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Thematic Issue

Exporting, International Cooperation and FDI

edited by
Agnieszka Głodowska
Cracow University of Economics, Poland

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Department of International Trade
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Department of International Trade
ul. Rakowicka 27, 31-510 Kraków, Poland
phone +48 12 293 5376, -5381, 5327, fax +48 12 293 5037
e-mail: eber@uek.krakow.pl
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Editorial Announcements

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Editorial

Nowadays, interactions between the participants of international economic relations, which are not only economies but also businesses, transnational corporations, industries, local governments and regions, can take various forms and shapes. The main point, however, is trade. Today, international trade is experiencing its most dynamic development in the entire history of the world. Global exports and imports of goods and services more than tripled in the last twenty years (International Trade Center, 2018). Trade liberalisation, technical progress, innovation as well as the development of information and communication technologies contribute to the ongoing changes that affect not only the pace and subject of trade, but also forms of establishing and conducting trade cooperation. Of particular significance here is also the activity of the enterprises which, through their foreign investments, have substantially boosted exports and internationalisation processes throughout the world (Bouras & Raggad, 2015). One should also acknowledge the importance of the issue of the internationalisation of small and medium-sized enterprises (SMEs) since it constitutes an important part of research (Idris & Saridakis, 2018; Gassmann & Keupp, 2007; Costa, Soares, & de Sousa, 2016). It is partly because SMEs are a dominant element of the EU economy (Hope, 2017). Since family firms are a core element of SMEs, a separate stream of research focused on the internationalisation of family firms can also be distinguished (Segaro, Larimo, & Jones, 2014).

Within such a framework, the articles in this issue contribute to the discussion originating from two broad fields of research. One is international trade (including FDI) and the other is internationalisation of small and medium-sized firms.

Maria Alejandra Gonzalez-Perez, Juan Velez-Ocampo and Carolina Herrera-Cano, in their article entitled *Entrepreneurs' Features Affecting the Internationalisation of Service SMEs,* analyse Colombian SMEs and their internationalisation from the perspective of special characteristics and traits that influence this process while dealing with parsimony of financial assets, country of origin liability and other institutional voids.

Tianchen Li tries to answer the question posed in the title of his article *What Explains the Varying Degree of Export? Internal or External Factors?* Using multilevel design, he evaluates export conditions by combining the entrepreneurial resource perspective and formal institutional approach.

Mariola Ciszewska-Mlinaric, in her article entitled *Export Intensity, Geographic Diversification and the Role of Public Support:* The *Evidence from Old and New Europe SMEs,* uses a large, cross-country and cross-industry dataset of SMEs from 27 European countries to determine direct and indirect effects of public support on the SMEs internationalisation intensity.

Aleksandra Parteka presents the results of her theoretical and empirical research on the labour market consequences of production fragmentation in the article titled *Import Intensity of Production, Tasks and Wages: Microlevel Evidence for Poland*. She

examines a relationship between wages of Polish workers and the degree of Polish production dependence on imported inputs.

Jarosław Michał Nazarczuk, Stanisław Umiński and Krystyna Gawlikowska-Hueckel, in their article entitled *The Role of Specialisation in the Export Success of Polish Counties in 2004-2015*, investigate the relationship between specialisation and export at regional level. They scrutinise export specialisation, product concentration, as well as comparative advantage on the value of export per capita taking into account other export stimulants.

Tomasz Brodzicki and Jakub Michał Kwiatkowski, in their article entitled *An Empirical Investigation into the Role of Technology Gap in the Trade Relations of the EU Member States*, construct a basic trade model in a gravity framework to investigate the significance of technology gap for the intensity of bilateral trade within the European Union countries in the years 1995-2015.

Based on direct interview method, Małgorzata Jaworek, Włodzimierz Karaszewski and Małgorzata Szałucka, in their article *Greenfield or Acquisition Entry? An Impact of Foreign Direct Investment on the Competitiveness of Polish Investors*, determine the relationship between FDI and their competitiveness and foreign market entry mode choice presenting the case of Polish companies.

In this issue, there are also 4 additional articles in the 'Other Articles' section.

Agnieszka Głodowska
Thematic Issue Editor

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Entrepreneurs' Features Affecting the Internationalisation of Service SMEs

Maria Alejandra Gonzalez-Perez, Juan Velez-Ocampo, Carolina Herrera-Cano

ABSTRACT

Objective: To analyse the internationalisation of SMEs from the perspective of the entrepreneur and the special characteristics and traits that influence internationalisation while dealing with parsimony of financial assets, country of origin liability and other institutional voids.

Research Design & Methods: 11 Colombian SMEs were observed and studied on a case-by-case basis, using a methodology inspired by the phenomenological interpretative analysis (IPA).

Findings: The coding and analysis of the collected empirical data highlighted five main features that positively influence the internationalisation of the observed SMEs: technical expertise of an entrepreneur, opportunistic behaviour towards internationalisation, international focus from inception, an ability to build networks and value creation based on personal traits of the entrepreneur.

Implications & Recommendations: The findings of this study contribute to a more comprehensive understanding of the behaviour, rationality and distinctive entrepreneur' traits that influence the internationalisation of service SMEs.

Contribution & Value Added: This study observes the internationalisation of SMEs from a region that is underrepresented in the literature, furthermore, it uses an entrepreneur-level approach and IPA methodology that is novel in international entrepreneurship studies.

Article type:	research paper
Keywords:	emerging markets; internationalisation; IPA; international entrepreneurship; service SMEs
JEL codes:	F23, L26

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INTRODUCTION

Firms that have experienced early internationalisation have been coined differently: Born Globals (BGs) in Knight and Cavusgil (1996) and Madsen and Servais (1997); International New Ventures (INVs) in Oviatt and McDougall (1994) and High Technology Starts-ups in Jolly, Alahunta and Jeanett (1992). The study of firms that engage in early or rapid internationalisation soon after inception was scarce three decades ago. However, today, due to an increase in international operations, there are abundant and important cases for the economic development of many countries (Cavusgil & Knight, 2014; Eurofund, 2012; OECD, 2013; UNCTAD, 2015, 2016b).

The concept of BGs imply young firms that have not just international sales but also international sourcing outside their own continent within three years from inception (Madsen, 2013), in other words, BGs are firms to which the world is their marketplace (idem). Knight and Cavusgil (2004) define BGs as firms that adopt internationalisation at an early stage, which implies expanding operations into foreign markets and displaying international business prowess and superior performance from or near their inception. Madsen (2013) defines BGs as those that exhibit at least one of these characteristics: (i) more than 25% of sourcing outside their own continent, and/or, (ii) more than 25% of foreign sales outside their own continent; both within three years after inception.

There is some evidence of BGs that internationalise on their owned region, at least at the beginning of their birth, therefore many of these firms are 'born regional', rather than purely BG firms (Gonzalez-Perez, Manotas, & Ciravegna, 2016; Lopez, Kundu, & Ciravegna, 2009). For the purpose of this analysis, Madsen (2013) highlights how high-tech firms tend to have activities all over the world, while low-tech companies usually focus their international on neighbouring countries. The academic literature on BG firms has been increasing during the 21st century, however, there are still fundamental questions like why some firms chose to remind local while others internationalise their operations rapidly and what the distinctive characteristics of entrepreneurs that prompt internationalisation are.

The boom of BGs has also coincided with a growing significance of firms of emerging markets. According to UNCTAD (2015, 2016a), and the WTO (2014), there has been an increasing importance of developing countries in the world economy. Cuervo-Cazurra and Ramamurti (2014) argue that most foundational theories on the internationalisation of companies are based on the empirical evidence of those companies from developed countries. However, since the year 2000, managers, international consultants and scholars alike have increased their attention to the international decisions of Emerging Multinational Corporations (EMNCs). There are two key questions on this issue: (i) what do EMNCs do differently than other MNC? and (ii), how come underdeveloped countries have been able to bring about so many global firms within the last two decades?

This article contributes to the latter question. And more specifically, the purpose of this manuscript is to analyse the internationalisation of BGs and INVs from the perspective of the entrepreneur and the special characteristics and traits that influence internationalisation while dealing with parsimony of financial assets, country of origin liability and other institutional voids. The present article represents a contribution in the understanding of

BGs and INVs from two understudied approaches, first, it focuses on the role of the entrepreneur on the internationalisation of the firm, and second, it explores this relationship in the context of Colombia, a representative Latin American country that has been understudied in the literature, especially because most of the BGs or INV studies have been conducted in developed economies in which there are not such constrain resources (Martin & Javalgi, 2016). The next section provides a literature review from an international entrepreneurship perspective, later, the methodology section introduces the Interpretative Phenomenological Analysis (IPA) that was used to design, conduct and analyse the findings of the study; then, the findings, discussion and conclusions sections are presented.

LITERATURE REVIEW

The internationalisation of multinational enterprises (MNEs) has been studied from a broad set of theoretical approaches (e.g. transaction cost analysis, eclectic model, evolutionary theories, among others). However, when studying the internationalisation of SMEs, traditional literature has mainly focused on three views intended to explain SMEs expansion: stage models, international new venture (INV) and networks. As Li, Qian, and Qian (2012) state, the internationalisation of small entrepreneurial firms is best understood by merging these three approaches; especially because each one focuses on some characteristics that the others leave behind. INV skips the time-dependent process needed to develop valuable knowledge and competences; the stage model ignores competition and strategic dynamics; while the network approach overlooks the firms-specific advantages that contribute as a driver in the international expansion because of its concentration on firms' inter-organisational relationships.

Greater technological intensity, defined as the relative share that technology constitutes of the firm's inputs and outputs (Hashai, 2011), constitutes a major incentive for the international success not only of BG firms (Hashai & Almor, 2004; Knight & Cavusgil, 2004; Oviatt & McDougall, 1994), but also of high-tech firms in general (Rugman, 1981; 1986). Furthermore, greater technological intensity is positively correlated with the growth of both the foreign operations and the geographic scope of BGs (Hashai, 2011; Mudambi & Zahra, 2007) and hence it increases the difficulties associated with intricate and risky knowledge transfer.

Recent studies demonstrate that there is an emerging trend of the so-called small technology-based enterprises (STEs) that satisfy the requirements of BG firms, especially that internationalise drawing upon the application of resources in several markets within up to three years from inception (Kuivalainen, Saarenketo, & Puumalainen, 2012; Zou & Ghauri, 2010; Li *et al.,* 2012). Firms that are both BG and STEs somehow object the mainstream theories of internationalisation because these approaches mainly defend that an internationalising firm requires robust amount of resources to overcome entry barriers, develop managerial skills and deal with both liability of newness and liability of foreignness (Pla-Barber & Escribá-Esteve, 2006; Kocak & Abimbola, 2009; Kuivalainen *et al.*, 2012).

As well as greater technological intensity, innovation is perceived as a major driver to engage early internationalisation (Li *et al.*, 2012), however, in those industries in which the product life cycles are short and competitors struggle to fully develop economies of scale, innovations are even more significant to internationalise before products become obsolete (Zou & Ghauri, 2010). STEs share some special characteristics: risk-taking tendency,

nimbleness, flexibility, quick adaptation to new technologies and the ease of internal communication (Rugman & Oh, 2010), besides, when STEs go abroad, they enjoy lower entry barriers due to favourable host governments' policies towards imports of innovations (Qian, Li, Li, & Qian, 2008), which boosts their international expansion.

The existing literature on internationalisation of BG STEs have focused on drivers, obstacles, effects and pathways of these companies from a firm-level unit of analysis. However, individual-level studies and more specifically, technical and/or psychological features of the entrepreneur that influence internationalisation do not have as much participation in the literature, especially in the context of emerging markets.

Drivers for Firm Internationalisation

Motivations for firm expansion and internationalisation have been long studied and discussed. Dunning (1980) argues that firms go abroad to exploit their firm-specific advantages when there are opportunities to benefit from internalising and benefit from locational advantages of host countries. Stoian and Mohr (2016) studied the outward foreign direct investment (OFDI) of emerging markets firms and found that high protectionism, high corruption and high bureaucracy at the home market prompt escapist OFDI.

Cuervo-Cazurra, Narula and Un (2015) classify the motives for internationalisation based on two dimensions, the economics-driven exploitation or the exploration of resources and the psychological actions associated with increasing sales and upgrading home operations through new resources and capabilities found abroad. In this study, they propose that the combination of the mentioned dimensions leads to four motives for expanding internationally: sell more (companies that obtain better conditions abroad by exploiting existing resources); buy better (companies that avoid home country liabilities by exploiting existing resources); upgrade (companies that obtain better conditions abroad by exploring new resources); and escape (companies that avoid home country liabilities by exploring new resources abroad). Cuervo-Cazurra *et al.* (2015) coined these four drivers as sell more, buy better, upgrade and escape.

International new ventures (INV) and BG firms are young, small and rapidly internationalised companies, adopting a global approach since their birth or short after it (Hennart, 2004; Madsen, 2013). Knight and Cavusgil (2004) explain that the BG exporter is a result of an interaction of entrepreneurial, marketing, and capability-based thinking around exporting. Nonetheless, Hennart (2014) suggests that these firms have accidental internationalisation, and proposes that BGs gain foreign customers fast because they know what, how and to whom to sell. This coincides with Cuervo-Cazurra, Narula and Un (2015) who found that the main motives for internationalisation of firms are selling more, buying better, upgrading host country conditions and escaping poor home country conditions.

International Entrepreneurs' Features

Although the role of founders in the internationalisation of BGs has been discussed in the literature (e.g. Madsen & Servais, 1997; Oviatt & McDougall, 1997; Weerawardena, Sullivan-Mort, & Liesch, 2017), the focus has been on former international experiences of the founder and/or on his/her global mindset (Knight & Cavusgil, 2004), which leaves room for further studies that explore value creation and internationalisation and its interlinks with the founder's capabilities (Weerawarderna *et al.*, 2017). Risk-taking behaviour, proactiveness,

competitive aggressiveness, international exposure and innovativeness are among the observed characteristics of BG founders (Gerschewski, Rose, & Lindsay, 2015).

The notion of innovativeness has been traditionally associated with entrepreneurship, INV and BG firms. Entrepreneurship has been related to the ability to create something different, to exploit resources in order to achieve monetary and personal satisfaction (Carson, Cromie, McGrowan, & Hill, 1995), while innovativeness is defined as the ability to implement original ideas that successfully make a difference in a particular area (Carland & Carland, 2009). Some authors defend that an entrepreneur does not need to be innovative *per se* (March & Yague, 1997). Nonetheless, innovativeness is positively correlated with entrepreneurs' success domestically and internationally (Kropp, Lindsay, & Shoham, 2006).

Sandberg, Hurmerinta and Zettinig (2013, p. 229), aware of the need to properly demarcate conceptual approaches to both terms, define an entrepreneur as 'a person who is able to combine resources with business opportunities in pursuit of value creation' and an innovator as 'a person who is able to create and/or is willing to try out a new idea before others do so'. International entrepreneurs creatively seek and maximise opportunities beyond their home market aiming to exploit and advance their competitive advantages (McDougall & Oviatt, 2000). Knight and Liesch (2016) state that BG founders tend to assume internationalisation proactively while having a proclivity to risk-taking behaviour. They coincide with Acedo and Jones (2007), Luostarinen and Gabrielssson (2006), and Rialp and Rialp (2006) in defending that the entrepreneur's characteristics strongly influence the internationalisation of BGs.

Features of the owners and founders of the firms, such as entrepreneurial proclivity, international orientation, social capital (networks and networking); and pre-existing internal knowledge identified in the literature are critical to trigger early internationalisation and future performance in international expansion. Different authors (e.g. Jones & Coviello, 2005; Jones, Coviello, & Tang, 2011; Rialp *et al.*, 2005; Weerawardena *et al.*, 2007; Zhou, 2007) have identified that entrepreneurial orientation is an explicit feature of BGs. The international proclivity of the entrepreneurs also plays an important role in the early internationalisation of firms, and in the development of international strategies to support their subsequent international performance (Acedo & Jones, 2007; Jones, Coviello, & Tang, 2011; Knight & Cavusgil, 2004).

Forms of social capital, such as networks and networking competencies, also contribute to the early internationalisation for firms (Cavusgil & Knight, 2009; Coviello, 2006), as these contribute to overcoming liabilities of foreignness and outsidership, and obtain competitive advantages (Freeman, Edwards, & Schroder, 2006). Pre-existing knowledge and background of founders tend to influence the early internationalisation of firms (Weerawardena *et al*., 2007). For young firms, as they might face limited financial and tangible resources, knowledge-based internal capabilities are critical resources for early internationalisation, and for performing well outside their domestic market (Knight & Cavusgil, 2004; Kogut & Zander, 1993).

Although during the last two decades research has led to the understanding of BG strategies, resources, capabilities, international decisions and performance, there is a need for research that explores BGs through multiple contexts and unit of analysis, including the managers' perspective (Knight & Liesch, 2016).

MATERIAL AND METHODS

This study adopts a qualitative research design as the observed phenomenon and its context are not well covered and understood in previous studies (Edmondson & McManus, 2007). Multiple case studies (Eisenhardt, 1989; Yin, 1994) were conducted and analysed using Interpretative Phenomenological Analysis (IPA). IPA is an in-depth qualitative methodological approach that has been used in phenomenological psychological studies since 1996 (Smith, Flowers, & Osborn, 1997). The purpose of this type of analysis is to give the research a study based on the structures of experience and consciousness. This method focuses on understanding the experience of the participants in order to explore the perspective of a group with similar characteristics or contexts (VanScoy & Evenstand, 2015). The method involves a two-stage interpretation-understanding process, in which research participants, in this case international entrepreneurs, try to make sense of their experience -overcoming (i) their lack of financial resources and assets at the creation of their company, and (ii) the limitations associated with the features of emergingness of the country of origin-; and the researchers analyse their views and compare them to the existing literature (Symeonides & Childs, 2015).

The IPA method has not been used in the International Business (IB) field, although the present study uses it in order to contribute to the understanding of BG or INV firm internationalisation through the experience of their founders. To follow the important contributions to the entry of international entrepreneurship into mainstream international business that Knight and Cavusgil (2004) have made, this analysis aims to provide insights about the challenges that enterprises face in their internationalisation processes. As stated by different authors in the field, IPA's attempt is not to construct an 'objective truth' about the facts, but to give a rigorous interpretation of the collected experiences based on the understandings, perceptions, and accounts.

Although, as already mentioned, the IPA method has not been applied in IB, previous studies have used IPA to understand broader organisational features and phenomena; for instance, Dalbello (2005) analysed technological innovation and creative decision-making; Kupers (2005) implemented this method with the purpose of interpreting implicit and narrative knowing in organisations.

IPA differs from other methods as its data collection and case selection are based more on individual and unique characteristics of the participants. While other methodologies aim to establish broader populations, IPA studies seek a minor sample (usually between 1-30 interviews) to get the widest data from single cases. It bases the analysis on examining divergence and convergence in smaller samples, with the purpose of maximising time, reflection and dialogue in each of the cases. In this sense, the sample should explore the perspectives of a group with similar characteristics, instead of a group of contrasting features and contexts (Symeonides & Childs, 2015; VanScoy & Evenstand, 2015).

Data Collection

The research design was based on a correlational cross-sectional data collection, and includes a single survey interview as the main instrument (Symeonides & Childs, 2015). The purpose of the design was to collect data with enough detail to give new lights that contribute to the analysis of the internationalisation of selected BGs and INVs from the

perspective of the entrepreneur and the special characteristics and traits that influence international expansion while dealing with parsimony of financial assets, country of origin liability and other institutional voids. The data was collected using a flexible open-ended interview questionnaire, for which literature review provided some categories that were included and observed in the structured interview, in which initial questions were modified according to participants' responses, so researchers were able to inquire interesting areas that arise in the interview.

An experienced researcher conducted the interviews. They were audio-recorded and subsequently transcribed. Participants were given to be signed an informed consent in which they were informed about the academic purpose of the study, and in which we offered anonymity to their company and their own. The structured interviews lasted between 50 to 120 minutes depending on the intensity and the level of involvement of the interviewee (international entrepreneur) in a particular topic. The interviews tool place in a familiar and comfortable place for the interviewee.

Selected Cases

The cases for this study consisted in a purposive sample of 11 firms from the services sector in an emerging market country (Colombia). The cases were selected from a population with similar demographics and socio-economic characteristics, and with a degree of commitment to the study (Smith, Flowers, & Osborn, 2007). The structured interview was administered to select owners or founders of services firms in Colombia whose at least 20% of their revenue comes from foreign sales. The subjects of the study were obtained by personal contacts and referrals. Table 1 in the findings section provides a description of the selected cases.

Data Analysis

The data (verbatim interview transcripts) read a number of times – in order to be as familiar as possible with the issues, and were analysed using interpretative phenomenological analysis (IPA). Phenomenological research usually involves identifying and locating participants who have experienced the explored phenomenon (Smith, 2007), – overcoming assets parsimony and emergingness liability in BG or INV firms. Using the option of comments at Microsoft Word, annotations were added to the transcript when interesting or significant matters (or insights) appeared in the text. This process allowed preliminary interpretation of the data and an initial categorisation. After the entire text is commented, the identification of emerging titles (using management and international business language) was carried out. This process allowed making theoretical cross-cases connections, and also clustering of themes.

Interview transcripts were coded in detail using a bottom-up approach. This implies producing codes from the data, rather than using pre-existing theory to find codes that might be applied to the data.

The reason why IPA was used as a method for data collection and data analysis was that this research aimed to thoughtfully understand business-related phenomena from an individual level of analysis in which entrepreneurs' rationality and point of view were the key to get a more comprehensive overview of the special characteristics of firms from emerging markets, as suggested by Cavusgil and Knight (2014). IPA offers possibilities of understand this phenomenon (through phenomenology), and how entrepreneurs – and researchers – made sense of it (interpretation).

Following data transcription, exhaustive and close work was done with the text, annotating meticulously (coding) for insights into the entrepreneurs' experience and viewpoint on their company, circumstances and the environment. Afterwards, the quest for patterns (constructs) in the codes took place. Some themes were grouped under superordinate themes (broader themes). Aiming to detect patterns then, a concluding set of themes was summarised in graphics as a result of the text which was transformed and numerically analysed and represented – using a binary coding (0 for non-emerged; and 1 for emerged category) – through manual coding with the use of a codebook. In order to enhance the reliability of the data two coders, using the same guidelines, applied codes to the data and then contrasted the results.

Trustworthiness

During the coding, an intimate emphasis on the meaning took place. Also, contextual details about the sample, and identifying key points by using verbatim quotes were crucial to estimate the plausibility of the transferability of the IPA approach to future studies on the internationalisation of the firm. So as to enhance reliability, the interviewer meticulously stuck to the interview schedule. Different approaches were undertaken to ensure validity within IPA methodology (Brocki & Wearden, 2006); in this study the data was analysed independently by two researchers, then both of them compared their coding looking for differences in the interpretation of the collected data; later on, participants provided their feedback on the preliminary interpretations. The researchers are aware that the conclusions of studies under IPA methodology are particular to the observed group and generalisations should be drawn with caution.

FINDINGS AND DISCUSSIONS

This section presents the findings of this study. Most of the graphics included in this section of the article are a graphic representation of the summarised results to facilitate analysis. Table 1 presents the profile of the observed firms including some basic characteristics of the entrepreneurs: the date of birth, years of formal education, years of entrepreneur's international business experience, and the command of English. Also, it provides basic information about the analysed companies: the date of establishment, the date of the first foreign sale, the percentage of foreign ownership, the percentage of current foreign sales, the number of owners, the number of employees at inception, and current employees.

As observed in Table 1, all entrepreneurs who participated in the study have over 18 years of formal education, which is far from the country average (7.6 years according to the United Nations Development Program, 2017); this implies that all of them have at least a college degree, while some obtained master's degree or further education. Something similar occurs with the years of international experience; in which an average of 10 years per entrepreneur implies high international exposure that could have an influence in the decision-making rationality applied within their firms. However, further information obtained in the interviews is needed to confirm this knowledge transfer. Similarly, 10 out of 11 entrepreneurs stated their ability to communicate in English, which is not the norm in Colombia, even among businesspeople.

Table 1 also presents that 8 out of 11 firms started their internationalisation within the first three years after inception, while the remaining companies waited for 6, 10 and

28 years to experience their first international sale. In terms of current foreign sales percentage, companies 5, 6, 10 and 11 declared that between 90 and 100 per cent of their sales is international; while the rest of the companies range from 20 to 40 per cent in foreign sales. Companies 2, 7 and 8 are the ones that currently have more employees, meanwhile, the average number of employees for the rest of the cases is 13.

Table 1. Observed firms

Company ID	Sector	Interviewed entrepreneur's date of birth	Entrepreneur's years of formal education	Years of entrepreneur's IB experience	Command of English
1	Animal health, and reproduction	1980	22	4	yes
2	Health (diagnostic)	1956	19	4	no
3	Communication, photography	1975	19	6	yes
4	Health (eye surgery)	1975	27	7	yes
5	Video games / software	1979	20	12	yes
6	Language services (teaching Spanish)	1973	24	23	yes
7	Software (software for banking)	1983	20	10	yes
8	Software (software for banking)	1986	18	2	yes
9	Consultancy	1964	22	20	yes
10	Software	1982	19	10	yes
11	Medical Tourism	1973	19	16	yes
Company ID	**Date of creation**	**Date of first foreign sale**	**Percentage of foreign ownership**	**Current foreign sales (percentage)**	**Number of owners**
1	2008	2009	0	22	2
2	1982	2010	5	20	4
3	2007	2008	0	20	1
4	2007	2013	0	20	5
5	2007	2010	0	100	2
6	2008	2008	0	90	1
7	2007	2007	100	40	4
8	1998	2008	0	20	2
9	2005	2005	100	20	2
10	2008	2008	0	99	5
11	2011	2013	0	100	8

Source: own study based on interviews.

Figure 1 presents the profile of the owners in terms of their age at the creation of the company and their years of formal education. The average age of the founders at the creation of the company is 30.18, while their average years of formal education is 21.81, which, as already mentioned, is way higher than the country average. Just two of the entrepreneurs were either above 35 or below 30 when they founded the firm.

Regarding the 11 analysed companies, it can be observed in Figure 2 below that older firms tend to begin their internationalisation later than younger firms. The average current age of the company is 10.63 years, while the average age of the companies at the first foreign sale was 4.63.

The purposive homogenous sampling was used to define the results in terms of groups that can be used to respond to the research question. After the categorisation and coding of the interviews, the analysis of the collected data resulted in five different constructs: technical expertise as a driver of entrepreneurial behaviour, opportunistic behaviour towards internationalisation, international focus from inception, ability to build networks, and value creation based on personal traits. Table 2 shows the constructs, and uses the collected qualitative information (entrepreneur's quotes) as related findings to show similarities between the results.

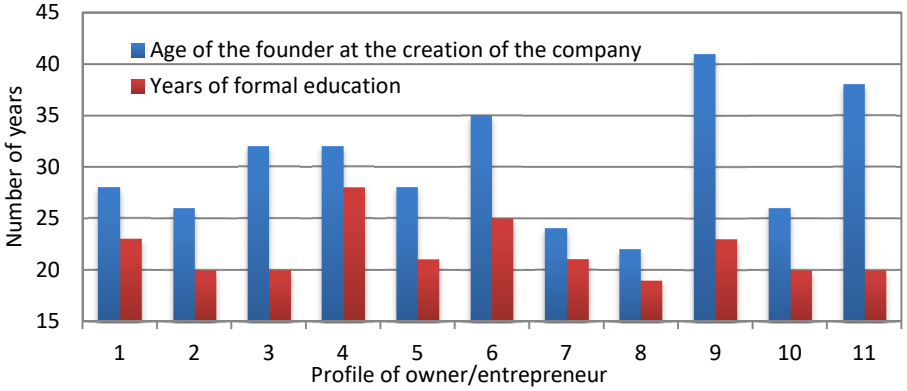

Figure 1. Age of the founder at the time of the creation of the company and years of formal education
Source: own elaboration based on interviews.

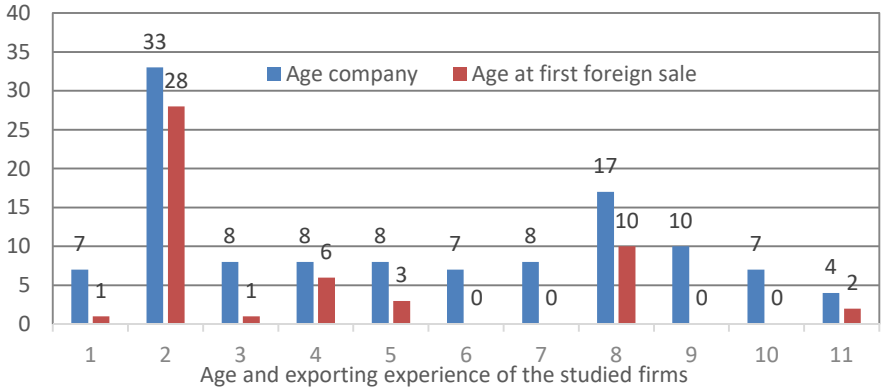

Figure 2. Current age and exporting experience of the studied firms
Source: own elaboration based on interviews.

Firstly, technical expertise is a common denominator in the sample. These enterprises show significant competitive advantages regarding their local competitors, and their founders consider these differentiators as one of the reasons for their international orientation. Somehow, these entrepreneurs have developed some technical skills that enhance their ownership advantages and boosted their companies' competitiveness domestically and internationally. However, not only internal factors (of the company and the entrepreneur)

were identified in the study, external forces pushing international operations of the companies were also possible to observe: opportunistic behaviour towards internationalisation was also part of the experiences narrated during the interviews. This refers to a more reactive behaviour when dealing with international opportunities, in which tangible and intangible resources are combined in new ways. Here entrepreneurs exhibit their capability to grow internally by exploring their skills to conceive, recognize and exploit opportunities.

International focus from inception was the third construct that was identified after analysing the generalised eagerness to go international of the employees and founders of the enterprise. As already mentioned, 8 out of the 11 studied cases started their internationalisation within the first three years after the creation of the company; in the interviews, entrepreneurs stated that this international orientation is the result of both planned and unplanned behaviour, in other words, some of them actively looked for internationalising their company very soon after inception, while others reacted to an external effect that encouraged them to look for international markets. This construct is somehow related to the fourth: one an ability to build networks, where the availability of international connections of the people inside and outside of the company were crucial for their relationships with customers, partners, and different organisations promoting international operations. Here we should mention that all the interviewed entrepreneurs had previous international experience, which contributed to the improvement of their skills and leverage networks to develop competitive advantages while overcoming liabilities associated with their emergingness.

Finally, the value creation based on personal traits was also confirmed in some of the analysed firms as an important factor overcoming firms' inherent liabilities. This characteristic is associated with the entrepreneur's ability to materialise personal circumstances, prior experience and even personality traits to pull international expansion of the firm.

Table 2. Study of constructs and related findings

Construct	Related Findings
Technical expertise as a driver of entrepreneurial behaviour	'[…] after visiting a canine fair, my husband and I decided to develop a business plan on a dog kennel specialized on small breeds where biotech elements were incorporated. We wanted to attach to high technical standards to ensure animal welfare that would eventually allow us to reach international markets' (Company 1 (C1)) '[…] both owners, as engineers, plus the managerial experience of one of them (who is a doctoral student in business administration) have influenced the implementation of innovations within the company […] we developed a software to track our patients' data' (C1) 'Our technical and medical capabilities influenced our internationalisation by strengthening international customers' trust' (C2) 'After working as an advertising agent for 12 years I decided to quit my job and study in England, where I made a photographic chronic of my trip, […], those photos were highly admired by my friends, who encourage me to develop a career as a photographer. Then I decided to start up my own photography company' (C3) 'Our competitiveness is based on our technical knowledge and international experience' (C5) 'When I started the company, I already had plenty of international experience teaching both English and Spanish' (C6) "Due our solid technical skills, our clients promote us through their own networks overseas […] reputation is our most valuable asset, our expansion rely on customers' satisfaction and word of mouth' (C7)

Construct	Related Findings
	'Our main competitive advantage is our ability to become pioneers in creating, supporting and managing specialized software for multinationals' (C9) 'We are confident we are way faster than our competitors, that's why we don't look for clients, they look for us' (C10)
Opportunistic behaviour towards internationalisation	'Entering the Mexican market is very promising for our business. We want to increase our phytosanitary standards to gain credibility and recognition' (C1) 'The main advantage of having international patients is the speed of payments. International customers mean immediate payments and liquidity' (C2) 'in 2007, a Latin American bank contacted the four of us (Indian engineers) asking for a software development, then the bank recommend us to create a formal company so we could enrol in long terms projects within the bank […] nowadays we develop software for over 15 banks in 5 countries' (C7) 'The company started in Canada, but due to business opportunities in Latin America both owners soon decided to relocate in Costa Rica and Colombia' (C9) 'Due to local violence in the 90s and the availability of patients, the city developed skills as a medical hub, especially in terms of transplants. This encourage us to look for international markets in order to exploit the city´s expertise' [C11]
International focus from inception	'[…] we decided to raise dog breeds with high potential to the international market. We basically focused on attractive breeds for the North American market' (C1) 'Initially I was hired as the official photographer of a major European company, this opened doors for other international customers' (C3) '[…] we were aware that this was a risky business, but it had a high potential, so we decided to commit to sell video games internationally […] we knew our company needed to be international from the beginning' (C5) 'We started our internationalisation from the very beginning, soon after creating the company we established direct operations in Panama looking to provide software to our main client […] then we realize that working from headquarters was more profitable so we reverse that foreign investment and concentrate on exports' (C8) 'We were confident that the company was going to be a born global, all of us (partners) had lived abroad, our international personal network leveraged the company' [C10]
Ability to build networks	'Our internationalisation has been influenced by the networks with international companies in the pet industry' (C1) '[…] most of our initial customers were foreigners that were referred by other satisfied customers. […] once we identified foreigners as our target, we decided to have an English version of our website and provide online counselling for our potential customers' (C2) 'Belonging to a cluster led by the local chamber of commerce let the company to identify its potential international advantages' (C2) 'undoubtedly: one customer leads to another' (C3) 'Initially we focused on local customers, then we identified a niche market on foreigners married to locals, so our relations with international customers was built upon our local network' (C4) 'A local agency that promotes internationalisation helped us to implement an internationalisation plan centered on the Colombian diaspora in Florida, USA. We contacted several institutions there, from the consulate to Latin American restaurants to identify potential customers' (C4) 'Our presence in international fairs (Interservice/Industry Training, Simulation and Education Conference (I/ITSEC) in Orlando, Florida and Game Developers Conference (GDC)

Construct	Related Findings
	in San Francisco, California) helped us to create connections with international partners and identify business opportunities' (C5) 'After several years living abroad, I came back to my country with the idea of starting a business in which I could apply my knowledge, so I decided to design a website in which I could contact foreigners using my family and friends as the platform to reach my potential clients' (C6) 'Our strategy is following our clients wherever they go. This way we take advantage of our reputation, recommendations and personal networks to contact potential clients abroad' (C8) 'Trust is built through relations, and relations need time. We do not invest on gifts because those could be taken as bribery and corruption, instead we spend time with our clients and try to get to know them better' (C9) 'We have developed close relationships with our clients, we consider some of the as our friends. […] we have centered on creating an online reputation through specialized online forums […]' (C10) 'We have received guidance from local agencies that promote internationalisation, besides we have built bridges with Colombia councils and embassies oversees' [C11]
Value creation based on personal traits	'I am confident that my company is more than just a talented person. I cannot rely just on my talent […] my company is a team, not a single person. Within this industry there are many single competitors who lack the ability to organize as a company' (C3) 'Although we work in Latin America, we rather hire Indian engineers, especially because working with people from your country eases both communication and knowledge transfer' (C7) 'We created the company because we were former co-workers and the five of us lost our job, so we wanted to have our own software company […] the company transformed itself quickly from a group of freelancers to a specialized and highly internationalized software boutique' (C10)

Source: own study based on interviews.

This article neatly captures special characteristics and traits of entrepreneurs and the liabilities of the country of origin that are compensated with the technical confidence, and international proclivity of founders and leading employees; it also relates to various theories of firm internationalisation and international entrepreneurship. After coding and analysing the responses of the observed firms, researchers identify five main constructs that influence entrepreneurial behaviour and internationalisation. Although five constructs were identified, the most relevant ones are the technical confidence as a driver of entrepreneurial behaviour (explicitly observed in 8 out of 11 firms) and the ability to build and maintain networks (observed in 10 firms). These results are consistent with the findings of Paul and Shrivatava (2016) in which the entrepreneurial intention of young managers from developing countries is highly influenced by their pro-active personality, knowledge and experience.

In the studied firms, it was found that because services do not necessarily depend on physical distance and therefore transport costs and logistics constraints are significantly less relevant for the delivery of services, a regional orientation of their foreign sales was not observed. This implies that findings by Lopez *et al.* (2009) are not generalisable. Instead, the exploration and exploitation of new resources and capabilities in the host country to acquire beneficial resources that could be used both domestically and internationally that Cuervo-Cazurra *et al.* (2015) coined as *upgrade* was a significant driver for this firms to internationalise.

The findings of this study differ from other studies on the internationalisation of companies from Latin America, for instance, Losáda-Otálora and Casanova (2014) found that the internationalisation of Latin American MNEs are similar to the international expansion of firms originated in developed economies, especially due to their defensive behaviour; while Gonzalez-Perez and Velez-Ocampo (2014), and Velez-Ocampo and Gonzalez-Perez (2015) claim that among the most relevant drivers for internationalisation are the defensive behaviour, crisis in domestic market and risk reduction at home; aspects that were not particularly found in the current study. This could be explained by two factors, first, former studies on the internationalisation of companies from Latin America usually took into consideration companies from a firm-level perspective, not from the entrepreneur-level as in this manuscript; and second, as the observed companies for this analysis belong to the service sector, their drivers and obstacles to internationalise are consistently different from other sectors.

This study also proves that specific services firms as were created based on technical expertise and sophisticated knowledge (formal research and development experience) of the entrepreneurs, before the creation of the firm (rather than business or entrepreneurial background), do not have an accidental internationalisation process as suggested by Hennart (2014). As a consequence, Hennart (2014) perspective could be completed, making exactness, that in the case of firms which previously to the inception count with former R&D, the internationalisation of these depends on the technical and knowledge confidence; and also the international proclivity of the entrepreneurs.

Strong confidence of strength on technical knowledge which was tested in the domestic market and was recognised by outstanding academic performance at the university, was a characteristic present in all studies. Close current relation with scientific and academic institutions as a mean of validating and advancing current knowledge, and R&D was an important feature. Strong and genuine interest in contributing through innovation to the development of science and knowledge frontier. Constant pursue of positive feedback regarding their performance, social recognition is a huge part of their psychological confidence to undertake international ventures.

Opportunities for future research are associated with comparing entrepreneurs' features from more than one country, which could contribute to the better understanding not only the differences in terms of drivers, motivations and obstacles that these managers face when internationalising their firms, but also the potential of the five constructs identified in this study. Furthermore, it could be prudent to extend both IPA methodology and the five main constructs identified in this study to other contexts, for instance, to analyse entrepreneurs from non-service industries. Further research could be intended to approach questions about how entrepreneurs build and maintain networks, what is the origin of the international focus from inception, to what extent the technical expertise triggers internationalisation in other industries, and the impact of the changes in the domestic environment to the opportunistic behaviour of entrepreneurs. Future studies could also explore longitudinal data and/or periodical interviews with entrepreneurs, so the tracking of the entrepreneurs at different stages of internationalisation would provide a deeper understanding of the characteristics and traits that affect the international expansion of their firms.

CONCLUSIONS

This study presented results concerning the questions of how BG and INV firms from emerging markets address the liabilities coming from their origin and lack of resources available for implementing complex internationalisation processes. Through an IPA methodology, innovative in international business and international entrepreneurship field, the authors were able to identify five different features that explain the successful international operations of the selected firms. Namely: technical expertise as a driver of entrepreneurial behaviour, opportunistic behaviour towards internationalisation, international focus from inception, an ability to build networks, and value creation based on personal traits were the most important findings in this study.

After analysing the collected information, researchers – in accordance with IPA method – were able to explore the perspectives of a group with similar characteristics and with a similar context (VanScoy & Evenstad, 2015), BG and INV firms in an emerging market scenario. This study provides some features that may be useful when analysing the connection of individual characteristics, and international new ventures success. In a context in which firms are internationalising with an increasing speed, and emerging markets are consolidating as important actors in international business, the present revision contributes to the understanding of how these enterprises are shaping their international strategies.

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Authors

The contribution of co-authors can be expressed as Maria Alejandra Gonzalez-Perez (40%), Juan Velez-Ocampo and Carolina Herrera-Cano (30% each).

Maria Alejandra Gonzalez-Perez

Maria Alejandra Gonzalez-Perez (PhD, MBS, Psy) is Full Professor of Management at Universidad EAFIT (Colombia); Vice-President of Administration at the Academy of International Business (AIB) (2015-2018), coordinator of Colombian universities in the virtual institute of the United Nations Conference for Trade and Development (UNCTAD) since 2009, Research Partner at the CEIBS Center for Emerging Market Studies (CEMS), and Editor-in-Chief of the business journal AD-minister.
Correspondence to: Cra 49 nro 7 sur 50, Bl. 26-416, Universidad EAFIT, Medellin, Colombia. Mgonza40@eafit.edu.co

Juan Velez-Ocampo

Juan Velez-Ocampo is Associate Professor of Management at CEIPA Business School and PhD student at Universidad EAFIT (Colombia). His research interests include the impact of globalisation on emerging economies, and the internationalisation of developing countries multinational corporations.
Correspondence to: Carrera 77Sur #40-165, Escuela de Admnistración. Sabaneta, Colombia. Juanf.velez@ceipa.edu.co, jvelezo@eafit.edu.co

Carolina Herrera-Cano

Carolina Herrera-Cano (MIB) is a full time professor at Universidad Autónoma Latinoamericana (UNAULA) (Colombia) and works as an adjunct lecturer at Universidad EAFIT. She has been linked to the study of issues regarding international trade, development, corporate social responsibility, sustainability, and gender. She also has experience in consulting services for governmental and international institutions, such as the Inter-American Development Bank and the Ministry of Environment and Development of Colombia.
Correspondence to: Cra 49 Nro 7 Sur 50, Bloque 26. Universidad EAFIT. Medellín, Colombia. Cherre16@eafit.edu.co

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What Explains the Varying Degree of Export? Internal or External Factors

Tianchen Li

ABSTRACT

Objective: The objective of this article is to determine and analyse export conditions by combining the entrepreneurial resource perspective and formal institutional approach.

Research Design & Methods: Drawing on a representative sample of global nascent entrepreneurs, cross-level (random-effects) moderation analysis is applied to explicate the influence of a country's formal institution on the relationship between entrepreneurial resource-based determinants and the degree of export, and this method enables the study of country-level slopes.

Findings: The results suggest that there is a positive relation between self-efficacy and export and that people who have the willingness to pursue decisions or courses of action associated with uncertainty are more likely to export. In addition, the research findings also confirm the positive moderating effect of formal institutions on entrepreneurial resource aspects and the degree of export.

Implications & Recommendations: The findings of the study have implications in particular for policy-makers who are interested in encouraging early export by influencing institutional dimensions. Policymakers have largely concentrated on institutions to increase entrepreneurial opportunities, but institutions may not be sufficient to stimulate international entrepreneurship.

Contribution & Value Added: The originality of this work lies in adopting a more comprehensive approach in studying export by integrating entrepreneurial resource perspective with the institutional dimensions.

Article type: research paper

Keywords: export; institutions; entrepreneurial resource aspects; risk attitude

JEL codes: F10, D02, L26

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INTRODUCTION

The drivers behind early-stage entrepreneurial firms going international have been a subject of increasing interest in international entrepreneurship (IE) research (Rialp & Knight, 2005; Nadkarni & Barr, 2008). However, relatively few studies of international entrepreneurship have empirically investigated the link between resource factors and the decision of early-stage entrepreneurs to export in particular. Given that much less attention has been paid to the national institutions which could mobilise and enable entrepreneurial resource factors to support the international expansion behaviour, this neglect may have contributed to the inconsistent findings in the relationship between entrepreneurial resource aspects and export. Therefore, this study first examines how entrepreneurial resources determinants in terms of self-efficacy and risk attitude exercise different influences of the extent of export. In addition, it assesses how the relationship between entrepreneurial resource and the degree of export can be modified by varying formal institutions of more than 60 countries.

Wright and Ricks (1994) identified international entrepreneurship and early-stage entrepreneurial firms as the emerging research area trending with greater methodological sophistication in the field of IB research. The early definition of international entrepreneur excluded already established firms and only focused on IB activities of new ventures (McDougall, 1989). The export phenomenon of 'born global' firms has been observed observed and researched recently. For example, 'Innovation, Organizational Capabilities, and the Born Global Firm' by Knight and Cavusgil (2004). They identified born global firms as these new international business organisations that reject the idea of long-term domestic business before export and focuse more on the superior international business performance from the application of entrepreneurial-based resources for international entrepreneurship (Kinghts & Cavusgil, 2004). In the beginning, most of the born global research was focused mostly on the export process of firms but later more resource-based aspect is introduced to recognise the dynamic nature of international entrepreneurship. Fan and Phan (2007) argued that the export of entrepreneurs is affected by cultural and economic factors of the home country alone with other static factors like the size of the firm's home market and by its internal entrepreneurial resource (Fan & Phan, 2007; Liu, 2017).

Baumol (1990) argued that changing institutional environment results in a various level of institutional context and thus resulting in different entrepreneurial activity for each environment. His research was enhanced further when Whitley (1999) identified and linked three aspects of institutional context; the financial system, the skill development and control system and the state, to shape the business environment for a country. The positive relationship between entrepreneurial effort and the country's financial and educational activities is also researched suggesting that institutional characteristics significantly influence the entrepreneurial effort of a country (Głodowska, 2017; Głodowska & Wach, 2017).

The objective of this article is to determine and analyse the export conditions by combining the entrepreneurial resource perspective and formal institutional approach. Drawing on a representative sample of global nascent entrepreneurs, cross-level (random-effects) moderation analysis is applied to explicate the influence of a country's formal institutions on the relationship between entrepreneurial resource-based determinants and the degree of export, and this method enables the study of country-level slopes.

Drawing on existing literature, section two and three briefly establish hypothetical relationships between entrepreneurial resource and the degree of export and deliberate the moderating effect of formal institutions and presents our hypotheses. Section four describes the dataset and the measurement. Section five focuses on the methodology and our approach to testing the hypotheses. Section six presents the results and conclusions.

LITERATURE REVIEW

Entrepreneurial Resource Aspects

Penrose (1959, p. 9) defined a firm as 'a collection of physical and human resources' and pointed to the heterogeneity of these resources. The term 'resource' is conceived widely as 'anything that can be thought of as a strength or a weakness' of the firm. The literature has addressed implicitly many resource issues. Following Penrose (1959), entrepreneurial resource refers to the characteristics of business owners, who are primarily responsible for the growth of the firm (Penrose, 1959; Dobbs & Hamilton, 2007). The relationship between decision-maker characteristics and the degree of export has been a much-researched issue. RBV provides a theoretical framework in which the variable can be anchored. Early research from Miesenbock (1988) argued that the key variable in business export is the decision-maker in a firm. Vatne (1995) presented a model on the export of SMEs in manufacturing activities, suggesting that social networking and an entrepreneur's quality may influence a firm's ability to identify and acquire external resources. Later, O'Farrell, Wood and Zheng (1998) extended the model to incorporate the export of SMEs engaged in business service activities. They asserted that a variety of demand-side factors affect the reasons for foreign market entry, while supply-side factors can influence a business service firm's ability to export. The supply of suitably educated and experienced business owners with a wide variety of entrepreneurial resource can lead to higher proclivity towards the export of firms that have internal competencies to sell specialised and innovative services internationally. Cooper (1994) suggested that the single most important influence upon the ability of an individual is the previous work experience of a founder. According to current research, the central mechanisms of the decision-maker include entrepreneurial self-efficacy and entrepreneurial risk attitude (Chrupała-Pniak, 2017; Dawson & Henley, 2012; Kowalik, 2017; Westhead, 1995). Therefore, we posit:

H1: Self-efficacy impacts export by early-stage entrepreneurial firms in such a way that entrepreneurs with a higher level of self-efficacy are more likely to choose a higher degree of export.

H3: Risk attitude impacts export by early-stage entrepreneurial firms in such a way that entrepreneurs who are more risk-tolerant are more likely to choose a higher degree of export.

Formal Institutions

While internal attributes of firms are important aspects in export, they are affected by national institutions (Zahra, Korri, & Yu, 2005). In particular, scholars have suggested that export behaviour is not only driven by entrepreneurial resource aspects as emphasised by traditional strategy research (Barney, 1991; Porter, 1980); it is also a reflection of the formal constraints of a specific institutional context in which entrepreneurs are embedded (Oliver,

1997; Scott, 1995). Prior research claims that since a business venture generated by an entrepreneur exists and competes in a business environment, an assessment of the relevant institutional context should be part of the decision-making process (Naffziger, 1994). North (1990, p. 3) defined institutions as 'the rules of the game in a society', or more formally, 'institutions are the constraints that shape human interaction'. Dunning and Lundan (2008) argued that export behaviour is enabled or constrained by a multitude of formal institutional forces including elements that both promote and hinder the upgrading of resource aspects. More specifically, the institution-based view contends that formal institutional environments in which a firm operates significantly shape the efficacy of its operations and performance (e.g. Hoskisson, Eden, Lau, & Wright, 2000; Scott, 1995). Buckley, Clegg, Cross, Zheng, Voss and Liu (2007) asserted that consistent and liberal regulatory policies enacted by home country governments can increase the self-efficacy level among business owners and encourage engagement in expansion abroad. Similarly, the study by Chen, Greene and Crick (1998) on business founders and non-business founders suggested that supportive institutions increase the self-efficacy level among business owners, which might further facilitate their international expansion because individuals examine their capabilities more favourably with regards to perceived opportunities, resources, and conditions in the global market. Entrepreneurs' attitudes towards risk are a contextual phenomenon (Fama & French, 1993; Wiseman & Catanach, 1997; Wiseman & Gomez-Meija, 1998). A recent study on risk attitude in psychology pointed that external cues to the risk-taking attitude are contingent on the degree to which they are recognized to affect the probability of business failure (Cacciotti, Hayton, Mitchell, & Giazitzoglu, 2016). Birney, Burdick and Teevan (1999) argued that under the threat of institutional environment characterised by inadequate legal framework the fear of failure is more instrumental for business decision and behaviour. On the other hand, Luo, Xue, and Han (2010) demonstrated that governmental institutional context, such as policies to promote outward foreign direct investment offset the perceived risks of being competitive disadvantages of EMNEs and thus stimulate entrepreneurs to expand into the global market. Likewise, Chen *et al*. (1998) argued that a risk-taking attitude can be derived, modified, and enhanced through variations in the institutional forces, leading to a high intention to export. Thus, this article argues that the influence of entrepreneurial resource factors on export behaviour can be moderated by national institutions.

