).

FDI is presented as a binary variable, showing whether the firm has foreign subsidiaries or offices or not.

Export experience was measured by numbers of years of exporting. The question was also included in the questionnaire and double-checked with objective data from database and corporate websites. Export experience contributes to a firm's absorptive capacity as, according to its definition, AC grows from the firm's prior knowledge and experience (Cohen/Levinthal 1990).

Control variable. We used the firm's profitability as a control variable (as well as FDI in the first model). Firm size in terms of its financial performance and foreign direct investment might explain variation in export activity of firms. More financially profitable firms are likely to enter foreign markets and increase their international operations.

The study constructs are summarized in Table 1.

Table 1: Study constructs

Dependent variable	Which kind of product innovation does your company develop?
Firm innovations	(respondents may select both answers)
	Radical innovation
	Incremental innovation (not included in the model)
Mediator variable	10-point scale measuring
Absorptive capacity	level of innovativeness (in terms of firm's product)
	level of innovativeness (in terms of processes)
	5-point scale (1=1<; 5= 10>)
	R&D intensity
Independent variable	11-point scale measuring export intensity
Export	(0=0% of total sales, 10=91–100% of total sales)
FDI	4-point scale measuring export intensity out of CIS (0=1–20%; 4=70%>)
	10-point scale for export profitability compared to home market sales
Export experience	(0=much less profitable, 10 = much more profitable)
	Whether a firm has sales or production subsidiaries abroad
	Years of exporting
Control variables	10-point scale indicating the perception of company profitability
Financial performance	(0=not profitable at all, 10=very profitable)

3.4. Descriptive statistics

Most of the 135 firms in the sample are small and medium-sized enterprises. Almost 55% of the companies declared that they pursued radical innovations, and about 50% incremental innovations. Twenty percent of our respondents are not exporters. For most exporters, from 20% to 30 % of their sales come from export. Thirty-two percent have offices abroad. Mean export experience is 9 years. The descriptive statistics are shown in Table 3.

Measurement validation

Construct validity refers to the degree to which a good representation of the measures can be made from the operationalization in a study to the theoretical constructs on which that operationalization was based (Li et al. 2015). The most widely adopted subcategories of construct validity are convergent validity (AVE) and discriminant validity (MSV) (Anderson/Gerbing 1988; Holmes-

Smith 2013). Table 2 reveals that all values of Cronbach's. α are above 0.7, which is normally used as the cut-off point for scale reliability. Table 3 also presents the analysis results for convergent and discriminant validity. All values of AVE (convergent validity) exceed the recommended level of 0.5 and are less than CR, which stands for reliability. Each squared root of AVE on the diagonal (discriminant validity) is greater than the correlations of the factors with other factors. Therefore, all of the measurement models demonstrate convergent and discriminant validity (Table 2).

Table 2: Measurement validation

	CR	AVE	MSV	MaxR(H)	export	AC
export	0.783	0.559	0.011	0.928	**0.747**	
AC	0.803	0.673	0.023	0.945	0.107	**0.820**

4. Analysis

Structural equations models (SEM) were used to perform the analyses of the dataset. SEM has been developed in a different academic discipline in order to allow for the inclusion of latent variables that can only be measured through observable indicators. Moreover, SEM assesses measurement errors and makes it possible to estimate all of the relationships proposed in the conceptual model simultaneously (Fernandez-Mesa/Alegre 2015; Hair et al. 1998). SPSS 22 and Amos 22 software was used to estimate the models for our research hypotheses.

Table 3: Descriptive statistics

	Mean	Standard deviation
Innovativeness (product)	7.77	2.929
Radical innovations	0.54	0.500
Process innovativeness	6.70	2.834
%RD	2.96	1.408
Export intensity	2.15	2.544
Export out cis	1.35	1.224
FDI	0.32	0.468
Export sales	4.06	3.273
Financial performance	6.13	2.576
Export experience	9.41	12.369

The psychometric properties of the measurement scales were assessed in accordance with prior research (Tippins/Sohi 2003), and included content validity, reliability, discriminant validity, convergent validity, and scale dimensionality. We used AGFI and the normed Chi-squared ($\frac{x^2}{df}$) to assess the parsimony of the

models fit. The models fit statistics suggests that the data fit the full structural model.
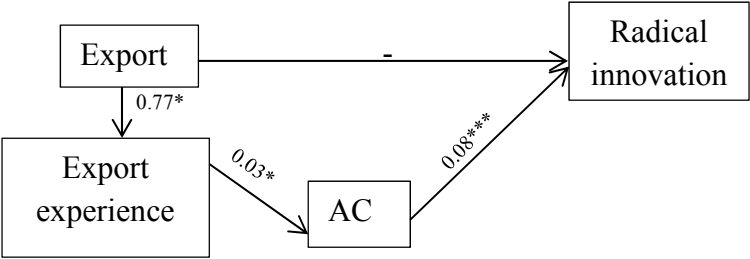
Table 4: Variables correlations