H3: National formal institutions moderate the relationship between entrepreneur's self-efficacy and the degree of internationalization in that the relationship is stronger when the national institutional conditions are stronger.

H4: National formal institutions moderate the relationship between entrepreneur's risk-attitude and the degree of internationalization in that the relationship is stronger when the national institutional conditions are stronger.

MATERIAL AND METHODS

Sample and Design

The theoretical framework will be tested using a multilevel design in which entrepreneurs (Level 1) are nested within countries (Level 2). The data come from four independent sources. The individual-level data will be collected from the Global Entrepreneurship Monitor-Adult Population Survey (GEM-APS). The data for the country-level variables are taken

from the Global Entrepreneurship Monitor-National Expert Survey (GEM-NES). GEM dataset identifies (1) nascent entrepreneurs (individuals who are active in the process of starting a new firm during the preceding 12 months and with expectations of full or part ownership, but have not launched one yet) and (2) young entrepreneurs (owners-managers of new firms who have survived for 42 months and have paid wages to any employees for more than three months) as early stage entrepreneurs. The final dataset forms a database of 63.794 observations from 64 countries.

Dependent Variable

Although multiple-item measures appear to be reliable, Ramaswamy, Kroeck and Renforth (1996) cautioned that aggregating components may hide the effects of each individual component. This study hence applies a single-item measure of the extent of export as defined by the percentage of sales in foreign countries to the total venture sales from GEM survey data.

Specifically, it identifies the status of export of only nascent or young entrepreneurs by asking all of the identified nascent or young entrepreneurs – 'What proportion of your customers will normally live outside your country?' GEM puts the individual-level responses across five categories. – (0 = No export; 1 = greater than 0 and less than 25; 2 = 25% and less than 50%; 3 = 50% and less than 75% and 4 = 75% and up to 100%). The dependent variable is categorical in nature and presents an evenly distributed range of the percentage of export.

Independent Variables

Individual-Level Predictors

Entrepreneurial resource measures. Entrepreneurial resources refer to the characteristics of business owners, who are primarily responsible for the growth of the firm (Penrose, 1959). According to Urbano, Alvarez and Turro (2013), the central mechanisms in entrepreneurial resources were measured by self-assessments of entrepreneurial ability and entrepreneurial risk attitude. In this study, self-assessments of entrepreneurial ability will be captured dichotomously, generating a binary variable coded 0 for No and 1 for Yes to the question – Do you have the knowledge, skill and experience required to start a new business? Risk attitude is defined as a personality trait concerning willingness to pursue courses of action or decisions under uncertainty regarding success or failure outcomes (Jackson, 1994). It is measured with the statement: 'Would fear of failure prevent you from business activities?' (yes = 1, no = 0).

Country-Level Predictors

National formal institutions. This article uses eight items developed by Bowen and De Clercq (2008) to measure the institutional context at the country level referring to entrepreneurial finance, government policies, governmental programmes, R%D transfer, commercial and services infrastructure, market openness, physical infrastructure, and intellectual property rights. We conducted a principal component analysis, a well-known dimensionality reduction technique, to aggregate these items into an index.

$$I = \sum_i w_i \, p_i \tag{1}$$

where:

$i = 1,2, \ldots ,8.$

If p_i represents the i^{th} principal component, explaining w_i proportion of variation in the data, the index I is calculated as the weighted average of the principal components where the proportion of variation used are the weights. Hence, note that all the components are used to calculate the index, thus capturing 100% of the variation in the data (Krishnakumar & Nagar, 2008). It employed the reliability and validity test of institutional measures (Cronbach's α=0.955).

Control Variables

Given the greater propensity of men towards export compared to women (De Carolis & Saparito, 2006), this study controls for gender (male = 1, female = 2). Empirical evidence also demonstrates a significant relationship between age and export level (Westhead, 1995). It therefore includes age variables to verify this relationship. Other evidence implies that age may have an inverted-U effect on export propensity (Hayton & Cacciotti, 2013). We thus include both respondents' age and age-squared as control variables. To control for industry effects on export, we will construct four industry dummies on the basis of a 1-digit industry classification for extractive industry, transforming industry, business services and consumer-oriented industry. In the analyses, extractive industry will be taken as the reference category.

Common Method Variance

Scholars are cautious and recommend both procedural and statistical methods to minimise the possibility of common variance bias (Podsakoff, MacKenzie, & Lee, 2003). Given that this study relies on the same respondents to obtain cognitive constructs and individual controls, it assesses the potential for common method bias. This study conducted the Harman's one-factor test (Podskoff & Organ, 1986), a technique often adopted by researchers to examine whether common variance bias is a concern. All individual-level variables were entered into an exploratory factor analysis and the results indicated that no single factor emerged, nor was there a general factor that could account for the majority of variance. Therefore, it indicates that common method bias is not a major concern in this study.

Multilevel Ordinal Logistic Model

Because there is a discrete number of values for dependent variables and these values can be rank-ordered, the impacts of covariates on the extent of export will be analysed using an ordinal logit model. Given that this study combines individual-level respondents with national-level measures, the data are analysed using hierarchical modelling methods.

In hierarchical modelling methods, fixed effects deal with individual variables that exert impacts on the dependent variable. In order to predict the effects of country-level characteristics (level 2) on the extent of export, this article will also apply random effects that include unobserved country-specific intercepts and country-specific slopes. This will enable the intercept and slopes to vary randomly across countries in order to model unobserved country-level heterogeneity, and it will also allow for more accurate tests of cross-level interaction effects (Martin, Cullen, Johnson, & Praveen, 2007). The model specification is given as below:

$$\mathrm{Y}_{ij} = \begin{cases} 0 & \text{if } y_{ij}^* \le c_1 \\ 1 & \text{if } c_1 < y_{ij}^* \le c_2 \\ 2 & \text{if } c_2 < y_{ij}^* \le c_3 \\ 3 & \text{if } c_3 < y_{ij}^* \le c_4 \\ 4 & \text{if } c_4 < y_{ij}^* \le c_5 \\ 5 & \text{if } c_5 < y_{ij}^* \end{cases} \tag{2}$$

$$\mathrm{y}_{ij}^* = \beta_{0j} + \beta_{1j}\mathrm{Selfefficacy}_{ij} + \beta_{2j}\mathrm{Risk}_{ij} + \sum_{k=5}^{K}\beta_k\,\mathrm{Individual\ Controls} + \mathrm{e}_{ij}$$

$$\beta_{0j} = \beta_0 + \mathrm{u}_{0j}\,;\ \ \beta_{1j} = \beta_1 + \beta_3\mathrm{Ins}_j + \mathrm{u}_{1j}\,;\ \ \beta_{2j} = \beta_2 + \beta_4\mathrm{Ins}_j + \mathrm{u}_{2j}$$

where:

y_{ij}^* - is the latent dependent variable for respondent i in country j;

β_{1j}, β_{2j} … - are the coefficients for major covariates and control variables.

The measure of institutions (i.e. Institution (IN)) is higher level covariates (country-level), and thus β_1 to β_4 are the coefficients for the cross-level interaction terms. u_{0j}, u_{1j} and u_{2j} are the country-specific effects (random effects) on the varying intercept β_{0j} , and the varying slopes of β_{1j} and β_{2j} respectively. eij represents the residual from the level-1 equation (with group variance).

Integrating the link function and generalised linear model, it can obtain:

$$\mathrm{g}(\mathrm{y}_{ij}^*) = \frac{1}{1+e^{-\left(\mathrm{k_m}-\mathrm{y}_{ij}^*\right)}} - \frac{1}{1+e^{-\left(\mathrm{k_{m-1}}-\mathrm{y}_{ij}^*\right)}} =$$

$$= \frac{1}{1+e^{-(\mathrm{k_m}-\beta_{0j}-\beta_{1j}\mathrm{X}_{ij1}-\cdots-\beta_{1j}\mathrm{X}_{ijk})}} - \frac{1}{1+e^{-(\mathrm{k_{m-1}}-\beta_{1j}\mathrm{X}_{ij1}-\cdots-\beta_{1j}\mathrm{X}_{ijk})}}$$

$$\frac{\partial\left(\mathrm{g}\left(\mathrm{y}_{ij}^*\right)\right)}{\partial \mathrm{X}_1} = \frac{\beta_{1j}e^{-(\mathrm{k_m}-\beta_{0j}-\beta_{1j}\mathrm{X}_{ij1}-\cdots-\beta_{1j}\mathrm{X}_{ijk})}}{\left(1+e^{-(\mathrm{k_m}-\beta_{0j}-\beta_{1j}\mathrm{X}_{ij1}-\cdots-\beta_{1j}\mathrm{X}_{ijk})}\right)^2} - \tag{3}$$

$$-\frac{\beta_{1j}e^{-(\mathrm{k_{m-1}}-\beta_{0j}-\beta_{1j}\mathrm{X}_{ij1}-\cdots-\beta_{1j}\mathrm{X}_{ijk})}}{(1+e^{-(\mathrm{k_{m-1}}-\beta_{0j}-\beta_{1j}\mathrm{X}_{ij1}-\cdots-\beta_{1j}\mathrm{X}_{ijk})})^2}$$

A precondition for running a hierarchical model is that significant between-group variance exists for the dependent variable (Hofmann, Griffin, & Gavin, 2000). Hence, this article conducts a Chi-square test with individual-level export as the dependent variable and country group as the predictor. This test implies significant between-group variance within the data, with $\chi^2(252)$= 3.406 E3 (p<0.000).

A plot of the null random intercept model is also generated in which the vertical axis represents the predicted intercept and the horizontal axis represents the rank of country effect. It will thus illustrate the differences between the countries in terms of the extent of export, with 95% confidence intervals.

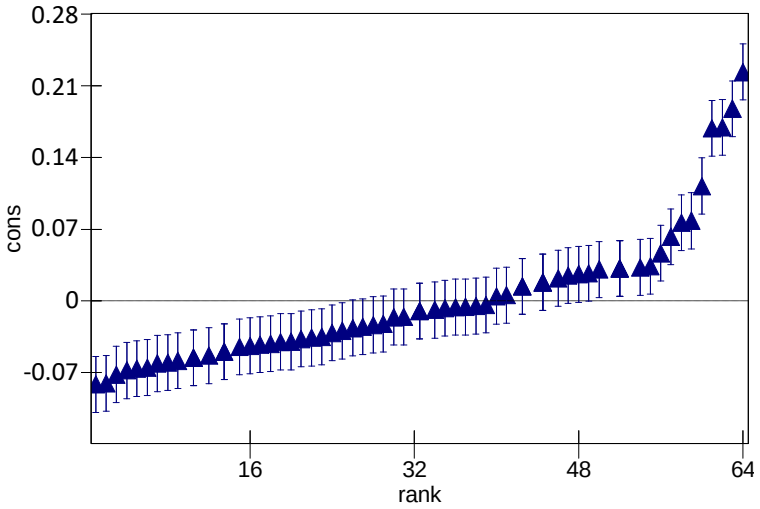

Figure 1. Heterogeneity across countries
Source: own elaboration.

RESULTS AND DISCUSSION

Table 1 in provides the means, standard deviations and pairwise correlation coefficients for the study variables. The correlations of Table 1 showed some variables to be highly correlated. Thus, it also conducted a diagnostic test of multicollinearity [examining the variance inflation factors (VIFs) of all variables in the analyses], and it found that it was not likely to be a problem in this data set.

In Table 2, Model 1 is an intercept-varying and a base model where control variables of age, gender, income, education attainment and industry controls are first entered. The intraclass correlation indicates that 18.6% of the total variance within the data resided between provincial a group, which suggests that the country-level variance is both non-trivial and highly significant. In the next step (Model 2), it tests a random coefficient model (intercept and slope as outcomes model), using level-1 variables as predictors. The analysis shows significant variance in both intercepts and slops across provincial groups. The results also show that self-efficacy is positively and significantly related to the degree of export (p<0.05). Additionally, risk tolerance is found to have a significant positive relation with the probability of choosing higher export category. In particular, comparing with risk tolerant entrepreneurs, the odds ratio of risk-averse entrepreneurs choosing a higher category of export increases by a factor of 1.159. Thus, hypotheses that the entrepreneur's self-efficacy and risk tolerance are positively associated with the degree of export are supported, Model 3 enters formal institutional index as the moderator. A comparison of Model 2 and 3 shows that the provincial-level variance reduces from 0.752 to 0.738, indicating the inclusion of the cross-level interaction terms explains additional country-level variance in the degree of export by early-stage firms.

Table 1. Correlation matrix

Category	Mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Export(1)	1.59	0.81	1.000								
Gender(2)	1.51	0.50	-0.068**	1.000							
Age(3)	39.56	14.64	-0.015*	0.033**	1.000						
Income(4)	2.96	1.58	0.146**	-0.026**	-0.106**	1.000					
Education(5)	3.31	0.50	0.052**	0.043**	0.065**	-0.140	1.000				
Industry(6)	2.06	0.72	0.079**	-0.084**	-0.039**	0.264**	0.137**	1.000			
Self--efficacy(7)	0.52	0.35	0.094**	-0.055**	0.015	0.067**	0.035**	0.078**	1.000		
Risk tolerance (8)	0.41	0.16	0.137**	-0.014	-0.035**	0.080**	0.035**	0.019*	0.021	1.000	
Institutional Index(9)	0.01	0.35	0.169**	-0.017*	0.010	0.117**	0.088**	0.084**	0.034**	0.204**	1.000

Note: ** p<0.01;* p<0.05;
Source: own study.

Table 2. Multilevel logistic regression analysis results

Category		Model 1		Model 2		Model 3	
		Coeffi-cient	S.E.	Coeffi-cient	S.E.	Coeffi-cient	S.E.
Fixed effects							
Control variables							
Age		**-0.012*** **	**(0.001)**	**-0.014*** **	**(0.001)**	**-0.014*** **	**(0.001)**
Gender		**-0.220*** **	**(0.037)**	**-0.128*** **	**(0.037)**	**-0.124** **	**(0.037)**
Household income		**0.223*** **	**(0.027)**	**0.180*** **	**(0.027)**	**0.180*** **	**(0.027)**
Education attainment		**0.093*** **	**(0.015)**	**0.061*** **	**(0.015)**	**0.065*** **	**(0.015)**
Industry controls	Extractive industry						
	Transforming	**0.306*** **	**(0.009)**	**0.287*** **	**(0.010)**	**0.287*** **	**(0.010)**
	Business service	**0.319 *** **	**(0.005)**	**0.298*** **	**(0.005)**	**0.298*** **	**(0.005)**
	Customer oriented	**0.366*** **	**(0.006)**	**0.343*** **	**(0.006)**	**0.342*** **	**(0.006)**
Individual-level predictors							
Self-efficacy				**1.103*** **	**(0.047)**	**1.085*** **	**(0.046)**
Risk attitude				**0.151*** **	**(0.041)**	**0.148*** **	**(0.041)**
Country-level predictors							
Institutional Index						0.188	(0.339)
Cross-level three-way interaction							
Self-efficacy*Formal Institution						**0.469*** **	**(0.125)**
Risk attitude*Formal Institution						**0.313** **	**(0.115)**
Random effects and model fits							
Residual country-level variance		0.752		0.752		0.738	
Number of obs.		63,794		63,794		63,794	
Number of countries		64		64		64	
Log-likelihood		-14082.2		-13757.1		-13744.8	
Akaike Information Criterion		28188.4		27542.3		27523.7	

Note: *** p<0.001 ; ** p<0.01;* p<0.05; + p<0.1
Source: own study.

The results find evidence to support the hypotheses that formal institutions moderate the relationship between self-efficacy and export and the relationship between risk-tolerance and export.

Looking at the control variables in all three models, it finds that gender is consistently a significant factor explaining the likelihood of one choosing higher category of export. More specifically, women are found to be only half as likely to adopt export as men. This is consistent with previous empirical findings (Reynolds, Carter, Gartner, Greene, & Cox, 2002). Household income and education attainment of the new venture have a significant positive relation with export degree. In particular, when the education attainment of entrepreneurs increases by one unit, the degree of export can increase by 9.7% ($p<0.01$) in Model 1, and 6.2% ($p<0.01$) in Model 2 in odds. Similarly, businesses with a higher degree of education can significantly increase the degree of export ($p<0.001$). In which industry the new business is trading also matters. Entrepreneurs in the transforming business and business service industries have much higher likelihood of export than those from the extractive industry (reference category).

Figures 2 and 3 illustrate the two-way interactions between self-efficacy and risk-attitude in explaining the degree of export. These figures confirm the expectation.

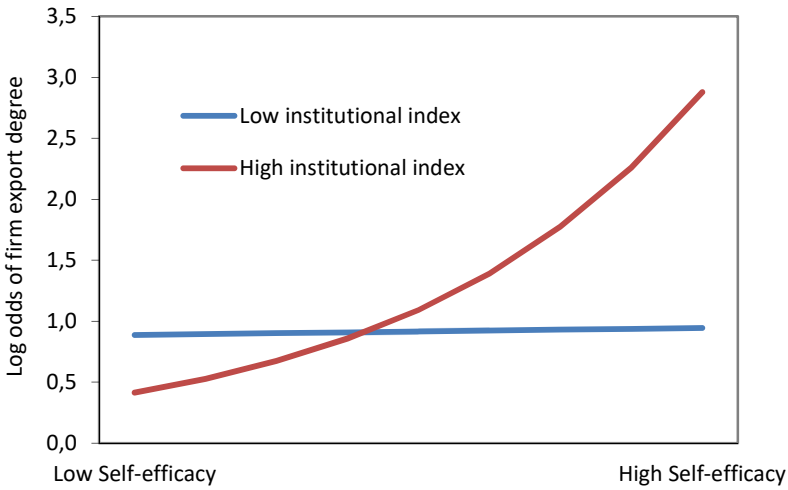

Figure 2. Interaction between self-efficacy and Institutional Index
Source: own elaboration.

Drawing on entrepreneurial resource perspective and formal institutional theory, the results suggest that there is a positive relation between self-efficacy and export and that people who have the willingness to pursue decisions or courses of action associated with uncertainty regarding success or failure outcomes are more likely to export. In addition, research findings also confirm the positive moderating effect of formal institutions on entrepreneurial resource aspects, suggesting that a stronger institutional environment strengthens the positive impact of motivational factors on the degree of export.

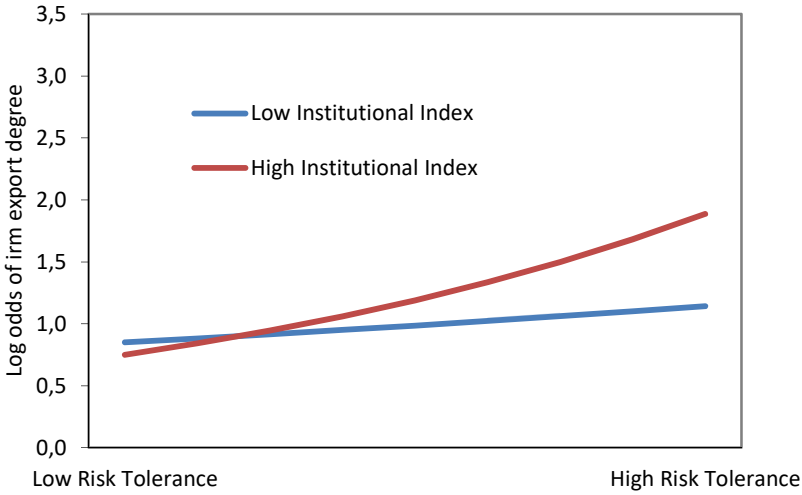

Figure 3. Interaction between risk tolerance and Institutional Index
Source: own elaboration.

CONCLUSIONS

This study adopts a more comprehensive approach in studying export by integrating entrepreneurial resource perspective with the institutional dimensions to consider the direct and indirect effects of motivational factors on export. The findings of the study have implications in particular for policy-makers who are interested in encouraging early export by influencing institutional dimensions. Policymakers have largely concentrated on institutions to increase entrepreneurial opportunities, but institutions may not be sufficient to stimulate international entrepreneurship (Stephan & Uhlaner, 2010). Based on a well-justified aggregated institutional index, it proves the importance of formal institutions to formulate policies and carry them out in the process of reaping the benefits of institutions for the development of export level. The identified moderating effect of institutional system suggests that along with the motivational factors emphasised by the entrepreneurial resource, it is important not to underestimate the role of the institutional system in shaping propensity and intensity of export activity.

The findings of this study should be considered along with its limitations. While the measure of export captures exported sales, they are limited in offering much insight into the other activities that comprise export, and how informal institutions would influence the extent of export. For example, future research might examine the extent of export in terms of foreign production, international sourcing, and geographical dispersion (Sanders & Carpenter, 1998). Moreover, this study is cross-sectional in nature. A longitudinal study is critically needed to fully capture the dynamic moderating effect of institutions. Specifically, different countries may require different institutional structures at different points in time (Holmberg, Rothstein, & Nasiritousi, 2009). The complexities of institutional arrangements across different stages of national development may vary differently. This fundamentally important question cannot be looked at in this study but deserves further investigation in the future.

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Author

Tianchen Li

Lecturer in International Management & Innovation at Middlesex Business School – Middlesex University London (UK). His research focuses on international business, entrepreneurship, innovation.
Correspondence to: Tianchen Li, PhD, Middlesex University, Hendon Campus, The Burroughs, London NW4 4BT, email: t.x.li@mdx.ac.uk

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Export Intensity, Geographic Diversification and the Role of Public Support: The Evidence from Old and New Europe SMEs

Mariola Ciszewska-Mlinarič

ABSTRACT

Objective: The objective of the article is to investigate how public support (both financial and non-financial) affects the geographic scope and export intensity of SMEs originating from Old (EU15) and New Europe (the CEE12 region). In particular, the work considers the direct and indirect effects (via geographic scope) of public support on the export intensity of SMEs.

Research Design & Methods: The empirical analyses use a large, cross-country, cross-industry dataset of 2 375 European SMEs from 27 countries.

Findings: The study findings indicate that only financial public support is positively, directly and indirectly associated with the export intensity of European SMEs, regardless of the origin. The results related to non-financial public support are less conclusive. Additionally, the study reveals that despite significant, firm-level differences characterising internationally oriented SMEs from Old and New Europe, the examined relationships and effects of control variables are largely the same.

Implications & Recommendations: The article offers clear insights into the significance of financial vs. non-financial public support programmes for internationalisation activities of SMEs, encouraging further research to focus on the question which firms should receive public support and how to increase the awareness and propensity of the owners/managers of SMEs to consult public support providers.

Contribution & Value Added: The originality of this work lies in investigating the impact of public support for internationalisation efforts (export intensity and geographic diversification) of SMEs originating from different contexts of the EU15 and CEE12 countries.

Article type: research paper
Keywords: public support; export intensity; geographic diversification; SMEs; CEE
JEL codes: F23

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INTRODUCTION

The role of small and medium sized enterprises (SMEs) for national economies is well recognized. They constitute majority of business entities, create new jobs, and are increasingly involved in international operations. However, in comparison with large firms, SMEs have limited managerial and financial resources, which makes the expansion into foreign markets more risky for them. Therefore, recognizing the role of SMEs for national economies, but also their resource deficiencies, governments and their agencies develop public programmes to support international efforts of SMEs.

Prior research on this topic offers several interesting insights that can be grouped under three main themes. Firstly, given that the awareness of public support programmes among SMEs is relatively low (European Commission, 2010), factors determining both the awareness and the use of such programmes are often examined (Fischer & Reuber, 2003a; Audet & St-Jean, 2007; Audet, Berger-Douce, & St-Jean, 2007; North, Smallbone, & Vickers, 2001). Secondly, a question concerning the effectiveness of public support is often asked (e.g. Liu, Jiang, Zhang, & Zhao, 2013; Bannò, Piscitello, & Varum, 2014; Yoo, Mackenzie, & Jones-Evans, 2012; Alonso-Nuez & Galve-Gorriz, 2012), although it is still not clear what type of support (financial versus non-financial) is of particular significance for SMEs. Thirdly, prior research has also provided some answers to the question which firms should receive support, and what allocation criteria should be used by the providers of public support. There are claims that from the economic point of view, public support programmes should be oriented on high-growth firms, as they are the most promising in terms of creating jobs (Fisher & Reuber, 2003b; Mason & Brown, 2013).

This study contributes to the second stream of research. In the light of often inconclusive, anecdotal, and contradictory evidence on the effectiveness of public support (Yoo *et al.*, 2012), reported by studies that are mostly undertaken within one-country samples, the question concerning the tangible outcomes of such support remains valid. Taking advantage of the broad context of 2 375 European SMEs originating from 27 countries, this study employs linear regression analyses to investigate the relationships between public support (financial and non-financial) and international activities of SMEs in terms of export intensity and geographic scope. Therefore, a key question in this study is: *Does public support enhance SME export intensity and geographic diversification? And what kind of public (financial and non-financial) is beneficial in this respect?*

The article is structured as follows. The first section presents the theoretical background to develop the research hypotheses. Next, methodological details are provided, followed by a presentation of results and analysis. The article concludes with a discussion of the implications and limitations of the findings.

LITERATURE REVIEW

Public Support for SMEs

A logic behind offering public support for internationally oriented SMEs was elegantly summarised by Fischer and Reuber (2003a, p. 69): 'internationalisation is good for small firms, and small firms are good for economies'. By definition, the role of public support is to enhance the performance of new and small firms (Yoo *et al.*, 2012), which means – in the con-

text of internationally oriented firms – to help them successfully enter and build the position on foreign markets. Public support programmes may include free or subsidised services in such areas as: business advice and consulting services, including access to information on foreign markets; training for employees; and financing (subsidies, loans, grants).

With an increase in public support programmes and their budgets, one of the most important research questions is whether public support pays off, helping the assisted firms to develop and making a good use of taxpayers' money. Indeed, the resulting answers are often contradictory (Yoo *et al.*, 2012). On the one hand, there is evidence that the use of public support enhances firm performance. For instance, Sarder, Ghosh and Rosa (1997) observed that firms using support services achieved higher performance (in terms of growth in sales, employment, and productivity) than their peers without support. More recently, Liu *et al.* (2013) observed that high level of domestic institutional effort exerted a positive moderating effect on the relationship between strategic flexibility and international venturing of Chinese firms. Also Bannò *et al.* (2014) investigated the impact of financial public support on outward FDI of Italian SMEs and found it to be beneficial for such performance indicators as domestic turnover and productivity growth.

On the other hand, there is also strong evidence that public support brings no gains or might be wrongly targeted. Ramsden and Bennet (2005) assessed the role of external business advice on 'soft' outcomes (improved ability to manage, ability to cope) and 'hard' outcomes (profitability, turnover, reduced costs) on satisfaction levels. They observed, however, that high level of owners/managers satisfaction from the advice was not necessarily associated with its specific 'hard' impact; they explained this phenomenon in terms of reassurance, which – in their opinion – was equally (if not more) important as specific 'hard' or 'soft' outcomes. Also Norman and Bager-Sjorgen (2006) found no significant effect of a financial support programme on the financial performance of new ventures. Examining the effectiveness of public support for technology-based SMEs, Yoo *et al.* (2012, p. 101) found that 'high performing firms benefited less from the public support services than low performers'. Finally, Alonso-Nuez and Galve-Gorriz (2012) found that public programmes that supported the creation of companies in Spain did not result either in higher survival rate or in higher net income among companies that received subsidy in comparison with those without such support. Similarly, in the context of Argentinian microenterprises, Berrone, Gertel, Giuliodori, Bernard and Meiners (2014) noticed that public policy may have a pro-poor character, as public support is directed to enterprises arising from unemployment, and these enterprises 'proved to be less successful in relation to the microenterprises' performance' (2014, p. 496).

These contradictory results may be explained by different methodologies, dependent variables, operationalisation of public support, and various contexts (country and sector differences). Taking advantage of cross-country, cross-industry dataset, we examine the role of public support for the internationalisation of SMEs. Recognizing that prior research offers mixed findings, in our theorising we follow the arguments highlighting the positive outcomes of public support for internationally oriented SMEs. As small firms suffer from resource deficiencies, including managerial and financial resources, the use of public support should help them to: gain information about foreign markets, including potential partners, buyers, distributors, suppliers, foreign law regulations, quality requirements; develop useful ties; leverage international opportunities; lower perceived risks; increase propensity to internationalise; and finally enhance internationalisation in-

tensity and geographical scope. Bannò *et al.* (2014) argue that financial support helps SMEs invest in foreign markets as it lowers one of the most significant barriers related to the lack of capital, but additionally they point out that financial support may be easily converted into other kinds of needed resources. Building on prior research (Kuivalainen, Puumalainen, Sintonen, & Kyläheiko, 2010; Wiklund & Shepherd, 2003; see also Yiu, Lau, & Bruton, 2007; Wach, 2012; Bruton, Lau, & Obloj, 2014), Bannò *et al.* (2014, p.24) indicate that: 'Improved internal organizational capabilities, especially financial, managerial, marketing, and technical capabilities, enhance firms' performance in a context of internationalization', and 'obtaining sufficient financing serves as a cushion against unforeseen setbacks' (2014, p. 25). Additionally, these authors mention that cooperation with a subsidising agency may result in organisational learning and eventually in 'an adjustment of management processes' (2014, p. 25).

In a similar vein, but in the context of export-oriented SMEs, this article builds on resource-based view (RBV), proposing that public support, both financial and non-financial, will have beneficial effects on SMEs' competencies (as it should enlarge the available resource pool), and in consequence help them to overcome the liability of foreignness (Zaheer, 1995; Johanson & Vahlne, 2009), liability of smallness (Kale & Arditi, 1998; Aldrich & Auster, 1986), liability of outsidership (Johanson & Vahlne, 2009), and/or liability of newness (Aldrich & Auster, 1986; Kale & Arditi, 1998). Following that logic, it is expected that public support will exert a positive impact upon international activities of SMEs, in particular export intensity and geographic scope:

H1: Public support (both financial and non-financial) positively impacts a degree of SME internationalisation (export intensity), regardless of the origin of SMEs.

H2: Public support (both financial and non-financial) positively impacts geographic diversification of SMEs, regardless of the origin of SMEs.

It is also argued that public support may have not only a direct effect (as predicted in H1) but also an indirect effect on export intensity, via geographic diversification. This notion is based on the assumption that firms using public support can expect to achieve higher intensity of exports by relying on more geographically diverse strategies. It should be noted, however, that geographic diversification increases the complexity of firms' operations. Indeed, prior research suggests that up to a point it is beneficial for performance, but at high levels geographic diversification may be associated with lower performance gains. In short, the relationship between diversification and performance may take the inverted U-shape (Driffield, Du, & Girma, 2008; Capar & Kotabe, 2003).

On the one hand, as summarised by Driffield *et al.* (2008), there are several reasons why increased geographic scope should lead to better performance. Those relevant also for smaller firms that operate in foreign markets through exporting include: (i) better access to technological knowledge and foreign product innovation; (ii) wider international networks and management structure to meet domestic competition; (iii) benefits from economies of scale and scope; (iv) dampening the impact of domestic business fluctuations by using foreign market outlets (Driffield *et al.*, 2008, pp. 145-146). It is also argued that a broader scope of export/destination markets allows SMEs to spread the risk (Dejo-Oricain & Ramírez-Alesón, 2009), particularly when markets are not perfectly interdependent in economic terms. Diversification of markets may

also trigger new opportunities to learn, and leverage knowledge/resources in a higher number of markets, leading to the growth of export sales.

On the other hand, the complexity that has to be faced by SMEs results from broader geographic scope, and differences in technology and culture existing between export markets (Zahra, Ireland, & Hitt, 2000). Prior studies offer several explanations as to why international expansion might not always bring performance gains. Summarising such arguments in the context of multinational companies from developed markets, Driffield *et al.* (2008, p. 146) point to: bounded rationality that lowers managers' capacity to face greater complexity, which in turn has negative impact on performance (Grant, 1987); and performance decline that may result from spreading managerial capabilities and coordination problems (Hitt, Hoskisson, & Kim, 1997).

Analysing the sample of emerging market firms, Nachum (2004, p. 290) found a strong association between geographical diversification and firm performance, suggesting that 'This route to growth, which until recently has been less developed by most developing country firms relative to the extent of their industrial diversification, is likely to prove rewarding'. In the context of developed market firms – British multinationals, Driffield *et al.* (2008) observed a strong non-linear relationship between performance and multinationality (defined by the number of markets).

To sum up, it is argued that public support enhances geographic scope, and broader geographic scope may in turn allow SMEs to spread risk and provide new learning and business opportunities, exerting a positive (but inverted U-shape) impact on export intensity. In other words, the geographic diversification will mediate the relationship between the usage of public support by SMEs and their export intensity (degree of internationalisation), thus:

H3: The scope of geographic diversification mediates the relationship between public support and degree of the internationalisation of SMEs, regardless of theorigin of SMEs.

The hypothesised relationships are presented in Figure 1.

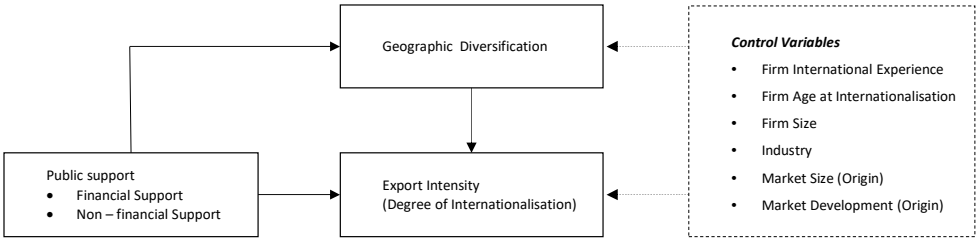

Figure 1. Conceptual model
Source: own elaboration.

MATERIAL AND METHODS

Data and Sample

This study uses the database of European SMEs originating from 33 countries, the 27 EU states plus Croatia,[1] Iceland, Lichtenstein, Macedonia, Norway and Turkey. As SMEs firms

[1] At the time of the survey Croatia, now the EU member, was a candidate for accession.

with between 1 and 249 employees were classified. The creation of the database was sponsored by the European Commission, within the scope of the research project *Internationalisation of European SMEs*, (European Commission, DG Enterprise and Industry, 2010). Directorate General for Enterprise and Industry of the European Commission commissioned the project, and Dutch EIM Business & Policy Research implemented it. In the spring of 2009, 9 480 SME owners or managers (key decision makers) were interviewed on their firms' international involvement (including, for example, propensity, intensity, and scope of foreign expansion). This database was also used in other studies, for instance by Hernández and Nieto (2015), to perform their analyses on the relationship between institutional distance and entry mode decisions.

Considering the objectives of this study (the role of public support targeted at internationally oriented SMEs for their international activities/performance), it focuses only on SMEs that reported to have been active exporters between 2006 and 2008, so the number of relevant cases was 3 669 SMEs (38.7% of the original 9 480 records). Then, SMEs from countries other than the EU15 or CEE12, thus those originating from Cyprus, Iceland, Malta, Liechtenstein, Norway and Turkey, were not included in the sample. Finally, the sample was further reduced by dropping all firm-records, in case of missing or unreliable values for such variables as export intensity (degree of internationalisation), the scope of geographic diversification, and time to internationalise. This reduced the total number of SMEs to 2 375. The size (in terms of the number of firms) and the scope (in terms of number of countries) covered by the database support the generalisability of the study results to different contexts.

The sample was next divided into two subsamples; the first one including 1 368 SMEs from the EU15 countries (Old Europe), and the second one – 1 007 SMEs from the CEE12 countries (New Europe). The EU15 sample comprises firms from 15 member countries in the European Union prior to the enlargement of the EU on 1st of May 2004, including the following ones: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

The term Central and Eastern Europe (CEE) or Central and Eastern European Countries (CEECs), denoting former communist states in Europe, was popularised in scholarly writings after the collapse of the Iron Curtain in 1989, but its roots can be traced to Winston Churchill's speech (1946). The CEE12 sample comprises firms from 12 countries belonging to the group of Central and Eastern Europe, which is defined by the former and shared communist past (OECD, 2007), including: former Eastern Bloc countries (Bulgaria, Czech Republic, Hungary, Poland, Romania and Slovakia); three Baltic countries, prior republics of the Soviet Union (Estonia, Latvia, and Lithuania); and several states of former Yugoslavia (Croatia, FYR Macedonia, Slovenia).[2] This list of the CEE countries is congruent with the OECD (2007) definition with two exceptions. Firstly, OECD includes also Albania; but due to the fact that the original survey was not conducted in Albania, there are no Albanian SMEs in the sample. Secondly, although not listed by OECD (2007), FYR Macedonia is also counted as one of the CEE countries due to the fact that it is one of former Yugoslavia states, and at present one of candidate countries, on the way to the EU membership. Among the CEE12 countries in the sample, as of the beginning of 2009, 10 of them already joined the EU in two waves of

[2] Other states of former Yugoslavia include: Bosnia-Herzegovina, Kosovo, Montenegro, Serbia.

accession (in 2004, and 2007).[3] The exact number of SMEs originating from each country is presented in Table 1, and the comparison of Old and New Europe samples across the key variables – in Table 2. As the samples are of different size, a non-parametric Mann-Whitney U test for independent samples was applied. Null hypothesis, that states that the distribution of the 'variable' is the same across groups, is rejected in case of all variables. In other words, the EU15 SMEs in comparison with the CEE12 SMEs are different in terms of: export intensity, geographic diversification, time to internationalisation, international experience, age and size. These findings are further discussed in the concluding section.

Table 1. The list of countries and the number of SMEs in the EU15 and CEE12 samples

SMEs originating from EU15 countries		*SMEs originating from CEE12 countries*	
Austria	64	Bulgaria	89
Belgium	68	Croatia	65
Denmark	68	Czech Republic	82
Finland	50	Estonia	105
France	111	Hungary	57
Germany	125	Latvia	80
Greece	76	Lithuania	89
Ireland	43	Macedonia	74
Italy	151	Poland	174
Luxembourg	45	Romania	57
Netherlands	115	Slovakia	71
Portugal	62	Slovenia	64
Spain	171	–	–
Sweden	76		
United Kingdom	143		
Total	1 368	Total	1 007

Source: own study.

Measures

Dependent Variables. Export Intensity and Geographic diversification. Export intensity, or degree of internationalisation, is one of the commonly employed operationalisations of firm international performance or international activities (Javalgi & Grossman, 2014; Gashi, Hashi, & Pugh, 2014; Nummela, Saarenketo, & Puumalainen, 2004; Kyvik, Saris, Bonet, & Felício, 2013; Rodríguez & Nieto, 2012; Reuber & Fischer, 1997; Ruigrok, Amann, & Wagner, 2007). According to Katsikeas, Leonidou and Morgan's (2000) review of export performance measures, export intensity measured as a foreign-sales-to-total-sales ratio (FSTS) is the most popular performance indicator, used in 61% of studies selected for the review. Although export performance measures based on sales were criticised as they 'can be affected by factors other than better exporting operations' (Katsikeas *et al.*, 2000, p. 498), Sousa (2004) indicates that it is still appropriate to use FSTS ratio to evaluate the export performance of SMEs. Taking into consideration the sample size and the available data, in this study export intensity is operationalised in a typical way, as the share of foreign

[3] Except for Croatia, which joined the EU in 2013, and Macedonia, which has been a candidate for accession since 2005.

sales in total sales, with values ranging from 0.01 to 1.00 in both samples. All respondents were asked to indicate the share of exports in total turnover for the enterprise in 2008.

Table 2. Comparison of samples: descriptive and non-parametric tests

Variables	*Group*	*Mean*	*S.D.*	*Mean Rank*	*Sum of Ranks*	*Mann-Whitney U*	*Z*	*Asymp. Sig. (2-tailed)*
Degree of Internationalisation	EU15	0.29	0.29	1160.40	1587426.0	651030.0	-2.29	0.02
	CEE12	0.32	0.32	1225.50	1234074.0			
Geographic Diversification	EU15	3.56	3.22	1307.41	1788537.0	525435.0	-10.21	0.00
	CEE12	2.27	1.82	1025.78	1032963.0			
Firm Age at Internationalisation (years)	EU15	13.56	8.62	1288.23	1762294.0	551678.0	-8.41	0.00
	CEE12	6.05	9.71	1051.84	1059206.0			
Firm International Experience (years)	EU15	19.93	16.43	1383.75	1892964.5	421007.5	-16.23	0.00
	CEE12	10.45	7.95	922.08	928535.5			
Firm Age (years)	EU15	33.37	24.20	1444.42	1975971.0	338001.0	-21.25	0.00
	CEE12	16.41	12.16	839.65	845529.0			
Firm Size (no. of employees)	EU15	51.35	58.59	1150.01	1573214.5	636818.5	-3.15	0.00
	CEE12	56.89	59.71	1239.61	1248285.5			

Source: own study.

Geographic diversification of export markets. There are several operationalisations of geographic diversification, but those most popular include (Cieslik, Kaciak, & Welsh, 2012): the number of foreign markets where a firm exports (Driffield *et al.*, 2008, Wheeler, Ibeh, & Dimitratos, 2008); operationalisations based on regions, for example, concentration on the home region versus the host region; or indicators based on export sales, such as concentration of export sales on one key market (Nachum, 2004). Following the arguments put forward by Cieslik *et al.* (2012, p. 77) that 'there is also a growing interest in incorporating the regional dispersion of international sales of SMEs into the analysis', in this article we focus on regions instead of individual markets. Thus, the geographic diversification of the export strategy SMEs was measured as a continuous variable (range 1-15), representing the number of geographic regions where the firm exports. All the firms were asked to indicate whether they have or do not have exports to the following regions, coded respectively as '1' or '0': (1) cross border regions; (2) other European Union; (3) Russia; (4) other European countries; (5) Middle East; (6) North Africa; (7) Other Africa; (8) Japan; (9) China; (10) India; (11) other Asia; (12) North America; (13) Brazil; (14) other South and Central America; (15) Australia/New Zealand. After summing up all answers, the value '1' indicates that a firm exports only to one foreign region, and '15' – to all fifteen regions. In order to examine the non-linear (inverted U-shape) relationship between geographic diversification and export intensity, the index of geographical diversification is also squared. As explained by Driffield *et al.* (2008, p. 147), the quadratic specification allows the rate at which export intensity increases to vary with the degree of geographical diversification. In other words, the initially positive impact of diversification on export intensity may start to diminish once it has reached a critical level.

Independent Variable. Public Support. Similarly to Fischer and Reuber's (2003) approach, the use of public support programmes for internationalisation was operationalised according to the respondents' answers to the questions whether or not they used such support programmes, and if they did,- what kind, financial or non-financial, the support was. In order to operationalise the public support for internationally oriented firms, SMEs in both samples (EU15 and CEE12) were grouped into three categories representing different situations considering the usage of public support for internationalisation between 2006-2008: (i) firms that did not use any public support for internationalisation ('No support' coded as '1', otherwise '0'), (ii) firms that used only non-financial support, such as counselling, information, etc. ('Non-financial support' coded as '1', otherwise '0'), and (iii) firms that used financial support, for instance subsidies, guarantees, tax incentives ('Financial support' coded as '1', otherwise '0'). Thus, there are three dummy variables. A similar approach was also adapted by Bannò *et al.* (2014) to operationalise public support for the outward FDI of SMEs. In the regression analyses, the variable depicting firms that did not use any public support ('No support') is not included in the models, as it represents a reference level for the interpretation of the results for two other binary variables ('Non-financial support' and 'Financial support').

In the EU15 sample, only 9.14% (125 firms) used public support, including 2.27% (31 firms) that used only non-financial support, and 6.87% (94 firms) that used financial support. Among SMEs originating from the CEE region, only 7.84% (79 firms) used public support, including 1.19% (12 firms) that used only non-financial, and 6.65% (67 firms) that used financial programmes.

Control variables. The study employs several control variables that were previously found significant in explaining either export geographical diversification and/or export intensity. Firstly, the firm international experience is argued to be of great importance in explaining the firms' export behaviour (Dejo-Oricain & Ramírez-Alesón, 2009; Erramilli, 1991). For example, it has been hypothesised that it may lead to the development of: ties with foreign partners, such as customers, suppliers and other business partners (Johanson & Vahlne, 2003); foreign market knowledge accumulation (Musteen & Datta, 2011), and thus enhance firms' international operations in terms of export intensity or/and scope. It was captured by the number of years a firm has sales in foreign markets. Secondly, we also control for a time to internationalisation (firm age at internationalisation). It is measured with the number of years the firm had when incurring first international sales. Recent studies have pointed to the 'learning advantage of newness' phenomenon (Autio, Sapienza, & Almeida, 2000; Sapienza, Autio, George, & Zahra, 2006; Sapienza, De Clercq, & Sandberg, 2005; Zhou, 2007). It is based on the assumption that young firms that decide to expand into foreign markets early in their life cycle, in comparison with older peers, are likely to possess higher capacity in terms of the assimilation of new foreign market information, recognition of opportunities and rapidly acting on them. Zhou (2007, p. 285) summarises prior research (especially Sapienza *et al.*, 2005), arguing that 'early internationalizing firms tend to possess fewer deeply embedded routines, face fewer inertial constraints, and thus are in a forward-looking position to explore new opportunities in international markets'. In line with prior research (e.g., Cieślik & Kaciak, 2009), time to internationalisation was operationalised by the number of years that passed since the firm founding and its first foreign sales. Third, the firm size is measured with the natural logarithm of

the number of employees. Although Bonaccorsi (1992) has found that the firm size is positively associated with export propensity, but no with intensity, the variable is still recognized as important. For instance, Hall and Tú (2004) indicate that (sunk) internationalisation costs, resulting for instance from market search, business negotiations, or accommodation to foreign regulations, may be too high for SMEs. Bannò *et al.* (2014) observed that the positive effect of public incentives on performance was stronger in the case of smaller and younger firms. Also Williams (2011) found that firm size was associated with its internationalisation. Fourth, industry was operationalised with dummy variables. The industries were divided into manufacturing (Industry 1), construction (Industry 2), wholesale (Industry 3), retail (Industry 4), transport and communication (Industry 5), business services (Industry 6), and personal services (Industry 7). In the analytical section of this article, the binary variable for manufacturing (Industry 1) is not included in the regression models as it represents a reference level for other industry variables. In both samples, majority of SMEs operate in manufacturing industry, respectively 43.5% (595 firms) in the EU15 sample, and 43.4% (437 firms) in the CEE12 sample.

Finally, the controls of the origin market size and market development are also included in the study. In line with a conventional theorising, it is argued that firms from smaller markets are more likely to be involved in international activities, achieving higher degrees of internationalisation as their domestic options might be limited, as small domestic market cannot support much growth (Reuber & Fischer, 1997; Ciszewska-Mlinarič & Mlinarič, 2010). Both the market size and the market development of the origin (that is domestic country), are measured respectively with the natural logarithm of the population size, and with the natural logarithm of the 2008 GDP per capita of the country. The data about the market size and development were collected from the UNCTAD STAT database.

Correlations and descriptive statistics for all variables in both samples are shown in Tables 3 and 4.

Methods of Analyses

The impact of public support for international activities of SMEs from Old and New Europe was examined according to the conceptual model (Figure 1). To test the significance of key independent variables (that is financial and non-financial public support) for dependent variables (that is export intensity and geographic diversification), a hierarchical regression approach was employed, separately in the EU15 and CEE12 samples. To test for the mediation effect of the geographic scope on the relationship between public support and export intensity, the study follows Baron and Kenny's (1986) approach that was adapted in a numerous studies (for example, Reuber & Fischer, 1997; Lee & Park, 2006; Rodríguez & Nieto, 2012). Additionally, the alternative framework of Cohen and Cohen (1983), based on Sobel and Aroian tests, is applied to check mediation.

To check for multicollinearity, the variance inflation factors (VIF) were calculated for all the variables in key models in both samples, and reported respectively in Table 3 and 4. The highest of average VIF was 1.57 and 1.22, respectively in the EU15 and CEE12 samples. Moreover, the VIFs for all the variables in both samples were below 1.60, which is substantially lower than the recommended cut-off, indicating that multicollinearity should not be a problem (Neter, Kutner, Nachtsheim, & Wasserman, 1996).

RESULTS AND DISCUSSION

Hypothesis 1 predicts that the use of public support (both financial and non-financial) positively impacts a degree of the internationalisation of SMEs regardless of the origin. In order to test H1, we employ a hierarchical regression analysis, entering the predictors in a theory-driven order and assessing the incremental 'change in R-squared. In other words, we compare the explanatory power of the baseline model, which examines only the effects of control variables, with the full model which includes independent variables, that is financial and non-financial public support. Two sets of regression models that are necessary to examine the mediation effect in both samples are presented in Table 5 (the EU15 sample) and Table 6 (the CEE12 sample). The baseline and the full models in both samples are significant at $p<0.001$ (see Model 0 and Model 1 in Table 5 and Table 6).

In the case of the EU15 sample, the inclusion of public support variables increases the explanatory power of Model 1 in a statistically significant way (captured by the change in R-squared), although the effect is rather small (Model 1 in Table 5: change in R-squared =0.011; F-change=9.281, $p<0.001$). Considering the direct effect of public support variables on export intensity, we found that financial support is positively associated with export intensity, supporting H1 ($p<0.01$). However, contrary to the expectations, the use of non-financial support is actually significantly ($p<0.1$) but negatively related to export intensity. This finding is further addressed in the discussion section. In the CEE12 sample, the inclusion of both public support variables does not significantly increase the explanatory power of Model 1 (Model 1 in Table 6: change in R-squared=0.003; F-change = 1.907, $p = 0.149$). Only one of public support variables – financial support - occurred to be a significant ($p = 0.060$) predictor of export intensity. Therefore, our results provide partial support for H1 in both samples: regardless of the SME origin, the use of financial support programmes increases the likelihood of achieving higher level of export intensity.

In Hypothesis 2 it is argued that there is a positive relationship between public support (both financial and non-financial) and the scope of geographic diversification. As before, H2 is tested with hierarchical regressions, based on comparison of baseline Model A and full Model B, presented in Table 5 and Table 6. All models in both samples are statistically significant at $p<0.001$.

In the case of SMEs originating from the EU15 countries, the inclusion of public support variables increases the explanatory power of Model B (Model B in Table 5: change in R-squared = 0.019; F-change = 15.669, $p<0.001$). According to the results, the use of financial support is positively and significantly ($p<0.001$) associated with the broader scope of geographical diversification of exports, supporting H2. However, the effect of non-financial support is not supported for Old Europe SMEs. Considering the second sample of SMEs from the CEE12 countries, both types of public support (that is financial and non-financial) occurred to be positively and significantly ($p<0.05$) related to the geographic diversification. Therefore, H2 is supported in the CEE12 sample.

Finally, to test whether the geographic scope mediates the relationship between public support and export intensity (H3), the study follows Baron and Kenny's (1986) approach. This approach states that four conditions must hold to support the existence of the mediation (Baron & Kenny, 1986). Firstly, the independent variable (here, public support) must affect the mediator (here, geographic scope). As already discussed (see analysis on

Table 3. Correlations, Descriptives and Collinearity Statistics in EU15 Sample (N=1368)

Factor	1	2	3	4	5	6	7	8	9	Mean	SD	VIF[a]	VIF[b]
1 Degree of Internationalization	1									0.29	0.29		
2 Geographic Diversification	0.46**	1								3.56	3.22		1.19
3 No Public Support	-0.08**	-0.16**	1							0.91	0.29		
4 Public Financial Support	0.12**	0.16**	-0.86**	1						0.07	0.25	1.03	1.05
5 Public Non-financial Support	-0.04	0.03	-0.48**	-0.04	1					0.02	0.15	1.01	1.01
6 Firm Age at Internationalization	-0.19**	-0.04	0.00	0.00	0.00	1				13.56	18.62	1.07	1.08
7 Firm International Experience	0.27**	0.26**	-0.02	0.02	0.00	-0.05*	1			19.93	16.43	1.10	1.15
8 Firm Size	0.07**	0.23**	-0.11**	0.11**	0.03	0.19**	0.19**	1		3.17	1.38	1.15	1.19
9 Market Size (Origin)	-0.08**	0.11**	0.02	-0.03	0.02	0.08**	-0.06*	0.08**	1	9.99	1.20	1.52	1.55
10 Market Development (Origin)	0.06*	-0.03	0.06**	-0.04†	-0.04	-0.01	0.11**	-0.14**	-0.57**	10.70	0.28	1.56	1.57

Note: Correlation is significant: **at the 0.01 level (2-tailed); *at the 0.05 level (2-tailed); †at the 0.10 level (2-tailed). [a]*Refers to Model B in Table 5;* [b]refers to *Model 2 in Table 5.*
Source: own study.

Table 4. Correlations, Descriptives and Collinearity Statistics in CEE12 Sample (N=1007)

Factor	1	2	3	4	5	6	7	8	9	Mean	SD	VIF[a]	VIF[b]
1 Degree of Internationalization	1									0.32	0.32		
2 Geographic Diversification	0.29**	1								2.27	1.82		1.11
3 No Public Support	-0.08**	-0.10**	1							0.92	0.27		
4 Public Financial Support	0.07*	0.08*	-0.92**	1						0.07	0.25	1.02	1.03
5 Public Non-financial Support	0.03	0.07*	-0.38**	-0.03	1					0.01	0.11	1.01	1.02
6 Firm Age at Internationalization	-0.12**	-0.03	0.01	0.00	-0.03	1				6.05	9.71	1.04	1.04
7 Firm International Experience	0.23**	0.19**	-0.01	0.00	0.02	-0.07*	1			10.45	7.95	1.07	1.10
8 Firm Size	0.18**	0.14**	-0.10**	0.11**	-0.01	0.11**	0.18**	1		3.36	1.31	1.13	1.14
9 Market Size (Origin)	-0.12**	-0.08*	-0.01	0.03	-0.04	0.08*	0.05	0.07*	1	8.71	1.12	1.03	1.04
10 Market Development (Origin)	0.01	0.09**	-0.01	0.03	-0.04	0.03	0.12**	-0.01	-0.09**	9.53	0.44	1.05	1.05

Note: Correlation is significant: **at the 0.01 level (2-tailed); *at the 0.05 level (2-tailed); †at the 0.10 level (2-tailed). a Refers to Model B in Table 6; b refers to Model 2 in Table 6.
Source: own study.

Table 5. Linear Regression Results in EU15 Sample (N=1368)

Dependent / Independent	Geographic diversification		Export Intensity (Degree of Internationalization)				
	Model A	*Model B*	*Model 0*	*Model 1*	*Model 2*	*Model 3*	*Model 4*
Public Financial Support (PFS)	n/a	0.14*** (5.57)	n/a	0.10*** (3.78)	0.04† (1.66)	0.03 (1.07)	0.01 (0.27)
Public Non-financial Support	n/a	0.02 (0.84)	n/a	-0.05† (-1.86)	-0.06* (-2.40)	-0.06* (-2.41)	-0.06* (-2.40)
Geographic Diversification	n/a	n/a	n/a	n/a	0.40*** (16.17)	0.70*** (8.89)	0.71*** (8.93)
Geographic Diversification^2	n/a	n/a	n/a	n/a	n/a	-0.32*** (-4.05)	-0.31*** (-4.00)
Time to Internationalisation (Firm Age at Internationalisation)	-0.08** (-3.08)	-0.08** (-3.00)	-0.19*** (-7.43)	-0.19*** (-7.43)	-0.16*** (-6.77)	-0.16*** (-6.82)	-0.10* (-2.27)
Firm International Experience	0.21*** (7.98)	0.21*** (8.07)	0.23*** (8.62)	0.22*** (8.66)	0.14*** (5.78)	0.14*** (5.81)	0.27*** (5.18)
Firm Size	0.20*** (7.38)	0.18*** (6.86)	0.06* (2.16)	0.05† (1.84)	-0.02 (-0.99)	-0.03 (-1.09)	-0.10† (-1.75)
Market Size (Origin)	0.15*** (4.80)	0.16*** (5.25)	-0.05† (-1.66)	-0.04 (-1.40)	-0.11*** (-3.79)	-0.11*** (-4.06)	-0.12*** (-4.10)
Market Development (Origin)	0.07* (2.10)	0.08* (2.50)	0.02 (0.51)	0.02 (0.70)	-0.01 (-0.33)	-0.01 (-0.49)	-0.01 (-0.45)
Industry 2	-0.04 (-1.50)	-0.03 (-1.22)	-0.09** (-3.44)	-0.08** (-3.30)	-0.07** (-3.06)	-0.07** (-2.97)	-0.07** (-3.03)
Industry 3	-0.08** (-3.12)	-0.08** (-2.87)	-0.14*** (-5.30)	-0.14*** (-5.22)	-0.11*** (-4.43)	-0.11*** (-4.45)	-0.11*** (-4.46)
Industry 4	-0.11*** (-4.06)	-0.10*** (-3.71)	-0.17*** (-6.36)	-0.17*** (-6.29)	-0.13*** (-5.21)	-0.12*** (-5.11)	-0.12*** (-5.15)
Industry 5	0.00 (0.14)	0.01 (0.20)	0.06* (2.32)	0.06** (2.44)	0.06* (2.58)	0.06** (2.75)	0.06** (2.74)
Industry 6	-0.02 (-0.79)	-0.02 (-0.73)	-0.08** (-3.02)	-0.08** (-3.05)	-0.08** (-3.01)	-0.07** (-2.88)	-0.07** (-2.82)
Industry 7	0.03 (1.03)	0.03 (1.19)	-0.01 (-0.45)	-0.01 (-0.46)	-0.02 (-1.03)	-0.02 (-0.88)	-0.02 (-0.96)
PFS x Time to Internationalisa-tion	n/a	n/a	n/a	n/a	n/a	n/a	0.08† (1.75)
PFS x Firm International experience	n/a	n/a	n/a	n/a	n/a	n/a	0.15** (2.84)
PFS x Firm Size	n/a	n/a	n/a	n/a	n/a	n/a	-0.08 (-1.40)
Model summary							
R-squared	0.139	0.158	0.159	0.170	0.305	0.313	0.319
Adjusted *R-squared*	0.132	0.150	0.152	0.162	0.297	0.305	0.310
F	19.875***	19.592***	23.308***	21.391***	42.350***	41.066***	35.041***
Change in *R-squared*		0.019		0.011	0.134	0.008	0.006
F-change		15.669***		9.281***	261.351***	16.361***	3.688*

Note: Cell entries are standardized regression coefficients; t-statistics shown in parentheses.
†p<0.10; *p<0.05; **p<0.01; ***p<0.001
Source: own study.

Table 6. Linear Regression Results in CEE12 Sample (N=1007)

Dependent / Independent	Geographic Diversification		Export Intensity (Degree of Internationalization)				
	Model A	*Model B*	*Model 0*	*Model 1*	*Model 2*	*Model 3*	*Model 4*
Public Financial Support	n/a	0.08* (2.46)	n/a	0.06† (1.88)	0.04 (1.38)	0.04 (1.35)	0.10* (2.19)
Public Non-financial Support	n/a	0.07* (2.32)	n/a	0.02 (0.57)	0.00 (0.07)	0.00 (0.12)	0.00 (0.13)
Geographic Diversification	n/a	n/a	n/a	n/a	0.21*** (6.95)	0.37*** (5.04)	0.38*** (5.05)
Geographic Diversification^2	n/a	n/a	n/a	n/a	n/a	-0.18* (-2.47)	-0.18* (-2.50)
Time to Internationalisation (Firm Age at Internationalisation)	-0.02 (-0.68)	-0.02 (-0.57)	-0.11*** (-3.70)	-0.11*** (-3.65)	-0.10*** (-3.61)	-0.10*** (-3.54)	-0.13* (-2.57)
Firm International Experience	0.16*** (5.02)	0.16*** (5.04)	0.17*** (5.75)	0.17*** (5.78)	0.14*** (4.75)	0.13*** (4.51)	0.31*** (3.69)
Firm Size	0.13*** (4.17)	0.13*** (3.93)	0.14*** (4.64)	0.14*** (4.42)	0.11*** (3.63)	0.11*** (3.47)	0.09 (1.43)
Market Size (Origin)	-0.09** (-2.94)	-0.09** (-2.91)	-0.14*** (-4.80)	-0.14*** (-4.81)	-0.12*** (-4.27)	-0.12*** (-4.10)	-0.12*** (-4.18)
Market Development (Origin)	0.07* (2.17)	0.07* (2.16)	-0.01 (-0.44)	-0.01 (-0.49)	-0.03 (-0.98)	-0.03 (-1.04)	-0.03 (-1.04)
Industry 2	-0.02 (-0.64)	-0.02 (-0.62)	-0.10** (-3.43)	-0.10** (-3.39)	-0.10** (-3.33)	-0.10** (-3.28)	-0.10** (-3.27)
Industry 3	0.01 (0.22)	0.01 (0.27)	-0.09** (-2.80)	-0.08** (-2.71)	-0.09** (-2.84)	-0.09** (-2.89)	-0.09** (-2.89)
Industry 4	-0.05 (-1.38)	-0.04 (-1.24)	-0.21*** (-6.81)	-0.21*** (-6.74)	-0.20*** (-6.62)	-0.20*** (-6.57)	-0.20*** (-6.56)
Industry 5	0.12*** (3.70)	0.12*** (3.91)	0.08** (2.82)	0.09** (2.94)	0.06* (2.13)	0.06* (2.15)	0.06* (2.19)
Industry 6	0.03 (0.96)	0.03 (0.94)	-0.15*** (-4.68)	-0.15*** (-4.69)	-0.16*** (-5.00)	-0.16*** (-5.00)	-0.16*** (-4.97)
Industry 7	0.09** (2.97)	0.10** (3.06)	-0.05† (-1.78)	-0.05† (-1.75)	-0.07* (-2.45)	-0.07* (-2.47)	-0.07* (-2.43)
PFS x Time to Internationalisation	n/a	n/a	n/a	n/a	n/a	n/a	-0.03 (-0.61)
PFS x Firm International Experience	n/a	n/a	n/a	n/a	n/a	n/a	0.197* (2.24)
PFS x Firm Size	n/a	n/a	n/a	n/a	n/a	n/a	-0.02 (-0.28)
Model summary							
R-squared	0.087	0.097	0.171	0.174	0.212	0.217	0.221
Adjusted *R-squared*	0.077	0.085	0.162	0.163	0.201	0.205	0.207
F	8.633***	8.229***	18.622***	16.079***	19.091***	18.316***	15.602***
Change in *R-squared*		0.010		0.003	0.038	0.005	0.004
F-change		5.575**		1.907	48.289***	6.098*	1.807

Note: Cell entries are standardized regression coefficients; *t*-statistics shown in parentheses.
†p<0.10; *p<0.05; **p<0.01; ***p<0.001
Source: own study.

H2, Model B in Table 5 and Table 6), the use of financial support is associated with an increase in geographic scope in both samples, but the effect of non-financial support was found significant only in the CEE12 sample. Secondly, the independent variable (public support) must affect the dependent variable (export intensity). The results of the analysis are presented in section concerning H1, and indicate that only the use of financial support is positively and significantly related to export intensity in both samples. Therefore, the effect of non-financial support on export intensity cannot be mediated by the geographic scope, either because the first condition (in the EU15 sample), or the second (in the CEE12 sample) is not fulfilled. Thirdly, the mediator (geographic diversification) must affect the dependent variable (export intensity), and fourth, the relationship between the independent variable (public financial support) and dependent variable (export intensity) is significantly reduced when the mediator (geographic scope) is included in regressions. These final conditions were tested in Model 2 and Model 3 (Tables 5 and 6). In Model 2 and Model 3 there is a positive and significant ($p<0.001$) relationship between the geographic scope and export intensity in both samples. Additionally, recognizing previously presented arguments on a non-linear (inverted U-shape) character of this relationship, Model 3 includes also a squared term of geographic diversification, which is negative and significant in both samples (in EU15, $p<0.001$; in CEE12, $p<0.05$). After the inclusion of the geographic scope, the effect of financial support on export intensity has been either significantly reduced (EU15: $p<0.1$, Model 2), or is no longer significant (EU15: $p>0.1$, Model 3; CEE12: $p>0.1$, Model 2 and Model 3). In order to validate the statistical significance of the mediation effect, the Sobel and Aroian tests were conducted (Table 7). The results provide significant evidence that geographic scope is a mediator between financial support and export intensity (EU15: Sobel-test statistic = 5.32, $p<0.001$, the Aroian-test statistic = 5.32, $p<0.001$; CEE12: Sobel-test statistic = 2.32, $p<0.05$, the Aroian-test statistic = 2.30, $p<0.05$). Thus, H3 is partially supported, suggesting the indirect effect only of financial support on export intensity.

Table 7. Tests of mediating role of geographic diversification

Sample	*Relationship*	*Test Name*	*Test Statistic*	*P-value*
EU15	*Financial Support – Geographic Diversification – Export Intensity*	Sobel Test	5.322	0.000
		Aroian Test	5.315	0.000
CEE12	*Financial Support – Geographic Diversification – Export Intensity*	Sobel Test	2.324	0.020
		Aroian Test	2.304	0.021
	Non-financial Support – Geographic Diversification – Export Intensity	Sobel Test	2.211	0.027
		Aroian Test	2.192	0.028

Source: own study.

Although the indirect effect of non-financial support (via geographic scope) on export intensity did not receive support according to the Baron and Kenny's (1986) approach, the alternative framework developed by Cohen and Cohen (1983) postulates that mediation exists when the relationships between (i) independent variable (non-financial support) and mediator (geographic scope) and (ii) mediator (geographic scope) and dependent variable (export intensity) are statistically significant. This alternative approach allows to test H3 in the CEE12 sample, as in that case both conditions are met. (The same analysis cannot be performed for the EU15 sample, as the first condition is not met, that is the relationship

between non-financial support and geographic scope is not significant). In order to examine the mediation effect, the Sobel and Aroian tests are used (see Table 7, CEE12: Sobel-test statistic=2.21, p<0.05, the Aroian-test statistic=2.19, p<0.05). These results imply that in the CEE12 sample, the geographic scope mediates the relationship between non-financial support and the export intensity. All key findings are summarised in Table 8.

Effects of control variables in both samples are shown in Table 9. Considering the effects of firm-level control variables (including firm age at internationalisation, international experience and size), no large differences were observed between samples.

Firm age at internationalisation is negatively associated with both dependent variables in both samples, indicating that SMEs that have decided to internationalise later in their life cycle have a more narrow scope of geographic diversification (in the case of the CEE12 sample, the effect is negative but insignificant), and achieve a lower level of export intensity. This finding is in line with an argument of learning advantages of newness (Autio *et al.*, 2000; Zhou, 2007). Nonetheless, firm international experience occurred to support the export geographic scope and export intensity in both samples, which indicate that experience and resulting knowledge is a valuable resource enhancing operations of SMEs in foreign markets. Similarly, firm size (which is often used as a proxy of firm resources) is also positively and significantly associated with both dependent variables in both samples (but in the EU15 sample this effect holds only in control Model 0 and Model 1; when geographic diversification is added, firm size becomes an insignificant predictor of export intensity).

Table 8. Summary of key findings

Hypothesised Relationships	***EU15***	***CEE12***
Public Support is Directly and Positively Related with Geographic Scope		
Financial Support	Supported	Supported
Non-financial Support	Not Supported	Supported
Geographic Scope is Directly Related with Export Intensity (Inverted U-shape)	Supported	Supported
Public Support is Directly and Positively Related with Export Intensity		
Financial Support	Supported	Supported
Non-financial Support	Not Supported[a]	Not Supported
Public Support is Indirectly Related with Export Intensity		
Financial Support	Supported	Supported
Non-financial Support	Not Supported	Supported[b]

Note: [a]Significant (p<0.1) but negative relationship (in contrary to H1, see Model 1 in Table 5). [b]Supported only by an alternative mediation framework of Cohen and Cohen (1983) (see Model B, Model 1, Model 2 in Table 6).
Source: own study.

The final two control variables (market size and development), that refer to the origin of SMEs, exert more differentiated effects on dependent variables in the EU15 and CEE12 samples. In the case of market size of firm origin, it has a negative significant effect on geographic diversification in the CEE12 sample (thus firms originating from larger CEE economies followed more geographically focused strategy), while in the EU15 sample it has significant positive effect, revealing that SMEs originating from larger markets pursue more geographically diversified strategy. But when applied to explain export intensity, it is evident that no matter what sample, SMEs originating from larger economies are characterised by lower levels of

export intensity, therefore supporting the argument that SMEs originating from smaller domestic market (which offer more limited growth opportunities) are more likely to focus on foreign markets searching for growth (Reuber & Fischer, 1997; Ciszewska-Mlinarič & Mlinarič, 2010). Finally, SMEs originating from more developed domestic markets were also more likely to follow more diversified export strategies (in both samples), but there was no significant effect of the development of the domestic market for the export intensity in none of the samples. The implications of the findings are discussed in the next section.

Table 9. Comparison of control variables' effects in EU15 and CEE12 samples

Variables	*Sample*	*Dependent variables*	
		Geographic Diversification	*Export Intensity*
Firm Age at Internationalisation (Time to Internationalisation)	EU15	(-) Significant	(-) Significant
	CEE12	(-) Not Significant	(-) Significant
Firm International Experience	EU15	(+) Significant	(+) Significant
	CEE12	(+) Significant	(+) Significant
Firm Size	EU15	(+) Significant	(+) Significant[a]
	CEE12	(+) Significant	(+) Significant
Market Size (Origin)	EU15	(+) Significant	(-) Significant[b]
	CEE12	(-) Significant	(-) Significant
Market Development (Origin)	EU15	(+) Significant	(-/+) Not Significant
	CEE12	(+) Significant	(-) Not Significant

Note: [a]*Positive and significant in Model 0 and Model 1, but insignificant in Model 2 and 3 (see Table 5).*
[b]*Negative and significant in Model 0, Model 2 and Model 3, but insignificant in Model 1 (see Table 5).*
Source: own study.

CONCLUSIONS

The study findings reveal that only a small portion of SMEs actively use the public support programmes (as already reported, only 9.1% and 7.9% of SMEs used them, respectively in the EU-15 and the CEE12 countries). This may be attributed to the low awareness of such programmes among SME owners/managers (Fischer & Reuber, 2003a; Orser, Fischer, Hooper, Reuber, & Riding, 1999; European Commission, 2010), which is a significant issue in itself, however, this article attempts to verify the relevance of such programmes for benefitting SMEs.

The study findings consistently support all hypotheses concerning the direct and indirect (via geographic scope) effects of the use of financial support on SME export intensity. Additionally, the study findings support the existence of the curvilinear (inverted u-shape) relationship between the geographic scope and export intensity in both samples. In line with the study expectations, it has been found that SMEs – regardless of their origin, be it Old or New Europe – that have used public programmes offering financial support (between 2006 and 2008) are likely to increase in 2008 the geographic scope of their exports, and increase their level of export intensity. Considering the broader debate whether or not private business should be supported by public funds (in the light of the mixed findings on the effectiveness of public support it is only reasonable to raise such questions), these findings provide some arguments for the intervention of the state, and are in line with

prior research (Bannò *et al.*, 2014). Undoubtedly, they suggest that public financial support programmes have a positive impact on SME export activities, so governments' and/or governmental agencies' assumptions behind such programmes seem to be well-justified.

Moreover, the current study supports the existence of the curvilinear relationship between export diversification and intensity in a new context of small and medium-sized firms, originating from developed and advanced emerging economies of Europe.

The situation is, however, much less clear when evaluating the impact of non-financial public support programmes. First, SMEs from the EU15 countries do not experience any significant and positive results for the geographic scope that could result from the use of non-financial support. On the contrary, such SMEs (using only non-financial support) are characterised by a lower level of export intensity than firms that use no public support at all. This effect is even stronger when we control for the mediating effect of the geographic scope (Model 2 in Table 5). Given that the overall usage of public support programmes by SMEs in the EU15 sample is relatively low (9.1%), it may indicate that SMEs using only non-financial support (2.3%) are those that experience problems trying to increase their foreign sales. Thus, they may see non-financial programmes as the means to improve international exposure. Unfortunately, due to the study design, it is not possible to answer the question whether in a longer term such support would occur beneficial. Secondly, SMEs from the CEE12 countries that use the non-financial export support programmes (only 1.2% of the sample) are likely to expect an increase in the geographic scope, however, only the alternative framework for mediation effect (Cohen & Cohen, 1983) supports the indirect relationship between non-financial support and export intensity. Therefore, according to the study results, it is not possible to formulate any direct and unequivocal recommendations for institutions providing non-financial support for internationally oriented SMEs.

In the background of the study findings there is, however, one additional important question: which firms should be supported by public money? Taking into consideration the death rate among new firms, limited growth potential and limited public funds, many researchers claim that public institutions should support not all, but only those most promising firms, usually categorised as high-growth firms, or 'gazelles'. Such arguments are well grounded in macro-level research. For instance, Onkelinx and Sleuwaegen (2010) found that SME export growth was 'driven by a small group of born global firms, accounting for 60 per cent of the total increase in SME exports between 1998 and 2005. (…) we find born globals to be more productive and characterized by a higher R&D spending and intangible asset intensity compared to other types of traders. (…) We find that born globals grow faster in terms of export sales, have a stronger commitment to export markets and are more likely to continue exporting' (Onkelinx & Sleuwaegen, 2010, p. 1). However, these authors also noticed that born-global firms were also characterised by a higher failure rate than traditional internationalisers.

Due to data limitations, the proper answer to the question which firms should be supported by public money is beyond the ambition of the current article. Nonetheless, the additional analysis of empirical data allows to identify the firm-level characteristics that shed some light on the relationships between public financial support and export intensity. Looking at the correlation Tables 3 and Table 4, it becomes quite obvious that firms which are bigger and operate in manufacturing industries are those most likely to use financial

support, regardless of their origin. However, the inclusion of several interaction terms[4] revealed a few interesting effects. First, in both samples the positive effect of firm international experience on export intensity is accentuated by the use of financial support programmes. Additionally, in the EU15 sample, the negative effect of time to internationalisation (in other words, age at internationalisation) on export intensity was smaller in the case of SMEs using financial support programmes. Thus, it is possible to conclude that firms with a more pronounced prior international experience are better prepared to achieve benefits (in terms of export intensity) that result from the use of financial support. Such conclusions may be important for government agencies and other providers of export support that are in charge of the distribution of usually limited public funds. However, it is not argued here that prior international experience should be the only criterion taken into account. Interesting insights in this respect are offered by Fischer and Reuber (2003a), who argue that not only firms', but also managers/owners' personal experience should be considered by providers of export support so that programmes are customised in terms of product/service offerings, and the communication and distribution tactics. More broadly, Mion and Muûls (2014) recommended the UK government to develop policies enhancing domestic firms to capture the full potential of growing BRIC (Brazil, Russia, India, China) markets, as well as 'Policies to help ensure a continuing annual influx of new exporters, and to help ensure successful persistence in exporting among more of those who begin to export' (Mion & Muûls, 2014, p. 9).

In this article, the empirical analyses of the large, cross-country sample reveal that there are significant, firm-level differences characterising internationally oriented SMEs from Old and New Europe (Table 2). For instance, SMEs from the EU15 follow more geographically diversified export strategy but achieve slightly lower export intensity. They are also older, have longer international experience, decide to internationalise later in their life cycle, and on average are slightly smaller. Many of these differences can be explained by different institutional/historic background of Old and New Europe SMEs, communist heritage and transition period (from centrally planned communist economies to market driven economic system). Thus, it is not surprising that SMEs in the CEE12 sample are younger, or that their international experience is shorter. However, originating from 'late-comer' economies in terms of the global economic integration, international trade and investment flows, New Europe SMEs decide to internationalise much earlier in their life cycle than peers from Old Europe, and achieve a higher level of export intensity, but more narrow geographic scope (this can be also explained in terms of colonial ties that many Old Europe countries developed in their history). New Europe firms are pushed for earlier internationalisation to catch up with Old Europe SMEs. To sum up, it is evident that Old and New Europe SMEs are different. But from that it cannot be concluded that either international business or international entrepreneurship fields are in need of new theories.

[4] In additional analyses, that are presented in Model 4 in Table 5 and Table 6, several interaction terms were added, such as: (i) financial support x time to internationalisation, (ii) financial support x firm international experience, (iii) financial support x firms size. All interaction terms were calculated by multiplying the corresponding components that were previously cantered (time to internationalisation, firm international experience, firm size were standardised, while the dichotomous variable of financial support was recoded into -1.1). To understand the nature of the interaction properly, and comment on the findings, I plotted the effects of the three firm-level variables for the export intensity for different situations concerning the use of financial support programmes (support vs. no support).

When it comes to the comparison of the studied relationships, including the effects of control variables, the key findings across Old and New Europe SMEs are the same: public financial support has a direct and an indirect (via geographic scope) effect on export intensity; and relationship between the geographic scope and export intensity has an inverted U-shape. Moreover, as already mentioned, firm-level control variables (including time to internationalisation, firm international experience, and firm age) have the same effect on the geographic scope and export intensity, regardless of the SMEs' origin. Thus, recognizing differences existing between Old and New Europe SMEs, the relationships explaining the studied phenomena are indeed the same.

Although the article offers clear insights into the significance of financial vs. non-financial public support programmes for internationalisation activities of SMEs, the study suffers from several limitations. First, the operationalisation of export intensity as a FSTS ratio may be criticised on the grounds that variables other than public support or geographic scope may affect it. To deal with this issue, the study controls for many firm- and environment-level variables and employs the hierarchical regression modelling to validate the significance of key independent variables. Secondly, the operationalisation of public support as a dichotomous variable – though employed also in other studies (e.g. Bannò *et al.*, 2014) – led to obvious limitations, thus, future research should employ more nuanced operationalisations, including the issue of the size of the public support or the very character of the support programme.

Thirdly, the cross-sectional character does not make it possible to evaluate longer term effects of public support, especially non-financial support. Therefore, studies using longitudinal analytical methods are needed to examine the effectiveness of public support properly, indicating how it helps to overcome liabilities of smallness, foreignness, outsidership and/or newness. Most studies on public support effects, and/or on the link between the diversification of developed and emerging market firms, including this one, are based on one point in time, which obviously renders the generalisability of findings questionable (Nachum, 2004). The popularity of a single year studies results from the challenge to collect reliable longitudinal and firm-level data from many countries at the same and multiple points in time.

Fourthly, it should be also recognized that in the face of major changes in both internal and external processes of SMEs in the post-crisis time (after 2010), the presented results that cover the period before the crisis should be treated with caution. Thus, more recent research on internationally oriented SMEs is needed.

The question which firms should receive public support is still an interesting and practically important topic. Thus, further theoretical and practical considerations concerning the public support and firms benefiting from it may address the 'middle income dilemma'. According to prior research, policies developed by governments for capability advancement are 'a key determinant of upgrading in open economies, both at the country level and in the development of 'pockets of excellence'' (Paus, 2012, p. 115). The post-transition economies of the CEE12 are developing; the economic distance to Old Europe shrinks. After the economic-political transition, their next challenge is how to deal with a middle income trap, or 'how to move from commodity production to more knowledge-intensive activities' (Paus, 2012, p. 115). In this respect, the strategic public/government support may play a significant role by supporting industries (and firms within them) that contribute most to the development of knowledge-based economy. Additionally, future research may consider in a more

nuanced way the type of exporters (born-globals vs. traditional internationalisers). Finally, given that the awareness and propensity of owners/managers of SMEs to consult public support providers is reportedly shown as low the question how to change it is still relevant.

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Author

Mariola Ciszewska-Mlinarič
Assistant Professor of Strategic Management and International Business Strategy at Kozminski University. She received Ph.D. in Economics, with specialisation in strategic management, from Kozminski University, and her M.A. in Management from University of Warsaw.
Correspondence to: Dr Mariola Ciszewska-Mlinarič, Kozminski University, Department of Strategy, Jagiellonska 59, 03-301 Warsaw, Poland, e-mail: mariolac@kozminski.edu.pl

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Import Intensity of Production, Tasks and Wages: Micro-Level Evidence for Poland

Aleksandra Parteka

ABSTRACT

Objective: This article relates to recent literature on labour market consequences of production fragmentation within Global Value Chains, analysed in the presence of workers' heterogeneity and differences in the task content of jobs. The main aim is to assess if there is a relationship between wages of Polish workers and the degree of Polish production dependence on imported inputs.

Research Design & Methods: Using microdata from EU-SILC on workers from Poland observed in 2008-2014, we estimate a Mincerian model, augmented by a measure of task content of occupations and the industry level index of the import intensity of production computed with input-output data and accounting for good's production sequence). IV estimation is employed to account for potential endogeneity between the import intensity of production and wages.

Findings: Regression results suggest that negative relationship between wages of Polish workers and the dependence of their sector of employment on foreign inputs is magnified by the routinisation level of the occupation. Hence occupation-specific task requirements play a role.

Implications & Recommendations: It implies that not all the Polish workers are affected in the same. The movements towards jobs with higher degree of non-routine content could protect against negative wage effects of fragmentation.

Contribution & Value Added: The relationship between wages in Poland and the reliance on foreign inputs and GVCs links has not yet been studied from the micro-level task-based perspective. This article fills in this gap.

Article type:	research paper
Keywords:	import intensity of production; global value chains; production fragmentation; wages; tasks
JEL codes:	J31, J24, F16, F66

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INTRODUCTION

One of the main topics in recent international economics literature involves the analysis of so-called 'trade in tasks'[1] and its consequences for the labour market outcomes observed in the countries involved in the process of global production sharing. It reflects the increasing importance of production fragmentation across countries and the proliferation of global value chains (from now on: GVCs), widely documented in the literature using trade in value added data (among others: Costinot, Vogel, & Wang, 2012; Johnson & Noguera, 2012; Johnson & Noguera, 2016; Koopman, Wang, & Wei 2014; Los, Timmer & Vries, 2015; Timmer, Erumban, Los, & Stehrerand de Vries, 2014; Timmer, Los, & Stehrerand de Vries, 2016).

Clearly, not all workers are affected in the same way. While initially the focus was on skilled-unskilled workers' division (Wood, 1995), recently more attention has been paid to a proper distinction of tasks which are performed by workers on the job (WTO, 2017). The prediction is that workers employed in occupations which are more intense in the routine (repetitive) tasks are more at risk of experiencing downward pressure on wages (or a job loss) due to the relocation of some of the activities abroad or due to technological replacement (Autor, 2013).[2]

In this article we relate to recent literature on the labour market consequences of cross-border production links in the presence of labour market agents' heterogeneity and differences in the task content of jobs. We focus on one of the main labour market outcomes: wages. In particular, we study the process of wage determination in Poland from a micro-level task-based perspective. The main aim of the article is to determine if there is a relationship between wages of Polish workers and the degree of the Polish production dependence on imported inputs. The hypothesis to be tested empirically is the following: negative relationship between wages of Polish workers and the dependence of their sector of employment on foreign inputs is magnified by the routinisation level of the occupation.

To this aim, in the empirical part of this study we merge the information on individual wages of Polish workers with the degree of the dependence of their sectors of employment on foreign production. The latter is measured with an indicator of global import intensity of production recently proposed by Timmer *et al*. (2016). We estimate the micro-level wage regression model in which the production dependence on imported inputs acts as an additional factor possibly influencing wages, once all the other dimensions of the wage determination process have been taken into account. We thus take into account different dimensions of the wage determination process: individual characteristics of workers and their job, regional or industry specificity, the task content of workers' occupations and the characteristics of the sectors in terms of involvement into global production.

[1] The term comes from the 'theory of the global production process that focuses on tradeable task' by Grossman and Rossi-Hansberg (2008). Since then numerous papers analysed, both empirically and theoretically, the phenomenon of trade in the presence of globally fragmented production and task specialisation, using either the names 'trade in tasks' or 'trading tasks' or 'task trade' (among others: Baldwin & Robert-Nicoud, 2014; Becker & Muendler, 2015; Grossman & Rossi-Hansberg, 2012).

[2] Apart from trade-driven mechanisms, the technology has also a strong impact on labour markets. See recent WTO report (WTO, 2017, 76-99) for the discussion on the impact of technology on labour market outcomes.

The analysis is based on the microdata coming from the EU-SILC (The European Union Statistics on Income and Living Conditions) and the analysed sample covers employees from Poland observed in 2008-2014. We acknowledge the fact that task requirements of occupations differ across countries (Marcolin, Miroudot, & Squicciarini, 2016), so we rely on newly available country-specific routinisation indices, kindly provided to the author by OECD. By doing so we address the limits of the existing literature which ignores country specificity and relies on the occupational task profile typical for the U.S.

The structure of our article is as follows: in Section 2 we present the review of recent literature on the effects of production fragmentation on globally integrated labour markets. We focus on 'task approach' literature and a significant progress in the methodology of the task content measurement. In Section 3, we present our data and crucial descriptive statistics on wages across different task categories of occupations. The empirical model and the results of its estimation are presented in Section 4. Finally, Section 5 concludes.

LITERATURE REVIEW

The literature assessing the impact of global production links (production fragmentation, offshoring, etc.) on domestically employed workers has a long tradition. The fact that different stages of production can be performed in various locations has important consequences for the labour markets, mainly stemming from the relocation of some of the activities abroad and the resulting changes in domestic labour demand (Acemoglu & Autor, 2011; Autor, Dorn, & Hanson, 2015; Baugmarten, Geishecker, & Görg, 2013; Becker, Ekholm, & Muendler, 2013; Becker & Muendler, 2015).

Early literature on the labour market consequences of trade (especially North-South intermediate goods trade) focused on the differences between skilled and unskilled workers and the potential threat that trade with less developed (typically low wage) countries can create for less skilled workers. The issue of the rising wage inequality between skilled and unskilled workers due to trade and production fragmentation was analysed, among others, by Wood (1995) or Feenstra and Hanson (2001). However, according to the 'trade in tasks' theory (Grossman & Rossi-Hansberg, 2008), the relocation of activities which are easier to be coordinated even at a large distance (routine tasks) can endanger domestic workers involved in less demanding stages of production (typically manual, routine) and favour workers performing non-routine tasks. More recently, the empirical focus has moved towards the approach accounting for the specificity of tasks performed in different occupations which in turn affects the degree of their offshorability (among others: Acemoglu & Autor, 2011; Autor, 2013; Autor & Handel, 2013; Autor & Price, 2013; Baumgarten, Geishecker, & Görg, 2013; Becker *et al.,* 2013; Becker & Muendler, 2015; Fortin & Lemieux, 2016; Hardy, Keister, & Lewandowski, 2016a, 2016b, 2018).

In the literature (Baumgarten *et al*., 2013; Becker *et al*., 2013; Becker & Muendler, 2015) it is now widely accepted that the conventional classification of workers into skilled and unskilled (typically on the base of the information on their education) is not necessarily linked to the type of tasks workers perform on the job (e.g. a person with tertiary education can be employed in a highly routine job). Consequently, the initial focus on skilled-unskilled workers' division has recently moved towards deeper analysis. Given the split of the production value chain into specific tasks, the analysis of changes observed on the labour markets has emphasised the differences across occupations and the type of

tasks they require (so called 'task content of jobs'). As underlined in one of the first studies on this issue (Autor, Levy, & Murnane, 2003), tasks differ from skills ('A skill is a worker's stock of capabilities for performing various tasks'). Hence, skills can be perceived as workers' ability to perform specific tasks. The development of the 'task approach' literature (see Autor, 2013 for an overview) reflects also significant progress in the methodology of the task content measurement, which we present below.

The 'task content of jobs' was studied primarily with respect to the American labour market. In their seminal paper, Autor *et al*. (2003) analysed the task content of jobs in the U.S. in the context of the routine-biased technical change (RBTC) hypothesis according to which workers performing routine tasks can be easily replaced by machines (mainly computers). They studied how computerisation reshaped the task composition of work and the structure of labour demand in the 1960-1998 period. Autor *et al.* (2003) introduced a novel methodology to distinguish skills from tasks and defined three main categories of tasks: *routine cognitive tasks* (e.g. data entry), *routine manual tasks* (e.g. repetitive production) and *non-routine tasks* (involving problem-solving, intuition, persuasion, and creativity), subsequently split into: *non-routine analytical*, *non-routine interpersonal* and *non-routine manual*. Their approach was to link the employment data (Census and Current Population Survey job titles) to the Dictionary of Occupational Titles (DOT)[3] to quantify the task content of jobs. They found that 'computerization is associated with reduced labor input of routine manual and routine cognitive tasks and increased labor input of non-routine cognitive task' (Autor *et al*., 2003, p. 1279). An update is provided in Autor and Price (2013) paper analysing changes in the task content of American jobs in the 1960-2009 period.

Importantly, Autor *et al*. (2003) conceptualised work as a series of tasks – it boosted the research on changes in the task composition of occupations. DOT is being replaced by the O*NET (the Occupational Information Network)[4] so later studies employed the original Autor *et al.* (2003) approach to the O*NET data as a primary source of information for the task content of occupations (e.g. Acemoglu & Autor, 2011; Fortin & Lemieux, 2016; Hardy *et al*., 2016a; Hardy *et al*., 2016b; Keister & Lewandowski, 2017).

The approach of Autor *et al*. (2003) was adopted to study other well developed countries, for instance Spitz-Oener (2006) employed the data for workers from Western Germany to describe how skill requirements changed within occupations and how technological change affected labour demand in Germany. Using the survey in which respondents specified what kind of activities they performed on the job (differently from the DOT or O*NET approach where the description of occupations is based on the expert knowledge), she classified activities into five skill categories (Spitz-Oener, 2006): *non-routine analytical* tasks (e.g. research); *non-routine interactive* tasks (e.g. selling), *routine cognitive* tasks (e.g. calculating); *routine manual* tasks (e.g. running a machine) and *non-routine manual* tasks (e.g. housekeeping).

Since then the task approach has been widely adopted, for instance to study the effects of offshoring on different categories of workers (Baumgarten *et al*., 2013; Becker *et al.,* 2013; Ebenstein, Harrison, McMillan, & Phillips, 2014) or the polarisation of the labour markets (Autor & Dorn, 2013; Goos, Manning, & Salomons*,* 2014). These recent papers offer an al-

[3] DOT is published by the U. S. Department of Labor (http://www.govtusa.com/dot/).
[4] https://www.onetonline.org/

ternative classification of occupations according to their task content and the degree of offshorability. Becker *et al*. (2013) developed a continuous 'task intensity measure' using direct information from a detailed German survey in which respondents were asked about the tasks they perform on the job and the associated work tools. Each occupation was assigned a number between 0 and 1 which measured its intensity in non-routine and interactive tasks. Similarly, Autor and Dorn (2013), Autor e*t al*. (2015) and Goos, Manning and Salomons (2014) use occupation-specific indices which help to group workers into categories differing in terms of routine content, abstractness and service task importance.

It shall be underlined that while there are numerous studies on the changing task content of jobs in the U.S. or in Western European countries, the case of Central and Eastern Europe (and Poland in particular) has not been so widely explored. The valuable exceptions include the studies by Hardy *et al*. (2016b) on Poland and Hardy *et al*. (2016a), Hardy *et al*. (2018) or Lewandowski (2017) and on Central and East European Countries (CEE) where they adopt Acemoglu and Autor (2011) approach and O*NET data. Lewandowski (2017) and Hardy *et al*. (2018) argue that contrary to the most advanced economies, the routine cognitive content of jobs has increased in CEE. It means that CEE countries are exposed to RBTC and potential displacement of workers due to technology improvements.

The recent developments (Marcolin *et al*., 2016) consider the computation of country-specific routinisation indices which take into account the fact that the task content of jobs varies across countries. Previous studies assumed that the classification of occupations developed for instance for the U.S can be adopted to study labour markets in other countries, like Poland (Hardy *et al*., 2016b). In the empirical part of the study we will rely on values of the country specific Routine Intensity Indicator provided by OECD in 2017.[5]

Given the scope of this article, we shall relate to the evidence which explicitly used the task approach and differences across occupations to study wage patterns. Krueger (1993) estimated that in the 1980s (1984-1989) workers employed in occupations which required the use of computers earned 10-15% higher wages. Baumgarten *et al*. (2013) found that German workers employed in occupations with higher non-routine task content are less exposed to the negative effect of offshoring on wages. Ebenstein *et al*. (2014) confirmed that the negative effect of offshoring on wages is most pronounced in the case of American workers performing routine tasks. Hence, the task content of jobs undoubtedly affects the wage determination process. Moreover, the low degree of routinisation of a particular job can act as a 'firewall' against the negative impact of offshoring on domestic workers (Becker *et al*., 2013).

The evidence on wages in Poland based on micro-level datasets (typically from Labour Force Survey or Structure of Earnings survey) focuses mainly on: the explanation of gender wage gaps (Majchrowska & Strawinski, 2017; Majchrowska & Strawinski, 2016; Goraus, Tyrowicz, & Velde, 2017), the role played by regional factors in wage determination (Cieślik & Rokicki, 2016; Adamchik & Hyclak, 2017) or institutional factors of wage setting (Magda, Marsden, & Moriconi, 2016). In the remaining part of the article we intend to fill the gap which refers to the general lack of the evidence concerning the link between wages in Poland and the import intensity of production, estimated in a task-based setting.

[5] The author would like to thank Luca Marcolin for sharing the data.

MATERIAL AND METHODS

For the purpose of the empirical analysis we use sector level indicators of the involvement into global production (measured by GIIP) merged with individual data on hourly wages and other personal characteristics of Polish workers from EU-SILC.[6] The matching between the micro-level and sectoral statistics is based on the information on the sector of employment of individuals present in EU-SILC data files. Below we describe these two types of data and the composition of our sample.

Sector Level Data on the Import Intensity of Production

We measure the dependence of sectors on foreign inputs using an index recently elaborated by Timmer *et al*. (2016) and called Global Import Intensity of Production (*GIIP*). *GIIP* is defined as 'the ratio of GVC imports to the value of the final product' (Timmer *et al*., 2016, p. 4). GIIP can serve as a new measure of production fragmentation which traces the imports needed in *all* stages of production. Formally, *GIIP* is computed using world input-output data (from the new WIOD release, November 2016)[7] which allow to sum 'all imports needed in any stage of production of a final good or service (GVC imports)' and refer it to the value of the final output.

Hence, it is a backward measure of the dependence of domestic production on foreign inputs. As it is computed with input-output information, it is obtainable at the level of industries (sectors) and can then be aggregated to the country level. Importantly, such a measure has a more straightforward interpretation than the indices based on gross exports decomposition (e.g. foreign value added content of exports – Hummels *et al*., 2001; Matoo, Wang, & Wei, 2013). For instance, the value of GIIP equal to 0.6 implies that each 1 USD value of the final output depended on (generated) 60 cents of imports related to different stages of production of this final product.

Available data shows that production fragmentation and the rise of GVCs started in the 1980s, accelerated in the 2000s (as documented by Los *et al.*, 2015), was negatively affected by the 2008-2009 crisis and stagnated after 2011 (see Timmer *et al*., 2016 and the recent evidence based on the 2016 update of WIOD). Despite the recent slowdown, cross-border fragmentation of production still remains an important phenomenon and the dependence of domestic production on imported inputs, used along the whole value chain, is considerable. As reported by Timmer *et al*. (2016, p. 5) the global import intensity of production was on average equal to approx. 30% in 2014, compared to 25% in 2000)[8]. There are significant differences in GIIP across products, e.g. for computers in 2014 the GIIP was equal to 43.9%.

Figure 2 shows the value of GIIP index for Poland (expressed as an index 0-1 where the value of 1 corresponds to 100% dependence of the final production on imported

[6] The data used in this article is a part of a wider database prepared within the research project realised in cooperation with Joanna Wolszczak-Derlacz (work in progress).

[7] WIOD stands for World Input Output Database. The firsts release (2013, see Dietzenbacher *et al.*, 2013 and Timmer *et al.*, 2015 for details) provided time series of input-output data for 40 countries and the period 1995-2011 while the second release (November 2016, see Timmer *et al.*, 2016) covers 43 countries for the period 2000-2014.

[8] The value reported by Timmer *et al.* (2016) is averaged across all goods produced in the world economy and based on GIIP on 836 production chains of final goods, weighted by their final output levels.

inputs, calculated along all the backward stages of production). The value of *GIIP* equal to 0.27 places Poland in the middle of European countries in terms of dependence of production on foreign inputs.

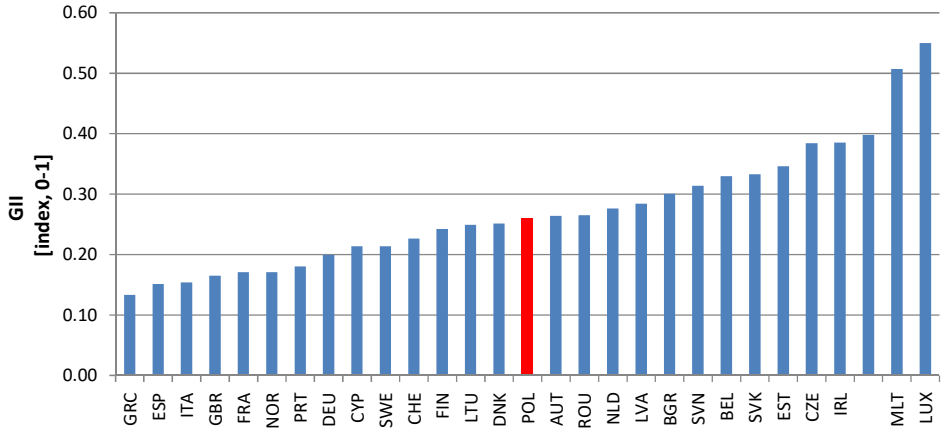

Figure 1. Global Import Intensity of Production – Poland versus other European countries (2014)
Source: own elaboration based on WIOD (November 2016 release) and Timmer *et al.* (2016) methodology.

Microlevel Data and the Sample

In the present study the EU-SILC serves as a source of information on earnings and personal characteristics important for the wage determination process (such as: gender, age, experience, family status, place of residence etc.).[9] The EU-SILC provides harmonised micro-level data for several countries (EU member states plus extra-EU countries) and is thus a good source for studies on income and social conditions.[10] Two types of datasets are available: longitudinal data and cross-sectional data. We use cross-sectional files (personal data, personal register, household data and household register) because some of the variables of interest, e.g. the information on the sector of employment (needed for a merge with sector-level statistics described above), are not provided in longitudinal files.

The years of analysis (2008-2014) are guided by data availability. While choosing the variables we rely on the documentation provided in EC (2014) along with the data files. In the sample we keep only working age individuals (18-65), working full time and for whom the information on occupation, earnings and hours worked is provided. Individuals working in all economy are considered (see the list of industries in Table 1A in the Appendix), we drop from the sample only people employed in the armed forces. In the end, the sample encompasses over 60.000 Polish workers (the number of observations in the regression is a bit lower due to joint availability of the data). The empirical results will be weighted by personal cross-sectional weights provided by EU-SILC.

[9] The description of the EU-SILC database, along with the country and variables coverage and a complete documentation can be found at: http://ec.europa.eu/eurostat/web/microdata/european-union-statistics-on-income-and-living-conditions. The routines to transform original csv files into the Stata format come from Gesis (prepared by Heike Wirth, http://www.gesis.org/en/missy/materials/EU-SILC/setups).

[10] The description of the EU-SILC potential for the purpose of research applications can be found in Berger and Schaffner (2016). Iacpovou (2012) discuss issues concerning the use of EU-SILC for cross-national analysis.

The main variable of interest – hourly wage – is computed for every individual on the base of the information on yearly income and the number of months in full-time job, combined with the average number of hours worked per week.[11] In order to minimise the influence of outliers and potentially misreported earnings data, we do the correction at the top and at the bottom of the wage distribution.[12] Wages are reported into the real terms with the use of harmonised index of consumer prices.

In the wage regressions we will additionally use individual level information on: sex, age, job experience (number of years spent in paid work), family status (information if living with a partner)[13], education (primary, secondary, tertiary)[14], firm characteristics (firm size: micro, medium or big[15]), type of job contract (temporary or permanent), managerial position, the sector of employment (NACE Rev.2, 2 digit code), country and region of the residence (NUTS 1). All of these variables come from EU-SILC.

Importantly, EU-SILC cross-sectional files provide information on workers' occupation (according to ISCO-88 2 digit level).[16] It allows us to match micro-level data on Polish workers with new country-specific indices of routine content from OECD (Marcolin *et al*., 2016).We will use this numeric index in the estimations. In the descriptive part, we will additionally employ the classification by Goos *et al*. (2014) to assign workers to different occupational categories. These are: *Rout* – highly routine, low in abstractness and service task importance, *Serv* – low in routine and abstractness, high in service task importance, *AbServ*- low in routine, high in abstractness and service task importance. They differ in the degree of abstractness, routines and service task importance.[17]

[11] Alternatively, the approach of Schäfer and Gottschall (2015, p. 477) could be used 'monthly gross earnings are the basis for calculating hourly earnings by multiplying the weekly working hours by 4.2 and dividing the monthly gross earnings by the resulting monthly working hours'. However, such a method of calculation is more crude. The correlation between the two series of hourly wages, obtained using our approach and the one of Schäfer and Gottschall (2015) equals to 0.66.