		1	2	3	4	5	6	7	8	9	10
1	Innovativeness	1									
2	Radical innovations	0.248[**]	1								
4	Process innovativeness	0.659[**]	0.288[**]	1							
5	% RD	0.323[**]	0.151	0.333[**]	1						
6	Export intensity	0.115	-0.151	-0.003	0.073	1					
7	Export out cis	-0.013	-0.042	0.082	0.009	0.599[**]	1				
8	FDI	0.076	-0.040	0.151	0.033	0.073	0.222[**]	1			
9	Export sales	0.159	0.008	0.089	-0.001	0.579[**]	0.397[**]	0.183[*]	1		
10	Fln.. performance	0.306[**]	0.132	0.401[**]	0.191[*]	-0.073	0.024	0.301[**]	0.095	1	
11	Export experience	0.084	0.092	0.162	0.049	0.261[**]	0.229[**]	0.340[**]	0.345[**]	0.153	1

5. Research findings

Two models were tested, aiming to elucidate the role of AC in the link export – radical innovation performance. The first model includes export, radical innovations, export experience, absorptive capacity and control variables (FDI and financial performance); the second model includes FDI as an independent variable. The Chi-squared statistic is significant for both models and other fit indices exhibit a good overall fit (Tippins/Sohi 2003).
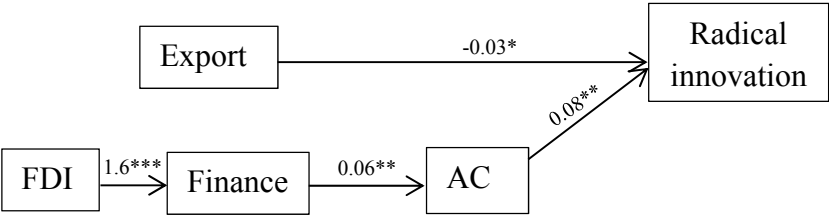
The first model has a good model fit with RMSEA= 0.65, GFI=0.930 and AG-FI=0.89. Empirical testing of the first model reveals that export, indeed, negatively associates with radical innovations (standardized regression weight (β) = -0.033 and p=0.08). Export experience positively correlates with a firm's AC (standardized regression weight (β) = 0.032 and p=0.05), supporting Hypothesis 3, and AC positively associates with radical innovations (standardized regression weight (β) = 0.078 and p=0.000). Therefore, we prove that AC mitigates a negative relationship between export and innovations. Financial performance significantly correlates with AC (standardized regression weight (β)=0.524 and p=0.000), whereas FDI positively associates with sustainability (standardized regression weight (β) = 0.055 and p=0.000). Figure 3 represents regression results.

Figure 3: Model 1 analysis result

Secondly, the model was tested with FDI as an independent variable affecting AC. The overall model fit is appropriate (RMSEA= 0.07; GFI=0.925; AG-FI=0.89). We did not find any significant link between FDI and AC directly, however, a strong indirect link was found through financial performance. FDI positively associates with financial performance (standardized regression weight (β)=1.658 and p=0.000) and financial performance associates with AC (standardized regression weight (β)=0.363 and p=0.000). It was proven in this model that AC positively relates to radical innovation, whereas there is no significant relation between FDI and radical innovations directly. Export still negatively associates with radical innovations (standardized regression weight (β)=-0.032 and p=0.09), nevertheless, the link is weak. The model result is seen in Figure 4.

Figure 4: Model 2 analysis result

6. Discussion

Our study confirms that firms' exports are negatively related to radical innovation. The results suggest that firms from developed and emerging countries may exhibit different behaviors regarding the conversion from the new knowledge coming from abroad into innovation output. The findings are in line with those from Lee et al. (2009) who, in a multi-country setting research, concluded that exporting is less likely to result in indigenous technological efforts in firms from emerging countries than in those from more developed economies. The results also appear to confirm our hypothesis, in the context of Russian firms, regarding the difficulties suggested by O'Connor/Veryzer (2001) of conducting simultane-

ously two strategic activities that require considerable amounts of human and financial resources such as internationalization and radical innovation. It could also be argued that firms that are prone to sell their products abroad already have an innovative product line, from which they are satisfied and thus not willing to make substantial changes. Another explanation, in line with the observations from Filipescu et al. (2013), could be found in the time lag between exporting and innovation. Firms need considerable time to convert the knowledge obtained from their exports into innovation, particularly in the case of radical innovations. This could be especially so in the case of Russian firms, which often start exporting under unfavorable circumstances and not being completely ready, and need the time and the resources to first process the organizational shock produced by the firm's initial foreign market entry, as suggested by Carr et al. (2010), before they may devote themselves to use the new knowledge to create radically new products.

The results also show that absorptive capacity is positively affected by a firm's export experience and that it encourages radical innovations. We conclude that international experience has more power to develop firm's absorptive capacity. New exporters do not develop radical innovations whereas experienced exporters can overcome a lack of resources through absorptive capacity. Furthermore, firms that do not only export but also have other operations abroad possess better absorptive capacity and thus can benefit more from export in terms of innovations.