[12] At the bottom, the distribution is trimmed at the 1/100 of mean, at the top wages greater than ten times the national median are set to ten times the national median. Additionally, hourly wage values below the 1st and above the 99th percentile of country and year specific wage distribution are set to be equal to the 1st and 99th percentile, respectively.

[13] Such information is used instead of a conventional dummy for married people (based on the variable PB190) because, as stated in the documentation (EC, 2014, p. 256): 'Marital status is the conjugal status of each individual in relation to the marriage laws of the country (i.e. de jure status). It therefore does not necessarily correspond with the actual situation of the household in terms of co-habitation, arrangements, etc.'. Specifically, we use the variable PB200 – Consensual Union ('with or without a legal basis, where the consensual union with a legal basis includes both married couples and registered partners, (..) both partners have to live in the same household.' – EC, 2014, p. 257).

[14] We reclassify variable PE040 (the highest ISCED level attained) which includes 9 categories of educational attainment into three broader groups: primary, secondary and tertiary education (for details see EC, 2014, p. 265).

[15] We reclassify variable PL130 (Number of persons working at the local unit) to get three categories of companies: micro (<11 persons working), medium (11-49) and big (=>50).

[16] International Standard Classification of Occupations: http://www.ilo.org/public/english/bureau/stat/isco/isco08/index.htm

[17] Due to space limits, the mapping between occupations and task categories is available upon request.

FINDINGS AND DISCUSSION

Descriptive Evidence

Concerning the wage level, it is evident that there are significant wage differences across types of occupations in Poland, given their task content. This is in line with similar evidence shown for other countries (Autor, 2013; Autor & Price, 2013; Baumgarten *et al.*, 2013). Table 1 reports that Polish workers employed in occupations which require relatively high ability to perform tasks low in routine, but high in abstractness and service task importance (AbServ category) earn considerably more than the other two categories (Serv and Rout).

Table 1. Average values of hourly wage according to the type of occupation

Year	AbServ	Rout	Serv
2008	4.8	3.1	2.5
2009	5.8	3.5	2.9
2010	4.9	3.0	2.5
2011	5.4	3.3	2.8
2012	5.5	3.4	2.8
2013	5.5	3.5	2.9
2014	5.6	3.5	2.9

Note: occupation categories based on Goos *et al.* (2014). Sample: 60,287 Polish workers. Values weighted by personal cross-sectional weights.
Source: own calculations based on EU-SILC data.

From the point of view of our primary aim, it is important to assess the link between the level of wages paid in a particular occupation, the degree of its routinisation and the dependence of sector on foreign inputs. In Table 2 we report the coefficients of correlation between these three variables present in our dataset. Hourly wage (*w*) is negatively correlated with RTI and with GIIP. In our sample in 2014 the coefficients of correlation equal to -0.3 and -0.07, respectively. The values computed for the whole analysed period (2008-2014) are similar: -0.3 and -0.08, respectively. In other words: wages in occupations with higher routine content and in sectors more dependent on foreign inputs (with higher import intensity of production) are typically lower. The latter relationship, however, is weak. Interestingly, relatively high positive correlation between the index of routinisation and *GIIP* (0.47) suggests that Polish sectors which value chain of production relies intensively on foreign inputs, use labour force employed in routine intensive occupations. This finding is linked to the structure of Polish employment and its general routinisation (Hardy *et al*., 2016).

So far, no other individual level or industry level characteristics have been taken into account as determinants of wages. Hence, in the next step we will check if the global import intensity of production and the task requirements are significant predictors of wages of Polish workers, once all the other dimensions of the wage determination process are accounted for.

Table 2. Correlation coefficients between w, RTI and GIIP

2014 (n=8489)			
Category	**Hourly wage (w)**	**Routinisation index (RTI)**	**Global Import Intensity of Production (GIIP)**
Hourly wage (w)	1.0000		
RTI	-0.3072*	1.0000	
GIIP	-0.0726*	0.4780*	1.0000
2008-2014 (n=60287)			
Category	**Hourly wage (w)**	**Routinisation index (RTI)**	**Global Import Intensity of Production (GIIP)**
Hourly wage (w)	1.0000		
RTI	-0.3113*	1.0000	
GIIP	-0.0854*	0.4641*	1.0000

Note: occupation categories based on Goos *et al.* (2014). Sample: Polish workers (n observations). Values weighted by personal cross-sectional weights.
Source: own calculations based on data from EU-SILC, WIOD and OECD (data described in the main text).

The Model

Using the micro-level and industry level data described in Section 2, we estimate an augmented version of Micer-type wage regression model (Mincer & Polachek, 1974; Heckman *et al*., 2006):

$$lnw_{ijort} = \alpha + \beta_1 Demog_{it} + \beta_2 Job_{it} + \beta_3 GIIP_{jt} + \\ +\beta_4 RTI_{oi} * GIIP_{jt} + \beta_6 \ln IND_{jt} + D_j + D_r + D_t + \varepsilon_{ijort} \quad (1)$$

where:

i - denotes an individual (a worker) employed in occupation *o* in sector *j* and living in region r at time t (here the model is estimated only for workers from one country, Poland, so the country subscript is omitted).

Hence, the model is estimated linking microdata on workers and more aggregated sector (industry) level data on involvement into global production – similar approach has been adopted by Baugmarten *et al*. (2013).

Hourly wage (*w*) is assumed to be determined by a set of individual characteristics called *Demog* which include personal characteristics (sex, information on a family status, age and age squared or experience and experience squared[18], education) and job characteristics called *Job* (firm size, type of contract, supervisory position) – all described in Section 2. Sector, region and time specific effects are captured through the inclusion of dummy variables, additionally we control for the industry value added (*IND*) which captures the effect of potentially lower wages in sectors with negligible value added content.

The crucial variables of interest are: *GIIP*, *RTI,* as well as their interaction. *GIIP* measures global import intensity of production typical for the sector of employment *j*, while *RTI* refers to the routinisation level (task requirements) in occupation performed

[18] The correlation between age and job experience in our sample is equal to 0.93, hence we decided to use these variables in separate specifications.

by individual *i*. In specifications employing *GIIP*, the model is estimated using IV (instrumental variables) estimator (with lags of *GIIP* used as instruments[19]), with robust standard errors. Personal cross-sectional weights are used.

Estimation Results

The first set of results is reported in Table 3. For comparison, the first two columns in the table refers to basic Mincer-type estimation with individual level characteristics, as well as country and industry dummies (*GIIP* is not yet taken into account). Given high correlation between age and experience, they do not enter into the estimation simultaneously. In line with the expectations, hourly wage is higher for males and persons having family (living with a partner), is positively correlated with longer job experience and higher education level. There is a positive but nonlinear relationship between hourly wage and both the age of the workers (column 1) and their experience (column 2). Polish workers employed in bigger firms, having permanent contract and performing supervisory work earn more. Hence, all the basic wage determinants, referring to individual dimension of wage determination, have the expected signs and are statistically significant. These findings are perfectly in line with the literature using the Mincerian approach to study wage determinants (Mincer & Polachek, 1974).

In columns (3) and (4) we report the results of IV estimation with additional explanatory variable: *GIIP* (in bold). The dependence of the sector of employment on foreign inputs, measured by global import intensity of production, results to be negatively related to wages. The estimated coefficient equals to approx. -0.35 and is statistically significant. It means that, once all the other controls are taken into account, the increase in *GIIP* by 1% is associated with a downward pressure on wages of Polish workers by 0.35%.

Now the question is to what extent this result depends on the category of workers given the tasks typical for their occupation. Is the relationship between wages and *GIIP* stronger in the case of routine intensive occupations (with higher *RTI* index)?

In Table 4 we report the results referring to the specification which incorporates the index of occupational routinisation *RTI* (columns 1 and 2). Again, all the variables traditionally present in the Mincerian model have coefficients of expected signs and are statistically significant. The estimated *RTI* coefficient is negative (-0.12) and statistically significant: unsurprisingly the higher the routinisation of the occupation, the lower the wage.

[19] See Parteka and Wolszczak-Derlacz (2017) for the application of an alternative instrumental strategy – based on the gravity approach (in the spirit of Frankel and Romer, 1999). It was not adopted here due to data constraints (GII measurement requires the loop over all the backward tiers of production in the global value chain).

Table 3. Estimation results (1)

Variable / Measure	(1)	(2)	(3)	(4)
Sex (=1 if male)	0.140***	0.129***	0.140***	0.130***
	[0.005]	[0.005]	[0.005]	[0.005]
Age (year)	0.035***		0.034***	
	[0.002]		[0.002]	
Age^2	-0.000***		-0.000***	
	[0.000]		[0.000]	
Experience (years in paid job)		0.022***		0.022***
		[0.001]		[0.001]
$Experience^2$		-0.000***		-0.000***
		[0.000]		[0.000]
Education (=1 if tertiary or higher)	0.583***	0.593***	0.556***	0.567***
	[0.012]	[0.012]	[0.013]	[0.013]
Education (=1 if secondary)	0.156***	0.145***	0.147***	0.137***
	[0.010]	[0.010]	[0.011]	[0.011]
Partner (=1 if living with a partner)	0.040***	0.038***	0.040***	0.038***
	[0.006]	[0.006]	[0.006]	[0.006]
Firm size – big (=1 if >49 employees)	0.203***	0.201***	0.235***	0.232***
	[0.007]	[0.007]	[0.008]	[0.008]
Firm size – medium (=1 if 11-49 employees)	0.081***	0.079***	0.110***	0.107***
	[0.007]	[0.007]	[0.008]	[0.008]
Contract (=1 if permanent)	0.180***	0.168***	0.173***	0.161***
	[0.006]	[0.006]	[0.006]	[0.006]
Manager (=1 if supervisory position)	0.179***	0.175***	0.181***	0.177***
	[0.007]	[0.007]	[0.007]	[0.007]
lnIND	-0.042***	-0.040***	-0.037***	-0.035***
	[0.004]	[0.004]	[0.005]	[0.005]
GIIP			**-0.359*** **	**-0.346*** **
			[0.065]	[0.065]
cons	0.405***	1.002***	0.420***	0.990***
	[0.072]	[0.063]	[0.080]	[0.070]
R2	0.33	0.33	(0.34)	(0.34)
N	55570	55470	46884	46831
Hansen J statistic (p-val)			0.00	0.00
Sector dummy	yes	yes	yes	yes
Region dummy	yes	yes	yes	yes
Time dummy	yes	yes	yes	yes

Notes: Personal cross-sectional weights used. Robust standard errors in parentheses, statistically significant at ***1, ** 5, * 10 percent level. Education- primary education set as default category, firm size -small size (1-10) set as default category. (1) and (2) – OLS, (3) and (4) – IV.
Source: own calculations in Stata.

Table 4. Estimation results (2)

Variable / Measure	(1)	(2)	(3)	(4)
Sex (=1 if male)	0.159***	0.148***	0.145***	0.134***
	[0.005]	[0.005]	[0.005]	[0.005]
Age (year)	0.037***		0.036***	
	[0.002]		[0.002]	
Age^2	-0.000***		-0.000***	
	[0.000]		[0.000]	
Experience (years in paid job)		0.023***		0.023***
		[0.001]		[0.001]
$Experience^2$		-0.000***		-0.000***
		[0.000]		[0.000]
Education (=1 if tertiary or higher)	0.477***	0.489***	0.507***	0.518***
	[0.012]	[0.012]	[0.013]	[0.013]
Education (=1 if secondary)	0.121***	0.110***	0.130***	0.119***
	[0.010]	[0.010]	[0.011]	[0.011]
Partner (=1 if living with a partner)	0.035***	0.034***	0.037***	0.035***
	[0.006]	[0.006]	[0.006]	[0.006]
Firm size – big (=1 if >49 employees)	0.203***	0.201***	0.237***	0.234***
	[0.006]	[0.006]	[0.007]	[0.007]
Firm size – medium (=1 if 11-49 employees)	0.079***	0.078***	0.112***	0.109***
	[0.007]	[0.007]	[0.008]	[0.008]
Contract (=1 if permanent)	0.163***	0.152***	0.164***	0.153***
	[0.006]	[0.006]	[0.006]	[0.006]
Manager (=1 if supervisory position)	0.133***	0.130***	0.156***	0.152***
	[0.007]	[0.007]	[0.007]	[0.007]
lnIND	-0.043***	-0.042***	-0.039***	-0.037***
	[0.004]	[0.004]	[0.005]	[0.005]
RTI	**-0.122*** **	**-0.120*** **		
	[0.004]	[0.004]		
GIIP			**-0.414*** **	**-0.399*** **
			[0.065]	[0.064]
RTI*GIIP			**-0.204*** **	**-0.202*** **
			[0.011]	[0.011]
cons	0.503***	1.130***	0.483***	1.080***
	[0.071]	[0.062]	[0.080]	[0.070]
R2	0.35	0.35	(0.34)	(0.35)
N	55570	55470	46884	46831
Hansen J statistic (p-val)			0.00	0.00
Sector dummy	yes	yes	yes	yes
Region dummy	yes	yes	yes	yes
Time dummy	yes	yes	yes	yes

Notes: Personal cross-sectional weights used. Robust standard errors in parentheses, statistically significant at ***1, ** 5, * 10 percent level. Education- primary education set as default category, firm size -small size (1-10) set as default category. (1) and (2) – OLS, (3) and (4) – IV.

Source: own calculations in Stata.

It is important to check if the result of negative relationship between *GIIP* and wages is conditional upon the type of tasks performed on the job. Columns (3) and (4) refer to the full specification of the model (1) with *GIIP* and the interaction term between *RTI* and *GIIP*. Here, the model is estimated with the use of instrumental variables method (*GIIP* is instrumented), so potential endogeneity between wages and involvement into global production is taken into account. The result is that wages of Polish workers are negatively associated with the global import intensity of production (coefficient = -0.4) but importantly, given that the coefficient associated with the interaction term (*GII***RTI*) is significant and negative (-0.2), this effect depends also on the task content of the occupation. For Polish workers employed in occupations characterised by high routinisation level (hence, with high *RTI* index). For instance, in the case of assemblers (one of the typically offshored jobs), *RTI*=1.78, so it is one of the most routinised occupations in the Polish economy. According to the estimation results reported in Column 3, 1% increase in *GIIP* would result in 0.75% downward pressure on their hourly wage [-0.4 + (-0.2)*1.78= -0.756]. This effect is more than two time stronger then when the routinisation of the occupation was not taken into consideration (Table 1).

These findings are in line with the evidence for other countries (e.g. Germany examined by Baumgarten *et al*., 2013, pp. 143-144: 'We find a pronounced negative wage effect of cross-industry offshoring that is inversely related to the interactivity and non-routine content of workers' occupations').

CONCLUSIONS

The literature review revealed that while there is an extensive task-based evidence on the effects of fragmentation on workers in the U.S. or in well-developed European countries (e.g. Germany or Denmark), the evidence for less developed countries, Poland in particular, is much scarcer. We do have evidence on the change in the observed changes in the task composition of jobs in Central and Eastern Europe, including Poland (Hardy *et al*., 2016; Keister & Lewandowski, 2017). However, the relationship between wages in Poland and the reliance on foreign inputs has not yet been studied from the micro-level task-based perspective.

The main aim of this article was to find out if wages of Polish workers are determined by the degree their sectors of employment depend on foreign production. To this aim, we estimated an empirical model of wage determination in which, in addition to typical individual characteristic (in the spirit of the Mincerian wage model), a measure of global import intensity of Polish production was included. The adopted task-based approach allowed a proper distinction between different types of occupations according to their routinisation level and offshoring potential. Importantly, two significant improvements, with respect to the existing empirical literature should be underlined: the use of country specific routinisation indices and the backward measurement of the import intensity of production along the whole value chain.

Descriptive evidence based on the EU-SILC data proves that wages of Polish workers differ across occupations with different routinisation level. Unsurprisingly, the higher the routine content of jobs, the lower the wage. Regression results show that occupations with higher routine content experience stronger downward pressure on wages exhibited by intensive dependence on imported inputs. Hence, not all the workers are affected by

global production fragmentation in the same way. The level of routinisation matters when estimating the relationship between the dependence on foreign intermediates and the level of wages in Poland. It has important policy implications for the perception of labour market consequences of the involvement into global value chains. Future work could involve the comparison of the Polish case with the one typical for workers from other countries from Central and Eastern Europe. Time-varying and country-specific measurement of the task content of jobs is also an important (and non-trivial) issue to be solved.

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Appendix A: List of industries

NACE rev.2 section	Description
a	agriculture, forestry and fishing
b-e	mining and quarrying, manufacturing, electricity, gas, steam and air conditioning supply; water supply; sewerage, waste management and remediation activities
f	construction
g	wholesale and retail trade; repair of motor vehicles and motorcycles
h	transportation and storage
i	accommodation and food service activities
j	information and communication
k	financial and insurance activities
l-n	real estate activities; professional, scientific and technical activities; administrative and support service activities
o	public administration and defence; compulsory social security
p	education
q	human health and social work activities
r-u	arts, entertainment and recreation; other service activities; activities of households as employers; undifferentiated goods- and services-producing activities of households for own use; activities of extraterritorial organisations and bodies

Source: own elaboration based on EC (2014), pp. 384-387.

Author

Aleksandra Parteka

Associate professor (with habilitation in economics) at the Faculty of Management and Economics, Gdansk University of Technology (Gdansk, Poland). Her research interests include: international trade, economic integration, trade-labour market interactions, productivity and efficiency analysis.

Correspondence to: Gdansk University of Technology, Faculty of Management and Economics, Narutowicza 11/12, 80-233 Gdansk, Poland; e-mail: aparteka@zie.pg.gda.pl

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The Role of Specialisation in the Export Success of Polish Counties in 2004-2015

Jarosław M. Nazarczuk, Stanisław Umiński, Krystyna Gawlikowska-Hueckel

ABSTRACT

Objective: The objective of this article is to evaluate the role of specialisation in the export success of counties (powiats) (LAU 1) in Poland between 2004 and 2015.

Research Design & Methods: Using panel fixed-effects regressions with Driscoll and Kraay standard errors, the authors investigate the role of export specialisation and product concentration, as well as comparative advantages on the value of log exports per capita, controlling for other important export determinants.

Findings: Estimations of the panel model bring the conclusion that specialisation in a positive way contributes to the value of exports per capita, assessed at county level. The robustness of the obtained results has been verified by the use of several concentration and specialisation measures, incl. HHI, Krugman specialisation index, weighted RCA and concentration ratio.

Implications & Recommendations: Further research is recommended to capture the consequences of differentiation in the patterns of exports among counties in terms of agricultural vs. industrial goods as well as the low-tech vs. high-tech products. Similar research is recommended to be done at NUTS-2 level in order to inquire into the rationale of smart specialisation(s).

Contribution & Value Added: The main contribution of the research is showing the lumpiness of Poland's exports at county level in terms of product specialisation and concentration. The value added is depicting the positive role of specialisation for the exports success, understood as exports per capita.

Article type:	research paper
Keywords:	internationalisation; regional trade; export specialisation; export concentration; LAU 1; panel
JEL codes:	F14, R12

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INTRODUCTION

Exporting activity is traditionally analysed at country level. However, as data for exports of regions become more available, a new perspective of research emerges. Moreover, regional authorities are more interested in discovering the character of export patterns – as the increasing openness of Poland's economy brings higher sensitivity and vulnerability of regional economies to external economic impulses and shocks.

Although the EU commercial policy – according to the Treaty on the Functioning of the EU – is a common one (Art. 207 TFEU), export policy has not been effectively uniformed yet. Its consequence is that exporters are promoted at country level and also at the regional level, also with the use of the European structural funds.

Having said that exporting activity assessed at regional level is focusing more attention – an interesting question arises: whether export specialisation translates into 'export success'. Thus, the main objective of the article is to verify the role of specialisation in the export success of counties (LAU 1) in Poland between 2004 and 2015.

Export specialisation can be assessed with the use of many measures, related to concentration, revealed comparative advantages or the differentiation of the export pattern a particular region vs. other regions. The 'export success' of a region can also be understood in many ways, including the dynamics of exports, the number of jobs depending on exports, the share of high-tech products and exports per capita. We decided to refer to the latter, however, in further research, the use of other measures of export competitiveness would be interesting.

Using the export data for the econometric model in which the dependent variable and some of the independent variables are related to the same dataset (confounding factor) raises the risk of endogeneity problem. In fact, we expected this issue in the modelling. In the initial stage of the research, many estimation methods were used and specification of the models prepared. Endogeneity was tested in many ways, however it turned out to be non-existent. Due to the lack of endogeneity problem, and the existence of cross-sectional dependence, serial correlation as well as heteroscedasticity in our balanced panel (with N>T) – the authors decided to estimate the fixed-effects (within) regression with Driscoll and Kraay standard errors to overcome the existing issues.

The remainder of the article is structured as follows: in section 2 literature overview is provided, data and methods used are presented in section 3, results are discussed in section 4, while section 5 concludes.

LITERATURE REVIEW

Specialisation in Trade Theories

The conceptual foundations defining the role of specialisation in regional exporting activity can be found in several theoretical strands. The problem, however, is that the theories (for instance international trade ones) were predominantly formulated at the country level of analysis and shall be therefore adapted to the regional dimension. The following concepts seem to be interesting: (a) international trade theory, (b) regional economics that deals with the issues of locating economic activity, (c) investment portfolio theory that deals with risk diversification.

The idea of specialisation in foreign trade dates back to the times of the work of Adam Smith (1776). With the use of a relatively simple framework, Smith tried to convey the explanation for the directions of foreign trade flows between countries, finding that trade can be beneficial for two sides of the exchange, as opposed to the Mercantilist point of view. Specialisation through the division of labour led to improvements in labour productivity, which enabled more efficient use of resources (workforce). Thus, specialisation could lead to the concentration of production in industries having an absolute advantage, however regions were not present in that theory. David Ricardo (1817) together with Robert Torrens (1829) also sharing a credit to the discovery theory (Aldrich, 2004), put the trade theory into relative terms, revealing the role of relative productivity. The idea of comparative advantage is heavily discussed in the debate on the competitiveness of regions (Armstrong & Taylor, 2000; Behrens & Thisse, 2007; Dixon, 1973). Although there are many doubts about the 'transposition' of the comparative advantages concept to regional level, empirical research shows that a particular region always has comparative advantages in some products (Cassey, 2011), however other authors (Armstrong & Taylor, 2000) point to its little explanatory power, when applied to the regions. In the spatial Ricardo model of comparative advantage developed by Rossi-Hansberg (2005) for a series of regions, two industries, constant return-to-scale – spatial specialisation patterns affect inter-regional technological differences.

Another flagship theory, factor proportions Heckscher-Ohlin (H-O) model, is also applied to the regional level analysis of trade. Davis, Weinstein, Bradford and Shimpo (1997) suggest, basing on the case of Japanese regions, that the H-O model tends to give better results when applied to interregional trade as compared to international trade. However, its predictions on the patterns of regional sectoral specialisation can be misleading, because the interregional mobility of inputs (capital and labour) equalises cross-regional factor abundance, reducing the regional comparative advantage and erode the cause stemming behind inter-regional trade (Hewings & Oosterhaven, 2014). The predictive abilities of the H-O model can be frequently improved by utilising additional factors (like human capital or natural resources) (Armstrong & Taylor, 2000; Kim, 1995; Kim, 1999). The idea of regional specialisation was further developed by Courant and Deardorff (1992) in their lumpy countries theory, indicating interior diversification of regions, in which regions are treated as small open economies. Due to the differences in proportional factor abundance, their exports specialisation patterns may be dissimilar, apart from country's (low) specialisation. The factor endowment concept is deeply embodied not only in international trade literature but also in regional economics, with focus on specialisation. Capello (2016) treats space as an important production factor, that is a source of economic advantages or disadvantages.

The New Trade Theory (NTT) introduced by the works of Dixit and Norman (1980), Ethier (1982), Helpman (1981), Helpman and Krugman (1985), Krugman (1979), Krugman (1980), Lancaster (1980), dropped former classical assumptions in trade pertaining full competition (to imperfect competition) and constant returns to scale, whereas the presumption of homogenous products was replaced with product differentiation. The economies of scale together with the love for variety at the demand side, were decisive in determining the observed increase in intra-industry trade. The NTT theory stresses the role of productivity and tries to explain the benefits resulting from: (1) specialisation and

economies of scale, (2) first mover advantage that can create entry barriers to next players entering the same market, (3) the role of governments in supporting home-based firms (Aswathappa, 2008). Increasing returns can provide a clear explanation for the existence of specialisation, also if the theory is applied to regions that owing to increasing returns tend to specialise in order to achieve lower costs of production. Increasing returns and trade costs contribute to the location of economic activity within regions close to foreign markets and economic centres, fostering inter-industry trade specialisation between the core regions (Ehnts & Trautwein, 2012).

New Economic Geography (NEG) represents a theoretical perspective that can hardly be classified as purely related to international trade or regional economics. It brings together the trade and location aspects, with economies of scale conditions. NEG stresses the role of benefits originating from the proximity of cooperating firms (agglomeration effects) in determining social and economic processes and the interplay between agglomeration and trade (Fujita & Krugman, 2003). NEG focuses on distribution of economic activity in space. Agglomeration effects, forward or backward linkages are driving forces of spatial concentration. Transport costs, congestions, costs of immobile factors in the suburbs – are contributing to its dispersion (Aiginger & Davies, 2004).

Industries with higher returns to scale also have a higher probability to become exporters and tend to localise closer to the markets (Krugman, 1991). The same rule applies to industries having revealed comparative advantages, which decide to establish close to international gates of transportation (Coşar & Fajgelbaum, 2016). The resulting pattern of regional specialisation may therefore be the effect of spatial agglomeration of economic entities (Krugman, 1991; Krugman, 1991). Lowering costs encourage more firms to locate in particular areas, which in turn accelerates the process of industry concentration. The initial distribution of manufacturing seems to be crucial in the emergence of regional specialisation, which can be furtherly magnified by a strong economic integration among regions due to firm-level vertical linkages, resulting in the agglomeration process, which leads to regional specialisation (Krugman & Venables, 1996).

The new new trade theory put the emphasis on the firm-level behaviour, stemming from firms' differentiated characteristics that induce export activity of firms with the role of sunk costs and fixed costs in entering the international market. Starting from the seminal work of Melitz (2003), scholars have put more attention to the firm's productivity differentials, in explaining exporting behaviour of firms. These selected characteristics (i.e. larger firm size, higher productivity, imports, being a part of MNC) increase the probability of exporting, among other motives of internationalisation studied in the literature (Ďaďo, Wiktor, & Źbikowska, 2015).

The latest trade models also highlight the importance of the reallocation of resources (within one sector), as a consequence of changes observed in the trade costs, and the interplay between export performance and firms' innovation capacity or productivity (Altomonte, Aquilante, Békés, & Ottaviano, 2013; Brodzicki, 2017; Cieślik, Michałek, & Szczygielski, 2016; Ciuriak, Lapham, Wolfe, Collins-Williams, & Curtis, 2015; Gajewski & Tchorek, 2017). These reallocations, i.e. as a consequence of trade liberalisation, imply productivity increases within a sector rather than inter-sectoral growth. The smallest or the least productive firms are wiped out the market (or decide to operate on the internal market only). The remaining market share is distributed from the non-exporters towards more productive or larger firms

(Melitz, 2008). Hence, a country or possibly a region that is more exposed to trade will further specialise in exporting goods as a result of the reallocation. The sectoral productivity increases, being influenced by the latter market process, and cannot be directly attributed to the sole effect of exporting (at least at the initial stage) (Bernard & Jensen, 1997; Clerides, Lach, & Tybout, 1996; Pavcnik, 2002). According to Bos and Zhang (2013), the trade specialisation nexus is driven by a low number of sectors, having crucial impact on the patterns of industry concentration and being driven by highly productive firms, benefiting from the increased openness by i.e. allotting resources from the least productive firms.

Another theoretical approach is also possible, which is related to investment portfolio diversification, that can be interpreted on a regional level. There is a certain portfolio of industries in a region's economy. The region's as well as external resources have been invested into these industries, with path dependency playing its role. If this industrial mix is significantly concentrated or even dominated by one or a few industries, it might be detrimental for the region if the leading industries witness downturn in the business cycle. Specialisation brings benefits, as it is shown in NEG, because of the economies of scale. However, if the economy of a region is too specialised, it may negatively affect the labour market, a long-run stability of economic growth and the quality of life. In this moment an idea of smart specialisation (SS) shall be recalled.

SS denotes the ability of a region to improve its competitiveness through the use of opportunities stemming from local agglomeration or concentration of resources, as well as adequate competences in this regard (Foray, 2015). Inevitably, regions that have such a capacity can induce appropriate changes in their economies to modernise, transform or to alter the composition of industries or services. SS is not just a concentration of a specific industry in a region; it is rather a process of future diversification of production or services, attained through the aggregation of inputs and competences, resulting in the emergence of new domains that indicate possible paths for economy transformations. With the use of local resources and productive structures, transformed with the application of new technologies, resources or knowledge, SS denotes the emergence of a new (in many cases innovative) activity, being to some extent compliment to the existing productive structures. By the transformation of local inputs, competences, knowledge and strategic priorities – regions are encouraged to generate original and unique competitive advantages.

The SS concept stresses the role of economic potential and the mechanisms governing it (McCann & Ortega-Argilés, 2013). By the concentration of available resources and prioritisation of activities in a low number of industries in a regional economy, it can foster growth through the agglomeration process (being vital in the development of innovation-related activities) and initiate positive externalities in other economic domains, if the specialisations were selected adequately (Foray, 2015).

The interlink between SS and trade is not frequently studied. However, Landabaso, Gianelle, Goenaga, González Vázquez, and Thissen (2014) developed a practical tool to analyse the outward economic strengths and weaknesses of regions. The regional trade data were mapped, in which regions were established as the nodes of the network and the links were attributed to the volume of trade flows. With the use of three indicators (number of export destinations, total value of exports and the weighted synthetic indicator of the above two, indicating the preference of higher export volumes combined with large number of destinations) the position of a region is analysed in the flow of goods.

Krammer (2017) proposed an analytical or diagnostic tool for the investigation of priority areas in exports that are suitable for the inclusion in the smart specialisation strategy of a country. The exemplified candidate areas in exports for Bulgaria had high potential for benefiting from the fundaments of smart specialisation strategy. They featured high reference to the existing smart specialisations of the country – only one of six areas was missing in the final programme. However, the study was conducted at a high level of trade data aggregation.

An important implication for the SS policy emerges from the analysis of the empirical data on regional trade in the EU. Regions being well-positioned within a specific industry, should strengthen its role within the RIS3 policy or at least try to find a synergy with complementary industries in the future development strategic plans. Isolation hampers the global competitiveness of a specific industry.

Cordes *et al*. (2016) using national trade data disaggregated to NUTS 2 regions found different specialisation patterns in high- and low-income EU regions: (i) in high-technology-intensive products, (ii) in medium-low or low-technology-intensive goods, respectively. The geographical distribution of comparative advantages in high-technology-intensive goods to some extent was in line with the EU core-periphery spatial pattern. The research has also revealed that specialisation trade patterns are stable over time (in the revealed comparative advantages). The magnitude of the advantage could change, but significant changes in the structure of comparative advantages were very rare. The amendments in the specialisation were not systematically correlated with the changes in regional output growth rates. Thus, globalisation creates a favourable process to the development of the core regions (Pietrzak, Balcerzak, Gajdos, Arendt, & Tvaronavičienė, 2017).

SS can also be interpreted in the framework of international trade in which a region (firms of a region) are engaged. SS usually reveals itself in a region's export profile, assessed for instance with the use of revealed comparative advantages (RCA) (Krammer, 2017). SS is a relatively new concept that has been applied to regional development and to the allocation of the EU structural funds. However, the attitude towards the idea of SS seems to be changing. For instance, at ERSA conference in Groningen in 2017, in high-level discussions related to the regional competitiveness and the resilience economies of regions to the global economy changes and the consequences of the financial and economic crisis, the idea of smart diversification was debated, as a 'smart' way in which region can become more resilient to external economic shocks.

MATERIAL AND METHODS

The data used in this study were collected from two main sources of information: (i) Local Data Bank, supervised by the Central Statistical Office in Poland, which provided different socio-economic indicators describing local economies, and (ii) the Customs Chamber, supplying data on foreign trade. The data were merged into one consistent dataset and aggregated to the LAU 1 level (in Polish *powiat*). However, in order to sustain fully balanced panel between 2004 and 2015, one of the counties had to be merged back due to the administrative reform introduced in 2013 that emerged the powiat of the city Walbrzych from the powiat Walbrzyski. Thus, the resulting number of counties equals 378.

Given the major objective of the paper, encompassing for the evaluation of the role of specialisation in the export success of counties (LAU 1) in Poland between 2004 and 2015, the authors set two hypotheses:

H1: Counties' specialisation determines their export success.

H2: Product concentration facilitates counties' export success.

The theoretical foundations of the relationship between product concentration or regional specialisation rely on the intensive activation of resources, spatial concentration of entities and the economy of scale. These coupled with potential externalities stemming from the agglomeration of economic entities (in general or sector-specific) result in a higher productivity that is a stimulus for exporting activity. In this regard, (smart or economic) specialisation stemming from a low number of highly productive firms significantly affecting local trade flows may reinforce the existing endogenous capabilities towards further productivity increases in selected industries, through backward and forward firm-level linkages. On the other hand, more concentrated output is to a higher extent prone to changes in the global economic cycle.

To grasp the relation between specialisation/product concentration and the value of exports per capita (logged), the authors utilise a series of indicators depicting the inter-local export specificities. Krugman specialisation index is introduced to identify the level of dissimilarities between local and national export product structure. In turn, to verify the concentration of exports among counties, the Herfindahl-Hirschman Index (HHI) index is used, as well as the Concentration Ratio (CR) index, indicating the share of exports dedicated to 3-5-10-15 main product groups in exports. Finally, to evaluate the number of product groups with comparative advantage, the authors computed the weighted revealed comparative advantage (WRCA) index, according to the following formula:

$$BRCA_{jm} = \left(X_{jm}/X_j\right)/(X_{km}/X_k) \quad (1)$$

$$WRCA_{jm} = \left(BRCA_{jm}\right)/\left[\sum BRCA_{jm}\,/N\right] \quad (2)$$

where:

X_{jm} - exports of j-th county of product group m;
X_j - total exports of j-th county;
X_k - total national exports;
X_{km} - total national exports of product group m;
$BRCA_{jm}$ - product group level *BRCA* for poviat j;
N - total number of product groups.

The calculations for WRCA were run at 4-digit HS nomenclature with ca. 1300 product groups in total. Furthermore, the share of exports in product groups with WRCA greater than 2, 5, 10, 20, as well as the quantity of such product groups was computed.

The descriptive statistics of the main covariates are presented in the Table 1. The dependent variable is the log of exports per capita (*lex_pc*). The *lcap_pc* variable is computed as a log of fixed assets per capita in constant prices, therefore represents the capital abundance in a county. The share of population with tertiary education (*sh_pop_h*) indicating human capital endowment was obtained from national censuses run in 2002 and 2011, further interpolated/extrapolated for the following years of the study due to the unavailability of the data in the whole-time span of the analysis. The

role of foreign capital is introduced by the inclusion of the share of exports generated by foreign-owned entities (*ex_sh_foe*), while the sectoral structure of the local economies is proxied with the share of employment in industry (*sh_empl_i)*. The METRO dummy depicts counties located within 8 metropolitan areas (the core and outer-sphere) in Poland, established by the ESPON MEGA classification.

Table 1. Descriptive statistics of the covariates

Variable	Description	Obs	Mean	Std. Dev.	Min	Max
ex_cr3	Share of 3 main product groups in exports	4536	59.919	17.700	8.629	100
ex_cr5	Share of 5 main product groups in exports	4536	70.964	15.859	13.703	100
ex_cr10	Share of 10 main product groups in exports	4536	83.646	12.270	24.432	100
ex_cr15	Share of 15 main product groups in exports	4536	89.305	9.846	33.344	100
ex_sh_foe	Share of FOEs' exports	4536	41.450	30.544	0	99.398
ex_hhi	Herfindahl-Hirschman Index	4536	0.204	0.144	0.011	0.968
ex_ksi	Krugman specialisation index	4536	1.556	0.159	0.472	1.952
ex_sh_wrca2	Share of exports in product groups with WRCA > 2	4536	64.670	20.539	0	99.737
ex_sh_wrca5	Share of exports in product groups with WRCA > 5	4536	45.558	24.551	0	99.708
ex_sh_wrca10	Share of exports in product groups with WRCA > 10	4536	30.482	24.562	0	99.620
ex_sh_wrca20	Share of exports in product groups with WRCA > 20	4536	16.198	20.495	0	99.307
lex_pc	Log exports per capita	4536	8.364	1.256	2.163	11.938
lcap_pc	Log capital (fixed assets per capita)	4536	2.605	0.121	2.431	2.845
METRO	Metropolitan dummy	4536	0.140	0.347	0	1
sh_pop_h	Share of population with tertiary education	4536	27.826	7.881	10.299	49.739
sh_empl_i	Share of employed in industry	4158	29.003	11.980	0	75.383
wrca2	No. of product groups with WRCA > 2	4536	15.991	16.014	0	189
wrca5	No. of product groups with WRCA > 5	4536	8.371	7.173	0	55
wrca10	No. of product groups with WRCA > 10	4536	4.665	3.797	0	27
wrca20	No. of product groups with WRCA > 20	4536	2.189	1.904	0	15

Source: own calculations in STATA.

The overall formula of the fixed-effects panel model which we consider was of the following form:

$$y_{it} = \alpha_i + x'_{it}\beta + \epsilon_{it} \tag{3}$$

where:

y_{it} - log export per capita;
α_i - unobservable county-specific effects;
x'_{it} - vector of control variables.

The use of log export per capita as the dependent variable stemmed from the high incidence of its usage as a regional export competitiveness index. However, other indices could be also used thereof, i.e. the share of exports in GDP, the share of high-tech products in exports, dynamics of exports, the number of jobs created in exporting firms. Due to unavailability of official GDP at LAU 1 level and observed practices in empirical papers, the authors decided to utilise export per capita (logged). The usage of any GDP-dependent version of the

index would imply the necessity of regional GDP (per capita) disaggregation, which could result in biased estimates. The alternate estimation approach would be to estimate spatial panel models with i.e. spatial autoregressive component, intercepting the spatially lagged dependent variable, what could result in a higher model's goodness of fit.

The dependent variable and the some of the independent variables related to the RCA and export concentration measures are based on the same data set, thus the problem of confounding endogeneity potentially arises. Therefore, the issue was treated with caution. The endogeneity was tested with the following tests: (i) Wu-Hausman F test, (ii) C Test (GMM Distance statistic). Additionally, regressions implementing endogeneity issue were estimated and compared to the regular ones. Finally, it turned out that the problem of endogeneity does not exist.

The covariates used in the study are stationary according to Levin-Lin-Chu unit-root test. The run test of overidentifying restrictions, which enables the comparison between fixed and random effects models (according to the p-value of Sargan-Hansen statistic), was in favour of fixed effect estimation.

Series of tests on the dataset – according to the Wooldridge (2002) test for serial correlation in the idiosyncratic errors – proved that the estimation procedure has to deal with serial correlation. Additionally, the Pesaran (2004) test for cross-sectional dependence indicated that the error terms are not independent across cross-sections. The cross-sectional dependence inappropriately treated could lead to severely biased estimates (Hoechle, 2007). Knowing that in our dataset $N > T$, and T is rather small, the authors decided to use the fixed-effects (within) regression with Driscoll and Kraay standard errors (Driscoll & Kraay, 1998) over the panel-corrected standard error (PCSE) regressions (which is a better choice when $T > N$) or regular fixed-effects regression with cluster-robust standard errors to achieve consistent estimates thereof. The estimations of the latter two methods are available upon request.

RESULTS AND DISCUSSION

Figure 1 presents the stylised facts about the value of exports per capita for Poland's counties. The obtained picture reflects the main features of the economic space in Poland that can be seen on many other similar maps, which are:

- the division of Poland into western and eastern parts, with the western one having higher exports per capita,
- the exports per capita concentrating around the transportation interworks (roads infrastructure, not only highways),
- the influence of agglomerations, around which exports is concentrated,
- 'islands' of exports, meaning that in the areas with low exports per capita higher values are observed, reflecting the activity of particular enterprises, often with foreign capital.

The map on the right side of Figure 1 shows the number of product groups with WRCA>2 in the exports of counties. The comparison of these two maps shows the probable endogeneity problem, as the maps are similar in many aspects. Figure 2 depicts the spatial distribution of the two specialisation measures, which are KSI and RC3. In comparison with the maps in Figure 1, they show different spatial distribution, with the highest concentration being observed in the eastern counties. The role of transport/road

infrastructure is also visible. The comparison of the results obtained with the use of different concentration measures brings a conclusion that structural characteristics of county's exports matters. Exports concentration may have many faces: it may be due to high-tech industrial products or to agricultural ones.

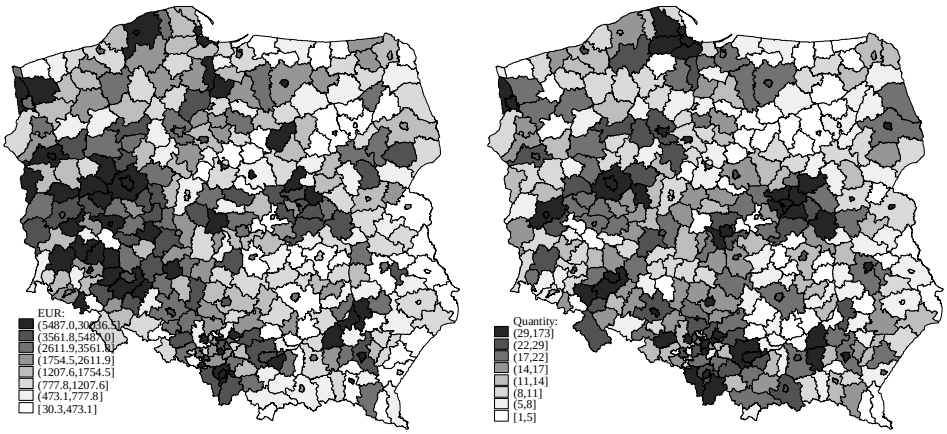

Figure 1. Export per capita in EUR in 2015 (on the left) and no. of product groups with WRCA > 2 in exports (on the right)
Source: own compilation.

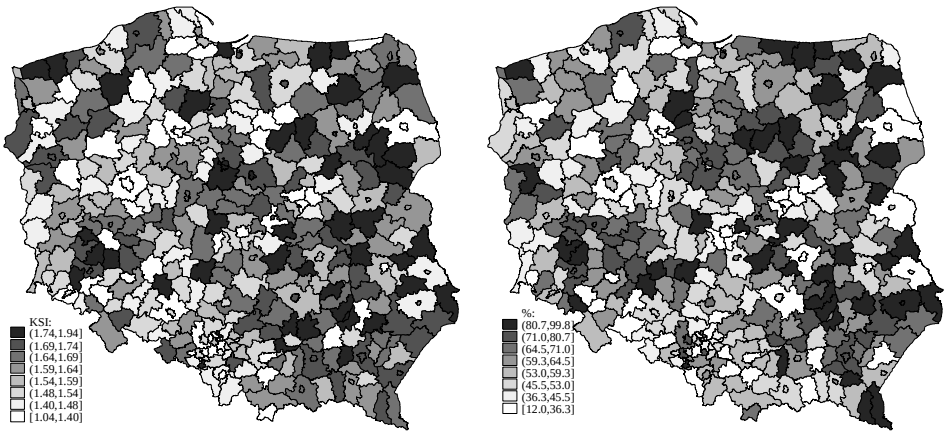

Figure 2. Krugman specialisation index (on the left) and share of exports of 3 most important export product groups (on the right)
Source: own compilation.

Tables 2 and 3 present the results of the model estimations, where the (in logs) value of exports per capita (in PLN) in counties is the dependent variable. In the basic specification of the model, the obtained direction of influence of the particular independent variable is as expected. The value of exports per capita is statistically significantly influenced by the share of the population with the tertiary education, the share of industry in total employment and

the share of FOEs in total exports. Also the fixed assets per capita value significantly, in a positive way, influences the dependent variable. In the initial specification of the model, the variable metro (metropolitan dummy) was used, however in the final version of the estimations, it is excluded from the set of the independent variables due to collinearity.

Table 2. Estimation results

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	lex_pc	lex_pc	lex_pc	lex_pc	lex_pc	lex_pc	lex_pc
sh_pop_h	0.0438***	0.0441***	0.0426***	0.0428***	0.0426***	0.0430***	0.0435***
	(0.00204)	(0.00212)	(0.00202)	(0.00200)	(0.00195)	(0.00203)	(0.00201)
ex_sh_foe	0.0061***	0.0043***	0.0057***	0.0053***	0.0054***	0.0055***	0.0058***
	(0.00091)	(0.00088)	(0.00090)	(0.00086)	(0.00084)	(0.00094)	(0.00091)
sh_emp_i	0.0203***	0.0191***	0.0197***	0.0192***	0.0188***	0.0193***	0.0202***
	(0.00262)	(0.00225)	(0.00254)	(0.00254)	(0.00263)	(0.00277)	(0.00253)
lcap_pc	0.120***	0.103**	0.106**	0.104***	0.0886**	0.107***	0.121***
	(0.0390)	(0.0420)	(0.0417)	(0.0367)	(0.0405)	(0.0358)	(0.0369)
ex_eur_hhi		0.788***					
		(0.0870)					
ex_eur_ksi			0.417***				
			(0.0689)				
ex_sh_wrca2				0.0040***			
				(0.00022)			
ex_sh_wrca5					0.0044***		
					(0.00036)		
ex_sh_wrca10						0.0039***	
						(0.00029)	
ex_sh_wrca20							0.0028***
							(0.00017)
Constant	6.002***	5.981***	5.454***	5.879***	5.986***	5.988***	5.979***
	(0.0902)	(0.0880)	(0.137)	(0.0819)	(0.0850)	(0.0828)	(0.0850)
Observations	3402	3402	3402	3402	3402	3402	3402
Number of groups	378	378	378	378	378	378	378
R^2 within	0.432	0.449	0.441	0.449	0.462	0.455	0.441
F	345.6	426	610.6	383.9	799.3	866.9	299.6

Explanation: Driscoll and Kraay standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.
Source: own study.

In the next specifications, HHI and KSI are introduced, and they positively influence exports per capita. KSI reflects the dissimilarity of exports structure of a county, compared to the national structure. In fact, it reveals its unique character compared to the national average. Over the years, the KSI level changed (Figure 3). A noticeable increase was observed after the crisis started in 2008.

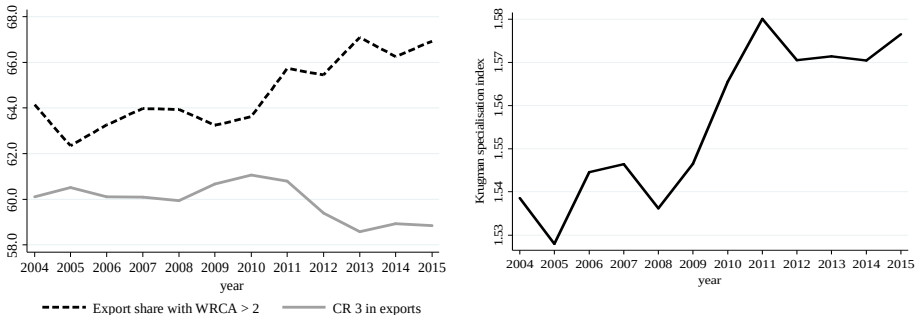

Figure 3. Concentration of exports (on the left) and Krugman specialisation index (on the right) in 2004-2015
Source: own elaboration.

Another measure used that depicts the export specialisation is a share of product groups with weighted RCA index exceeding 2 in total exports (or respectively, 5, 10, and 20). The obtained results are in line with our expectations, the higher the share of exports with WRCA indices, the greater the value of counties' exports. The RCA formula was used in the weighted variant (WRCA) to capture the unequal contribution of particular product groups to the county's overall exports. It was expected that different cut-off of RCA indices can bring different results, as regards the influence on the dependent variable. The application of a higher threshold reduces the share of exports that is covered by the revealed comparative advantage, however not significant changes can be seen if RCA cut-off is 2, 5 or 10. If 20 cut-off is used, the magnitude of influence drops.

WRCA index was used in another formula, related to the number of product groups for which RCA exceeds the cut-off threshold. The obtained results depend on the cut-off level. Increasing it from 2 to 10 results in the higher magnitude of influence on the dependent variable. For WRCA20, the magnificence of the influence drops.

Another concentration measure used in modelling is CR index which also positively influences the exports per capita. Increasing the cut-off within CR index results in the increased magnitude of the dependent variable.

Using different measures of regional specialisation and product concentration, the authors acknowledged the positive role of the two in determining the success of county export (among other factors), proxied by exports per capita (logged). By showing the robust role of specialisation/concentration, we confirm theoretical considerations of the NEG theory, the heterogeneity concept and RCA approach in terms of the consequences of regional specialisation of regional trade. The results bring important implications for regional policy, by showing the directions, in which potential stimuli should be introduced. We also propose a set of indicators that can be used in similar analyses. The portrayed theoretical/analytical framework can be also easily extended in further analyses investigating e.g. the role of smart specialisation in other regional trade evaluations.

Table 3. Estimation results (continued)

Variables	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	lex_pc	lex_pc	lex_pc	lex_pc	lex_pc	lex_pc	lex_pc	lex_pc
sh_pop_h	0.0442***	0.0446***	0.0448***	0.0450***	0.0425***	0.0425***	0.0425***	0.0434***
	(0.0023)	(0.00234)	(0.00229)	(0.0022)	(0.00202)	(0.00200)	(0.00192)	(0.00203)
ex_sh_foe	0.0040***	0.0039***	0.0042***	0.0045***	0.0063***	0.0063***	0.0062***	0.0061***
	(0.00096)	(0.00098)	(0.00099)	(0.00101)	(0.00088)	(0.00089)	(0.00085)	(0.00091)
sh_emp_i	0.0187***	0.0186***	0.0183***	0.0185***	0.0200***	0.0194***	0.0196***	0.0199***
	(0.0021)	(0.00209)	(0.0023)	(0.00248)	(0.00242)	(0.00237)	(0.00255)	(0.00251)
lcap_pc	0.109**	0.115**	0.123**	0.126**	0.116***	0.109***	0.107***	0.116***
	(0.0436)	(0.0466)	(0.0483)	(0.0486)	(0.0348)	(0.0365)	(0.0360)	(0.0379)
ex_cr3	0.0099***							
	(0.0005)							
ex_cr5		0.0131***						
		(0.00056)						
ex_cr10			0.0180***					
			(0.00080)					
ex_cr15				0.0226***				
				(0.00133)				
wrca2					0.0108***			
					(0.00208)			
wrca5						0.0195***		
						(0.00277)		
wrca10							0.0315***	
							(0.00270)	
wrca20								0.0217***
								(0.00373)
Constant	5.552***	5.195***	4.591***	4.055***	5.874***	5.923***	5.941***	5.988***
	(0.0917)	(0.0965)	(0.102)	(0.127)	(0.100)	(0.0907)	(0.0903)	(0.0906)
Obs.	3402	3402	3402	3402	3402	3402	3402	3402
No.of groups	378	378	378	378	378	378	378	378
R^2 within	0.464	0.469	0.462	0.456	0.439	0.440	0.441	0.434
F	2502	2402	1626	1614	994.4	556.4	347.2	410.8

Explanation: Driscoll and Kraay standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.
Source: own study.

CONCLUSIONS

The idea of specialisation in international trade is a fundament one, which goes back to Adam Smith and David Ricardo. Specialisation enables to concentrate on what the country can do best, meaning that the available resources are utilised most profitably. Different approaches to capture specialisation are possible, related to specialisation measures or revealed comparative advantages.

Countries are lumpy, regarding their export base, which results in different export patterns. The question we asked is whether the specialisation translates into the export success, proxied as exports per capita, controlling for regions characteristics, such as human capital, FDI, capital endowment and share of the industry. The general conclusion is that specialisation in a positive way contributes to the value of exports per capita, assessed at the county level (H1). The same conclusion applies to higher product-level concentration in exports (H2).

Obviously, the two are highly interconnected at the local level of analysis, showing the tremendous role of low number of highly productive/innovative entities in exports. These entities to a high extent utilise the initial/endogenous regional potential or are simply the fundament of it. Local authorities, by setting friendly environment for cooperation of firms, resulting in easier learning-from-exporters, can furtherly enhance the internationalisation of regions' economies. The character of the observed relations between specialisation and product concentration may entail higher importance of MAR vs. Jacobs externalities, which should, however, be further tested.

The results may also imply that the established smart specialisation approach towards setting priorities in regional policy may be beneficial for area units smaller than NUTS 2. Finding their uniqueness, fitting into the broader picture of regional specialisation, embracing highly competitive industries may be a key to the export's success. The concentration of efforts on the areas of production in which local units have some kind of advantage or are connected on the basis of forward or backward linkages, may result in the creation of new specialisations, which are highly attached to the economic base of the local area units. Given the high persistence of export specialisation, being path-dependent, as reported by Cordes *et al*. (2016), regions/local units should direct towards its initial strengths or base new specialisations around them. Yet, more research is needed to fully countercheck SS effects, due to the importance of the valid selection of regional smart specialisations.

However, there is also the downside of the excessive specialisation. If trade policy continues the ongoing trend of subsequent product concentration, the resulting image of the Polish export structure would eventually restrict to the most important ones: machinery, transport parts/vehicles, metals, chemicals, production of animal/vegetable food, wood/paper products. The increased product concentration may expose the country's economy to global shocks, especially if it is based on primary commodities (Herzer & Nowak-Lehnmann, 2006). Similarly, local economies enhancing existing manufacturing specialisation (in line with their RCA) instead of the policy stressing the role of finding new industries or product groups that could be offered on foreign markets will become more vulnerable to future downturns of the global economy or shocks witnessed in their main trade partners. Therefore, we acknowledge the view of Cordes *et al*. (2016); Zaman and Goschin (2016) thereof.

The obtained results on the role of specialisation are in line with Naudé, Bosker, and Matthee (2010) showing positive impact of trade specialisation on local economic growth, basing on the example of magisterial districts in South Africa. They also fit into the picture of trade inequalities observed in Poland by Nazarczuk and Umiński (2018).

Our study has a few limitations. Firstly, similarly to Krammer (2017), it takes under consideration export as an account of international competitiveness. One can image other fac-

tors contributing to it, witnessed e.g. in the role of: human capital, FDI, productivity, institutions, etc. Secondly, given the data restrictions for the Polish trade at LAU 1 level, only trade in manufacturing is analysed in detail. However, the role of services in the global trade flows plays more and more important role (Stefaniak-Kopoboru & Kuczewska, 2016). The availability of trade in services data would greatly increase the comprehensiveness of the study by revealing general implications of specialisation. Owing to the data, the authors could also reveal more desired patterns of specialisation (i.e. manufacturing/services).

Further research is recommended, and different level of analysis should also be applied, to test the robustness of the obtained results. The similar research would be interesting to be done at the NUTS-2 level in order to inquire into the rationale of smart specialisation). SS strategy is carried on at the NUTS-2 level, as these are the regional authorities that are responsible for distributing resources (policy efforts, financial funds) aimed and SS development. A lot of interesting further research is possible to evaluate if these efforts translate into the export success.

The comparative advantage of a region can reveal itself in many aspects. It can be high concentration of exports (measured by the HHI index) or the distinguished exports pattern that is unique (vs. national average or other regions). Different versions of RCA indices can be used, in non-weighted or weighted formulas, with different cut-off levels, the same issue being with CR indices. Moreover, specialisation can be attributed to the exported industrial products or the agricultural ones. These structural aspects deserve further inquiry.

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Authors

The contribution of co-authors is as follows: J.M. Nazarczuk (45%), S. Umiński (35%), Krystyna Gawlikowska-Hueckel (20%). J.M. Nazarczuk prepared the literature review, statistical calculations, and the methodology of the research, while S. Umiński elaborated the part of literature review, depicted the results and formulated the findings, whereas K. Gawlikowska-Hueckel discussed the findings and gave implications to the regional policy.

Jarosław M. Nazarczuk
PhD in Economics, Assistant Professor appointed at the University of Warmia and Mazury in Olsztyn (Faculty of Economic Sciences), Poland.
Correspondence to: Jarosław Nazarczuk, PhD, University of Warmia and Mazury in Olsztyn, Faculty of Economic Sciences, Oczapowskiego, 4, 10-719 Olsztyn, Poland, e-mail: jaroslaw.nazarczuk@uwm.edu.pl ; ORCID ID: orcid.org/0000-0002-2318-6333

Stanisław Umiński
Associate Professor of the Gdańsk University (Research Centre on European Integration) and the vice chairman of Institute for Development in Sopot, Poland.
Correspondence to: University of Gdańsk, Research Centre on European Integration, ul. Armii Krajowej 119/121, 81-824 Sopot and Instytut Rozwoju, ul. J. Czyżewskiego 6/1, 81-706 Sopot, e-mail: uminski@univ.gda.pl and s.uminski@instytut-rozwoju.org ; ORCID ID: orcid.org/0000-0002-4445-0893

Krystyna Gawlikowska-Hueckel
Associate Professor of the Gdańsk University (Economics of European Integration Chair) and the vice chairman of Institute for Development in Sopot, Poland.
Correspondence to: University of Gdańsk, Economics of European Integration Chair, ul. Armii Krajowej 119/121, 81-824 Sopot and Instytut Rozwoju, ul. J. Czyżewskiego 6/1, 81-706 Sopot, e-mail: k.gawlikowska@ug.edu.pl

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An Empirical Investigation into the Role of Technology Gap in the Trade Relations of the EU Member States

Tomasz Brodzicki, Jakub Kwiatkowski

ABSTRACT

Objective: The objective of this article is the assessment of the role of technology gap in explaining the intensity of trade relations among the EU28 member states over the period of 1995-2015.

Research Design & Methods: We constructed a basic trade model in a gravity framework and further augmented it by incorporating various measures of technology gap. We verified the robustness of the results by re-estimating the model for subgroups depicting the south-south, south-north & north-north trade.

Findings: We have found that the technology gap plays a substantial role in determining the intensity of present trade relations of the EU28 Member States. We tested the robustness of the results and have found that the impact of technology gap varies with respect to different groups of reporters and partners depending on their level of technological sophistication. The results are in line with the postulates of trade theory.

Implications & Recommendations: Technology gap plays an important role in determining the intensity of trade within the group of the EU28. The gradual convergence in incomes and TFP levels is likely to modify its role, with more effort directed at horizontal differentiation which in turn could lead to the intensification of the IIT.

Contribution & Value Added: We tested various standard and non-orthodox measures of technological gap. The semi-mixed effects panel data model was estimated with the use of PPML – a new and superior approach.

Article type: research paper
Keywords: technology gap; gravity model; panel data; semi-mixed effects; PPML
JEL codes: F10, F14, C23

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INTRODUCTION

The levels of technological sophistication differ significantly between countries and between sectors. In addition, the recent micro-level evidence proves that they vary greatly between firms within the same sector located in the same country (e.g. Bernard, Jensen, & Lawrence, 1995), which is reflected in highly right skewed productivity distribution at the core of the heterogeneous firms' theory.

Taking the above into account, the gap in technological sophistication could be one of the most important determinants of bilateral trade between any two countries, even if they are the same level of technological sophistication (north-north or south-south trade) or we deal with trade between a leader and a follower (north-south trade). To our surprise, with some exceptions, relatively little attention has been given to the empirical investigation of the role of the technology or innovation gap in determining the intensity of trade flows with the use of the very popular and clearly robust gravity approach.

The objective of the present article is the assessment of the role of technology gap in determining the aggregate intensity of bilateral trade within the group of the EU28 Member States over the period of 1995-2015 utilising the panel data approach. We constructed a basic gravity model of bilateral trade with exports as the chosen dependent variable and then further augmented it by introducing various measures of bilateral technological gap or technological distance. From this perspective, the present article can be considered an extension of the studies of Brodzicki and Śledziewska (2016) and Brodzicki (2016) on the role of technology in the trade relations of Poland allowing more general conclusions to be drawn. Based on the prior results as well as theoretical postulates, we expected technology gap to play a significant role in determining the intensity of trade relations. For the time being, the lack of suitable sectoral data does not allow us to test the technology gap hypothesis on a global panel of countries at more disaggregated, adequate sectoral or even product level. We thus consider the present analysis as a step towards the comprehensive verification of technology gap trade as proposed by Soete (1981).

We would like to acknowledge that the linkage between technology and trade is multifaceted and has been investigated since the earliest contributions to economics. Technology differentials of exogenous nature, for instance, are the basis of Smith's absolute advantage trade model as well as Ricardian comparative advantage model. Eaton and Kortum (2002) build an interesting modern extension of the Ricardian model with heterogeneous technology allowing both geographic barriers (not only distance) as well as technology to determine international specialisation. A thorough review of the role of technology gap in economic growth and trade has been recently conducted by Kubielas (2011). According to Kubielas, technology gap can play a role of both a barrier as well as an incentive to trade and furthermore effective catching-up process (structural convergence).

However, as noticed by Lall (1992), economic literature neglected the mechanisms for technology creation, assuming only static effects of technology and thus adopted exogenous technological change. Simplified neoclassical models assumed equal access to technology at both macroeconomic and microeconomic levels with perfect knowledge diffusion. The initial endowment in production factors determined the factor price ratios which corresponded to a certain level of physical capital per worker or the K/L intensity. Furthermore, all companies were assumed to share the same production function and barriers to

technology diffusion were zero. In that setting, a purposeful innovative activity by a given company did not result in any advantage for the firm or economy in general over its competitors. There was no rational justification for R&D spending.

The dominant framework was questioned in the 1960s by the emergence of the technology gap theory by Posner (1961) or Freeman (1963) who in their stylised models described an advantage enjoyed by a country introducing a new good into a market, thus gaining the first-mover advantage due to technological lead (supremacy) that led to gaining an initial exporter status. The initial importers could potentially become exporters after gaining the necessary knowledge. It required a certain lag due to the imperfect character of knowledge diffusion.

It is also worth stressing that Vernon (1966) and Hirsch (1974) developed the theory of trade with product life cycles. The theory was elaborated by Krugman (1979) in his general-equilibrium model of bilateral trade between industrialised north and underdeveloped south with a product life cycle. Krugman's model assumed that innovating North enjoyed an initial advantage in the production of innovative goods thus becoming their exporter. However, the non-innovating South can eliminate the North's initial advantage thanks to 'technology borrowing' or technology imitation. In order to retain the leadership, the Northern economy is forced to innovate repetitively. The technology gap can be partially reduced by prior imports or FDI inflows (e.g. Coe & Helpman, 1995) – major channels of international R&D spillovers and technology transfer (Kwiatkowski, 2015). Thus, we have to acknowledge that trade and technology gap could be endogenous at least to some extent.

In contrast to the theoretical literature, the results of the initial empirical analyses on the technology gap based trade are mixed. In his influential paper, Soete (1981) performed a static cross-sectional analysis of OECD trade at the disaggregated sectoral level, and the results strongly supported the theoretical postulates. The international trade performance of innovative sectors in the OECD countries was found to be a function of sectors' relative technological performance as measured by technology-output indicators.

A more elaborated analysis by Cotsomitis, DeBresson, & Kwan, (1991) exposed, however, that the technology gap theory was unable to properly predict the directions of high technology trade between OECD economies. The authors linked it to inadequate theoretical formulation of the theory. Specifically, it is based on the overall technology leadership and does not allow for variation at the level of product.

However, more recent studies are clearly in favour of technology gap based trade. In her work Wakelin (1998) analysed the role of innovations in trade performance of the OECD countries disaggregated for 22 industries over the period of 1980-1988 and concluded that at the aggregate level and in the case of the majority of sectors innovative activity played a significant role. Moreover, she suggested that innovations impacted trade performance to a greater extent in sectors that created technology ('net producers') than in sectors utilising the technology ('net users'). The result was is in line with the classic work by Dosi and Soete (1983). Similar results were obtained by Kerr (2017), who proved that Ricardian technology differences had a significant impact on bilateral trade among 88 countries disaggregated into 26 industries in the period of 1980-1999.

The remainder of the paper is as follows. Section 2 presents a review of empirical studies on the role of technology gap applied in the gravity setting; Section 3 presents the methods utilised, the empirical model and data source, and considers the measurement

of the technology gap. Section 4 presents and discusses the results of the estimation on the general sample, as well as trade between the groups depending on their level of technological sophistication. The final section concludes.

LITERATURE REVIEW

The utilisation of the gravity framework in modelling trade intensity since the early contribution by Tinbergen (1962) has been extensive and successful. The later seminal contributions include, for instance, the works by Bergstrand (1985), Anderson and van Wincoop (2003) or Anderson (2011). The gravity model is one of the most successful empirical models in which bilateral trade between any two trade partners is modelled as inversely proportional to the distance between them and proportional to their sizes. This basic framework is regularly extended to incorporate variables in line with the hypotheses tested in a given study that could potentially affect mutual trade intensity. The quick review of contemporary studies shows that researchers are rather flexible in the selection of explanatory variables based on the context or aim of their particular analysis (Kepaptsoglou, Karlaftis, & Tsamboulas, 2010). Head and Mayer (2014), in turn, critically review the methodological foundations of the gravity equation and empirical methods utilised.

Despite its robustness, new methods of analysis are being developed and applied, leading to more precise results. Egger (2000) points to the need of a proper econometric specification of the gravity equation in order to obtain unbiased estimates.

In the most typical usage, the empirical model is log-linearised and estimated with the use of country-pair dummies (in order to account for the problem of trade persistence - Anderson and van Wincoop [2003]) Log-linearisation leads to a number of problems, such as the presence of zero-trade flows typically solved by zero-adjustment, etc. Furthermore, the introduction of fixed-effects in the two way setting could lead to neglecting time-invariant variables and therefore requires the use of more elaborate methods such as of the Hausman-Taylor estimator, for instance.

In contrast to the usual approach, Santos Silva and Tenreyro (2006) stressed that the logarithmic transformation of the model was not an appropriate approach to estimate elasticities in gravity equation. As an alternative, they proposed the use of the Poisson pseudo-maximum likelihood estimator (PPML). Recently, Proenca, Sperlich and Savaşcı, (2015) recommended the use of a semi-mixed effects method which relaxed the very strict assumptions of random errors model but kept more restrictions than the fixed effect model. This approach was successfully utilised in Brodzicki (2016) and in Brodzicki and Śledziewska (2015) and is going to apply in the present study as well.

As it has been already mentioned, despite the significance of technological sophistication and the role of technology gap as postulated by theoretical literature, only a limited number of empirical studies tested for the role of technology gap or technological distance in explaining bilateral trade flows within the gravity framework.

Martinez-Zarzoso and Ramos (2005) utilised a composite index capturing technology and human knowledge gaps in an augmented gravity framework in a cross-sectional study on 62 developed and developing countries in 1999. The model for exports was estimated with the standard OLS on a standard double log specification. The authors utilised a composite Technology Achievement Index (TAI) developed by the United Nations. The index composed of eight distinct achievement indicators (Desai *et al.* 2002)

captured the efficiency in the creation and diffusion of new as well as existing technologies and in building the human skill base for technology creation. TAI indices for exporters and importers were introduced separately to test their significance in subsamples of wealthy and poor exporters. Martinez-Zarzoso and Ramos (2005) included a standard set of conditioning variables controlling in addition to infrastructure endowment. The impact of exporters' TAI on the value of exports was found to be statistically significant and positive for both developed and developing countries. However, it was statistically significant for importers' TAI only in the case of developing countries.

Filippini and Molini (2003) included technological distance measured by an indicator proposed by Lall (1992) in an extended panel model to examine the relevance of technology gap in the trade flows between East Asian industrialising countries and selected developed countries over a period of 30 years. They split the sample into developed and developing countries and furthermore decomposed the trade flows into manufacturing and non-manufacturing goods. Filippini and Molini (2003) applied the fixed effects estimator and were able to positively verify the hypothesis that bilateral trade tends to increase in technological similarity between countries.

In the study by Wang, Wei and Liu (2010) for 19 OECD countries over the period of 1980-1998, R&D stock, similarities in the domestic R&D stock, market sizes as well as inward FDI stock were found to play a major role in determining the value of exports. At the same time, domestic R&D stock was found to play a bigger role than GDP and FDI in promoting bilateral trade. A 1 percent increase in total domestic R&D stock increased bilateral trade by up to 1 percent, and a 1 percent increase in the R&D similarity between trade partners raised trade by around 0.4 percent. R&D was furthermore observed to be the second most important variable in explaining trade flows within the group of the OECD countries just after the geographical distance. The results by Wang *et al.* (2010) are in line with the postulates of the new growth theories (e.g. Romer, 1990; Grossman & Helpman, 1991; Aghion & Howitt, 1998).

Brodzicki and Śledziewska (2016) estimated a panel model of trade relations of Poland with its 234 trade partners over the period of 1999-2013. The technology gap was measured by TFP and relative patenting performance controlling for the quality of institutions as well as technology and innovation indices of the Global Competitiveness Report (Schwab, 2010) published by the World Economic Forum on a yearly basis. They applied the PPML estimators. The technology gap was proven to play a statistically significant role, however, the elasticity of trade on the technology gap differ significantly between groups of trade partners classified by the level of income and the level of their technological sophistication.

Brodzicki (2016) performed a linked analysis on the Polish trade with all possible trade partners over the period of 1999-2011 using similarly to the present study a semi-mixed effects model using PPML estimator as suggested by Proenca *et al.* (2015). In measuring the technology he utilised several approaches taking into account differences in TFP, GERD (technology-input), patenting and citation in scientific journals (technology-outputs), while controlling for differences in human capital. The major result was that Poland exported more to countries at the similar level of technological sophistication. The results were checked on sub-groups of countries based on their GERD intensity levels. It was found to be evident that the results varied depending mostly on whether Poland enjoyed leadership, followership or was a peer vis-à-vis a given group of partners. The

present study extends the analysis to numerous reporting countries, therefore, allowing for more general conclusions to be drawn.

MATERIAL AND METHODS

Our empirical panel data model for total exports of reporting country i to partner country j in the year t took the following form:

$$\text{export}_{ijt} = \exp\big(\ln \alpha_0 + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 \ln d_{ij} + \gamma \ln X_{ijt} + \rho \ln Tech.Gap_{ijt} + \nu_t + \eta_i\big)\varepsilon_{it} \quad (1)$$

where:

Y_{it} - size of the reporting country;
Y_{jt} - size of the partner country;
d_{ij} - distance in kilometres between reporter's and partner's capital cities;
X_{ijt} - conditioning set of standard gravity variables describing bilateral trade relations;
$Tech.Gap_{ijt}$ - measure of the technological gap of direct interest to us.

The form of the empirical model allowed to interpret the coefficients on the key variables as elasticities.

In contrast to the traditional approach, the dependent variable entered the equation in levels and not in logs. In addition, we estimated the model for total bilateral trade (total trade) as well as imports (import) separately. We expected the coefficients on it to be statistically significant.

The explained variable (exports) was the value of exports from a given reporting EU 28 members state to a given EU 28 partner in millions USD in a given year. All values were converted to constant 2005 USD in order to obtain coherence with the data from the PWT 9.0 database.

In contrast to previous analyses by Brodzicki (2016) and Brodzicki and Śledziewska (2016) conducted for Poland and its trade partners, we dealt with a matrix of 784 trade flows on a bilateral basis observed over a period of 21 years (1995-2015), thus allowing for more universal conclusions.

The trade data for the EU28 countries were retrieved from COMEXT database (http://epp.eurostat.ec.europa.eu/newxtweb/). The data were converted from EUR to USD and deflated in order to guarantee their coherence with the explanatory data retrieved from the PWT 9.0.

Table 1 contains a description of the utilised variables, their source and basic statistical properties. The membership in the EU28 was utilised as a clustering variable (eu) in our semi-mixed effect model. It was a dummy variable which was time variant.

The basic specification of the gravity model includes standard variables such as the sizes of reporter and partner as measured by the log of their real GDP (real GDP) and the log of distance between trade partners (distance). The distance is measured by the 'as the crow flies method' between the capital cities of reporter and trade partner. In accordance with the postulates of the gravity theory, the coefficients on real GDP of partner and reporter should be positive and negative in the distance.

Economic theory postulates that trade between two countries at the similar level of development is more intense. In order to account for this, we adopted natural log of absolute difference in real GDP per capita as a measure of the gap in the level of development (rld) and expected the coefficient on it to be statistically significant and negative. We would like to stress furthermore that we chose to apply the above mathematical transformation (that is the natural log of absolute difference) to all variables depicting the technology gap in order to ease the interpretation of the obtained results. At the same time, other alternatives were checked – such as e.g. the log of the ratio of key variables between reporters and trade partners. It proved not to have a major impact on the results once we allowed the different interpretation of coefficients on technology gap variables.

We utilised COMEXT dataset as a principal source of trade data. For the set of explanatory variables, we utilised first of all the Penn World Tables 9.0 (Feenstra *et al*., 2015). The dataset provided information on real GDP, capital, labour and human capital endowments, import and export shares as well as TFP of all countries considered. Most of the remaining data come from the World Bank's World Development Indicators Database.

In their seminal article, Dosi and Soete (1983) postulated that technological gap should be preferably measured by the difference in patenting performance vis-à-vis the US. The US was chosen as a benchmark country located on the global technology frontier (GTF). Dosi and Soete (1983) approximated the difference by the technology-output or R&D efficiency indicator. Other approaches utilised in the empirical literature on the subject include for instance the share of high technology or medium-high technology goods or sectors in exports or total production. On the other hand, the use of technology-input indicators is also popular. The most popular include R&D spending intensity as proxied by General Expenditures on R&D (GERD) or some measure of R&D sector's size, such as the number of employees involved in R&D.

Acknowledging the complex nature of technology and its diffusion channels, as well as the importance of both technology-inputs and technology-outputs, many researchers try to build composite technology or innovation indicators. The example, being the TAI or the Summary Innovation Index (SII) utilised in the European Innovation Scoreboards (European Commission, 2015). The use of this kind of variables is however debatable. At most, their direct interpretation is difficult if not impossible. On a more serious note, Grupp and Mogee (2004) show that the use of composite measures led to purposeful manipulation, which obviously should be prevented as it could result in false policy recommendations or policy decisions. Therefore, we eliminate this possibility from our analysis.

Bearing the above in mind, in the present article we introduce several measures of a technological gap not favouring any of the utilised approaches driven by the review of the theoretical literature. Both technology-input and technology-output proxies technology gap are utilised.

Economic growth theory postulates that technological sophistication can be proxied foremost by total factor productivity (TFP). Our preferred measure of the technological gap was, therefore, the difference in TFP levels as measured by a natural log of the absolute difference in TFP levels between a given reporting and partner country a given year (diff_ctfp). The TFP levels come from the PWT 9.0 dataset.

Soete (1981) attributed technological gap to differences in relative factor endowments of physical capital in relation to labour. We thus introduced a relative difference in K/L ratios between the reporting and partner country as one of the options considered.

Some authors (e.g. Comin & Mestieri, 2013) utilise electric power consumption in kWh per capita as a proxy for the level of technological sophistication. We thus used it as an alternative proxy (diff_epc). The data for this and the following variables come to form the World Bank Development (WDI) Indicators database. Relative technological readiness (diff_techred) is typically measured by the difference in the individual usage of the Internet given in the percentage of total population of a given state. We treated it as another alternative.

As a proxy for technology gap from the technology-input perspective, we utilised first of all the difference in R&D intensity – General Expenditures on Research and Development as a share of to GDP (dif_gerd).

As technology is said to be skilled-biased (Acemoglu, 1998; Acemoglu, Gancia, & Zilibotti, 2012; Gancia, Müller, & Zilibotti, 2011), we furthermore took into account the gap in human capital endowments (diff_hc). For human capital, we utilised PWT 9.0 measure – an index of human capital per person based on average years of schooling and returns to education.

Taking into account specific skills of research & development activity, we also controlled for the differences in the size of employment in the R&D per 1 million inhabitants (diff_emp_rd) from the WDI.

In turn, as a proxy for technology gap from a technology-output perspective we utilised the difference in total patenting activity in the United States Patent & Trademark Office (USPTO) in total (diff_uspto) as well in per 1 million inhabitants (diff_uspto_pc) in order to better account for differences in potential. The USPTO was selected on purpose as an illustration of the ability to patent at the global technological frontier.

As a secondary measure of technology-output, we took a total number of scientific journal articles (diff_jrn) and scientific journal articles per capita (diff_jrn_pc). The data once again came from the WDI database.

For the robustness analysis purposes we analysed in detail the global distribution of real GDP per capita and TFP levels from PWT 9.0 in 2004 – the year a significant number of countries in our sample joined the EU. After a careful examination, we chose the third quartile of the global distribution of the two key parameters and applied it throughout the panel in order to classify the analysed trade flows into three subgroups: south-south, south-north and north-north trade (6740, 6792 and 3716 observations respectively for TFP). In the present article, we have decided to present the robustness estimates for the groups delimited by the level of TFP only (the estimates for the real GDP per capita based groups are available upon request).

In order to eliminate a potential bias, we calculated the correlation measures and constructed correlation matrix for our technology gap proxies (Table 2). The analysis shows that at least several variables should not enter the same regression. Finally, we decided that various measures of technology gap would enter our empirical model separately. A similar analysis was conducted with the measures of technology gap and of similarity in the level of development (rld) showing that the correlation in most cases was weak or only moderate.

RESULTS AND DISCUSSION

The analysis was carried out for all possible trade flows between the Member States of the European Union present in the COMEXT dataset over the period of 1995-2014. The panel is unbalanced, in particular the specification of the model due to data restrictions in the PWT 9.0.

The explained variable is the value of exports or the value of total trade in millions USD (constant USD from 2005). The preferred explained variable in the present article is the value of exports, however due to the article size restrictions (the results for total trade can be made available upon request, they do not differ significantly from the presented results).

We built a semi-mixed effects empirical panel model and estimated it with the use of Poisson Pseudo Maximum Likelihood (PPML) estimator. The EU membership (eu) played the role of a clustering variable in our empirical analysis.

Our empirical strategy was as follows. We first estimated the augmented gravity model with standard gravity variables and various measures of the technology gap entering the model separately for the general sample. In the next stage, as it has already been stressed, we split the sample into three – the trade between south-south, south-north (or north-south) and north-north for reporting and partner countries respectively. The results for the broad sample of trade partners are provided in Table 3. The estimates for split samples are presented in Tables 4, 5 and 6.

We would like to notice that the obtained results proved not to be sensitive to the inclusion of time fixed-effects. We therefore decided to exclude them from the analysis.

In all analysed specifications of the models for both the general as well as subgroups, the overall fit of the model is high – explaining around two-thirds of the variation in the exports between the reporter and partner country. The fit of the model is the highest in the case of north-north trade.

In all analysed specifications the coefficients on distance are statistically significant at 1 percent and negative as it could be expected. The magnitude of the effect in most cases is below of 0.9, it is above of 1 in several specifications in the case of the south-south trade group. The intensity of bilateral trade increases in the proximity of trade partners.

The size of trade partner as well as of reporter as measured by the log of real GDP has a statistically significant (at 1 percent level) and positive impact on exports. The elasticity is below of 1 in most cases. The elasticities are the lowest on average in the case of north-north trade and the highest in the south-south trade. The choice of the log of the total population as a measure of size does not affect the outcomes (not shown in the tables with estimates).

The impact of the membership in the EU (eu) is positive and statistically significant in all analysed specifications. The effect is particularly strong in the case of north-north trade. Nonetheless, the membership of a trade partner in the EU28 significantly intensifies mutual trade.

Last but not least, the impact of the gap in the level of development as indicated by rld is statistically significant and negative, therefore the closer two trade partners in the EU28 are in terms of the level of development, the greater the intensity of exports is.

Furthermore, we would like to stress that the inclusion of additional variables such as adjutancy or integration linkages among states did not modify the key results.

In interpreting the results, we obviously focused on the variables of interest of the present article related to the impact of technology gap on the intensity of exports within the analysed groups of countries.

A careful analysis of the estimation results for the general sample (Table 3) and the following estimates for subsamples: south-south trade (Table 4), south-north trade (Table 5) and north-north trade (Table 6) shows that the significance of the effect of the gap on exports and its direction to a large extent depends on the type of the utilised proxy.

In the general sample, including all possible trade partners within the EU28 group, the impact of the gap in TFP, K/L ratios, GERD, technological readiness and journal articles per capita is statistically significant and negative. The impact of the gap in human capital, the number of patents in the USPTO in general and per capita is statistically significant and positive. The impact of the gap in employment in R&D and electricity consumption per capita is statistically insignificant. This applies to all types of models in the case of R&D employment, an important technology-input variable, which could indicate for instance problems with its measurement or relatively small differences in the analysed group of countries. The EPC is statistically significant only in the case of south-south trade (SS6) with a negative impact on the explained variable.

As it could be expected, the impact of the technology gap is not robust to changes in the sample. The level of sophistication of both the reporter and the partner matters. Here we only report the results which are statistically significant on at least 5 percent level. The difference measured by human capital is positive in the case of south-north trade (SN2) and is not significant in the case of south-south and north-north trade. Thus, in the case of south-north trade the greater the gap in human capital endowment, the more intense the exports.

The impact of the gap in TFP considered in the literature of the subject as the best measure of the level of technological sophistication has a negative impact in the case of SS and SN trade (SS3 & SN3). It is irrelevant in the case of NN trade. The similar pattern holds for the gap in K/L ratios with greater similarity increasing exports in the case of south-south and south-north trade. Nonetheless, we have to note here that some authors perceive the difference in K/L ratios to represent the difference in endowments in physical capital and labour and not in the level of technology per se.

The gap measured by the difference in GERD is of great significance as probably the most important technology-input indicator. The result is statistically significant and negative only in the case of south-north and north-north trade. It is irrelevant for south-south (SS5) trade probably due to small differences in generally small expenditure on R&D in these countries. Thus, the result seems to be rational.

The gap measured by technological readiness (the Internet usage) is only to have a negative and statistically significant impact throughout. It is the opposite for the gap in the major technology-output indicator, that is the number of patents in the USPTO (SS8-NN8). The greater the difference, the greater the intensity of exports. This holds for a number of patents per capita in the case of south-south and south-north trade (SS9, SN9), and is statistically insignificant in the case of the north-north trade so within the most technology-intensive group of countries (NN9).

As to journal articles, the results for the two variables (jrn, jrn_pc) are statistically significant, however, the direction of their impact differs between the analysed subsamples. In the case of a total number of scientific journal articles the impact is negative in the case of south-south trade (SS10), and positive in the remaining cases (SN10, NN10). If we control for

the population size, however, the result becomes negative in the case of south-south (SS11) and north-north (NN11) trade and positive in the case of south-north trade (SN11).

The obtained results are in line with the principal theoretical postulates of the technology gap based theory, as well as postulates of the new growth theory. The technology gap has a statistically significant impact on the intensity of exports between trade partners. In the case of the principal measures of the technology gap, such as based on differences in TFP or GERD, the mutual trade increases in technological similarity. This is in line with Filippini and Molini (2003). Nonetheless, not all measures of technology gap are robust and the results are more nuanced. Furthermore, the results differ between the analysed subgroups similarly to Martinez-Zarzoso and Ramos (2005), Brodzicki (2016) or Brodzicki and Śledziewska (2016). The differences between south-south, south-north and north-north trade do not contradict the logic of the theory itself.

CONCLUSIONS

The major objective of this empirical article was to investigate the role of technology gap in explaining the intensity of trade at the country level and thus to verify the postulates of the technology gap based trade. We utilised the trade gravity approach further augmenting it with technology gap measures.

The analysis was conducted for a panel of trade flows between 28 EU member states observed over the period of 1995-2015. To obtain unbiased results, we utilised the semi-mixed effects model estimated with the PPML estimator as suggested in the most recent methodological and empirical literature (Proença, Sperlich, & Savaşcı, 2015). The advantages of the approach comprise the possibility to include all possible trade flows including zero-trade flows without the need for log-linearisation. Nonetheless, we would like to stress that the major results hold even if the analysis is conducted with other empirical strategies present in the literature of the subject.

The gravity framework can be successfully applied to determine the intensity of exports between the EU28 states with more than two-thirds of variation explained. The gravity holds clearly – with the reporters and partners sizes having a positive impact and the distance between them having a clearly negative impact. The proximity in the level of development within the analysed group clearly boosts bilateral exports. Furthermore, the membership in the EU28 of the partner clearly brings positive benefits.

In measuring the technology gap, we have utilised several approaches taking into account differences in TFP, GERD, human capital and R&D employment (technology-inputs), patenting at the global technology frontier in the USPTO & scientific journals articles (technology-outputs). We also controlled for K/L ratios and non-standard measures, such as technological readiness (internet usage) or electrical power consumption.

The results vary between the indicators and the analysed subgroups of trade relations constructed in accordance with the economic logic – south-south, south-north (& north-south), as well as north-north trade. The most popular indicators that are TFP and GERD point to the negative impact of the gap on the intensity of exports. Countries seem to export more to countries at the similar level of technological sophistication. Nonetheless, the observed differences can be rationally explained despite being more nuanced. The results support the postulates of the technology gap based trade. The role of technology gap is likely to remain important or even increase in significance as the role of technology is ever increasing

Table 1. The description of key variables

Variable	Full description	Obs	Mean	Std. Dev.	Min	Max	Data source
import	Value of imports, M of constant 2011 USD	13 525	4403.696	14647.840	0.000	195050.20	Eurostat COMEXT
export	Value of exports, M of constant 2011 USD	13 522	4539.961	14932.990	0.000	188440.40	Eurostat COMEXT
total trade	Total trade, M of constant 2011 USD	13 522	8944.634	29126.080	0.000	353316.90	Eurostat COMEXT
ln_gdp_rep	Real GDP of reporter, M of constant 2011 USD, ln	15 680	12.2076	1.504	8.755	15.126	PWT 9.0
ln_gdp_par	Real GDP of partner, M of constant 2011 USD, ln	15 680	12.2076	1.504	8.755	15.126	PWT 9.0
ln_pop_rep	Population of reporter, M, ln	15 680	2.038	1.418	-0.988	4.407	PWT 9.0
ln_pop_par	Population of partner, M, ln	15 680	2.038	1.418	-0.988	4.407	PWT 9.0
rld	Difference in the level of development	15 120	9.047	1.188	1.164	11.261	PWT 9.0
ln_distance	Distance between capitals, ln**	16 632	7.175	0.769	4.087	8.857	Own elaboration
eu	EU membership	17 248	0.786	0.410	0.000	1.000	Own elaboration
diff_hc	Relative human capital level	15 120	-1.497	1.093	-8.751	0.353	PWT 9.0
diff_ctfp	Relative total factor productivity	15 120	-1.877	1.091	-9.486	-0.027	PWT 9.0
diff_k_l	Relative capital/labour endowment ratio	15 120	11.104	1.153	0.426	13.0450	PWT 9.0
diff_gerd	Relative general expenditures on R&D, percent of GDP	12 956	-0.486	1.180	-9.028	1.302	World Bank WDI
diff_epc	Relative electric power consumption, kWh per capita	15 120	7.585	1.238	-1.519	9.600	World Bank WDI
diff_techred	Relative individuals using Internet, percent of population	16 111	1.984	1.807	-12.477	4.252	World Bank WDI
diff_uspto	Relative no. of utility patents granted by the USPTO	15 502	5.573	2.317	0.000	8.808	USPTO
diff_uspto_pc	Relative no. of utility patents granted by the USPTO per capita	15 100	2.907	1.866	-7.750	5.785	USPTO
diff_jrn	Relative scientific and technical journal articles published	10 584	9.152	1.565	0.916	11.528	World Bank WDI
diff_jrn_pc	Relative scientific and technical journal articles published per capita	10 584	5.860	1.092	-3.660	7.523	World Bank WDI
diff_emp_rd	Relative no. of researchers in R&D per 1 M people	13 120	6.925	1.193	-2.081	8.899	World Bank WDI

*rld was calculated as natural logarithm of absolute value of difference between reporter's and partner's GDP. All other variables approximating technology gap were calculated accordingly. **(DISTANCE:=6371*2*ATAN2((SQRT(1-(SIN(ABS(LATITUDE_2-LATITUDE_1)*PI()/180/2)^2+COS(LATITUDE_1*PI()/180)*COS(LATITUDE_2*PI()/180)*SIN(ABS(LONGITUDE_2-LONGITUDE_1)*PI()/180/2)^2)));SQRT((SIN(ABS(LATITUDE_2-LATITUDE_1)*PI()/180/2)^2+COS(LATITUDE_1*PI()/180)*COS(LATITUDE_2*PI()/180)*SIN(ABS(LONGITUDE_2-LONGITUDE_1)*PI()/180/2)^2)))
Source: own study.

Table 2. Correlation matrix between technological gap indicators in our dataset

Variable	diff_hc	diff_ctfp	diff_k_l	diff_gerd	diff_epc	diff_techred	diff_uspto	diff_uspto_pc	diff_jrn	diff_jrn_pc	diff_emp_rd
diff_hc	1.0000										
diff_ctfp	-0.0989	1.0000									
diff_k_l	-0.0719	0.1277	1.0000								
diff_gerd	0.0086	0.2077	0.0935	1.0000							
diff_epc	-0.0439	0.1548	0.1126	0.4531	1.0000						
diff_techred	0.0646	0.1435	0.0820	0.2932	0.2814	1.0000					
diff_uspto	0.0060	0.2732	-0.0119	0.4010	0.1873	0.1903	1.0000				
diff_uspto_pc	-0.0705	0.3125	0.0595	0.5500	0.4546	0.3448	0.6855	1.0000			
diff_jrn	0.0808	0.0761	0.0099	0.1197	-0.0424	0.0175	0.7150	0.2772	1.0000		
diff_jrn_pc	0.0205	0.1520	0.1792	0.4714	0.3369	0.2858	0.2974	0.4172	0.1158	1.0000	
diff_emp_rd	0.0026	0.1309	0.0853	0.5467	0.4386	0.3654	0.2593	0.4786	0.0161	0.3777	1.0000

Note: Estimated in STATA 14.

Source: own study.

Table 3. Technological gap in the exports within the EU28 – semi-mixed effects model estimated with the PPML

Variables	(G1)	(G2)	(G3)	(G4)	(G5)	(G6)	(G7)	(G8)	(G9)	(G10)	(G11)	(G12)
ln_gdp_par	0.710***	0.708***	0.705***	0.705***	0.725***	0.706***	0.714***	0.727***	0.715***	0.757***	0.747***	0.726***
	(0.0125)	(0.0124)	(0.0128)	(0.0125)	(0.0127)	(0.0133)	(0.0126)	(0.0127)	(0.0121)	(0.0118)	(0.0125)	(0.0131)
ln_gdp_rep	0.802***	0.799***	0.799***	0.799***	0.811***	0.797***	0.800***	0.807***	0.807***	0.848***	0.845***	0.807***
	(0.0139)	(0.0137)	(0.0141)	(0.0141)	(0.0140)	(0.0147)	(0.0139)	(0.0148)	(0.0139)	(0.0132)	(0.0134)	(0.0144)
ln_distance	-0.859***	-0.861***	-0.858***	-0.841***	-0.840***	-0.852***	-0.827***	-0.870***	-0.883***	-0.886***	-0.893***	-0.878***
	(0.0208)	(0.0207)	(0.0207)	(0.0214)	(0.0211)	(0.0212)	(0.0223)	(0.0205)	(0.0210)	(0.0215)	(0.0216)	(0.0237)
rld	-0.138***	-0.137***	-0.128***	-0.135***	-0.119***	-0.139***	-0.116***	-0.139***	-0.153***	-0.0502***	-0.0293**	-0.124***
	(0.0136)	(0.0137)	(0.0145)	(0.0135)	(0.0144)	(0.0135)	(0.0133)	(0.0138)	(0.0130)	(0.0136)	(0.0138)	(0.0142)
eu	1.785***	1.783***	1.767***	1.764***	1.755***	1.786***	1.790***	1.697***	1.743***	1.704***	1.768***	1.736***
	(0.0706)	(0.0705)	(0.0701)	(0.0712)	(0.0728)	(0.0707)	(0.0707)	(0.0715)	(0.0713)	(0.0660)	(0.0659)	(0.0746)
diff_hc		0.0281**										
		(0.0137)										
diff_ctfp			-0.0486***									
			(0.0149)									
diff_k_l				-0.0660***								
				(0.0132)								
diff_gerd					-0.0744***							
					(0.0144)							
diff_epc						-0.0196						
						(0.0133)						
diff_techred							-0.117***					
							(0.0149)					

diff_uspto								0.108***				
								(0.0133)				
diff_uspto_pc									0.0594***			
									(0.0170)			
diff_jrn										0.0957***		
										(0.0117)		
diff_jrn_pc											-0.0932***	
											(0.0147)	
diff_emp_rd												0.0200
												(0.0152)
Constant	-6.144***	-6.038***	-6.223***	-5.458***	-6.801***	-5.927***	-6.328***	-7.025***	-6.147***	-9.113***	-7.659***	-6.541***
	(0.353)	(0.352)	(0.354)	(0.371)	(0.356)	(0.401)	(0.365)	(0.358)	(0.353)	(0.375)	(0.351)	(0.383)
No of observations	13,522	13,522	13,522	13,522	12,308	13,522	13,518	13,244	13,520	10,581	10,581	11,776
R-squared	0.639	0.639	0.647	0.642	0.657	0.643	0.652	0.649	0.657	0.752	0.748	0.659
No of parameters	6	7	7	7	7	7	7	7	7	7	7	7
Log-likelihood	-1.910e+07	-1.900e+07	-1.900e+07	-1.890e+07	-1.690e+07	-1.900e+07	-1.840e+07	-1.790e+07	-1.890e+07	-8.878e+06	-8.904e+06	-1.620e+07
AIC	3.810e+07	3.810e+07	3.790e+07	3.780e+07	3.370e+07	3.810e+07	3.680e+07	3.580e+07	3.780e+07	1.780e+07	1.780e+07	3.230e+07
BIC	3.790e+07	3.780e+07	3.770e+07	3.750e+07	3.350e+07	3.790e+07	3.660e+07	3.550e+07	3.760e+07	1.760e+07	1.760e+07	3.210e+07

Note: All regressions carried out using semi-mixed effect ppml with the EU28 as a clustering variable. Robust standard errors in parentheses. *significant at 10 percent; **significant at 5 percent; ***significant at 1 percent. Estimated in STATA 14. Dependent variable – bilateral exports in millions USD.

Source: own study.

Table 4. Technological gap in the exports within the EU28 – semi-mixed effects model estimated with the PPML - south-south (SS) trade

Variables	(SS1)	(SS2)	(SS3)	(SS4)	(SS5)	(SS6)	(SS7)	(SS8)	(SS9)	(SS10)	(SS11)	(SS12)
ln_gdp_par	0.753***	0.753***	0.740***	0.767***	0.779***	0.771***	0.756***	0.635***	0.738***	0.794***	0.779***	0.790***
	(0.0267)	(0.0274)	(0.0263)	(0.0257)	(0.0246)	(0.0291)	(0.0225)	(0.0257)	(0.0286)	(0.0190)	(0.0175)	(0.0217)
ln_gdp_rep	0.954***	0.954***	0.944***	0.968***	0.933***	0.972***	0.941***	0.810***	0.939***	0.938***	0.915***	0.937***
	(0.0324)	(0.0325)	(0.0312)	(0.0312)	(0.0290)	(0.0339)	(0.0267)	(0.0325)	(0.0343)	(0.0221)	(0.0187)	(0.0246)
ln_distance	-1.024***	-1.024***	-1.026***	-1.023***	-1.020***	-1.020***	-0.938***	-0.934***	-1.021***	-0.995***	-0.988***	-1.028***
	(0.0377)	(0.0374)	(0.0368)	(0.0342)	(0.0371)	(0.0367)	(0.0323)	(0.0320)	(0.0396)	(0.0343)	(0.0325)	(0.0396)
rld	-0.211***	-0.211***	-0.197***	-0.153***	-0.170***	-0.231***	-0.189***	-0.251***	-0.233***	-0.109***	-0.103***	-0.129***
	(0.0342)	(0.0343)	(0.0328)	(0.0335)	(0.0357)	(0.0294)	(0.0313)	(0.0402)	(0.0351)	(0.0232)	(0.0235)	(0.0260)
eu	1.493***	1.493***	1.528***	1.552***	1.368***	1.455***	1.574***	1.322***	1.414***	1.485***	1.490***	1.284***
	(0.108)	(0.108)	(0.110)	(0.112)	(0.107)	(0.114)	(0.111)	(0.106)	(0.108)	(0.0996)	(0.101)	(0.107)
diff_hc		-1.80e-05										
		(0.0283)										
diff_ctfp			-0.0497**									
			(0.0233)									
diff_k_l				-0.172***								
				(0.0231)								
diff_gerd					0.0221							
					(0.0233)							
diff_epc						0.0559*						
						(0.0323)						
diff_techred							-0.157***					
							(0.0247)					

diff_uspto								0.141***				
								(0.0237)				
diff_uspto_pc									0.0565***			
									(0.0191)			
diff_jrn										-0.0461**		
										(0.0215)		
diff_jrn_pc											-0.0510**	
											(0.0237)	
diff_emp_rd												0.0264
												(0.0199)
Constant	-7.088***	-7.089***	-7.045***	-6.078***	-7.482***	-7.761***	-7.510***	-4.655***	-6.612***	-8.237***	-8.019***	-8.135***
	(0.497)	(0.556)	(0.498)	(0.528)	(0.481)	(0.726)	(0.462)	(0.692)	(0.564)	(0.447)	(0.445)	(0.437)
No of observations	5,482	5,482	5,482	5,482	5,142	5,482	5,482	5,378	5,480	4,391	4,391	4,949
R-squared	0.664	0.664	0.676	0.702	0.679	0.672	0.746	0.533	0.652	0.751	0.764	0.753
No of parameters	6	7	7	7	7	7	7	7	7	7	7	7
Log-likelihood	-2.829e+06	-2.829e+06	-2.819e+06	-2.745e+06	-2.234e+06	-2.809e+06	-2.652e+06	-2.648e+06	-2.813e+06	-1.434e+06	-1.431e+06	-1.895e+06
AIC	5658597	5658599	5637498	5489168	4467757	5618154	5303705	5296303	5627012	2868106	2862701	3789189
BIC	5.578e+06	5.578e+06	5.557e+06	5.409e+06	4.393e+06	5.538e+06	5.223e+06	5.217e+06	5.546e+06	2.805e+06	2.800e+06	3.717e+06

Note: All regressions carried out using semi-mixed effect ppml with the EU28 as a clustering variable. Robust standard errors in parentheses. *significant at 10 percent; **significant at 5 percent; ***significant at 1 percent. Estimated in STATA 14. Dependent variable – bilateral exports in millions USD.

Source: own study.