With this study we contribute to export literature as well as to absorptive capacity and innovation's research. The results on our sample of Russian firms have confirmed that in order to develop radical innovations firms have to gain experience abroad and develop their absorptive capacity. It has implications for the government developing export promotion programs: increasing the level of firm's innovativeness cannot be expected soon after the program launch. Exporters require time and international experience in order to be successful in developing radical innovations.

7. Limitations and future research directions

Several limitations of this article deserve to be acknowledged, which point out to areas for further research. First, while the study extends prior research by including different innovation outputs, the survey used in the study included in most cases a simplified measurement of the constructs, in order to make them friendlier for respondents and increase response rates. Further research could include more sophisticated measurements that consider the different dimensions of the term innovation (Hüsik 2014). For example, in line with the suggestions from Danneels/ Kleinschmidt (2001) and Garcia/ Calantone (2002), future studies could complement the measurements of innovation from the point of view of

the firm, with those from the perspective of the market, or develop more refined analysis by distinguishing between types of newness (e.g. product features, technology, design, product line, or services). Second, future studies could use larger samples, thus allowing for a more clear generalizability and interpretation of the results. In this vein, while this paper increased sample homogeneity by including only manufacturing firms, it would be interesting to see the variance in the results when considering service companies. Finally, future research could explore the effects of various firm-level heterogeneity factors such as firm size or sector, which are likely to have an impact in firms' internationalization (Freixanet, 2012), innovation (Slater et al. 2014), and in the conversion process (Duran et al. 2016).

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Appendix 1: Descriptive statistics

R&D (% of sales)			
		Frequency	Percentage
Valid	<1	22	16.3
	1–3	39	28.9
	4–7	28	20.7
	8–10	15	11.1
	>10	31	23.0
	Total	135	100.0

Export intensity 2014			
		Frequency	Percentage
Valid	0	29	21.5
	1–10	52	38.5
	11–20	19	14.1
	21–30	11	8.1
	31–40	3	2.2
	41–50	6	4.4
	51–60	2	1.5
	61–70	2	1.5
	71–80	2	1.5
	81–90	7	5.2
	91–100	2	1.5
	Total	135	100.0

FDI (office or subsidiaries abroad)			
		Frequency	Percentage
Valid	0	92	68.1
	1	43	31.9
	Total	135	100.0

Export experience			
		Frequency	Percentage
Valid	0	26	19.3
	1	6	4.4
	2	7	5.2
	3	12	8.9
	4	6	4.4
	5	18	13.3
	6	6	4.4
	7	1	.7
	8	4	3.0
	9	1	.7
	10	12	8.9
	11	1	.7
	12	5	3.7
	15	4	3.0
	16	2	1.5
	18	2	1.5
	20	9	6.7
	21	2	1.5
	25	2	1.5
	30	1	.7
	35	1	.7
	40	2	1.5
	50	3	2.2
	60	1	.7
	70	1	.7
	Total	135	100.0

Appendix 2: Model 1 – results

			Estimate	S.E.	C.R.	P	Label
AC	<---	Export experience	.032	.017	1.892	.058	par_8
export	<---	Export experience	.060	.017	3.622	***	par_7
sustainability	<---	AC	.524	.112	4.667	***	par_10
Export intensity2014	<---	Export	1.000				
Export sales	<---	Export	.924	.148	6.242	***	par_1
Export intensity out cis	<---	Export	.353	.053	6.600	***	par_2
innovativeness	<---	AC	1.000				
Process innovative-ness	<---	AC	1.137	.163	6.972	***	par_3
Rd percent	<---	AC	.255	.060	4.241	***	par_4
Radical innovations	<---	AC	.078	.021	3.648	***	par_5
Radical innovations	<---	Export	-.033	.019	-1.672	.095	par_6
FDI	<---	Sustainability	.055	.015	3.654	***	par_9

Appendix 3: Model 2 – results

			Estimate	S.E.	C.R.	P	Label
sustainability	<---	FDI	1.658	.454	3.654	***	par_7
AC	<---	Sustainability	.363	.082	4.446	***	par_8
export	<---	Export experience	.060	.017	3.621	***	par_9
AC	<---	Export experience	.019	.016	1.195	.232	par_10
Export intensity 2014	<---	Export	1.000				
Export sales	<---	Export	.924	.148	6.239	***	par_1
Export intensity out cis	<---	Export	.353	.053	6.597	***	par_2
innovativeness	<---	AC	1.000				
Process innovative-ness	<---	AC	1.135	.166	6.829	***	par_3
Rd percent	<---	AC	.255	.060	4.245	***	par_4
Radical innovations	<---	AC	.078	.021	3.639	***	par_5
Radical innovations	<---	Export	-.032	.019	-1.660	.097	par_6