Table 5. Technological gap in the exports within the EU28 – semi-mixed effects model estimated with the PPML - south-north (SN) trade

Variables	(SN1)	(SN2)	(SN3)	(SN4)	(SN5)	(SN6)	(SN7)	(SN8)	(SN9)	(SN10)	(SN11)	(SN12)
ln_gdp_par	0.700***	0.698***	0.672***	0.698***	0.730***	0.695***	0.717***	0.722***	0.722***	0.794***	0.769***	0.724***
	(0.0179)	(0.0173)	(0.0179)	(0.0180)	(0.0180)	(0.0172)	(0.0186)	(0.0202)	(0.0174)	(0.0178)	(0.0191)	(0.0180)
ln_gdp_rep	0.858***	0.855***	0.843***	0.858***	0.893***	0.851***	0.865***	0.860***	0.889***	0.952***	0.941***	0.889***
	(0.0230)	(0.0224)	(0.0223)	(0.0232)	(0.0233)	(0.0226)	(0.0235)	(0.0260)	(0.0217)	(0.0217)	(0.0234)	(0.0228)
ln_distance	-0.775***	-0.786***	-0.777***	-0.767***	-0.689***	-0.741***	-0.677***	-0.823***	-0.855***	-0.744***	-0.728***	-0.796***
	(0.0395)	(0.0398)	(0.0378)	(0.0397)	(0.0443)	(0.0387)	(0.0452)	(0.0377)	(0.0399)	(0.0448)	(0.0442)	(0.0506)
rld	-0.136***	-0.129***	-0.0779***	-0.132***	-0.0790***	-0.132***	-0.110***	-0.159***	-0.193***	-0.0392	-0.00516	-0.0971***
	(0.0275)	(0.0274)	(0.0262)	(0.0279)	(0.0295)	(0.0268)	(0.0271)	(0.0264)	(0.0234)	(0.0309)	(0.0283)	(0.0271)
eu	1.583***	1.583***	1.423***	1.566***	1.547***	1.561***	1.532***	1.588***	1.527***	1.594***	1.590***	1.531***
	(0.0934)	(0.0929)	(0.0927)	(0.0937)	(0.0964)	(0.0932)	(0.0928)	(0.0931)	(0.0928)	(0.0894)	(0.0897)	(0.0984)
diff_hc		0.0637***										
		(0.0218)										
diff_ctfp			-0.369***									
			(0.0493)									
diff_k_l				-0.0411**								
				(0.0202)								
diff_gerd					-0.145***							
					(0.0233)							
diff_epc						-0.141***						
						(0.0253)						
diff_techred							-0.148***					
							(0.0218)					

diff_uspto								0.144***				
								(0.0353)				
diff_uspto_pc									0.141***			
									(0.0328)			
diff_jrn										0.135***		
										(0.0199)		
diff_jrn_pc											-0.163***	
											(0.0216)	
diff_emp_rd												0.0446
												(0.0293)
Constant	-7.163***	-6.998***	-7.528***	-6.768***	-9.192***	-6.204***	-8.002***	-8.012***	-7.286***	-12.40***	-9.995***	-8.427***
	(0.647)	(0.636)	(0.612)	(0.666)	(0.756)	(0.648)	(0.731)	(0.588)	(0.586)	(0.724)	(0.732)	(0.713)
No of observations	6,167	6,167	6,167	6,167	5,536	6,167	6,165	6,067	6,167	4,766	4,766	5,307
R-squared	0.550	0.548	0.619	0.554	0.597	0.587	0.597	0.591	0.623	0.669	0.706	0.593
No of parameters	6	7	7	7	7	7	7	7	7	7	7	7
Log-likelihood	-7.246e+06	-7.182e+06	-6.726e+06	-7.217e+06	-6.148e+06	-7.073e+06	-6.853e+06	-6.706e+06	-7.007e+06	-3.784e+06	-3.734e+06	-6.040e+06
AIC	1.450e+07	1.440e+07	1.350e+07	1.440e+07	1.230e+07	1.410e+07	1.370e+07	1.340e+07	1.400e+07	7567030	7468658	1.210e+07
BIC	1.440e+07	1.430e+07	1.340e+07	1.430e+07	1.220e+07	1.400e+07	1.360e+07	1.330e+07	1.390e+07	7.492e+06	7.394e+06	1.200e+07

Note: All regressions carried out using semi-mixed effect ppml with the EU28 as a clustering variable. Robust standard errors in parentheses. *significant at 10 percent; **significant at 5 percent; ***significant at 1 percent. Estimated in STATA 14. Dependent variable – bilateral exports in millions USD.

Source: own study.

Table 6. Technological gap in the exports within the EU28 – semi-mixed effects model estimated with the PPML – a north-north (NN) trade

Variables	(NN1)	(NN2)	(NN3)	(NN4)	(NN5)	(NN6)	(NN7)	(NN8)	(NN9)	(NN10)	(NN11)	(NN12)
ln_gdp_par	0.629***	0.627***	0.628***	0.629***	0.634***	0.619***	0.618***	0.653***	0.629***	0.658***	0.641***	0.613***
	(0.0215)	(0.0217)	(0.0217)	(0.0215)	(0.0227)	(0.0235)	(0.0216)	(0.0231)	(0.0215)	(0.0211)	(0.0214)	(0.0242)
ln_gdp_rep	0.643***	0.641***	0.642***	0.643***	0.643***	0.633***	0.632***	0.665***	0.643***	0.678***	0.661***	0.614***
	(0.0215)	(0.0211)	(0.0218)	(0.0215)	(0.0222)	(0.0230)	(0.0212)	(0.0237)	(0.0215)	(0.0208)	(0.0198)	(0.0232)
ln_distance	-0.817***	-0.816***	-0.818***	-0.817***	-0.788***	-0.800***	-0.810***	-0.797***	-0.814***	-0.926***	-0.950***	-0.777***
	(0.0325)	(0.0325)	(0.0326)	(0.0326)	(0.0331)	(0.0330)	(0.0330)	(0.0333)	(0.0330)	(0.0329)	(0.0300)	(0.0370)
rld	-0.0828***	-0.0827***	-0.0817***	-0.0819***	-0.0791***	-0.0892***	-0.0582***	-0.0672***	-0.0827***	-0.0154	-0.00448	-0.0810***
	(0.0166)	(0.0167)	(0.0166)	(0.0165)	(0.0171)	(0.0175)	(0.0160)	(0.0170)	(0.0166)	(0.0130)	(0.0134)	(0.0174)
eu	2.655***	2.667***	2.653***	2.659***	3.484***	2.682***	2.729***	2.632***	2.655***	2.106***	2.072***	3.616***
	(0.284)	(0.284)	(0.284)	(0.284)	(0.274)	(0.285)	(0.285)	(0.283)	(0.285)	(0.280)	(0.282)	(0.278)
diff_hc		0.0158										
		(0.0202)										
diff_ctfp			-0.0115									
			(0.0182)									
diff_k_l				0.00692								
				(0.0215)								
diff_gerd					-0.0653***							
					(0.0212)							
diff_epc						-0.0305*						
						(0.0184)						

diff_techred							-0.122***					
							(0.0228)					
diff_uspto								0.0453**				
								(0.0200)				
diff_uspto_pc									-0.00679			
									(0.0205)			
diff_jrn										0.0402**		
										(0.0187)		
diff_jrn_pc											-0.0794***	
											(0.0199)	
diff_emp_rd												-0.0315
												(0.0236)
Constant	-4.260***	-4.194***	-4.268***	-4.332***	-5.422***	-3.848***	-4.014***	-5.430***	-4.242***	-5.160***	-3.749***	-4.657***
	(0.651)	(0.648)	(0.649)	(0.674)	(0.656)	(0.745)	(0.647)	(0.783)	(0.653)	(0.709)	(0.591)	(0.697)
No of observations	1,873	1,873	1,873	1,873	1,630	1,873	1,871	1,799	1,873	1,424	1,424	1,520
R-squared	0.662	0.662	0.663	0.662	0.667	0.665	0.665	0.657	0.661	0.799	0.797	0.662
No of parameters	6	7	7	7	7	7	7	7	7	7	7	7
Log-likelihood	-7.683e+06	-7.679e+06	-7.680e+06	-7.682e+06	-6.900e+06	-7.668e+06	-7.361e+06	-7.369e+06	-7.682e+06	-2.922e+06	-2.881e+06	-6.633e+06
AIC	1.540e+07	1.540e+07	1.540e+07	1.540e+07	1.380e+07	1.530e+07	1.470e+07	1.470e+07	1.540e+07	5843563	5762638	1.330e+07
BIC	1.530e+07	1.530e+07	1.530e+07	1.530e+07	1.380e+07	1.530e+07	1.470e+07	1.470e+07	1.530e+07	5.820e+06	5.739e+06	1.320e+07

Note: All regressions carried out using semi-mixed effect ppml with the EU28 as a clustering variable. Robust standard errors in parentheses. *significant at 10 percent; **significant at 5 percent; ***significant at 1 percent. Estimated in STATA 14. Dependent variable – bilateral exports in millions USD.
Source: own study.

in the so-called 4th Industrial Revolution (Liu, 2017). However, the nature of its impact could change driving not only the intensity of trade per se but more towards horizontal or vertical differentiation thus driving the various components of intra-industry trade.

Nonetheless, in order to verify the technology gap based trade fully, the analysis should be conducted for larger datasets of countries – OECD or preferably global, in order to fully account for the differentiation in technological sophistication levels as well as for other contributing factors. Secondly, as it has already been stressed, the precise verification of the theory similar to Soete (1981) requires the analysis at a disaggregated sectoral level. The next step envisaged will be an analysis of mutual trade of OECD countries at a disaggregated level (40 + sectors) along with the sectoral dimension. We also envisage further investigation of the impact of technology gap in the short and long run which has not been addressed in the present analysis.

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Authors

Contribution share of authors is equal to T. Brodzicki 60% and J. Kwiatkowski 40%.

Tomasz Brodzicki

Assistant Professor at the Economics of European Integration Division, Faculty of Economics, University of Gdansk (Sopot, Poland). Research Partner in the Institute for Development. Visiting Professor at Hochschule Bremen (Bremen, Germany). Lecturer in International Economics, Economic Growth and Development, Industrial Organization and Innovation Management. His research interests include determinants of international trade, economic growth, firm heterogeneity and spatial aspects of economic development.

Correspondence to: Tomasz Brodzicki, PhD, Faculty of Economics, University of Gdansk, Armii Krajowej 119/121, 81-824 Sopot, Poland, e-mail: t.brodzicki@ug.edu.pl

Jakub Kwiatkowski

Research Assistant at the Economics of European Integration Division, Faculty of Economics, University of Gdansk (Sopot, Poland). Teacher of International Economics and Economics of European Integration. His research focuses on international economics, technological gap and financial aspects of innovations.

Correspondence to: Jakub Kwiatkowski, MSc, Faculty of Economics, University of Gdansk, Armii Krajowej 119/121, 81-824 Sopot, Poland, e-mail: j.kwiatkowski@ug.edu.pl

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Greenfield or Acquisition Entry? An Impact of Foreign Direct Investment on the Competitiveness of Polish Investors

Małgorzata Jaworek, Włodzimierz Karaszewski, Małgorzata Szałucka

ABSTRACT

Objective: The purpose of this article is to determine the impact of Polish FDI companies on their competitiveness, depending on their establishment mode choice in the host country (greenfield investment vs. acquisition).

Research Design & Methods: The study used a direct interview method. The results were analysed using impact indicators (w) calculated as the arithmetic mean of numerical values assigned to each response as well as Fisher's exact test. Statistical calculations were performed using the IBM SPSS Statistics software version 21.0.0.1.

Findings: The impact of FDI on investor competitiveness in relation to the main competitors operating on the home market and on foreign markets depends on FDI entry mode (greenfield investment vs. acquisition), among other things.

Implications & Recommendations: The results of this study may be the starting point for further research on the impact of FDI on competitiveness, particularly through foreign acquisitions. It should be assumed that as Polish companies gain experience on the international stage, this mode of entry will be chosen by investors more frequently.

Contribution & Value Added: The uniqueness of the following study is in the presentation of the results of original empirical research, which demonstrate the relationship between the foreign establishment mode choice (greenfield investment vs. acquisition) and the competitiveness of investing companies. Ex post evaluations were taken into account while forming the conclusions.

Article type:	research paper
Keywords:	international business; FDI; establishment mode choice, greenfield; acquisition; competitiveness
JEL codes:	F21, F23

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INTRODUCTION

The research on Foreign Direct Investment (FDI) among Polish enterprises has its justification, among other things, in their increasing investment activity abroad. This is evidenced by the growing value of Polish FDI outward stocks, as well as an increasing number of enterprises with foreign entities. The Central Statistical Office data indicates that in the period 2009-2015 alone the number of companies based in Poland and holding entities abroad increased by 35%. During this time, the number of foreign entities increased by almost 50%. The vast majority of foreign entities are direct investment companies. Out of the total number of foreign entities having capital invested by companies domiciled in Poland as many as 82.3% were entities with a 50% share of that capital or more (Central Statistical Office, 2017).

The purpose of this article is to determine the impact of FDI made by Polish companies on their competitiveness, depending on their foreign establishment mode choice (greenfield investment vs. acquisition).

The following research hypotheses guided the direction of this study.

H1: The evaluation of FDI influence on the competitiveness of Polish enterprises on the home market and on foreign markets depends on the foreign establishment mode choice.

H2: The benefits associated with the impact of FDI on the individual components of the competitiveness potential depend on the foreign establishment mode choice.

The article is structured as follows. First, the authors provide a brief overview of the theoretical approach to FDI establishment modes in foreign markets with a review of the literature. Data and research methods follow in the next section. The authors then present the results of the study and conclude with a discussion and appraisal including suggestions for future research.

LITERATURE REVIEW

FDI Establishment Mode Strategy

One of common areas of research is the problem of FDI location in the process of company internationalisation, including establishment modes in foreign markets. This can be attributed, among other things, to the increased investment activity among enterprises in the form of foreign direct investment observed over the last few decades (UNCTAD, 2016).

By making the decision to enter foreign markets through foreign direct investment, potential investors must decide on the establishment mode strategy, that is decide whether it should take the form of an investment from scratch (greenfield investment), or whether it is to be made by taking over part or all of the equity of a company which is already active on the market (acquisition). Greenfield investment involves the creation of a new affiliate abroad, which may mean the construction and furnishing of the necessary facilities: a factory, a warehouse, office space, etc. A foreign affiliate established via a greenfield investment can take the form of either a wholly-owned subsidiary or a joint venture. An acquisition is an alternative way to enter a foreign market and

involves the purchase of part or all of the shares of a company located abroad. Sometimes acquisitions are analysed together with mergers as one form of investment – this is how FDI entry modes are analysed in global investment reports published by UNCTAD,[1] as well as in some other publications (Bruning, Turtl, & Buhr, 1997). However, the majority of empirical studies in this area use the distinction between greenfield investments and acquisitions, which was also adopted in this article.

The choice of a foreign establishment mode in foreign markets affects both current and future results of the company making the investment as well as the foreign subsidiary (Shaver, 1998; Shrader, 2001; Szałucka, 2008; Szałucka, 2010). It is therefore extremely important to analyse in depth potential benefits and risks which a given choice may entail. When deciding on the foreign establishment mode, investors should be aware that the consequences of their mistakes can be very severe and irreversible.

The available literature on the subject includes numerous research papers which discuss the question of foreign establishment mode choice (e.g. Hennart & Park, 1993; Brouthers & Brouthers, 2000; Datta, Herrmann, & Rasheed, 2002; Werner, 2002; Larimo, 2003; Shimizu, Hitt, Vaidyanath, & Pisano, 2004; Brouthers & Hennart, 2007; Gorynia, 2007; Slangen & Hennart, 2007; Slangen & Hennart, 2008; Demirbag, Tatoglu, & Glaister, 2008; Demirbag, Tatoglu, & Glaister, 2009; Arslan & Larimo, 2011; Slangen, 2011; Jiménez-Burillo & Jiménez-Moreno, 2013; Kowalewski & Radło, 2014; Gorynia, Nowak, Trąpczyński, & Wolniak, 2015a; Gorynia, Nowak, Trąpczyński, & Wolniak, 2015b; Shen & Puig, 2017; Holtbrügge & Berningn, 2018). They focus primarily on identifying the determinants of the choice between alternative capital investment options available on the host market.

The research results show that the choice between greenfield investment and acquisition depends on many different, sometimes interrelated factors. They can be divided into four main groups, namely factors relating to the investing company (the parent company), the subsidiary, the industry and the host country (Slangen & Hennart, 2007). The large number of factors that impact the decision on the establishment mode and the resulting difficulty and complexity of the decision making process imply that investors must take into account a number of factors resulting from theoretical perspectives including transaction cost theory (Caves & Mehra, 1986; Zejan, 1990; Hennart & Park, 1993; Cho & Padmanabhan, 1995; Hennart, Larimo, & Chen, 1996; Brouthers & Brouthers, 2000; Larimo, 2003; Wach, 2012, pp. 95-96; Daszkiewicz & Wach, 2013, pp. 43-44), the organisational-learning perspective (Padmanabhan & Cho, 1999; Barkema & Vermeulen, 1998; Vermeulen & Barkema, 2001), the industrial organisation perspective (Caves & Mehra, 1986; Hennart & Park, 1993; Hennart, Larimo, & Chen, 1996), institutional theory (Brouthers & Brouthers, 2000; Harzing, 2002) and information economics (Hennart & Park, 1993; Hennart *et al*. 1996). It should be noted, however, that the problem is much more widely studied by researchers and there have been many attempts in the literature to clarify this issue based on other theories as well (Dikova & Brouthers, 2016).

Among the most frequently quoted and studied factors which impact the investing company's choice of the establishment mode are the size of the investing company (Barkema & Vermeulen, 1998; Shaver, 1998; Cho & Padmanabhan, 1995; Padmanabhan & Cho, 1999; Larimo, 2003), its international experience (Cho & Padmanabhan, 1995;

[1] This division is also mentioned in the UNCTAD publication on foreign direct investment statistics and on transnational corporation activities (UNCTAD, 2009).

Padmanabhan & Cho, 1999; Barkema & Vermeulen, 1998; Shaver, 1998; Larimo, 2003), its experience in investing in the host country (Hennart & Park, 1993; Shaver, 1998; Larimo, 2003), its experience in applying a given establishment mode (Padmanabhan & Cho, 1999; Slangen & Hennart, 2007), the level of product/company diversification (Caves & Mehra, 1986; Zejan, 1990; Hennart & Park, 1993; Cho & Padmanabhan, 1995; Padmanabhan & Cho, 1999; Harzing, 2002; Larimo, 2003; Slangen & Hennart, 2008), the company's international strategy (Harzing, 2002), and the level of technological intensity and complexity (Hennart & Park, 1993; Cho & Padmanabhan, 1995; Padmanabhan & Cho, 1999; Shaver, 1998; Brouthers & Brouthers, 2000; Harzing, 2002; Larimo, 2003). The ownership structure of a subsidiary (Caves & Mehra, 1986; Barkema & Vermeulen, 1998; Larimo, 2003; Demirbag *et al*., 2008; Slangen, 2011), its size (Caves & Mehra, 1986; Slangen, 2013) and the level of its autonomy (Demirbag *et al.,* 2008; Slangen & Hennart, 2008; Slangen, 2011; 2013) are indicated in the literature of the subject as factors determining the establishment mode in a foreign market connected with a subsidiary.

The research results also show that the probability of choosing a particular mode of establishment in a foreign market can be increased or decreased by the following factors at the industry level: the growth rate of the industry/market (Caves & Mehra, 1986; Hennart & Park, 1993; Shaver, 1998; Brouthers & Brouthers, 2000; Slangen & Hennart, 2008; Slangen, 2011), the level of concentration (Caves & Mehra, 1986; Hennart & Park, 1993; Shaver, 1998), technological intensity (Caves & Mehra, 1986) and the intensity of advertising (Caves & Mehra, 1986). An important group of determinants which impact the choice of the foreign establishment mode are factors at a country level, such as cultural differences (Cho & Padmanabhan, 1995; Padmanabhan & Cho, 1999; Barkema & Vermeulen, 1998; Brouthers & Brouthers, 2000; Lamiro, 2003; Demirbag *et al*., 2008; Slangen, 2011), the rate of the economic growth (Zejan, 1990; Barkema & Vermeulen, 1998; Lamiro, 2003; Demirbag *et al.,* 2008); economic development (Zejan, 1990; Barkema & Vermeulen, 1998; Slangen, 2013), legal limitations/barriers (Cho & Padmanabhan, 1995; Padmanabhan & Cho, 1999; Barkema & Vermeulen, 1998; Slangen & Hennart, 2008), country-related risks (Barkema & Vermeulen, 1998; Demirbag *et al*., 2008), and difficulty with finding companies to take over (Slangen & Hennart, 2008; Slangen, 2011).

There are not many studies, however, which discuss the evaluations of alternative establishment modes in foreign markets based on the identification of outcomes reported by investors (Shaver, 1998; Shrader, 2001; Datta *et al*., 2002; Shimizu *et al.*, 2004, Slangen & Hennart, 2008; Szałucka, 2010). In particular, there is not enough work on evaluating alternative foreign establishment modes *ex-post* (post-investment efficiency). When such work is undertaken, it relates primarily to the outcomes of subsidiary operations. Some studies point out that subsidiaries built from scratch are more successful than subsidiaries created as a result of taking over an already existing company as the investing company incurs high costs resulting from the integration of the two companies, which may not always deliver expected results (Hennart, Kim, & Zeng, 1998; Woodcock, Beamish, & Makino, 1994). Other studies, on the other hand, consider acquisitions to be superior, as they allow a company to limit the so-called cost of being new (liability of newness) resulting from the lack of knowledge and experience in operating on the host country market (Pennings, Barkema, & Douma, 1994). In fact, there are hardly any studies based on empirical research which show the relationship between the investor's chosen establishment

mode and their competitiveness, or the link between the foreign establishment mode choice and its potential outcomes (benefits) in the context of building the investing company competitiveness. The nature of these benefits should, of course, be considered in relation to the motives of companies undertaking FDI. The goals which motivate FDI are also the areas of the FDI impact, where an improvement in the competitiveness potential may be identified. It can be assumed that the establishment mode choice will depend on the objectives of an investment project and that the effectiveness of meeting a specific objective will vary depending on the establishment mode chosen.

MATERIAL AND METHODS

The results presented in this article come from a study conducted between 2012 and 2013. It covered 622 enterprises based in the Republic of Poland, which engaged their capital abroad through direct investment. All of them, regardless of their ownership of capital, had the status of Polish companies according to the current laws. The bulk of these companies held only Polish capital (61.7%). The remaining 38.3% were companies with foreign capital, with only 26.3% of them having solely foreign capital (26.3% with majority ownership and 42.1% with minority ownership). The research sample was selected in a non-random way (target selection)[2]. The study used a direct interview method and was conducted by interviewers from a market research company using a standardised questionnaire developed by the research team. The questionnaire part related to the research area described in this study contained only closed multiple choice questions but allowed the respondents to add their own options. 64 questionnaires were filled out correctly, which meant a return rate of 10.3%.

The companies which participated in the study had completed a total of 278 FDI projects. Out of these, 144 projects had been undertaken as acquisitions (51.8%) and 134 as greenfield investments (48.2%). The bulk of investors who chose acquisitions decided to buy part of the foreign company shares (96 projects), whereas 48 investors acquired all the shares in foreign companies.

Most investors participating in the survey decided to engage their capital in host country markets solely by investing from scratch (37 out of 64 respondents indicated this entry mode). 13 respondents indicated that the entry was made solely by purchasing part or all of the foreign company shares. The remaining 14 enterprises completed greenfield investment projects, as well as acquisitions of foreign companies. Research results presented later in this article refer to two out of three groups included in this survey: enterprises which have chosen only greenfield investments and those which entered foreign markets only via acquisitions. Excluding from the analysis those enterprises which made both foreign acquisitions and greenfield investments is dictated by the fact that it cannot be definitely said to what extent each of the establishment mode choice influenced the investing enterprises' level of competitiveness.

The results obtained from the study were analysed using impact indicators (w) calculated as the arithmetic mean of numerical values assigned to a given response. They

[2] Polish data protection laws prevent researchers from accessing the database of Polish companies – foreign direct investors held by state institutions (Central Statistical Office and the National Bank of Poland). The choice of elements for the research sample and the lack of accurate identification of the collective structure suggest caution in formulating conclusions. There is no scientific basis for the generalisation of conclusions based on the results obtained in the course of the study.

ranged from -1 to 1. It was assumed that the values in the range of -1≤ *w* <-0.5 denote a negative impact, where: -0.5≤ *w* <0 – means a moderately negative impact, *w* = 0 – means no impact, 0> *w* ≥0.5 – means a moderately positive impact, 0,5> *w* ≥1 – means a positive impact. Fisher's exact test was also used to meet the required assumptions with the assumed significance level at $p<0.05$[3]. Statistical calculations were performed using the IBM SPSS Statistics software version 21.0.0.1.

RESULTS AND DISCUSSION

Based on the study, it can be concluded that FDI contributed to improving enterprise competitiveness to a different degree among the main competitors both in the domestic and foreign markets. It is interesting to note that the scale of FDI positive impact on competitiveness was higher among the main competitors operating on foreign markets.

It follows from the analysis of responses of the companies grouped by their establishment mode choice that the positive change in their competitiveness compared to their main competitors on the home market was more often identified by companies which entered the host country market via greenfield investments (57.1%). It should also be noted that 45.7% of all the investors believed the impact of these investments on competitiveness was moderately positive. Only 11.4% of the companies in this group declared achieving a significant improvement in competitiveness (Figure 1).

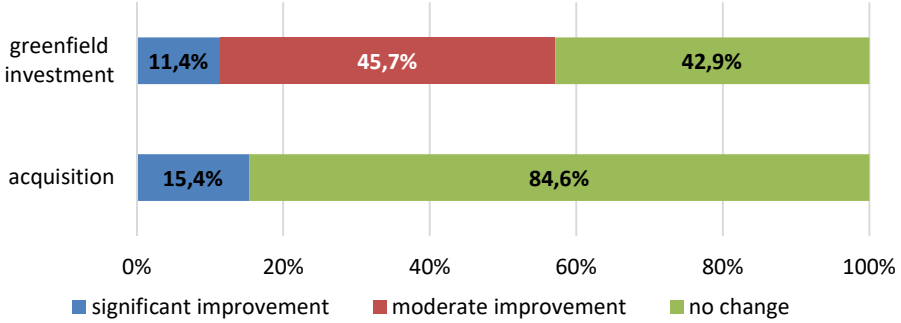

Figure 1. An evaluation of FDI impact on the competitiveness of the studied enterprises on the domestic market

Source: own elaboration based on research results.

It is interesting that a significant positive change in competitiveness was slightly more common among respondents who opted for FDI through an acquisition of part or all of a direct investment enterprise. However, the differences in the percentage of indications for this variant of responses between the groups were marginal. Slightly over 15% of the respondents in this group believed that the change in competitiveness was significant, but according to the remaining companies in this group their competitiveness did not change (84.6% of indications).

[3] The use of Fisher's exact test instead of the Chi-Square test of Independence was dictated by too small empirical numbers (<5) in the independence table cells.

The reasons for this clearly higher evaluation of greenfield investments when compared to acquisitions can be attributed to the different nature of the analysed establishment modes, which impacts the potential results in building competitiveness on the home market. One of the fundamental advantages of greenfield investments is the possibility of optimal project adaptation to the needs of the investor, both in the scale and structure of the direct investment enterprise and in the adaptation to technical and economic requirements (Karaszewski & Szałucka, 2011, p. 23) These attributes allow the investor to match and synchronise the activities carried out within the company located abroad with the activities of other companies within the organisational structure, including the parent company, and to benefit from the integration of their activities. Adapting and synchronising activities enables direct and targeted enhancement of the investor's competitiveness potential on the home market. In the case of acquisitions, the ability to adjust and synchronise activities is much more limited and depends on many factors, both internal and external ones.

The differences in the evaluation of FDI impact on enterprise competitiveness depending on the establishment mode choice are confirmed by the Fisher's exact test results. The significance of the test was 0.004 and allowed us to reject the independence hypothesis and make the assumption that the evaluation of FDI impact on the competitiveness to major home market competitors depends on the foreign establishment mode choice (greenfield investments vs. acquisitions), while confirming the differences in the evaluation of FDI impact on competitiveness between two business groups. These results indicate an advantage of greenfield investment projects over acquisitions in the fact that they have a higher positive impact on the investor's competitiveness on the home market.

The differences in the evaluation of FDI impact on the company's competitiveness depending on the establishment mode choice were also observed in relation to the main competitors in foreign markets (Figure 2). Similarly to the home market, the respondents who frequently identified a significant improvement in competitiveness as a result of FDI were the investors who entered the host country market through acquisitions (23.1% respondents). However, the percentage of companies in this group that experienced a general improvement in competitiveness as a result of their investment was lower (only 30.8% of respondents).

A high percentage of companies among the respondents of this group which failed to observe any improvement in their competitiveness resulting from FDI may be the result of little experience among some Polish investors in conducting complex transactions of an enterprise's purchase/sale, as well as problems with managing such an entity and its integration with other companies within the organisation structure. Limited experience and insufficient management competencies of some Polish enterprises may result in significantly limited benefits from investment projects undertaken abroad via acquisitions.

60% of the companies which decided to invest exclusively from scratch indicated that the impact on their competitiveness was positive when compared to their main competitors in foreign markets, with only 14.3% of the companies which evaluated this impact as significant. The low percentage of companies that experienced a significant improvement and a relatively high percentage of companies seeing a moderate improvement in their competitiveness may be due to a relatively slow pace of entry into the foreign market via

greenfield investments and the accompanying gradual change in the investor's competitiveness potential. Contrary to this, an incremental change in the competitiveness potential can be expected in the case of acquisitions.

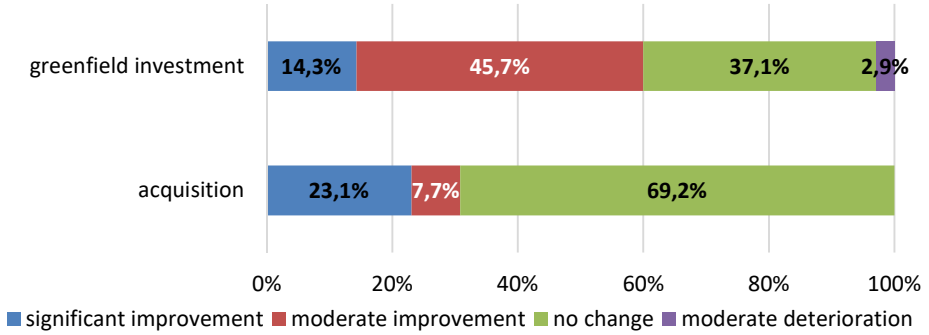

Figure 2. An evaluation of FDI impact on the competitiveness of the studied enterprises in foreign markets

Source: own elaboration based on research results.

The differences in the evaluation of FDI impact on competitiveness depending on the establishment mode choice are also reflected in statistical tests. Fisher's exact test results disproved the hypothesis that the evaluation of FDI impact on the competitiveness to major foreign competitors is independent of the establishment mode choice, suggesting statistically significant differences in the evaluation of FDI impact on competitiveness between the groups of enterprises (p=0.040). From the perspective of foreign markets, positive changes in competitiveness were more frequently observed by respondents who chose to enter into foreign markets through greenfield investments. These results may be indicative of lesser benefits gained from entering foreign markets via acquisitions.

Interesting conclusions can also be drawn from the analysis of the evaluation of FDI impact on particular areas and components of the competitiveness potential among the enterprises covered by this study. Respondents' opinions suggest that regardless of the establishment mode choice, the most significant benefits were observed in 'sales and marketing' (Table 1). The evaluation of FDI impact on some of other aspects of competitiveness potential was somewhat different. Apart from the above area, direct investment companies which had been created via greenfield investments contributed mainly to the strengthening of 'intangible assets' and 'organisation and management'. Acquisitions, however, contributed to the improvement of 'intangible assets' and 'production'. Regardless of the establishment mode, the investors found the least benefits in 'research and development' and 'finance'.

A detailed analysis of FDI impact on the individual components of the competitiveness potential, however, indicates different benefits from FDI depending on the establishment mode choice. In the opinion of the respondents, direct investment companies created via greenfield investments contributed the most to the understanding of client needs and preferences (0.68 – the impact indicator; 1st place), to better access to the market (0.67; 2nd place) greater knowledge of competitors' behaviour (0.61; 3rd place) and organisational knowledge and skills (0.60; 4th place). The positive impact of this factor was also identified with respect to the company reputation and customer relations (both in 5th

place with the impact indicator of 0.54). Organisational culture, knowledge and skills in marketing and technology, the ability to achieve economies of scale and the ability to react quickly to market changes (0.51), all ranked 6th in this hierarchy.

Greenfield investments contributed more than acquisitions to strengthening the following competitiveness elements: understanding customer needs and preferences, competitor behaviour, knowledge and skills within an organisation, the ability to scale and reliability in terms of deliveries. Investors in this group ranked relatively high FDI benefits in building company reputation and creating an appropriate organisational culture. The areas of positive FDI impact identified by this group of investors also include the following: gaining experience in organising and managing companies located abroad, optimising the scope of their activity and achieving economies of scale. The respondents' evaluation of FDI impact on the individual components of competitiveness potential compared to the group of enterprises which made only acquisitions suggests that the enterprises which created a company abroad from scratch had greater benefits from their investment activity through FDI as they identified no less than fourteen components which had a positive impact[4]. As for the impact on the other components of competitiveness potential, the improvement was moderately positive.

An analysis of the survey results for the respondents who undertook FDI via acquisitions provides different conclusions. According to the respondents in this group, acquisitions of foreign companies were mainly used to increase the access to foreign markets (0.54; 1st place). Investors ranked knowledge and skills in marketing and understanding customer needs and preferences (0.50) second. Compared with greenfield investment projects, acquisitions contributed more to the improvement customer relations and employee qualifications. These elements were ranked 3rd by the investors in this group, but they ranked 5th and 9th, respectively among the investors investing solely in greenfield projects.

Particular attention should also be given to high ratings attributed to FDI impact on the brand of products and services, the ability to react quickly to market changes and the insight into the competitor behaviour – they all ranked 4th with an impact indicator of 0.42. Investors in this group also evaluated high FDI impact on gaining access to intellectual property rights and improving their relations with suppliers. These components were ranked 5th together with organisational knowledge and skills and company reputation (0.38).

In addition to this, when compared to greenfield investment projects, acquisitions proved to be a more effective instrument for building competitiveness potential in the following areas: innovation in production processes (7th place against 20th place), other relations with the external environment (6th place against 18th), convenience of location in terms of legal norms and economic conditions of operation (10th place against 21th), the degree of risk diversification and the access to workforce (8th place against 14th). The enterprises in this group also noticed greater FDI benefits in terms of knowledge and skills in quality (6th place against 10th), the level of technological advancement, innovations in products and services (7th place against 11th), access to equity capital (8th place against 12th), as well as the ability to coordinate resources effectively (9th place against 13th).

[4] Based on the value of the impact indicator. See more in the explanations for Table 1.

Table 1. FDI impact on the components of competitiveness potential among the studied enterprises depending on their establishment mode choice

Specifications	Greenfield		Acquisition	
	Indicator value	Position	Indicator value	Position
Research and development	**0.35**	**V**	**0.28**	**V**
research and development facilities	0.30	19	0.18	14
knowledge and skills in creating innovation	0.37	15	0.25	11
innovations in products and services	0.44	11	0.33	7
innovations in production processes	0.29	20	0.33	7
Production / services	**0.43**	**III**	**0.32**	**III**
production (service) facilities	0.34	17	0.25	11
ability to achieve economies of scale	0.53	6	0.27	10
level of technological advancement	0.44	11	0.33	7
knowledge and skills in technology	0.53	6	0.38	5
employee qualifications	0.49	9	0.46	3
access to workforce	0.39	14	0.31	8
access to natural resources	0.17	23	0.25	11
access to materials and half-finished products / auxiliary services	0.30	19	0.17	15
knowledge and skills in logistics	0.51	7	0.35	6
relationships with suppliers	0.49	9	0.38	5
quality assurance system	0.50	8	0.35	6
knowledge and skills in quality	0.47	10	0.35	6
Sales and marketing	**0.58**	**I**	**0.45**	**I**
access to the market	0.67	2	0.54	1
understanding customer needs and preferences	0.68	1	0.50	2
insight into competitor behaviour	0.61	3	0.42	4
an ability to ensure reliable deliveries	0.51	7	0.27	10
knowledge and skills in marketing	0.53	6	0.50	2
customer relations	0.54	5	0.46	3
an ability to react quickly to market changes	0.53	6	0.42	4
Finances	**0.37**	**IV**	**0.24**	**VI**
equity capital	0.42	12	0.31	8
access to foreign capital	0.36	16	0.15	16
cost level	0.24	22	0.21	13
knowledge and skills in financial management	0.42	12	0.23	12
degree of risk diversification	0.39	14	0.31	8
Intangible and legal assets	**0.44**	**II**	**0.40**	**II**
company reputation	0.54	5	0.38	5
brand of products and services	0.49	9	0.42	4
intellectual property rights	0.29	20	0.38	5
Organisation and management	**0.44**	**II**	**0.30**	**IV**
enterprise size	0.51	7	0.31	8
organisational culture	0.53	6	0.35	6
organisational structure	0.47	10	0.31	8
organisational knowledge and skills	0.60	4	0.38	5
interpersonal relations in an enterprise	0.40	13	0.27	10
an ability to allocate resources efficiently	0.42	12	0.21	13
an ability to coordinate resources efficiently	0.40	13	0.29	9
convenience of location in terms of legal norms and economic conditions of operation	0.28	21	0.27	12
other relations with the external environment	0.32	18	0.35	6

Source: own study on the basis of survey results.

It is worth pointing out that only with three components of competitiveness potential (innovation in products and services, intellectual property rights and other relationships with the environment) FDI impact as measured by the value of the applied indicator was higher than the value calculated on the basis of the indications in the second group. In addition to this, only one component of competitiveness potential was believed to have a positive impact (the value of the impact factor> 0.50). The above results also lead to a conclusion that the group of companies which undertook FDI only via acquisitions benefited less from their operations on foreign markets when compared to the group that made only greenfield investments.

The differences in the evaluation of FDI impact on the individual components of competitiveness potential depending on the establishment mode choice are also confirmed by the results of Fisher's exact test. The significance of this test revealed the relationship between the establishment mode choice and the evaluation of FDI impact on the components of competitiveness potential for 6 out of 39 analysed components. Significant statistical differences were observed with respect to the ability to achieve economies of scale ($p = 0.039$), the access to materials and half-finished products / auxiliary services ($p = 0.008$), customer relations ($p = 0.019$), the ability to respond to market changes ($p = 0.003$), corporate reputation ($p = 0.037$) and the ability to allocate resources effectively ($p = 0.035$).

A detailed analysis of the frequency of individual evaluations of FDI impact on selected components of competitiveness potential shows that FDI undertaken via greenfield investments was a more effective instrument for building all the above-mentioned components of competitiveness potential than acquisitions. The greatest differences in the evaluation of FDI impact on selected components were observed in respect of economies of scale, the access to materials and semi-finished products and the ability to allocate resources efficiently. For over 83% of enterprises, greenfield projects contributed to improving their ability to achieve economies of scale (respondents rated the change as positive or moderately positive) against only 46.2% of investors who entered the markets through acquisitions.

In terms of the ability to allocate resources effectively and the access to materials and half-finished products/ancillary services, 72.2% and 54.3% investors undertaking only greenfield investments respectively observed an improvement in the competitiveness potential against merely 33.3% and 16.7% respondents using acquisitions as an establishment mode in foreign markets. With the vast majority of components, however, except for 'the ability to achieve economies of scale', the percentage of companies which indicated a positive change was greater among enterprises undertaking acquisitions than those that invested from scratch. A larger percentage of companies which observed only a significant change in their potential may be the result of an incremental rather than gradual increase in their potential when taking over a foreign company. FDI impact on the remaining 33 components of competitiveness potential was similar between the two groups of companies, and the test results did not justify a rejection of the null hypothesis with two independent variables.

Based on the studies, it can be concluded that there are no significant differences as far as the importance of FDI for building competitiveness potential depending on the establishment mode choice (Figure 3). In the opinion of both studied groups of enterprises, FDI is an important factor in building their competitiveness potential. However, a slightly larger proportion of investors who undertook greenfield investments responded that FDI proved to be

very important in building competitiveness potential compared to 15.4% investors who made foreign acquisitions. This confirms previous research findings pointing to the fact that greenfield projects brought greater benefits to the studied investors. However, a group of investors who made greenfield investments pointed out less frequently that FDI proved to be important for building their competitiveness potential – 40.0% vs. 53.8% of such responses in the group of investors who made foreign acquisitions. Investors who took over foreign companies pointed more often to the fact that foreign investment did not play a role in building their competitiveness potential. Fisher's exact test results also confirmed negligible statistical differences in the evaluation of the importance of FDI in building a company's competitiveness potential depending on their establishment mode choice (p = 0.625).

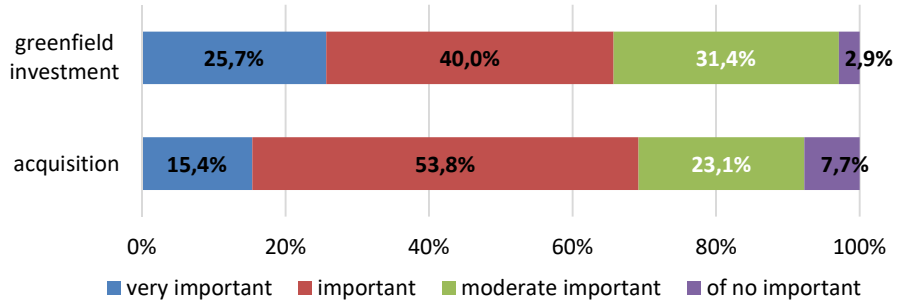

Figure 3. The importance of foreign direct investment in building competitiveness potential among studied enterprises by their entry mode into the host market

Source: own elaboration based on survey results.

CONCLUSIONS

Foreign investment activity among Polish companies contributes to the improvement of their competitiveness. This positive FDI impact on competitiveness was more apparent among the investors in relation to competitors on foreign markets rather than competitors on the home market. The studied companies generally indicated a moderately positive impact of their investments on their competitiveness.

The research results also show that in the case of companies which undertook FDI from scratch, these investments contributed to improving their competitiveness on the Polish as well as on foreign markets. Relatively lesser FDI benefits were observed among those companies which entered foreign markets via acquisitions, which may have its explanation in the nature of the purchase/sale transaction and the accompanying difficulties.

The differences between the two groups of enterprises in the evaluation of FDI impact on competitiveness does not justify rejecting the first hypothesis (H1), which claims that 'the evaluation of FDI impact on the competitiveness of Polish companies on both home and foreign markets depends on the foreign establishment mode choice'.

The results of the study point to the differences in the evaluation of FDI impact on the individual components of competitiveness potential depending on the foreign establishment mode. Therefore, there are no grounds for the rejection of the second hypothesis (H2), which says that 'the benefits of FDI impact on the components of competitiveness potential depend on the foreign establishment mode'.

The most diverse benefits of internationalised operations were achieved by companies which had undertaken FDI via greenfield investments. Within this group of companies, FDI had the largest impact on the following components of competitiveness potential: sales and marketing, intangible and legal assets, organisation and management.

The companies which chose the acquisition of all or part of a foreign enterprise estimated that the investment projects they undertook abroad had a significant impact on gaining access to the market. These companies perceived a stronger FDI impact on improving innovation in production processes, gaining access to intellectual property rights and improving relations with the wider environment.

Based on the results of the study, it can be said that the allocation of capital in the form of FDI significantly affects the competitiveness potential of Polish foreign direct investors. This is the case regardless of the establishment mode choice. In conclusion, foreign direct investment should be seen as an effective tool for building a company's competitiveness.

As mentioned above, the data protection laws in Poland prevent researchers from accessing the database of Polish companies which are foreign direct investors (such databases are owned by the Central Statistical Office and the National Bank of Poland). The method of selecting companies for a research sample and the lack of accurate identification of the structure of the examined population calls for caution when generalising the above conclusions. It is very likely, however, that they are close to being factual.

The results of this study may be a starting point for further research on the impact of FDI on competitiveness, particularly through foreign acquisitions. It should be assumed that as Polish companies gain experience on the international stage, this mode of entry will be chosen by investors more frequently. Furthermore, it would be interesting to analyse data on the performance of the companies making FDI as well as their foreign subsidiaries. Finally, future investigation can also try to explore more deeply the foreign establishment mode choice as a variable affecting the company's global competitive advantage from the resource-based view of the firm.

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Authors

The contribution of co-authors is: M. Jaworek 30%, W. Karaszewski 30%, M. Szałucka 40%.

Małgorzata Jaworek

Professor of Nicolaus Copernicus University in Toruń. Her research interests include internationalisation of Polish enterprises in the form of foreign direct investment, foreign direct investment in the privatisation process of the Polish economy, evaluation of FDI and FDI inflows in The Kuyavian-Pomeranian Voivodeship.

Correspondence to: dr hab. inż. Małgorzata Jaworek, prof. UMK, Nicolaus Copernicus University in Toruń, Faculty of Economic Sciences and Management, Gagarina, 13a, 87-100 Toruń, Poland, e-mail: mjaworek@umk.pl

Włodzimierz Karaszewski

Professor of Nicolaus Copernicus University in Toruń. His research interests include internationalisation of Polish enterprises in the form of foreign direct investment, market transformation of Polish enterprises and FDI inflows in The Kuyavian-Pomeranian Voivodeship.

Correspondence to: dr hab. Włodzimierz Karaszewski, prof. UMK, Nicolaus Copernicus University in Toruń, Faculty of Economic Sciences and Management, Gagarina, 13a, 87-100 Toruń, Poland, e-mail: wkaras@umk.pl

Małgorzata Szałucka

Associate Professor of Nicolaus Copernicus University in Toruń. Her research interests include internationalisation of Polish enterprises in the form of foreign direct investment, company competitiveness and FDI inflows in The Kuyavian-Pomeranian Voivodeship.

Correspondence to: dr Małgorzata Szałucka, Nicolaus Copernicus University in Toruń, Faculty of Economic Sciences and Management, Gagarina, 13a, 87-100 Toruń, Poland, e-mail: mszalucka@umk.pl

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Family Entrepreneurship Orientation in Family Owned SMEs: A Key Resource for Internationalization?

Alicja Hadryś-Nowak

ABSTRACT

Objective: The main goal of this article is to find the answer to the questions: what is the nature of the internationalization of family businesses from Poland? Do they internationalize ad hoc or do they plan an internationalization strategy? Which resources are needed for the internationalization process?

Research Design & Methods: The author used qualitative approach with CATI (*Computer Assisted Telephone Interview*), PAPI (*Paper & Pen Personal Interview*) and CAII (*Computer Assisted Internet Interview*) methods. 420 questionnaires were used in the statistical analysis.

Findings: This study focuses on the evaluation of entrepreneurship orientation as the main resource of the internationalization nature (ad hoc or a strategic plan) of family businesses from Poland and measured it through the four elements proposed by Covin and Slevin (1989): *Innovation, Proactivity, Autonomy and Risk.*

Implications & Recommendations: To internationalise, family business families need to apply entrepreneurship orientation, especially proactiveness towards new challenges, and strategic planning and tools.

Contribution & Value Added: The research provides evidence of a higher degree of EO in the behaviour of a family. More successful family businesses are in international markets. They also have a challenge oriented culture, which means that such companies are oriented towards new ventures, new relations, new solutions and new markets. But they plan new challenges using the strategic approach.

Article type:	research paper
Keywords:	family businesses; internationalization; entrepreneurship orientation; resource-based view
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INTRODUCTION

Internationalization is one of the most complex achievements for every company. Nevertheless, international economy is getting more and more integrated in the proceeding decrease of obstacles in the exchange market and constant progress in the technological field (Lu & Beamish, 2001). Thus, starting internationalization seems to be a strategy needed for the further development of the company. Considering the globalization of markets, even family companies, historically tending to be concentrated on the local market, can be forced to expand externally (Donckels & Frohich, 1991; Floren, 2001; Gallo & Estape, 1992; Gallo & Garcia-Pont, 1993; Gallo & Sveen, 1991; Graves & Thomas, 2006; Okoroafo, 1999). The easiest and the widest definition of internationalization is every kind of business activity taken by the company abroad. It is believed that the conception of the company internationalization process makes an exceptional opportunity to run the company in external markets, granted that the external market manifests strong differences in comparison to the local environment (Fernandez & Nieto, 2005). Internalization strategy shows the company's activity in the external area. In the internationalization strategies, the existing (or not) correlation between the firm's characteristic, internationalization and ways of external expansion is crucial. As far as internationalization as such was described and examined by many of the authors, there is relatively little knowledge about internationalization in the context of the family-owned business (McKibbin & Pistrui, 1997). Special features of the family-owned business result in a desire to maintain the control over the company in family's hands (family ownership structure), an aversion to take an excessive risk and a long time perspective, whose activities can determine both benefits and threats of the external expansion taken. Ownership plays a special role in international business, and it can be a factor stimulating the internationalization of firms (Wach, 2017). In family businesses the family ownership plays a crucial role.

The culture of the organisation in the company, which is often a reflection of the system of values in the owner's family, formal and informal engagement of the family, attachment to tradition and drawing from the experience of older generations make the internationalization strategies in those companies theoretically different from the internationalization in non-family-owned business (Coviello & Munro, 1995; De Chiara & Minguizzi, 2002; Gankema, Snuif, & Van Dijken, 1997; Leonidu, 2004; Manelova, Brush, Edelman, & Greene, 2002; McDougall & Oviatt, 1996; Wolff & Pett, 2000; Hadryś-Nowak, 2013). The main goal of this article is to find the answer to the question: what is the nature of internationalization of family businesses from Poland? Do they internationalize ad hoc or do they plan an internationalization strategy? The Polish context is very interesting because with the collapse of the old regime in 1989, the outburst of entrepreneurship resulted in the creation of numerous family businesses which became the backbone of the blossoming free-market economy (Bednarz, Bieliński, Nikodemska – Wołowik, & Otukoya, 2017). Most of Polish family businesses are still in the first generation phase, so called 'founder stage'. The first succession process is happening. Researchers from Poland reveal that family firms are less internationalized than the rest, however, some researchers show that family firms listed on the stock exchange are more internationalized (Daszkiewicz & Wach, 2014; Wach & Wojciechowski, 2014).

What resources are needed for the internationalization process? Many authors also point to the need to increase the knowledge of the key factors that enable SMEs to be

successful on international markets (e.g. Knight & Cavusgil, 2004; Zahra, Ireland, & Hitt, 2000). This study focuses on one of these elements, Entrepreneurship Orientation (EO), which refers to the processes, practices, and decision-making activities that lead to new developments for the company (Lumpkin, 1996). It is considered an important resource in order to accelerate the internationalization process (Barney, 2011), and it is especially important for SMEs (Lumpkin, 1996). Despite this importance, and although there is abundant literature on both EO and business internationalization, there is very little research regarding the relationship between these two concepts (Wach, 2015). This study investigates how different dimensions of EO contribute to the internationalization nature of family owned businesses. To be able to meet the goal, the author used CATI (*Computer Assisted Telephone Interview*), PAPI (*Paper & Pen Personal Interview*) and CAII (*Computer Assisted Internet Interview*) methods. The collected material was analysed in the form of tables, discussed and verified. Two questionnaires containing errors were excluded from the whole set of questionnaires collected. The remaining 420 questionnaires were used in the statistical analysis. Earlier studies (Okoroafo, 1999; Child, Hong, & Wong, 2002; Erdener & Shapiro, 2005; Olivares-Mesa & Cabrera-Suárez, 2006; Kontinen & Ojala, 2012a; Graves & Thomas, 2008; Claver, Rienda, & Quer, 2007; Kontinen & Ojala; 2010b, Muñoz- Bullón & Sánchez-Bueno, 2012; Muñoz-Bullón & Sanchez-Bueno; 2011; Lin, 2012) indicate that a decision on the internationalization nature in family owned comapnies is determined by a number of factors related to the business, the competitive position of the company (Gallo & Sveen, 1991; Gallo & Pont, 1996; Yeung, 2000; Tsang, 2001, 2002; Zahra, 2003; Sciascia, Mazzola, Astrachan, & Pieper, 2012a, 2012b; Fernández & Nieto, 2006; Carr & Bateman, 2009; Donckels & Fröhlich, 1991; Kim, Kandemir, & Cavusgil; 2004) and very strongly depends on family related features (Menendez-Requejo, 2005; Graves & Thomas 2006; Claver, Rienda, & Quer, 2009; Davis & Harveston, 2000; Byrom & Lehman, 2009; Calabrò, Mussolino, & Huse, 2009). To meet the aim of the article, first the internationalization in context of family businesses is discussed. Then, based on the proposed theoretical framework research hypothesis are evaluated. Based on research results discussion is elaborated. The research was conducted in 2015. It is not representative of the whole Polish family business population.

LITERATURE REVIEW

Internationalization and Family Businesses

The term internationalization can be described as the process of increasing involvement of international activity across borders (Welch & Luostarinen, 1988). The amount of cross -border activities of a firm can therefore be expressed by its degree of internationalization (Oesterle, Richta, & Fish, 2013). Other definitions define internationalization as a strategy process with the aim of growth (Dana, Welpe, & Ratten, 2008). However, it is argued that the main difference between internationalization and alternate strategies of growth is that an organization transfers or sources its products, services or resources across borders (Dana *et al*., 2008). Various internationalization theories have been developed in order to explain the internationalization behaviour of firms, however with a somewhat different focus. Some look at transaction costs, the role of entrepreneurs or the influence of relationships, while others looks at it as a stepwise process that evolves over time. All the

above stated theories require firms to commit resources to their internationalization. Johanson and Vahlne (1977) describe internationalization to be a stream of decisions. In the internationalization process a firm has to take a large amount of decisions, including financial decisions, as the expansion process requires substantial capital. For instance, Koch (2001) researched different aspects of the internationalization decision process – amongst others the market entry mode selection, which involves committing financial resources. This research was grounded on the basis of a wide range of influencing factors which are categorised into internal, external and both mixed factors, that is both internal and external. Regarding the internal factors, the author studied the firm size in terms of their resources, which resulted in the conclusion that industry-specific resource demands have critical influence in the entry mode choice of a firm. So for instance, a fully owned subsidiary, which is very favourable for firms in terms of control, requires much more investment and involves higher risk than exporting. Khemakhem (2010) explains foreign operations to be a trade off between the cost of resources committed and control over the operation. However, whether commitment is tangible or intangible, it can involve large financial investments (Johanson & Vahlne, 1977; Figueira-de-Lemos, Johanson, & Vahlne, 2011). Johanson and Vahlne (2006) note in their paper that the incremental process mainly focuses on learning and commitment building, which they determine as important components in the business process. If increasing knowledge and commitment evolve successfully, the next stage is characterised by greater investments, which also includes more risk and control. In terms of the network perspective, this can also be related to relationship commitment, as a firm might be willing to invest a lot of resources in order to establish and maintain the relationship. The critical issues found by the authors are the aspects of cost, time and uncertainty involved. This leads to the definition of relationships being an asset resulting from investments (Johanson & Vahlne, 2006). Therefore, a critical aspect in the internationalization process is the necessary resource commitment in terms of investments. At the beginning of the nineties an innovative concept appeared in strategic management. It is called the resource-based view of the firm. Knowledge is more and more often perceived as a kind of the company's 'anchor' in a turbulent environment. As a consequence of an increase in the rate of change in the market environment, a lot of companies have discarded the idea of basing their strategy on a particular market segment. Instead, numerous companies have started to look inside their own organisations, basing their strategy on their resources and competencies. This phenomenon can be characterised as a supply approach (resource-based theory approach). So far, the question of outstanding market results has been explained according to the market and product analysis (Porter, 1991). The economists paid more attention to the environment and less to the company's inside. In contrast to the finding that the sector structure determines competitive advantage (Porter, 1991), the resource-based theory suggests that having unique resources can be the source of competitive advantage (Barney, 1991). Company's knowledge and organisational procedures are important sources of competitive advantage. The resource-based theory states that the future of the company depends on the optimal use and maintenance of unique abilities: fundamental competencies. Analysing market or product quality according to this theory does not provide enough information on the company growth potential. Above all, fundamental competencies include intangi-

ble assets, such as knowledge and abilities, which produce financial results. Tangible assets, such as buildings, perform auxiliary function towards fundamental competencies. Therefore, a research question arises: Which resources of a family enterprise influence the nature of the internationalization of family owned businesses from Poland? Very valuable resources of family enterprises, which are their essence, are for sure commitment and the presence of the next generation (Björnberg & Nicholson, 2012). The international strategy undertaken by a firm will include the scale, scope and speed of its internationalization. The scale of firm internationalization is the extent to which the company relies on foreign sales. This indicates the decreasing dependency the firm has on its home market in favour of its international markets. Therefore, the scale of internationalization shows the extent to which a firm's sales have been developed outside of their home market. This is a good indicator of a firm's increased dependency on their foreign activities (Hilmersson, 2013). The second is the scope of internationalization. This refers to the number of markets that SMEs choose to enter, it denotes the international geographic reach of a firm's business (Hashai, 2011; Lu & Beamish, 2001). By operating in many different markets, firms can learn from diverse circumstances and environments, and leverage this experience in new markets to aid international performance (Hilmersson, 2013). The speed of internationalization refers to the rapidity at which firms spread their international activities between different country markets. It assesses the dynamic aspect of the growth strategy. Most literature on the subject focuses on the time it takes from the inception of the firm to the start of internationalization, where a short time is treated the same as a high speed of internationalization. This 'born global' literature also only focuses on the start phase, how quickly firms enter more than one market and how quickly they spread their operations is neglected. Hilmersson (2013) however, provides a measure to analyse the speed of internationalization, by dividing the distance covered (markets entered) by the time it takes to cover this distance. To conclude, internationalization strategy is based on several decisions made, depending on resource commitment. Based on the RBV, some literature has found the importance of three interrelated factors for venturing, which are internal resources, entrepreneurship orientation and external factors (Jones, 1999; Coviello & Munro, 1997; Westhead, 2001). International venturing is a type of business development, for which entrepreneurship is considered a fundamental driver (Covin & Slevin, 1991; Lumpkin, 1996).

The starting point for the study of the internationalization of SMEs is recognizing that SMEs are not simply smaller versions of large corporations (Shuman & Seeger, 1986; Pagarkar, 2008). It is argued that operating in a globalised environment is more complex for SMEs than for large companies (Gary, 2000), since any initiative related to foreign markets will use a greater share of resources in an SME. Further, in the event of failure, the impact of such an initiative on an SME is of much more importance, and thus it entails a higher risk (Pagarkar, 2008; Buckley, 1999; Lu & Beamish, 2001). Some authors call this effect resource disadvantage and scale disadvantage for SMEs compared to their global rivals, both of which affect their possibilities of resilience (Yip, Biscarri, & Monti, 2000). SMEs suffer a shortage of managerial resources (Qian, 2002), both in terms of quantity and of the quality needed for internationalization. Consequently, they may not perform systematic global scanning and may lack the information necessary for exploiting international opportunities (Buckley, 1999). To cope with this, SMEs tend to take short-cuts in decision-making and information gathering, which can be disastrous (Buckley, 1999). Also,

SMEs in general do not have specialised managers for international operations and their administrative procedures are underdeveloped (Aharoni, 1966; Buckley, 1999; Van Hoorn, 1979). In addition, internationalization increases the need for coordination and communication among different units within and outside the firm and across regions (Qian, 2002), further stretching the thin managerial resources of many SMEs. Some authors have found that managerial expertise and competence, together with lack of information, were the top two difficulties faced by small technology based firms in internationalization (Karagozoglu & Lindell, 1998). On the other hand, it is arguable that SMEs have some competitive advantages, such as greater flexibility to respond to clients' needs, and adaptability to serve small market niches. Moreover, internationalization may have some positive effects for SMEs, such as enabling them to increase the use of their production capacity, as well as providing learning opportunities when working to satisfy different customers' needs and facing the diverse competition of export markets (Pangakar, 2008; Kostova & Roth, 2002; Zahra, Irlanda, & Hitt, 2000). Through the process of internationalization, an SME may find it easier to build a network of contacts that will support its growth strategy (Gary, 2000; Knight & Cavusgil, 1996). Similarly, it can be argued that the ability to carry out international expansion may not be solely related to a business size or to a business age. Rather, and especially for SMEs, the human capital of the entrepreneur and the internal resources of the firm may influence the competitive strategies pursued, as well as their performance (Reynolds, 1987; Romanelli, 1989; Bates, 1998; Kalleberg & Leicht, 1991; Westhead, 1995b; Gimeno, Folta, Cooper, & Woo, 1997). To sum up, despite the limitations and challenges that SMEs face in their internationalization processes, this activity may enable them to learn and improve their performance (Loth & Parks, 2002). Therefore, and given the critical nature of international ventures for SMEs, there is still a need for further research on the factors that contribute to their success.

Entrepreneurship Orientation

Entrepreneurship orientation (EO) refers to the activities that lead to new business growth achieved by the marketing of new products to current markets or the existing products to new markets. This view emerges from a strategic – choice perspective (Child, 1972), which asserts that new entry opportunities can be successfully undertaken by 'purposeful enactment' (Van dr Ven & Poole, 1995). According to Miller (1983) and Covin and Slevin (1989), a firm's EO is defined by the intention and actions of key players in the business, who engage in a dynamic generative process aimed at new venture creation. Entrepreneurial orientation is a broader sense of entrepreneurship (Gaweł, 2013). The key dimensions that characterise EO include: 1) the propensity to act autonomously, 2) the willingness to innovate and take risks, and 4) proactive relative to marketplace opportunities (Covin & Slevin, 1991). Autonomy refers to the independent action of an individual or a team to bring forth an idea or a vision and carrying it through to completion. In general, it means the ability and a will to be self-directed in the pursuit of opportunities. (Covin & Slevin, 1989). Innovation reflects a firm's tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes (Miller & Fried, 1978). Essentially the definition that Miller and Fried adopted when they defined risk taking as 'the degree to which managers are willing to make large and risky resource commitments, i.e., those which have a reasonable chance of costly failures' (Miller & Fried, 1978, p. 923). Miller and Fried argued that the proactivity of a firm's

decisions is determined by answering the question, 'Does it shape the environment (high score) by introducing new products, technologies, administrative techniques, or does it merely react' (Miller & Fried, 1978). Some authors argue that the successful new entry may also be achieved when only some of these factors are operating (Kilby, 1971). EO can be considered an important resource for domestic and international activities (Barney, 2011) one that can boost the internationalization process. In the case of SMEs, which try to develop their leadership, deploy resources and build an effective strategy for internationalization, EO could be a valuable, unique and difficult to imitate resource on which to base competitive advantage. It could even be the most valuable resource for a young company to grow and reach a stage that allows its survival (Lumpkin, 1996) especially considering the likely scarcity of other resources in SMEs as noted above. Lumpkin (1996) following Covin and Slevin (1991) argues that EO is fundamental for business development. For SMEs Lumpkin considers that the processes of decision making for a new entry and its implementation are basically in the hands of their leaders. Although the concept of entrepreneurship has been applied to many different levels (individuals, groups and organisations), entrepreneurship is often thought to be within the purview of individuals only, because it is frequently associated with the introduction of a revolutionary invention (Kilby, 1971). In the case of SMEs the individual level is very important. Some authors contend that 'the small business firm is simply an extension of the individual who is in charge' (Lumpkin, 1996, p. 138). In family firms, the firm is very often the extension of the family. The experiences, skills, and competences of entrepreneurs (family) are generally regarded as key factors influencing business survival and development (Storey, 1994). Consequently, it can be argued that the entrepreneurship capability of the leaders of SMEs is a good representation of the company's EO. Vatne (1995) presented a conceptual model for the internationalization of SMEs engaged in manufacturing activities, suggesting that the territorial environment could influence a firm's internal resources. Also, social networking and the entrepreneur's quality influence a firm's ability to identify, acquire and use external resources for product development, production, and promotion. Given the differences between SMEs and large companies, especially regarding tangible resources, the use of intangibles by SMEs, such as managerial capabilities, is probably distinctive and specific for business success (Knight, 2009).

Based on the above considerations, the author takes into consideration the following factors:

- family firm internationalization nature as planned internationalization strategy or ad hoc process,
- factors related to the business, like: the age and size of the business,
- family related features and entrepreneurship orientation: 1) the propensity to act autonomously, 2) the willingness to innovate and take risks, and 3) a tendency to be aggressive toward competitors, and 4) proactive relative to marketplace opportunities.

MATERIAL AND METHODS

The population unit represented by the analysed sample was a family business understood as *a business in which the majority of decision-making rights are in the possession of the natural person(s) who established the firm, or in the possession of the natural person(s)*

who has/have acquired the share capital of the firm, or in the possession of their spouses, parents, child, or children's direct heirs, moreover at least one representative of the family or kin is formally involved in the governance of the firm (European Family Business Foundation) through the owner or co-owner.

The analysed population was assessed on the basis of information concerning the number of family businesses as 36 % (Lewandowska *et al.*, 2016) of the total number of firms in Poland. The size of the sample obtained during the research was greater than the assumed minimum one which allowed to generalise analyses[1] and was at the level of 422 family businesses. In order to efficiently conduct the research, a survey method was adopted and was carried out along three paths using CATI (*Computer Assisted Telephone Interview*)[2], PAPI (*Paper & Pen Personal Interview*)[3] and CAII (*Computer Assisted Internet Interview*)[4]. The survey was conducted in 2015.

The main hypothesis, which became an introduction to further analyses, assumes that family businesses when they internationalize, regardless of whether they plan it or do it ad hoc, concern also characteristics and activities connected with the family firm specificity. This assumption is complemented by five auxiliary hypotheses in which it was essential to recognize relationships between dependent variables (family firm internationalization nature) and independent variables (family enterprise metrics and entrepreneurial orientation):

1. Family firm internationalization nature (IS) is connected with the age of a business (AB).
2. Family firm internationalization nature (IS) is connected with the size of a business (SB).
3. Family firm internationalization nature (IS) is connected with the family propensity to act autonomously (IP).
4. Family firm internationalization nature (IS) is connected with the family willingness to innovate and take risks (EE).
5. Family firm internationalization nature (IS) is connected with family proactiveness relative to marketplace opportunities (VA-GM).

RESULTS AND DISCUSSION

Each of the auxiliary hypotheses made was broken into two detailed ones, connected with the family firm internationalization nature (here: planned internationalization strategy – PS or internationalization ad hoc – AH). A chi-squared test was used as a verifying tool of the hypotheses made. As a result of that, each detailed hypothesis was divided into the next two ones: the null hypothesis stating that there is no relationship between the analysed variables and the alternative hypothesis stating there is a relationship between them. The test results for the detailed hypotheses are contained in Table 1.

The analysis of the detailed hypotheses allowed to single out relationships between the variables of family businesses in Poland.

The first of the detailed hypotheses assumed a relationship between the family firm internationalization nature and the age of a business. No relationship with the age of

[1] The minimum sample was 383 firms, with $\alpha = 0.05$, $b=0.05$ and $p=0.5$.
[2] The CATI method was used to conduct research with 75 respondents.
[3] The PAPI method was used to conduct research with 67 respondents.
[4] The CAII method was used to conduct research with 280 respondents.

a business was recorded either in the case of internationalization ad hoc or planned internationalization strategy (H.1). Common observations of family businesses and their decision-making processes may indicate another type of behaviour, e.g. 'consuming' profit in the first years of business operation. Statistical results unequivocally exclude the influence of this independent variable on the internationalization nature.

Table 1. Test results for auxiliary hypotheses

auxiliary hypothesis		relationship between	chi-squared test	df	p	V-Cramer
H.1	1.1	IS-PS/AB	19.583	15	0.189	0.124
	1.2	IS-AH/AB	21.457	15	0.123	0.112
H.2	2.1	IS-PS/SB	50.702	15	**<0.001**	0.256
	2.2	IS-AH/SB	18.87	15	0.220	0.023
H.3	3.1	IS-PS/IP	63.216	25	**<0.001**	0.173
	3.2	IS-AH/IP	24.363	25	0.498	0.012
H.4	4.1	IS-PS/EE	45.026	20	**0.0012**	0.238
	4.2	IS-AH/EE	46.726	20	**0.001**	0.216
H.5	5.1	IS-PS/ VA-GM	46.398	25	**0.006**	0.259
	5.2	IS-AH/ VA-GM	19.365	25	0.0779	0.121

(α=0.05; n=420)
Source: own study.

The second hypothesis emphasised the relationship between the analysed variable and the size of a business. The obtained results of statistical testing indicate the lack of relationship between family firm internationalization nature and the size of a business (H.2.2). However, in the case of activities connected with planned internationalization strategy, there is a link with the size of a business (H.2.1). It means that businesses along with their development invest profit earned (or part of it) into progressive measures.

Another testing area comprised relationships between the analysed dependent variables and the family propensity to act autonomously. A relationship between family firm internationalization nature and planned internationalization strategy and the propensity to act autonomously was confirmed (H.3.1). At the same time, the hypothesis regarding interdependency between family firm internationalization nature to internationalization ad hoc and the propensity to act autonomously in the business sphere was rejected (H.3.2). It testifies to family enterprise owners' and managers' business maturity.

The detailed hypothesis assumed a relationship between family firm internationalization nature and the family willingness to innovate and take risks. Testing the hypothesis revealed that both in the first case (planned internationalization strategy) and the second case (internationalization ad hoc) there is a connection with the willingness to innovate and take risks (H.4). Innovation in this context refers to the creative capacity, and the necessary flexibility and knowledge, to adapt to new markets and to personalise the offered solutions.

The hypothesis H.5 concerned the analysis of the relationship between family firm internationalization nature and proactiveness relative to marketplace opportunities. The existence of relationships between family firm internationalization nature and family proactiveness relative to marketplace opportunities was confirmed. It may mean that the more valuable assets for family business are assigned for foreign market the more intention there is in a company to strategically plan the internationalization process.

The main hypothesis concerning activities connected with the family firm internationalization nature in both planned internationalization strategy and internationalization ad hoc was confirmed. In accordance with the results, it can be stated that family entrepreneurs treat internationalization, regardless of whether they plan it or do it ad hoc, as company development possibility. The results of a multiple analysis therefore entitle to believe that, firstly, Polish owners of family businesses show high awareness and maturity in terms of the need of the company's internationalization activities, and secondly: having regard to internationalization factors associated with the company's family nature should be regarded as fulfilled.

Table 2. Results of testing the main hypothesis

The main hypothesis	relationship between	chi-squared test	df	p	V-Cramer
	PA-B/PA-F	215.7982	25	<0.001	0.34

(α=0.05; n=420)
Source: own study.

CONCLUSIONS

This study focuses on the evaluation of entrepreneurship orientation as the main resource of the internationalization nature of family businesses from Poland, and measured it through the four elements proposed by Covin and Slevin (1989): *Innovation, Proactivity, Autonomy and Risk***.** The research provides evidence of a higher degree of EO in the behaviour of the families of the surveyed companies that were successful in the international market. There is not much difference regarding the level of autonomy. This factor is especially relevant in small companies, in which the firm is an extension of its leader. In these organisations it is common that the director has a tendency to want to be responsible for all decisions and tasks, and has difficulty delegating. The study shows that companies which do not internationalize have mainly implemented changes within their organisations, while successful ones have emphasized changes enabling the adaptation of their services to their clients. It is interesting that all family owned businesses from the research refer to their lack of financial resources, and this is probably an important factor which limits investments which may involve significant risk, because they could endanger the survival of the company. The difference found is that some companies admit that they started their internationalization only because they could use government assistance by entering an export promotion programme. The different motivation for internationalization can also be judged as a different level of proactivity. Most surveyed family companies started their expansion in foreign markets as a strategic decision, prior to the economic crisis, which reinforced their proactive behaviour. These results are in accordance with Alon and Higgins (2005) who consider that successful international companies are proactive and can respond to particular foreign environments. According to Wach (2017), 'the role of the family in international entrepreneurship seems to be still unexplored and needs further detailed research studies'. That is why, this study focuses on an important yet under-researched topic, the internationalization nature of Polish family owned businesses. The likely shortage of human and financial resources for these companies, together with service inseparability, drives them to develop other intangible resources. After using three complementary strategies to ensure internal validity (literature

research, pattern matching, and theory triangulation), the results show that, as hypothesised, one of these resources, EO, must be considered the key for the internationalization process. Regarding proactivity, research shows that successful companies do not just react to events. They foresee future scenarios and have a long-term plan in order to be better prepared. They started international expansion in a favourable economic context and therefore could proactively choose the most appropriate timing and allocate the necessary resources. The level of risk taking is in general low for all the companies studied. This attitude is reflected in the fact that companies only ventured internationally when they perceived that they were sufficiently secure. Low level of risk taking is very characteristic for family owned businesses. This is connected with the desire to protect family and the desire to pass the family company to the next generations.

There is no research about family entrepreneurship orientation and its influence on internationalization. However, there is research about family ownership and its impact on the internationalization process. The research results are in line with the survey conducted by Morono, Monreal-Perez and Sanchez-Marin (2015). They found that in Spanish firms the family experience positively affects internationalization. On the other hand, the presented research is inconsistent with result of Daszkiewicz and Wach (2014) or Fernandez and Nieto which evidenced that internationalization is negatively related to family ownership. The answer to this inconsistency may lay in construct of family and family members entrepreneurship orientation. This, for sure, need more in depth research.

The main hypothesis, verified during the interpretation of statistical data, points to the ability of Polish owners of family businesses to internationalize in a strategic and planned way. Moreover, a few dependencies were proven to be linked to the analysed variable:

1. The bigger the business, the more often profit is earmarked for business development and to the strategic internationalization process.
2. Innovative (or aspiring to be innovative) businesses earmark profit for business development more often and to the strategic internationalization process.
3. Entrepreneurship orientation seen as the propensity to act autonomously, the willingness to innovate and take risks and proactiveness relative to market opportunities, is tied with an open and planned attitude to the internationalization process.
4. The more proactive the owner is the more often internationalization process is carefully planned.

To summarise, these results show that, although all five EO dimensions may be important for the international success of SMEs, they are not all equally relevant. What can be also deduced from the research is that the surveyed Polish family owned businesses when they internationalize, they not only have high level of entrepreneurship orientation, but they also have challenge-oriented culture which means that such companies are oriented towards new ventures, new relations, new solutions and new markets. But, they plan new challenges using the strategic approach.

The study allowed to observe the relations that may be important for policy makers, family business owners, managers in family businesses and advisors. First of all, the family has a significant influence on the choice of the internationalisation strategy. The results show that for service SMEs, the entrepreneurship qualities of their leaders are a critical resource, because he/she has high interaction with primary activities. Therefore, family

business owners should understand that these aspects are crucial for their success on international markets. Family business owners need to develop strategic competencies, such as: analysing the competition, positioning their companies in the market, setting goals and final results, as well as building action plans and applying control systems. This study focuses on a field in which there is a general consensus that there is a need for more research. In order to enhance the strength of the conclusions obtained, further studies could extend the present work by the use of larger samples. Also, carrying out similar studies in different geographical areas (regions or countries), especially in the CEE region, could be interesting to compare the results. The biggest limitation of the research is that it is not representative and the results cannot be generalised for the whole population of family owned businesses in Poland. The second limitation is that the result presented in the article are from a pilot study and they will be extended in the future.

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Author

Alicja Hadryś-Nowak
Adjunct at International Management Chair, Poznań University of Economics and Business. PhD in economics specialist in family business management, internationalization and branding. Author of several book chapters and over scientific articles. Visiting Professor at Lethbridge University in Canada, Jonkoping International Business School in Sweden and Politecnica della Marche in Italy. Expert in PARP, European Commission and IBR (Instytut Biznesu Rodzinnego). Team member in several European grants and projects.
Correspondence to: Alicja Hadryś-Nowak, Poznań, University of Economics, al. Niepodległości 10, 61-875 Poznań, Poland, e-mail: alicja.hadrys@ue.poznan.pl

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The Impact of Conflicts in Foreign Business Relationships on SME Performance

Milena Ratajczak-Mrozek, Krzysztof Fonfara, Aleksandra Hauke-Lopes

ABSTRACT

Objective: The objective of the article is to discuss the impact of conflicts in foreign business relationships on the performance of SMEs. Two possible ways in which conflicts influence the company's performance are considered: direct (conflicts → company's performance) and indirect (conflicts → business relationships → company's performance).

Research Design & Methods: The article uses the case study method and presents the results of a study of 13 SMEs operating in international markets.

Findings: The article proposes a model of the positive impact of conflicts in foreign business relationships on SME performance. A model links relational and operational sources of conflicts with their direct and indirect (through relationships) impact on SME performance and positive and negative outcomes.

Implications & Recommendations: The article provides information how to transform conflicts in foreign business relationships into positive outcomes. A crucial role in this respect is played by moderators: trust and informal relationship development, cultural awareness and formal action development.

Contribution & Value Added: The originality of the study is that it identifies the main operational and relational sources of conflict situations that impact (directly and indirectly) SMEs performance in their international activities. The identified 4 moderators, by positively impacting SMEs foreign relationship in conflict situations, help these companies to obtain positive conflict outcomes.

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INTRODUCTION

Conflicts are an inherent feature of business relationships and can be defined as a tension between business or social entities. They can manifest themselves to different degrees and can range from day-to-day problems and small misunderstandings to severe escalating conflicts that threaten the existence of both the relationship and the company itself.

The impact of conflicts on companies' activities can be analysed from two perspectives. Firstly, one can focus on how conflicts affect the relationships themselves, including an impact on relationship development, trust, satisfaction and relationship termination (e.g. Lumineau *et al.*, 2015; Vaaland, 2004). Secondly, the impact of conflict is perceived more broadly, taking into consideration its influence on the company's performance (e.g. Duarte & Davies, 2003; Lam & Chin, 2005). We see these two perspectives as interrelated because by affecting the relationship a conflict can influence performance as well.

International activities of companies entail higher risks of conflicts (Vaaland, Haugland, & Purchase, 2004). However, in the existing literature conflicts in relationships with foreign entities have not been widely analysed (with the exception of Leonidou, Barnes, & Talias, 2006; Vaaland *et al.*, 2004). Especially, the existing research lacks the analysis of conflicts in SMEs foreign relationships, where due to the specific character of these enterprises, conflicts may have more severe negative consequences than for larger companies.

The objective of the article is to discuss the impact of conflicts in foreign business relationships on SME performance. In order to understand the nature of this impact, two possible ways in which conflicts influence the company's performance are considered: direct (conflicts → company's performance) and indirect (conflicts → business relationships → company's performance).

It has been assumed that:

- Conflicts in foreign business relationships have both a negative and positive impact on the SME performance (Proposition 1);
- SMEs may undertake actions to moderate outcomes of conflict in foreign business relationships and achieve a positive impact of conflicts on their performance (Proposition 2).

In the article we use the case study method and present the results of a qualitative study of 13 SMEs active in international markets. First, we present the theoretical background of the research problem, starting with the theory of conflicts in business relationships and a review of research on conflicts in international activity, SMEs and conflict outcomes. Next, we describe the research method and present the results of the study conducted among 13 SMEs. The first part of analysis focuses on the sources of conflict situations that appeared in the process of cooperation in foreign markets, in an attempt to explain why conflicts occur. In the second part the emphasis is placed on direct and indirect, positive and negative impacts of conflict in foreign business relationships on SME performance, in order to show how conflicts can influence SMEs. In the third part we propose a model of the positive impact of conflicts in foreign business relationships on SME performance. The analysis finishes with conclusions, including managerial implications.

LITERATURE REVIEW

Social aspects are crucial in activities of every company, that is why conflicts are an inherent part of business relationships (Duarte & Davies, 2003; Plank & Newell, 2007). They can manifest themselves to different degrees and can range from day-to-day problems, misunderstandings to severe escalating conflicts that threaten the existence of the relationship and even the company itself. In the article we stay in line with the discussion and literature on the impact of conflict on performance (Duarte & Davies, 2003; Lam & Chin, 2005) and on constructive conflicts (Mele, 2011; Vaaland & Håkansson, 2003).

Taking into consideration classifications presented in the literature (e.g. Duarte & Davies, 2003; Plank & Newell, 2007), the sources of conflicts can be divided into those that are strongly linked to the social aspects of cooperation (referred to in this article as relational) and conflicts that originate in company's operational day-to-day activities (referred to in this article as operational).

Conflicts can be both damaging and beneficial (Mele, 2011; Vaaland & Håkansson, 2003). In terms of the negative impact of conflicts on relationships, research shows that conflict negatively impacts trust (Leonidou *et al.*, 2006), loyalty (Plank & Newell, 2007) and in extreme cases may lead to the relationship termination (Nordin, 2006). Conflicts also affect relationships positively. Vaaland and Håkansson (2003, p. 137) state that in a situation of severe conflict, when both partners are determined to collaborate, the value of the relationship in terms of mutual prosperity increases.

With respect to the impact of conflict in business relationships on companies' performance, research focuses on the general relationship between conflict and performance, without taking into consideration the international context of companies' activities or the specific characteristics of SMEs. In this regard research results are not unanimous. First, there is evidence of the negative impact of conflict in business relationships on performance (Lam & Chin, 2005; Lin & Germain, 1998). Second, there are studies showing that conflict in relationships can have a positive influence on performance (Finch *et al.*, 2013). Regarding particular outcomes of conflicts in relationships, analyses focus on the impact of conflict on learning, innovation and development. Lam and Chin (2005) argue that conflicts in relationships result in distorted information flows, while Nordin (2006) maintains that conflicts can improve learning in alliance relationships. The positive impact of conflicts in relationships is particularly linked to creativity stimulation and innovation enhancement (Nordin, 2006; Vaaland & Håkansson, 2003). It is even argued that a relationship without too many conflicts may become less innovative and slide back into stagnation (Duarte & Davies, 2003, p. 92).

Taking into consideration potential cultural, economic and geographical differences, the risk of conflict in business relationships with foreign entities seems to be higher than in those with domestic ones (Skarmeas, 2006; Vaaland, 2004). Although the impact of conflicts is important in international business and relationships with foreign entities, this aspect has not been widely analysed in the literature. A large part of research in the field of conflict refers to their importance in general, without special emphasis on the specific character of conflicts in the international context.

What concerns existing and rather limited studies on conflicts in the international business relationships, research focuses on cultural sensitivity in the buyer-seller relation-

ships (Skarmeas, 2006), the negative influence of task and emotional conflicts on performance and relationship quality (Rose & Shoham, 2004) or tracks the evolution of conflicts in the international business network (Welch & Wilkinson, 2005).

Analysis of conflicts with foreign entities is especially important with respect to small and medium-sized enterprises (SMEs). SMEs often lack economies of scale and resources needed to enter foreign markets (Deszczyński, Fonfara, & Dymitrowski, 2017; Ellis, 2011). In order to conduct international activities, SMEs need to engage a bigger part of their general resources. In case of a failure this means a relatively greater negative impact, which is associated with a greater business risk for SMEs (Pangarkar, 2008). Given the above resource constraints and different specifics of internationalisation, conflicts in foreign business relationships can have a different and stronger impact on SMEs than on larger companies.

To the best of our knowledge research lacks complex analyses of conflict in business relationships of SMEs that operate in international markets. One study in this field investigated the impact of contractual conflicts experienced by SMEs on their further engagement in relationships (Ntayi, 2012). There is also a study of considerable cultural distance in inter-firm conflict and its impact negative on relationship termination (Vaaland *et al*., 2004).

MATERIAL AND METHODS

The objective of the study was to identify the impact of conflicts in foreign business relationships on SME performance. In order to analyse this impact, a conceptual framework was proposed (Figure 1). Following the conceptual framework we have had to identify the negative and positive outcomes of conflicts and classify them. We also tried to identify sources of conflicts and moderators affecting positive impact of conflicts in foreign business relationships on SME performance.

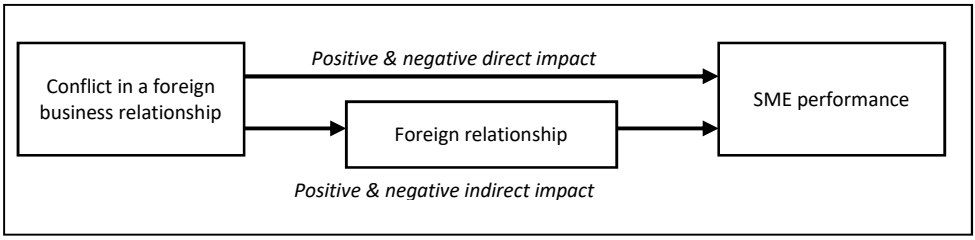

Figure 1. The impact of conflicts in foreign business relationships on SME performance – conceptual framework
Source: own elaboration.

The study was conducted using the case study method (Eisenhardt & Graebner, 2007), as this kind of research is particularly suitable for understanding why and how things happen (Marschan-Piekkari & Welch, 2004) and is believed to be the most appropriate in analyses of industrial networks and business relationships (Easton, 1998). However, one needs to be aware of the limitations of the case study method as it does not allow to conduct statistical verification or generalisations on the entire population.

The purposive sample of cases for the analysis was selected in order to reflect the phenomena of interest. As detailed criteria of SMEs selection we chose (1) company size

(employment of less than 250 people in 2016), (2) company being not part (business unit) of a foreign multinational company, (3) company being active in foreign markets, (4) presence of conflicts or problem situations in company's foreign relationships. All 13 SMEs were based in Poland and were active in at least one foreign market, but represented different industries. The main characteristics of the companies are presented in Table 1 (in case of one SME we analysed relationships on two different foreign markets (T1 and T2), this is the reason why in the Table we present 14 cases).

Data were collected during interviews, which were held in the first half of 2016. To make sure the interviews yielded relevant information, a special guide for a semi-structured interview was developed. The interviews mainly consisted of open-ended and probing questions to encourage discussion of the phenomena. To ensure confirmability (Guba & Lincoln, 1994), all interviews were recorded and later transcribed to provide interview protocols. Each interview lasted between 1 and 2 hours. The transcripts were used to prepare baseline compilations, which are the starting point for this article.

Table 1. The main characteristics of the analysed companies

SME	Industry	Main foreign markets	Year of starting foreign expansion	Market described in the case study	Year of starting activity in the foreign market described in the case study
A	Manufacturing operating room equipment and furnishing	European Union, Asia, Africa	late 90s.	Saudi Arabia	2011
E	Production of headgear for children and teenagers	Belarus, Russia, Germany, Great Britain	2000	Belarus	2011
G	Production of audio equipment	Germany, Norway	2014	Germany	2016
L	Production of agricultural machinery	Germany	2013	Germany	2013
M	Software development	Western Europe	2008	Great Britain	2010
N	Production and distribution of fittings for sanitary and heating systems fittings	Romania, Germany, Czech Republic, Slovakia, Lithuania, Latvia, Ukraine	2006	Czech Republic	2010
O	Production of exhibition stalls	Middle and Far East, China, South Korea	2007	China	2012
P	IT and new technologies	*born global*, without defined main foreign markets	2007	USA	no data
R	Specialist translations	Germany, Austria	2004	Germany	2004
S	Software development	Baltic states	2014	Lithuania	2014
T1	Production of lenses and glasses frames	Germany, Czech Republic, Slovakia, Lithuania	2007	Czech Republic	2007
T2	Production of lenses and glasses frames	Germany, Czech Republic, Slovakia, Lithuania	2007	Germany	2012
ZB	Services for car industry	Europe	2012	Germany	2015
ZC	Logistics	France	2006	France	2014

Source: own study.

RESULTS AND DISCUSSION

Sources of Conflict Situations in Foreign Relationships of SMEs

The interviewed managers reported conflict situations that originated in different aspects of business activities with foreign partners, which could be related to two identified types of sources of conflicts – relational and operational ones.

As far as identified relational conflicts are concerned, cultural differences as the source of conflict situations are mentioned in the case of relationships with greater psychic distance. These differences included language problems and different business attitudes. In one case the language barrier discouraged the business partner from further cooperation (L). Cultural differences were also manifested in different approaches to relationship building and cooperation development exhibited by Polish and French managers (ZC), as well as Polish and Chinese ones (O).

Another relational source of conflict in foreign business relationships was miscommunication (P, ZB). This included miscommunication between individual people, such as managers representing different SMEs, as well as more general miscommunication at the company level. The latter form was related to mismatched expectations of cooperating partners. Excessive and imprecise customer expectations led to the dissatisfaction of one of the companies (P) and even to the termination of the relationship.

The second type of the sources of conflict identified in the interviews was related to operational activities of the analysed SMEs. These included technical problems with goods and documents and the co-operator's desire to cut costs. In the case of four companies (E, L, N, O), conflicts arose as a result of technical or quality requirements for delivered machinery (L) or final products (E, N) made by the foreign distributor. In one firm (ZC), severe conflicts were triggered by problems with imprecise conditions of cooperation. In one case the foreign partner's excessive willingness to cut costs led to a 6-month conflict (R). The conflict was especially severe as it also involved a big multinational enterprise that the firm in question was dependent on. Table 2 summarises identified relational sources and operational sources of conflict.

Table 2. Sources of conflict in foreign business relationships of SMEs

Relational sources	Operational sources
- Cultural differences - Disagreements with co-operators & Miscommunication - Mismatched expectations	- Technical problems with product quality & documentation - The partner's desire to reduce costs

Source: own study.

Indirect Impact of Conflicts in Foreign Relationships on SME Performance

With respect to the impact of conflict on the relationship and its indirect impact on performance (see the conceptual framework), the first negative outcome is relationship termination. In three case studies, firms could not resolve the conflict and the relationship had to be terminated (L, P, ZC). The immediate sources of termination included imprecise conditions of cooperation, mismatched expectations and cultural differences. As regards the conflict caused by cultural differences, one relationship (ZC) was negatively affected by the language barrier.

A conflict in a foreign business relationship does not always have negative outcomes. In some cases (O, ZB, ZC), conflicts with foreign partners contributed to strengthening the relationship. Partners came to know one another better, which improved mutual understanding, cooperation and increased mutual willingness to compromise. Knowledge gained from the conflict helped one firm (L) to resolve conflicts with other business partners in foreign markets. Two managers (L, ZC) admitted that they were ready to incur extra costs (even if the conflict arouses owing to the foreign partner's fault) that decreased the company's income in order to maintain the foreign relationship. Such a situation can be classified as a negative indirect outcome of conflict. Two other managers added that the ability to make concessions showed commitment and adapting the partnership orientation had a positive effect on the relationship because it encouraged the business partner to seek a compromise (L, ZB).

Direct Impact of Conflicts in Foreign Relationships on SME Performance

Regarding the direct impact of conflict in foreign business relationship on performance, first of all, reported conflicts resulted in additional costs due to penalty fees for unfulfilled agreement (O). In another relationship that was more informal, personal, the same company was able to avoid paying penalty fees since the foreign partner was more lenient.

Some of the reported conflicts were resolved with positive outcomes. One example reported by a few companies (L, O, R, ZB, ZC) was the continued cooperation. Another important positive outcome of conflicts mentioned in the interviews was the potential for fostering innovation. One manager described conflicts as conducive to creativity because they enabled the company to come up with innovative ways of conflict resolution, even though the business partners represented two different management styles (S).

Table 3 summarises identified conflict outcomes in foreign business relations of SMEs.

Table 3. The impact of conflicts on relationships and performance of SMEs in a foreign market

Type of impact	Impact on the relationship and indirect impact on performance	Direct impact on performance
Negative impact	- Relationship termination - Extra costs required to strengthen the relationship	- Additional costs due to contract fees
Positive impact	- Strengthening the relationship (facilitated by adaptations, concessions) - New knowledge derived from experience on how to manage new foreign relationships	- Continuity of orders - Innovation

Source: own study.

Discussion: A Model of the Positive Impact of Conflict in Foreign Business Relationships

As it was exposed in our two propositions and the conceptual framework, our intention was to identify sources of conflict in business relationships and their direct and indirect impact on SME performance in foreign markets. The respondents perceived their company's performance first of all at the background of sales (export) and costs. That is why a negative impact of conflicts on a company performance was understood as an increase in costs and a decrease in exports (because of extra costs due to contract penalty fees, termination of relationships, etc.). The positive impact of conflicts on the SME's performance was related by respondents to the export growth due to innovations or continuity of orders.

Our study confirmed findings made by Duarte and Davis (2003) that relational conflicts originate in miscommunication and misunderstandings. The results support also previous research made by Vaaland *et al.* (2004) or Sandström (1992), indicating that cultural differences are another important source of relational conflicts in foreign relationships. This is especially important because small companies in particular lack the necessary resources to employ foreign managers with adequate knowledge and experience of dealing properly with cultural differences (Ellis, 2011; Musteen, Francis, & Datta, 2010). The analysis also revealed operational sources of conflicts. Such conflicts may be resolved by introducing additional quality control or required international certificates but for small companies with limited resources such solutions are not always possible. In the case of operational conflicts, problems were measurable and could easily be identified and managed. The conducted analysis shows comprehensive outcomes of conflicts in foreign business relationships for SMEs performance (Table 3). The identified outcomes are related to the impact of conflicts on the relationship and the direct impact on performance.

The negative impact on relationships and the resulting indirect negative impact on performance was manifested mainly in the termination of the relationship and extra costs incurred by SMEs in order to maintain the relationship. Such costs were justified in the case of SMEs which were ready to maintain their relationships in order to ensure the continuity of orders and secure future income. The direct negative impact included additional costs due to contract fees.

Like the negative impact, the positive impact of conflict on SME performance in international markets can also manifest itself in two ways. It is possible to identify indirect positive effects on performance, which improves because the relationship has been strengthened by the conflict thanks to a better understanding of mutual requirements. Our analysis confirms findings reported by Vaaland and Håkansson (2003) and Finch *et al*. (2013), suggesting that conflict can increase the value of a relationship. However, our case study analysis indicates that these were mainly SMEs that chose to bear the cost of saving the relationship, which often involved additional spending on operational activities.

We also observed a direct positive outcome of conflict on SMEs performance in foreign markets. In some cases, positively resolved conflicts not only enabled further cooperation but also fostered innovation in SMEs. Thanks to continuing foreign orders, the companies could improve their performance and develop their international activity. This is crucial for small companies, which do not have many resources and a sudden decline in the number of orders can threaten their very existence.

The realised study enabled to confirm the Proposition 1 concerning both negative and positive impact of conflicts on the SME performance. Our analysis strongly supports the importance of the financial outcomes of conflicts in foreign business relationships, which can be positive (like continuity of orders) and negative (additional costs for companies) and therefore affect SMEs performance in both ways. Financial aspects are mentioned in previous studies focused on the relation between conflict and performance (for example Duarte & Davies, 2003; Finch *et al*., 2013), but the results of those studies are not as detailed and do not refer to specific outcomes, such as continuity of orders or their underlying mechanisms.

The conducted analysis enabled also to positively verify Proposition 2 regarding actions that SME may undertake to moderate outcomes of conflict in foreign business rela-

tionships and achieve a positive impact of conflicts on their performance. Within the empirical study we have identified four moderators affecting the positive impact of these conflicts on SME performance: development of informal, personal relationships, trust, cultural awareness and formal actions. These moderators are included in the model of the positive impact of conflict in foreign business relationships on SME international performance (Figure 2). The model presents the complex nature of conflicts in foreign business relationships and links the conflict sources with their impact on SMEs performance and with four moderators enabling to achieve the positive conflict effects.

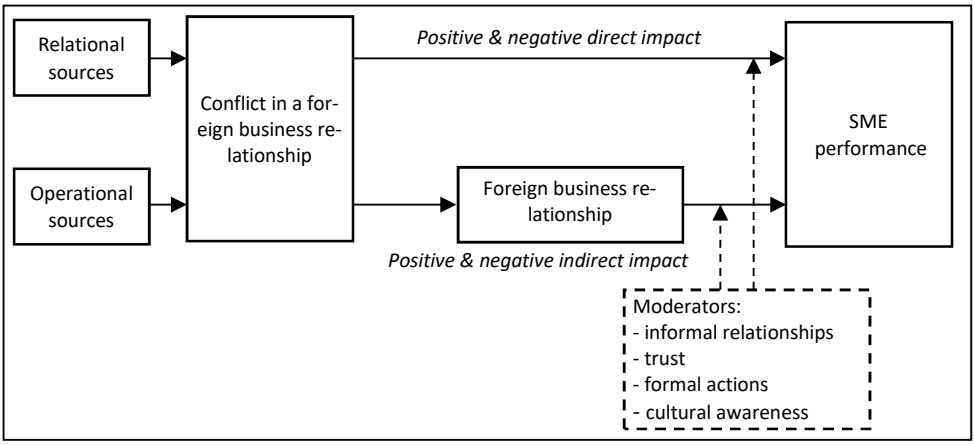

Figure 2. The model of the positive impact of conflict in foreign business relationships on SME international performance
Source: own elaboration.

Our study indicates that in an effort to prevent the negative impact of conflict, managers tried to develop informal, personal relationships. Such actions led to a higher level of mutual trust, tolerance for minor cases of non-compliance and awareness of mutual expectations. However, such an approach is not always possible when significant cultural differences are involved.

Many of the interviewed managers (A, M, N, O, S, ZC) regarded trust as the crucial element that helped to overcome conflict and reinforce the relationships. The development of informal, personal relationships is seen as a moderator decreasing the negative impact of conflict in relationships on SME international performance. However, sometimes formal actions as a solution in conflict situations are needed. These actions included obtaining certificates, conducting a formal product quality examination or formal measures aimed at assuring proper comprehension of technical issues. Especially, in the case of operational conflicts, formal actions are sometimes a sufficient and at the same time the simplest solution that can prevent a possible negative impact on performance.

Our study has revealed that cultural awareness can positively moderate the impact of conflict on relationships. Because many SMEs have limited resources and their managers often have limited international experience, cultural awareness can play a key role in conflict resolution and in further cooperation with business partners. The investigated companies either adapted to the cultural background of their partners, or due to their

cultural awareness, accepted the implications of cultural differences in the process of developing cooperation with their foreign partner.

CONCLUSIONS

The objective of our study was to discuss the impact of conflicts in foreign business relationships on SME performance. Additionally our intention was to find out how negative impacts could be transformed into positive ones. Due to the realised analysis, we positively confirmed Proposition 1 and Proposition 2.

The study contributes to research on conflicts in two ways. Firstly, it analyses the impact of conflict on SME performance in foreign markets. Given their limited resources, SMEs encounter more problems with foreign partners than bigger enterprises, which usually have more international experience and more resources to rely on in foreign operations. Our analysis provides a contribution to the existing and rather limited body of literature of SME international activity in conflict situations. Secondly, in our model we propose four moderators of a positive impact of conflict on SME performance in foreign markets. These moderators play an important role, especially for SME managers, who, despite limited resources of their companies and often their own limited international experience, can nevertheless control the moderators in order to derive positive outcomes from conflicts that appear in relationships with their foreign partners.

Several managerial implications can be drawn from the analysis. The four moderators set directions for actions required for successful conflict and relationship management. In this sense, our study confirms the conclusion drawn by Vaaland *et al*. (2004) that managers' awareness and attitude are of extreme importance while selecting and developing the relationship with new as well as existing partners. The positive impact of conflict in foreign business relationship may be obtained and the negative impact may be diminished by developing informal personal relationships with business partners. As our study has shown, foreign partners were ready to make concessions if informal relationships had previously been established. Trust is another important moderator that can have a positive impact on conflict resolution or can diminish the negative impact of conflict on performance. In our study we found that trust helped companies diminish the conflict and avoid negative outcomes. However, although trust is beneficial, an excessively high level of trust is associated with certain risks, like a false sense of security. The impact of conflict on performance can also be moderated by formal actions, including obtaining certificates, formal expertise or documents. The last moderator that needs to be mentioned is the level of cultural awareness exhibited by managers, which can help them anticipate potential sources of conflict. Since every relationship is unique, managers can exploit these moderators in different configurations in order to strengthen the relationship. Their effect should be treated as complementary, that is, e.g. the development of informal relationships does not exclude the possibility of taking formal action as well. The analysis has a practical value, especially when one considers that in some cases sources of conflict and its outcomes may not be limited to a specific dyadic relationship but might be transmitted from one dyad to another within the network. In effect, the conflict may have consequences for the entire network. That is why, another important implication is the fact that conflict analysis should be conducted from a broader perspective, in which

conflict is viewed as a natural element of each relationship, and if handled properly can be beneficial for both sides of the relationship.

Our analysis is not free of some limitations which determine directions of further research. First of all, we analyse the conflict from the perspective of only one side of the business relationship. In the further research the analysis should involve two sides of the relationship. This approach would help to obtain more complex and objective analysis of SME conflicts in foreign business relationships. The second limitation is linked with the data on cultural differences that we were able to obtain from the interviews. In the future, more detailed research on how inexperienced SMEs (including ones operating in traditional and production branches) may operate in the markets with high psychic distance is recommended.

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Authors

The contribution share of authors is equal and amounted to 33% each of them.

Milena Ratajczak-Mrozek

Associate Professor at the Poznań University of Economics and Business, Poland. Her main areas of research include companies' relationships and networks in an international setting as well as their performance. She has published for "IMP Journal" and "Industrial Marketing Management", and is the author of the book titled "Network Embeddedness. Examining the Effect on Business Performance and Internationalisation" (Palgrave Macmillan 2017). She is a board member at the IMP Group.
Correspondence to: Milena Ratajczak-Mrozek, Ph.D., Poznań University of Economics and Business, Department of International Marketing, al. Niepodległości 10, 61-875, Poznań, Poland, e-mail: milena.ratajczak@ue.poznan.pl

Krzysztof Fonfara

Full Professor, Head of the Department of International Marketing at the Poznań University of Economics and Business, Poland. His research interests span issues of the internationalisation process (network approach), market orientation, B2B marketing and relationship marketing. His has published in "International Marketing Review", "European Journal of Marketing", "International Journal of Research in Marketing", "Marketing Management" and "Industrial Marketing Management". He is an Editorial Committee member and reviewer at the "Industrial Marketing Management" journal, and a member of the EIBA and IMP Group.
Correspondence to: Professor Krzysztof Fonfara, Poznań University of Economics and Business, Department of International Marketing, al. Niepodległości 10, 61-875, Poznań, Poland, e-mail: krzysztof.fonfara@ue.poznan.pl

Aleksandra Hauke-Lopes

Associate Professor at the Poznań University of Economics and Business, Poland. In her research, she focuses on the strategic aspect of business networks, relationship management and knowledge transfer among companies in a culturally diversified international environment. She is a member of the EIBA and IMP Group.
Correspondence to: Aleksandra Hauke-Lopes, Ph.D., Poznań University of Economics and Business, Department of International Marketing, al. Niepodległości 10, 61-875, Poznań, Poland, e-mail: a.hauke@ue.poznan.pl

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Factors Influencing the Participation in Customers' Loyalty Programmes: The Case of Croatia

Ivan Kovač, Dora Naletina, Dunja Brezović

ABSTRACT

Objective: The purpose of this research is to explore selected components of loyalty programmes in Croatia, so that retailers can conceptualise an optimal and effective loyalty programme for their customers.

Research Design & Methods: The article is based on an analysis of secondary data, and primary research on buyers' attitudes to loyalty programmes on the consumer goods retail market in Croatia.

Findings: The results of the conducted research show that the relationship with the staff is the most important element of loyalty programme to the buyers. Preferential treatment, personalised approach and the sense of belonging are important to buyers. The results also showed that of those components preferential treatment is the most important.

Implications & Recommendations: Retailers can improve their business by using loyalty programmes, since they are in a way represented through them. It can be assumed that for the buyer who is satisfied with the loyalty programme, this programme will be a stimulus for establishing a deeper relationship with the retailer.

Contribution & Value Added: Based on this research, retail companies on the Croatian market can get a clear picture of the significance and the role of specific components of loyalty programmes, so they can focus on what is most important to buyers and can conceptualise an optimal and effective loyalty programme for their customers.

Article type:	research paper
Keywords:	Croatia; customers; Loyalty programmes; elements of loyalty programmes; retailing
JEL codes:	M30, M31, M37

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INTRODUCTION

Looking for a way to attract customers or keep the existing ones, retailers will often implement loyalty programmes into their business. Those programmes offer customers the possibility of collecting credits which they can then trade for specific products after a certain period. Meyer-Waarden *et al.* (2013: 202) define a loyalty programme as "a set of activities that offers conveniences to customers, based on the evidence of loyalty". Retailers can use them as competitive advantage, in such a way that they will offer financial and non-financial benefits as well, like special treatment and product and service adjustment to the customer's needs. The role and existence of loyalty programmes in retail are to provide some very important information to the customer. Namely, loyalty programmes bring benefits to the customer, but the retailer certainly benefits from them, too, possibly even more than the customers. It is a well-known fact that loyalty programmes are included in the customers' databases, and in this case, they are a retailer's treasure. Based on the collected data, identification and segmentation of customers is conducted. Besides, a retailer will make a connection with the buyer by using the information from the database (previous purchases, personal data) to address the buyer and for promotional reasons, but at an individual level. Although it seems that loyalty programmes are just a system of giving rewards to customers, their more valuable role is to study the customers and create relationships with them. Over the past years, loyalty programmes have become 'the key component of customer relationship management, creating a critical role in the development of relationships with the customers, stimulating the use of goods and services, and keeping the customer' (Omar et. al., 2011). To create loyalty, a retailer must make a connection with the buyer. In line with that, Dorotic, Bijmolt and Verhoef (2012: 231) list 'creating connections with the customers' as one of the basic goals of loyalty programmes. However, it is clear that through loyalty programmes they try to increase the consumption level a customer holds at a retailer's.

This article will thoroughly explore some of the components of loyalty programmes, which previous research has deemed important for the efficiency of loyalty programmes, and customers' attitudes to these components on the Croatian consumer goods market. In order to achieve the set goals of this article, the secondary and primary research was conducted. In order to confirm the findings of the previous research on loyalty programmes, a detailed overview of domestic and foreign scientific literature from the research area was carried out. After the literature review, and the description of the applied methods, the results of the conducted primary research are presented with the aim of validating research hypotheses. The structure of the programmes is analysed according to the components conceptualised by Breugelmans *et al.*, (2015, p. 128), those being: membership application, types (structure) of the programmes, credit structure, relationship and communication with the buyers and reward structure. Further, the survey results are discussed and the final chapter presents conclusions and implications and recommendations for practice.

The research results, i.e. stated opinions, wishes or priorities of the customers regarding the factors most often characterised as being crucial for the success of a loyalty programme, can be useful for retailers in the improvement of their loyalty programmes.

LITERATURE REVIEW

To what extent loyalty programmes actually contribute to the business is still rather unclear. This question cannot be precisely answered, because it depends on the retailer's strategy. If a retailer's goal is to make profit, and the loyalty programme is just another way of generating it, the segmentation of customers is also needed, alongside the strategy. The change in the buyers' behaviour, i.e., more frequent purchases at a specific retailer, according to Agudo *et al.* (2012, pp. 1335-1336), is influenced by the quality of the provided service, the customers' trust to the retailer and the customers' attitude towards loyalty programmes. The result of a proper strategy are satisfied customers who can become loyal. Hajdukiewicz (2016, p. 160) links customers' satisfaction to a positive influence on the reputation and image of the company, and thinks this type of promotion is 'one of the best loyalty indicators'. Xie and Chen (2013, p. 472) state that 'loyal customers usually expect better products and services for their commitment'. Meyer-Waarden *et al.* (2013, pp. 220-221) propose that the retailers should offer rewards according to the customers' motivation and shopping preferences.

Previous research focused mainly on the rewards that contribute most to customers' loyalty and on approaches which are most valuable to gain loyalty (e.g. Kim *et al.*, 2013; Bojei *et al.*, 2013), or on the impact of the programmes on the satisfaction from the store (Sreejesh *et al.*, 2016). Bakhtieva (2017, pp. 472-473) in her research has analysed B2B digital marketing strategy as a framework for assessing digital touchpoints and increasing customer loyalty based on Austrian heating, ventilation and air conditioning industry companies. She has developed new framework which aims to increase customer loyalty and focuses on channels/touchpoints, assets, skills, audience and customer journey. Szwajcy (2016, pp. 102-104) in her paper analysed, on the example of Polish banking sector, corporate reputation and customer loyalty as the measures of competitive enterprise position. The results of conducted research have confirmed weak relationship between reputation and loyalty. As well, results have confirmed the existence of positive dependence between the loyalty level and market share. Although a lot of this research has positive outcomes for the retailers, the question remains whether the confirmation of the customers' satisfaction from the store, as the consequence of the participation in a loyalty programme can actually translate into the success of the loyalty programme. The answer to this question depends on the way in which the retailer perceives the success of the loyalty programme. As Rudle-Thiele (2005, p. 492) marked, loyalty should be considered as more than one thing. The influence on retailers' business results these programmes carry can only be assumed. By analysing previous research on loyalty programmes, Dorotic, Bijmolt and Verhoef (2012, p. 230) state that it is difficult to determine the influence of loyalty programmes on the retailers' profit, because it is hard to get the information on the costs of implementing them. Most retailers use loyalty programmes as defensive tools because their competitors also provide them (Julian *et al.*, 2016, p. 1191). 'The main reason for launching many loyalty programmes is the competition' (Dowling and Uncles, 1997, p. 71). This statement is supported by the research of Solarova (2015), which showed two new loyalty programmes by different retail chains which emerged on the market at approximately the same time.

Besides wrong reasons for launching loyalty programmes, their failure can be prompted by unprofitable members – the buyers. Xie and Chen (2013, p. 468) divided

them into three categories: those who look for good deals (deal seekers), inactive buyers and those who switch between programmes (switchers). Customers who are deal seekers will not make the connection and collect credits, but will rather agree to a lower value reward, just to make use of the opportunity. Inactive buyers are those who are not really interested in loyalty programmes, and most often shop only once. Programme switchers often change between programmes, i.e. their motivation for staying in the programme is not high. A retailer can contribute to the success of loyalty programmes in different ways. Besides creating a quality rewarding concept and capturing customers with personalised approach, retailers have to think about the reputation and impression they make on customers who will use the loyalty programme. Omar *et al.* (2011) prove the importance of an honest and sincere approach to the customer, and claim that loyalty programmes characterised by fairness and honesty result in customers' pleasure and trust to the programme. Brashear-Alejandro *et al.* (2016, p. 1193) think that a retailer can invite buyers to try out new products, and in that way show them that they are accepted and their opinion is valued. Customer satisfaction is important for yielding success with loyalty programmes. Sreejesh *et al.* (2016, p. 891) state that 'customers satisfaction is the necessary element for keeping customers loyal'. Bearing in mind that loyalty plays an important role in the creation of loyalty programmes, it is crucial to perceive all the factors that lead to customers' positive assessment of a loyalty programme, i.e. their satisfaction.

Out of seven dimensions for assessing service quality in loyalty programmes (psychological aspects, programme policy, rewards, personalisation, usefulness of information, communication quality, courtesy/serviceability), in the research by Omar *et al.* (2011), programme policy has proved to be the most important factor in the evaluation of the service quality. Simple programme policy implies easy enrolment, recalculation and checking of credits, and is very important to buyers. Noble *et al.* (2014) conducted research on restrictive policies of claiming rewards in a loyalty programme, like setting the date until the coupon/discount can be redeemed. The results of this research are equal to those of previous research (e.g. Dowling & Uncles, 1997), and they suggest that restrictions on money rewards harm the owners of the programmes. The literature lists two terms, i.e. mechanisms connected with credit collection, one of which relates to the credit threshold, and the other with rewarding. The credit pressure effect refers to adjustment of/increase in the number of purchases so that the buyer could reach or cross the set threshold. By approaching the threshold, that effect becomes more expressed. It can also be called the credit threshold effect, because the existence of that very threshold causes certain changes in buyers' behaviour. The other mechanism is the rewarded behaviour effect, and its goal is to entice more frequent purchases with rewarding. It can be said that its success depends on the internal motivation of the buyer. If a buyer has been shopping in line with his shopping habits, i.e. standard products he always buys, and in that way has earned a reward, then the rewarding should encourage repeated purchases at the same retailer's. But if a customer buys something just to win a reward, the reward effect is questionable. The rewarded behaviour effect depends on the reward as well. If the buyer is not satisfied with the reward, the effect will not bring much result.

Buyers' opinions are various, tastes and interests are different. This is the reason why a perfect loyalty programme concept, which would meet everybody's expecta-

tions, cannot be created. Most customers, especially on the Croatian market, will participate in a loyalty programme solely with the aim to save money, due to the lack of financial resources. Some buyers simply enjoy the very process, shopping is not monotonous; they look forward to going through catalogues and clipping out coupons. Their priority is not to save money, but to have fun. It is therefore difficult to specify what the buyers want from a loyalty programme. It would be ideal if there were no limitations, and if the buyers could always choose for themselves on what to spend the collected credits. But, on the other hand, if the requirements of the customers were always met, loyalty programmes would make no sense because there would be no profit for the retailer. That is why it is important to find balance, provide the customers with the minimum of what most of them want and expect.

MATERIAL AND METHODS

The relationship and communication with the buyers is the component of loyalty programmes that has been thoroughly researched, primarily on the question how much the relationship with the staff is important to buyers to be satisfied with the programme. The research by Vesel and Zabkar (2009) showed that the quality of interaction between the staff and the buyers influences the satisfaction in the buyers. Buyers' satisfaction from all the services from the retailers and their employees will probably translate into the satisfaction from the programme. The satisfaction from the entire service can result in the creation of a relationship with the retailer, which will probably have a positive impact on the attitudes towards the loyalty programmes of the same retailer. This loyalty is important because there can be a situation when the buyer will not be interested in the conveniences offered through loyalty programmes, but if a company has created a connection with them, there is a possibility that because of this connection, they will stay in the programme and will not look for other conveniences with the competitors. It is unquestionable that the relationship between the sales staff and the buyers influences buyers' feelings and opinions on loyalty programmes and the store. Therefore, for the establishment of a good relationship, it is necessary for the staff to be trained (selection, education, rewarding), and what is more important, to become acquainted with facts on the buyers' needs for a tight relationship with the employees. Omar and Musa (2011) confirm the importance of the interaction of the sales staff with the customers. Bojei *et al.* (2013) established that the emphasis on the customer service has a positive impact on staying in the programme, i.e. retaining the customers, and that those customers who receive good service will continue to buy from the same retailer. In line with that, for the purpose of this research, we constructed the following hypothesis:

H1: In loyalty programmes, the relationship with the sales staff is important to the buyers.

The rewards within loyalty programmes can be observed according to: the form of the reward (material or immaterial), connection with the product (direct or indirect) and time of rewarding (immediate or postponed). Material rewards (hard benefits) are financial benefits and other tangible rewards like discounts, financial rewards, coupons and gifts. Immaterial rewards (soft benefits) are benefits that evoke certain emotions and psycho-

logical states in buyers. Those are: personalisation, adjustment, special treatment, hedonistic benefits (entertainment and exploration), and emotions as the consequence of those benefits, and they are combined under the term 'symbolic benefits'. Soft benefits are often characterised as the means for differentiation. Some soft benefits are listed by Julian *et al.* (2016, p. 1195): invitations for special occasions, sending catalogues, personal/individual treatment, and adjustments of the products or services. To achieve a better effect in buyers, individuality plays the key role in soft benefits. The goal is to make the customers feel welcome, informed on all current deals, that they gladly return to the same retailer, and with the individual approach a retailer shows respect and acknowledges their loyalty. Individuality can boost the value of all immaterial benefits and it is achieved by a direct contact with the buyer, via e-mail, invitations, gift cards etc., where great importance can be attached to addressing them with the full first name and surname. Individual or personalised approach is the second determinant in the research by Omar and Musa (2011), following the quality of interaction with the staff, which influences the evaluation of the quality of service in a loyalty programme. Bearing in mind that the same authors have proved that service quality influences the loyalty of the buyers more than satisfaction, it is important to pay attention to this statement. The positive influence of personalisation on retaining customers was also confirmed by Bojei *et al.* (2013). It is therefore, for the purpose of this research, necessary to formulate the following hypothesis:

H2: For the buyers, personalised approach in loyalty programmes is important.

Personalisation was divided by Bojei *et al.* (2013, p. 174) into three levels: 1. Operative level (refers to collecting information from the customers, so they can be offered unique ideas). 2. Interpersonal level (it implies the recognition of the buyers by name, improvement of the relationship between the staff and the buyers.) 3. Organisational level (it refers to an original approach to the buyer, e.g. via personalised birthday cards.

Actually, the literature often points out to the problem of the imitation of loyalty programmes. But, within a programme, there is also the issue of equivalence, imitation and no innovation. Special attention of retailers or preferential treatment are also considered one of immaterial (soft) benefits. It can be described as the unification of hard (e.g. discounts only for members) and soft (e.g. informing the buyers about the deals) benefits. This treatment relates to 'any type of special or preferential treatment that buyers receive via the membership in a loyalty program' (Brashear-Alejandro *et al.*, 2016, p. 1192). The aim is to show the buyers that they are considered 'special' and distinguished from others who are not members. Huang (2015) points to the relationship between the special treatment and the loyalty of customers in Taiwan. The author claims that when a buyer recognizes some marketing investments of the retailer, special treatment is recognized as the most important tool, and it is followed by communication between the buyer and the staff, and tangible rewards – gifts and coupons. The buyers will feel gratitude and it is probable that the future purchases at the retailer's will be increased. For the purpose of the previously mentioned research in Croatia, we formulated the following hypothesis:

H3: For the buyers, 'preferential treatment' in loyalty programmes is important.

Hedonistic benefits are connected with entertainment a loyalty programme offers via credit collecting, trading them for rewards, and the sense of pleasure and achievement that arises in the buyers. The research made by Sreejesh *et al.* (2016, p. 888) showed that the loyalty programmes generate satisfaction from the store, and claim

that different hedonistic elements (e.g. interesting games or competitions customers want to join) in loyalty programmes can help to turn this satisfaction into love and loyalty towards the retailer. Based on the research that showed a great impact of hedonistic benefits on loyalty in certain programmes, Kim *et al.* (2013, p. 109) suggest retailers that they should pay more attention to the fun factor in loyalty programmes. Therefore, for the purpose of this article, the following hypothesis is constructed:

H4: Buyers want loyalty programmes that include fun elements.

The feelings the individual approach evokes in customers, or 'symbolic benefits' can be the consequence of the very participation in a loyalty programme, so the members can feel accepted, i.e. the sense of social belonging, because they think they share the same interests with other members. Positive feelings and experience will be most often connected with the service that was provided in the store, where the key role is played by the staff. The sense of status and social belonging is also the consequence of immaterial benefits. With the hierarchical loyalty programmes (multi-tiered programmes), buyers on higher levels enjoy the status of a special customer. Recognition by the staff or other members of the programme is also listed by some authors as a type of an immaterial benefit (e.g. Gwinner *et al.*, 1998), since it stimulates the sense of status in the buyers. According to the research by Bojei *et al.* (2013, p. 177), the sense of belonging is an important factor for keeping the customers. It is achieved by creating friendly relationships and comfortable atmosphere in a retail store. Keeping the customers is one of the key goals of loyalty programmes, so it is important to determine how important the sense of belonging is to the buyers. The very participation in the programme creates that feeling, and the relations and events in the programme make it stronger. Besides the aforementioned soft benefits, like the preferential treatment, this feeling can be created by providing an image of the programme as the community of the like-minded, by enabling connections, socialisation, and exchange of experiences between the members. Wijaya (2017, p. 195) remarks that customer experience plays a significant role in moderating the effect of self-congruity on customer loyalty. Acceptance by the staff and the retailer via the inclusion of the customer in some business activities, e.g. trying out new products, will also induce the feeling of belonging. In line with the results of the previously mentioned research, we think that it is necessary to do research relating to this statement, and it was therefore necessary to formulate the following hypothesis:

H5: For the buyers, the 'sense of belonging' in loyalty programmes is important.

This research also focused on the respondents who are not members of any loyalty programmes, with the aim of determining the reasons and to provide the retailers with the information on the opinions of the buyers who are not members of any loyalty programme.

In order to achieve the set goals of this article and with the aim of validating the research hypotheses, primary research was conducted. For the purpose of primary research quantitative inferential method was applied and as an instrument for data collection a Google questionnaire was used, whose goal was to find out how important specific components of loyalty programmes are to the customers. The questionnaire was conducted in the Republic of Croatia, during March and April 2017. The questionnaire consisted of 19 questions divided into two parts. The first part consisted of demographic questions. The second part was made of questions and statements compiled in line with the formulated hypotheses, relating to the

loyalty programmes in retail. The second part was filled out by members of at least one loyalty programme, while respondents who were not members of any loyalty programmes only needed to state the reasons for not participating in loyalty programmes.

For analysing the collected data quantitative research methods were used. To test the research hypothesis CHI Squaring Independence test well as analysis of variance (ANOVA) were used. This methodology was used because collected data was of ordinal and numerical type. Chi-Square test of independence is used to determine if there is a significant relationship between two nominal (categorical) variables, while the frequency of each category for one nominal variable is compared across the categories of the second nominal variable. With the aim of testing differences in parameter values ANOVA was applied. ANOVA is a statistical method that is used to test differences between two or more means. It is also used to test general rather than specific differences among means.

The population for the research were consumers on the Croatian FCMG market. Data for the sample were collected by using an online Google form questionnaire (CAWI method). Data collection was the result of snowball sampling. For the snowball sampling technique it is characteristic that process begins with the identification of the initial respondents which will provide a further increase in respondents through their network. This method seeks to exploit the effects of the social network of initial respondents that will ensure an increasing number of potential participants in the survey. It differs from the conventional approach to qualitative research, as their primary task is the strategy of target selection (Goodman, 1961: 148). The research sample consisted of 380 respondents of different gender, age and educational background.

RESULTS AND DISCUSSION

Out of the total of 380 respondents, 66.3% (252) of them declared they were members of at least one loyalty programme in retail, while the other 33.7% (128) of the respondents wrote they were not members of any loyalty programme. The research showed that 32% of the respondents who were not members of any programme thought that the loyalty programmes are too demanding and that rewards are hard to achieve. 30% of them felt that only a retailer benefits from loyalty programmes. A smaller percentage (23%) thought that a lot of personal data is required while entering a programme, and the remaining 15% listed other reasons, (e.g. no reasons or they were not interested). The model was tested for the influence of control variables (gender, age, education, work status and income) on the tendency of the buyers to participate in consumer goods retail loyalty programmes in the Republic of Croatia.

Table 1 shows the characteristics of those respondents who answered the question about loyalty affirmatively. The respondents evaluated on the 1-5 Likert scale a series of elements considered to form predispositions for the participation in loyalty programmes: program innovation, simplicity, no limitations in the way of using the benefits, no time limitations in using the benefits, relationship with the staff, staff behaviour, the sense of special treatment, retail chains' familiarity with the buying habits of the consumers, entertainment in the programme and the desire to be a part of the community.

The results presented in Table 2 show that gender and education have a statistically significant influence on the probability of entering a specific loyalty programme. Women and individuals with higher education have proved to be more prone to participate in retail

chains' loyalty programmes. While barely 38.5% of men were members of a loyalty programme, the share of women was 78.1% (Table 3).

Table 1. Characteristics of the sample

Factor	M	F	18-24	25-34	34+	LOW/ SECONDARY EDUCATION	HIGHER EDUCATION	HIGH EDUCATION+
F	42	210	91	94	68	119	48	86
%	16.7	83.3	36	37.2	26,9	47	19	34
	Undetermined, retired	*Part-time, fixed-term*	*Unemployed*	*Student*	*<3k HRK*	*3-5k HRK*	*5-7k HRK*	*>7k HRK*
F	121	33	28	71	93	57	62	26
%	47.8	13	11.1	28.1	39.1	23.9	26.1	10.9

Source: own study.

Table 2. Influence of gender and age regarding participation in loyalty programmes

Participation in loyalty programms	*GENDER*	*AGE*			
	Male	*Female*	*18-24*	*25-34*	*34+*
YES	42	210	91	94	68
	38.5%	78.1%	65.5%	69.1%	66.0%
NO	67	59	48	42	35
	61.5%	21.9%	34.5%	30.9%	34.0%
χ^2	0.000		0.792		

Source: own study.

Table 3. Influence of education and work status regarding participation in loyalty programmes

Participation in loyalty programms	*EDUCATION*			*WORK STATUS*			
	LOWER AND SECONDARY EDUCATION	HIGHER EXPERTISE	HIGH EXPERTISE	Indeterminate period, etired	Part-time, fixed-term contract	Unemployed	Student
YES	119	48	86	121	33	28	71
	57.50%	78.70%	76.80%	65.80%	71.70%	59.60%	70.30%
NO	88	13	26	63	13	19	30
	42.50%	21.30%	23.20%	34.20%	28.30%	40.40%	29.70%
χ^2	0.000			0.52			

Source: own study.

Based on the results presented in Table 3 and Table 4 it can be concluded that age, work status and the level of income were not significant control variables.

It is evident that buyers deem the relationship with the staff important in the overall evaluation of a loyalty programme. The results of the conducted research show that almost 72% of the respondents think that the relations with the staff are very or absolutely important. From these results a conclusion can be drawn that the sales staff has a strong influence on buyers' evaluation of the programme, i.e. their satisfaction from the loyalty programme. Also, the average value of the respondents who evaluated the importance of

the relationship with the staff related to loyalty programmes was μ=3.94, which is statistically significant (p=.000, Table 5). In line with this, H1: In loyalty programmes the relationship with the sales staff is important to the buyers – is confirmed.

Table 4. Influence of monthly income regarding participation in loyalty programmes

Participation in loyalty programms	MONTHLY INCOME			
	<3k HRK	3-5k HRK	5-7k HRK	>7k HRK
YES	93	57	62	26
	67.90%	5.80%	76.50%	68.40%
NO	44	40	19	12
	32.10%	41.20%	23.50%	31.60%
χ^2				0.093

Source: own study.

Table 5. Summary research results

Loyalty programmes components	*μ*	*P.V.*	*GENDER*	*AGE*	*EDUCATION*	*INCOME*
Relationship with the staff H1	3.94	0.000	**0.0002**	0.843	0.557	0.834
Knowing my buying habits and needs H2	3.50	0.000	0.138	0.706	0.790	0.083
Preferential treatment H3	3.66	0.000	0.090	0,696	0.036	0.041
Fun in loyalty programmes H4	3.49	0.000	0.956	0.857	0.556	400
Being a part of the community H5	3.61	0.000	0.055	0.813	0.613	0.316

Source: own stud.

Further on, the importance of a personalised approach was investigated. The personalised approach to the customer implies that the retailer is familiar with the customer buying habits and needs, and in line with that can approach them on an individual level. They can, for example, send coupons for the products that the customer usually buys, and this approach also includes making connections between the retailer and the customers, most often via sending personalised coupons or birthday cards. The analysis of the results suggests that 55.6% of the respondents agreed with the statement that a personalised approach has big or absolute importance in loyalty programmes. If we add 25.2% of the respondents who said it was neither important nor unimportant, the significance of the personalised approach for the buyers is absolutely unquestionable. The average value of the respondents who evaluated the importance of the personalised approach towards the customers in loyalty programmes was μ=3.50, which was also statistically significant (p=.000, Table 5). Generally, it can be said that these results are in line with previous research (Omar & Musa, 2011; Bojei *et al.*, 2013), that also confirmed the importance of a personalised approach to buyers in loyalty programmes. Based on the above-mentioned, H2: For the buyers, personalised approach in loyalty programmes is important is confirmed.

Preferential treatment is one of the soft benefits in loyalty programmes. As all other immaterial benefits, preferential treatment helps the retailer to form connections with the customers. Preferential treatment is very or absolutely important to 60% of the respondents. Such results can seem very persuasive, especially when added to 23.7% of those respondents who opted for medium importance. The average value of the respondents who evaluated the importance of the preferential treatment for the buyers was μ=3.66, also of statistical importance (p=.000, Table 5). It can be therefore concluded that

special treatment is important to buyers. The significance of the acquired results is also confirmed by the fact that only 16.3% of the respondents stated that preferential treatment was not important, or of little importance. In line with that, H3: For the buyers, 'preferential treatment' in loyalty programmes is important is confirmed.

The importance of entertainment to the buyers was proved by the research made by Kim *et al.* (2013, p. 109), where it was shown that the factor of fun in a loyalty programme is the key driver of loyalty towards a loyalty programme. Fun elements that can be implemented in loyalty programmes are winning games or appropriate contests for the members of loyalty programmes. Many respondents (34.7%) remained neutral when asked about the importance of fun elements in loyalty programmes, while 48.8% agreed that they are important and 16.5% considered them unimportant. Accordingly, H4: Buyers want loyalty programmes with elements of fun is rejected. Nevertheless, although the hypothesis is rejected, due to a large number of the respondents that remained neutral, and the small percentage of them who did not support the element of fun (16.5%), it is important to implement some elements of fun on the Croatian retail market in order to investigate buyers' opinions on them.

The sense of belonging in buyers is a consequence of the connections made with the staff, other employees of the retailer, and other members of the programme, all related to the atmosphere in a store. It is about positive feelings that should arise from the joint efforts of everybody who is included in the programme. The results of the research on the respondents' attitudes relating to the importance of the sense of belonging in loyalty programmes unmistakably show that it is very or absolutely important for 57.2% of them, and 27.2% of the respondents opted for the medium importance. Likewise, the average value of all the respondents who evaluated the importance of the sense of belonging in a loyalty programme was $\mu=3.61$, which is also statistically significant ($p=.000$, Table 5). Bearing in mind the small percentage (15.7%) of those respondents who think that the sense of belonging is of little or no importance, it can be confirmed that to the buyers, the sense of belonging is important, so the H5: For the buyers, the 'sense of belonging' in loyalty programmes is important – is confirmed.

The primary aspiration of this research was to point to the significance of some components, so that retailers can review their activities related to these components. Above all, does the retailer undertake specific activities too much or too little? This question especially refers to the soft benefits. Although the research has confirmed that preferential treatment is important to the buyers, every retailer should choose the way of implementing it, i.e. investigate the components that are more or less convenient for specific customers. Namely, some customers can think that it is a great idea that the retailer has access to the information about them, so they could be informed on the deals, be sent coupons and be informed on novelties, while other customers will be more pleased if they are not disturbed much, just an occasional invitation or a card. Besides the guidelines for more successful loyalty programmes, a retailer can get the idea about the implementation of some new elements from this article.

The results of the research largely confirm the authenticity of the previous research, especially on the importance of the quality of the service – the staff in loyalty programmes. It was shown that the importance of the staff in loyalty programmes is very important to the buyers, like in the research by Omar and Musa (2011), where this component occupied the first place in the evaluation of the quality of the service in loyalty programmes. The

importance of soft benefits in loyalty programmes – personalised approach, preferential treatment, the sense of belonging, was confirmed with this research, in line with previous researches by Bojei (2013) and Huang (2015). Based on the acquired results, this research rejected the hypothesis on the importance of the element of fun in loyalty programmes for the buyers on the Croatian retail market, so the research in this case differs from the one conducted by Kim *et al.* (2013), where the element of fun was highlighted.

CONCLUSIONS

The aim of this research was to establish buyers' attitudes towards the specific components of loyalty programmes. The relationship with the staff has proved to be the element of the loyalty programme that is important to buyers on the Croatian market, and the research confirmed that it greatly influences the buyers to stay in a loyalty programme. Within the framework of immaterial rewards, the empirical research was principally focused on: the personalised approach to the buyer, preferential treatment of the buyer, buyer's attitudes to fun elements in loyalty programmes, and the sense of belonging.

The results of the conducted research undoubtedly show that on the fast-moving consumer goods market in Croatia, preferential treatment, personalised approach and the sense of belonging are important to the buyers. Out of those components, most important is the preferential treatment. Buyers' attitudes on the implementation of fun elements point to a certain level of interest, but, nevertheless, half of the respondents remained neutral, so it cannot be claimed that it is what the buyers want. Namely, these are still 'innovations' on the Croatian retail market, and they are novelties in loyalty programmes. The interest of the respondents is evident, but many of them cannot decide. In line with that, it is rational to conclude that the buyers should first be acquainted with the innovations, so they can clearly state their opinions and then their attitudes could be established. Besides the above-mentioned, it is important to note that opinions and attitudes of the buyers will vary according to the location of the retailer, the assortment of goods, etc.

In the theoretical part of the article, special attention was given to the analysis of the influence of loyalty programmes on business dealings of the retailers. The analysed literature, above all, suggests that retailers can improve their business by using loyalty programmes, since they are in a way represented through them. It can be assumed that for the buyer who is satisfied with the loyalty programme, this programme will be a kind of a stimulus for establishing a deeper relationship with the retailer.

Based on the results obtained from the empirical research on the Croatian retail market, conclusions and recommendations for the management can be formulated. Besides, most respondents (31.9%) who are not members of loyalty programmes think that they are too demanding and the rewards are difficult to get, while 30.4% think that only retailers profit from the loyalty programmes. The statement that too much personal data is required when entering a loyalty programme is supported by 23% of the respondents. The other 15% offered their reasons as to why they do not participate in loyalty programmes. The management should address the stated issues in such a way that they should ensure the availability of the rewards and set realistic thresholds and rules of the participation, so those who are not yet members of a loyalty programme could become willing and motivated. Retailers should also work on giving the information on activities related to the functioning of a loyalty programme, starting

with the financial side – necessary for its implementation. Such transparency could help to refute common opinions and attitudes about the customers' exploitation which evoke the feelings of fear and rejection towards loyalty programmes. In line with that, for example, Melnyk and Bijmolt (2015, p. 413) recommend that the companies can suppress the feeling of fear related to giving personal data and stimulate the membership, with offering the option of choosing the anonymous and personalised loyalty card. The differences in the research results are not drastic, on the contrary, they are minimal, but it is necessary to draw a line and establish the elements of loyalty programmes that should be real priority for the retailers.

Based on this research, retail companies on the Croatian retail market can get a clear picture of the significance and the role of specific components of loyalty programmes, so they can focus on what is most important to the buyers.

Further research may be conducted about what influences purchase decisions and retailer choice of those consumers who claim not to be loyal to a specific retailer. Further research could also examine what the proportion of loyal customer for each retailer on currently highly dynamic FMCG Croatian retail market is and how important loyalty is in the market success of Croatian retailers.

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Authors

The contribution share of authors is equal and amounted to ⅓ each of them.

Ivan Kovac

Assistant Professor at the Department of Trade, University of Zagreb. PhD in Economics (2009). He is teaching courses at undergraduate and graduate level at Faculty of Economics and Business Zagreb. His research interests include supply chain management, entrepreneurship and innovations in trade, retailing, distribution channels and logistics systems.
Correspondence to: Ivan Kovac, PhD, University of Zagreb, Faculty of Economics and Business, Department of Trade; Trg J. F. Kennedy 6, 10000 Zagreb, Croatia; e-mail: ivan.kovac@efzg.hr

Dora Naletina

Assistant Professor at the Department of Trade at the Faculty of Economics and Business in Zagreb. PhD in Economics (2016). She is teaching courses at undergraduate and graduate level at Faculty of Economics and Business Zagreb. Her research interests include supply chain management, sharing economy, transportation management, transport policy, transport insurance and green transport.
Correspondence to: Dora Naletina, PhD; University of Zagreb, Faculty of Economics and Business, Department of Trade; Trg J. F. Kennedy 6, 10000 Zagreb, Croatia; e-mail: dora.naletina@efzg.hr

Dunja Brezovic

Dunja Brezovic graduated from the Faculty of Economics and Business in Zagreb at the Department of Trade and became MA. She wants to develop more training skills and knowledge in supply chain management and consumer protection. She has work experience in sales and promotions.
Correspondence to: Dunja Brezovic, MA; e-mail: dunjabrezovic@gmail.com

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Success Factors of Start-Up Acquisitions: Evidence from Israel

Ofer Zaks, Jan Polowczyk, Piotr Trąpczyński

ABSTRACT

Objective: This article aims to explore the factors behind successful M&A of start-up companies.

Research Design & Methods: The objectives of this qualitative study are pursued in the context of acquired high-tech start-ups in Israel. The study employed semi-structured interviews. The practical model for analysing the transcribed interview responses was based on Shkedi's (2003) method, drawing also from the grounded theory tradition in the process of coding and interpreting data categories.

Findings: The results of this research highlight the communication climate (comprising factors such as openness, trust, supportiveness and interest of top managers in the employee's well-being) as a vital behavioural mechanism influencing post-acquisition performance. Also, we found that effective knowledge transfer to the acquired company is one of the essential determinants of success.

Implications & Recommendations: M&A require a clear business plan, that which is based on realistic needs. A major fault in many start-ups is focus on technology rather than on strategy. Many start-ups are established and staffed by engineers and scientists who often believe, erroneously, that a good product will sell.

Contribution & Value Added: In extant research, most attention has been paid to the acquiring company perspective on success. In contrast, this study focuses on the seller's perspective and contribution to M&A success, instead of on the buyer's perspective.

Article type:	research paper
Keywords:	start-up acquisitions; trust; commitment; resistance to change; success factors; firm performance; Israel
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INTRODUCTION

Due to rapid technological changes and the complexity of new high-tech products and processes, single firms are often struggling to keep up with new developments (Rahman Civelek, & Kozubíková, 2016). As a consequence, they can no longer solely rely on their internal R&D to maintain their competitive advantage. Frequently, the required technological capabilities and knowledge are created outside the firm and it therefore becomes necessary to exploit technological opportunities and knowledge sources which lie outside the firm's boundaries. In fact, most acquired companies nowadays are small and medium-sized enterprises (SMEs), with a preference for creative and entrepreneurial start-ups. The reasons for acquiring such firms are various, ranging from the ability to adopt a flexible approach for strategic and operational needs to the integration of a culture characterised by entrepreneurship, innovation, high motivation, technology-orientation, improvisation and an aggressive market outlook (Bauer & Matzler, 2014).

And yet, high failure rate of M&A stands in sharp contradiction to the vast expansion in M&A activity (Papadakis & Thanos, 2010). M&A indeed tend to fail or are at least considered difficult to manage, time consuming and complex change processes. Therefore, the question as to the critical success factors (CSFs) of M&A becomes a focal one (Gomes, Angwin, Weber, & Yedidia Tarba, 2013; Trąpczyński, 2013). In this context, this article aims to explore the factors behind successful M&A of start-up companies. In extant research, most attention has been paid to the acquiring company perspective on success. In contrast, this study focuses on the seller's perspective and contribution to M&A success, instead of on the buyer's perspective.

The objectives of this study are pursued in the context of acquired high-tech start-ups in Israel. The Israeli hi-tech sector, with about 50.000 employees, is very small in comparison to the respective US or European sectors. Relative to its small population of 7.8 million people, Israel has an abundance of high-calibre engineering (Zaks, 2016). Also, the uniqueness of the Israeli national culture (the culture of doubt and argument, team work, friendship, etc.) contributes to the potential emergence of start-ups. The seller's view on M&A success is less explored in extant research, especially in relation to the Israeli hi-tech and start-up industry. It is assumed that some of the CSFs mentioned above may have an even greater influence on the performance of M&A involving start-up firms, such as SMBs which are a part of the hi-tech sector, than on those involving other types of companies. This, in turn, may mean that exploring these CSFs in relation to M&A involving start-ups may yield clearer research results.

LITERATURE REVIEW

Many scholars have attempted to identify and classify the main CSFs (critical success factors) in M&A. Different research streams have sought to explore the determinants of M&A performance, including such aspects as trust between merging firms, national and corporate cultural differences (Weber & Tarba, 2012), leadership (Vasilaki, 2011), knowledge transfer (Junni & Sarala, 2013; Oberg & Tarba, 2013), or implementation of the post-merger integration process (Ellis, Weber, Raveh, & Tarba, 2012).

Firstly, there is evidence that trust is critical to the successful implementation of M&A, as it helps the management to overcome resistance and gain commitment from employees. The period following the announcement of an M&A is one of intense risk assessment, when trust is easily damaged and is then difficult to restore. A new top management team tends to be accompanied by a lack of trust (Hurley, 2006) and resistance to change (Stanley, Meyer, & Topolnytski, 2005). Thus, the ability to involve, foster trust among the target company's key personnel and retain it is considered to be the main challenge for M&A (Graebner, 2004).

Further, one of the key debates in M&A research revolved around the role of cultural differences. Scholars have agreed that cultural differences tend to have a negative impact on M&A performance, although some positive impacts were identified as well (Björkman, Stahl, & Vaara, 2007). Thirdly, the quality and intensity of communication is a significant factor in managing M&A effectively. The management can deal with employees' reactions to a merger, as well as with the anxiety and stress levels that tend to follow a merger or an acquisition through effective and timely communication.

One of the most prevailing responsibilities of top management, when it comes to M&A and to changing management, is therefore to ensure extensive communication, especially to employees. In fact, it is also not uncommon for employees to feel ambivalent, experience conflicting emotions regarding the change (Piderit, 2000), and for the attitudes toward change to vary over time across the different stages of change implementation. The degree to which employees are able to offer informed input for the change of strategy is largely contingent on whether organisations share information through a variety of communication channels; whether they enable the workforce participation at the planning and implementation stages (Elving, 2005). The findings of several studies suggest that committed change recipients tend to report higher levels of readiness to change and change acceptance (Madsen, Miller, & John, 2005). In order to successfully lead a major organisational change, it is important for the management to consider both the human and technical aspects of change.

Finally, most M&A have the purpose of realising synergies, as this has benefits. such as enhancing the acquiring company's future growth potential, reducing costs or creating value (Zaheer, Castañer, & Souder, 2008). Other benefits of synergy realisation include cost-based synergies, revenue-based synergies or organisational learning (Austin & Leonard, 2008). Many corporations announce wonderful expectations for inter-firm synergies following a merger, yet organisational integration is an essential determinant for synergy success.

To summarize, past research regarding M&A tends to suffer from a few deficiencies:

1. An almost endless search for a cluster of variables that may explain the variance and could predict the circumstances in a consistent way. In particular, the definitions of success and the way to measure it within the field varies. This turns the 'success' definition into a contentious term (Meglio & Risberg, 2010).
2. Organisations that differ in their size and sector, as well as in their reasons to conduct M&A, are often all included in one study and compared to one another, although they might not be comparable (Teerikangas, 2012).
3. The differentiation between different types of organisations' ownership (public, private or commercial) is often insufficient (Zaheer, Castañer, & Souder, 2011).

4. The dominant research method when studying M&A is quantitative, with only very few studies utilising qualitative methods (Cartwright, Teerikangas, Rouzies, & Wilson-Evered, 2012).

MATERIAL AND METHODS

The study employed 10 semi-structured interviews with key managers of acquired firms (for more details see Zaks, 2016). Many M&A studies use top-level executives as key informants because they are suitable to provide critical information about constructs such as cultural differences, autonomy and involvement by target managers (Capron, 1999). The semi-structured interview questionnaire prepared for the sake of this study was based on a combination of two interview protocols: one that was used by Drori, Wrzesniewski and Ellis (2011) to identify cultural clashes in high-tech start-ups and the other was used by Weber and Tarba (2011) to explore integration processes.

Each interview lasted approximately one hour and all ten interviews were carried out between March 2015 and June 2015. All the interviews were recorded, with the permission of participants, who were assured of their anonymity and confidentiality. The interviews were conducted in the Hebrew language. They were then transcribed and translated into English. Participants were also guaranteed that their responses would be reported in an aggregate form.

In the analysis of the scripts, we treated texts as subjective analysis units and aimed at exposing the inductive connection between the sub-texts which are referred to as 'Themes'. The aim of creating thematic categories consists of assigning several response codes that have functionally equivalent meaning to a higher order (superordinate) thematic category (Zaks, 2016). In the current study, we looked for relationships between the themes obtained from recorded interviews in order to find, theoretically and empirically, equivalent meaning in such a way that will allow us to generalise findings or provide support to previous findings.

The practical model for analysing interview responses was based on Shkedi's (2003) method. The method utilises a thematic analysis based on words and descriptions that informants use to describe their emotions, thoughts, beliefs and knowledge. We therefore paid attention to what interviewees said and not how they said it. This was done by referring to the context instead of focusing on key words. Therefore, in the analysis of the current study, text paragraphs were used as the analysis sections. A phenomenon is usually understood within its own nature and culture. Therefore, after the interviews with informants were conducted, the data was analysed by splitting the information into categories and by rearranging the different categories into a specific meaningful analytical order. Shkedi's (2003) four stages of analysis, in which each stage is based on the previous one, was adopted for the sake of this research. Two potentials emerged from these stages – a focused description and/or a theoretical description. Throughout the dynamic and repetitive analysis we continuously asked ourselves: Who? Where? Why? How? And so what? The process of categorisation, or coding, was conducted by differentiating, classifying and separating texts in order to find the data's conceptual meaning. The names of the categories were extracted from the informants' own language, 'in-vivo' (especially during the initial stages; these names can be different than the terms extracted from the quantitative segment of this research). We followed Shkedi's (2003) instructions and began the

data-analysis with data narrowing by coding interviews texts and developing data displays by capturing all coded data and quotes in a matrix table. At the same time, we were aware of the 'concept perspective' and of the 'theoretical sensitivity' in the grounded theory tradition (scholars' literature, research and documentation). A 'categories tree', a data driven schematic presentation of the themes, was another tool used in the analysis.

RESULTS AND DISCUSSION

Overview of Cases

Our main research question involved identifying the specific factors that are most critical for the success of M&A involving start-up companies. In order to present the overall findings, we first present the results divided into firms which experienced an M&A as a success and those which experienced it as a failure.

Successful Cases

Y.V. – began his entrepreneurial career in 1969, at the age of 26, as co-founder of the first software house in Israel. Y.V. is now an early stage investor ('angel'). Since 1996 he has been active in founding young Internet companies and start-ups. The sale of his last start-up inspired a whole generation of young Israelis to establish start-ups of their own. In recent years Y.V. has been active in fostering a culture of innovation and creativity in Israel and abroad: '[…] *What the Israelis have is more related to culture than to technological knowledge […]. What the big companies like in us, and are willing to collaborate with, is the culture of running fast, to attack, to improvise, not to give-up to conventions by thinking 'out of the box'.[…] Israelis – you see them everywhere, they don't stay at home and waiting […] they run everywhere. If they are thrown out the door, they enter through the window*'.

B.V. – established his own start-up company in 2005 together with two co-founders as part of an 'incubator'. The company provided solutions for clients when and where there was excess demand for mobile communication. When excess demand was identified, the company's technological solutions balanced the demand so that entire mobile networks would not collapse. Since 2010 the company has been selling technological systems and has been financially balanced. In 2012 it was acquired. 'Our products are complementary' B.V. stated '*Together we can offer a unified product and aggressively compete in the market'. […] in the past there were some 'flirtations' and offers to buy us, but we felt that they were not the proper partner*'. He intends to remain working in the acquired company: '*I'm looking for challenges and I can find great ones here – to proceed and grow the business in the signalling area*'.

B.S. – is a serial entrepreneur. Since 1999, he and his co-founder have made six exits totalling more than 1 billion dollars. His last start-up was established in 2011 and two years later a product was already developed: *'[…] actually we operate as a virtual operator to the cloud area. We allow companies to put their software and applications on cloud systems and we manage it with transparency for them*'. He believes that the price paid by the buyer for their company mainly reflects the readiness of the acquirer to pay for the technology and its exclusivity. The price that other acquirers paid for similar targets was also taken into account when the price for B.S's company was negotiated. In any case *'[…] the decision to sell is only made by the entrepreneur and not the investors or the angels*'.

R.V. – is currently during his second exit. The present exit is with a telecom company that supports mobile network operators specialising in the utilisation of automatic networks. The companies' software monitors unexpected and unusual faults via a mathematical algorithm and rejects exceptional events (such as excess in demands for video and data). Their platform has no competitors as of yet. R.V. recommends to young founders: '*(…) Build a profitable company that justifies its existence (don't rely on capital raising). The acquirer bought us because the company was profitable and it was excellent in innovation*'.

A.B. – joined an acquired company which produces electronic security products in 2009 after a career as a strategic marketing manager in the telecom industry. The founder nominated him as the company's CEO two years before the acquisition took place. The founders' 'sprit de core' included strategic and cultural continuity in Israel, responsibility for people, leadership and positive mind-set in order to realise the advantages, synergy and serendipities of the deal. His main concern was how to best manage the process of internal communications during the M&A while, at the same time, managing employees' emotions and personal plans. '*I delivered communication on every detail to avoid rumours about hidden owner's interests*', he argues, '*transparency at all times was my orientation – even in bad things*'.

T.B.Z. – joined his childhood friends in order to 'earn money for existence' by producing a few 'not existing nor innovative' products without any intent to establish a big company. The software they developed was quite conventional, but its supporting tool became a 'real hit' that changed the rules of the game for T.B.Z. and his partner. They refused an offer to sell the company for $18M. Today, they are worth more than $1B, following their second M&A as an acquirer. His opinion regarding the lack of domestic deals is '*One of the problems is that entrepreneurs think that they can do everything alone. It is amazing how much technology and start-ups are here and how few deals occur. The reason that it fails is because of ego – who will manage, lead and in which structure. We understood that it's all about combination of organic and inorganic growth*'. During their first M&A, T.B.Z. states, '*what amazed me is that while we succeeded with our technology, they [the buyers] have succeeded without technology but with such a great operating system that I knew it's not reasonable that we'll have a similar one. Finally, together with our acquirer we created a kind of DNA that first of all believes in openness to see what you have and what you will not get alone. It is like in psychology, when you learn to recognise your own 'defects*".

Failure Cases

I.B. – Three years after I.B. had established and managed a start-up, it was acquired for its technological knowledge following issues with receiving income from sales. His main concern, following his second exit, was that '*people felt that they worked in a vacuum where there were no customers […] they were stressed and some couldn't wait so they left […] for me it was important to continue with the project after three years in which we'd developed something and it was reported in public, there was a competitor and a 'Buzz*". He mentioned that '*I sold the company mainly to end it nicely. When you sell in a failure situation you know it and, therefore, I convinced the buyer to agree to acquire us, without even raising the issue of the price they would have to pay for acquiring us. […] the acquirers' business unit that bought us was not technologically complimentary or capable of managing our potential product*'.

N.B. – was part of a TMT as a business development manager. His start-up, offering camera optical solutions, suffered from problems relating to reaching customers. The financial forecast indicated cash flow issues as investors held further investments. For N.B.,

the indication that an acquisition was required was '*[…] that the company was going nowhere […] without cash flow the sales would have gone down and the technological advantages would have gotten lost in the global competition*'. As far as he is concerned, the main reason for this situation was that '*[…] the CEO was a technological leader but was less business orientated and didn't have enough emotional 'sensitivity' to positively communicate with customers from different cultures*'.

Success Factors of Acquisitions

The main categories identified through the analysis of the qualitative data are related to themes such as: the perceived reasons for acquiring an Israeli start-up company, different attitude terminology and narratives of success and failure cases. As this study looks at CSFs, the analysis of the data focused on the informants' description of M&A and on how the acquirer is perceived by the acquired TMT. The sub-categories, second order themes that were analysed are: the acquired leading team, the start-up employees, the Israeli start-up culture, the M&A process, communication patterns, the technology and the differences that emerge from the company's size.

Figure 1 presents the schematic network analysis diagram which is the outcome of focused analyses. A similar analysis was performed for the failure cases and we found that three themes were in common: employee, TMT and technology. It means that our informants see those themes as the major CSFs in success and/or failure of M&A deals. To summarise, according to informants, the conditions for a successful M&A include: prioritisation of employees rather than technology, during the negotiations; commitment for development continuity of the products; the placing of projects in Israel with resources and a fixed schedule; exclusive, independent and high standard projects; the option for being separately managed as a business unit, without a need to integrate or disassemble; and the recognition that the acquired firm (management and employees) needs to adapt to the acquirer. The sections below elaborate on the success factors in more detail.

Acquirers, mainly global hi-tech giants, are constantly scouting Israel for new ideas and innovative, advanced solutions because *'[...] people in Israel don't make innovation – they live innovation, because it's in their DNA*'. This continuous matchmaking between large companies and start-ups is part of the local ecosystem. One of the informants said in relation to acquirers: '*they are ready to finance starting initiatives, to support the development of excellence centres and 'incubators', they remain local in developing products and services*' and '*[…] they don't pack the brain gain and the knowledge into 'boxes' and take it abroad*'. At the same time, acquirers recruit new employees in order to keep growing. By so doing they contribute to the establishment of long term processes and strategic thinking norms: '*they buy businesses, not patents or technology by itself*' and, therefore, they view the existing acquired TMT as those who will continue to run the business.

Thus, through their local M&A activity, acquirers earn talented and skilled employees as well as unique products which add value to their businesses. In order to retain these core employees acquirers *'[…] did everything they could to satisfy our employees: relocation, vacations, work from home, etc.*'. Flexibility, on both sides, is one of the CSFs of M&A. Openness and recognition in the acquired experience, furthermore, what is essential in M&A: *'[…] mutual consultations and respected compromises taught us to fit ourselves together with deep breath takings*'.

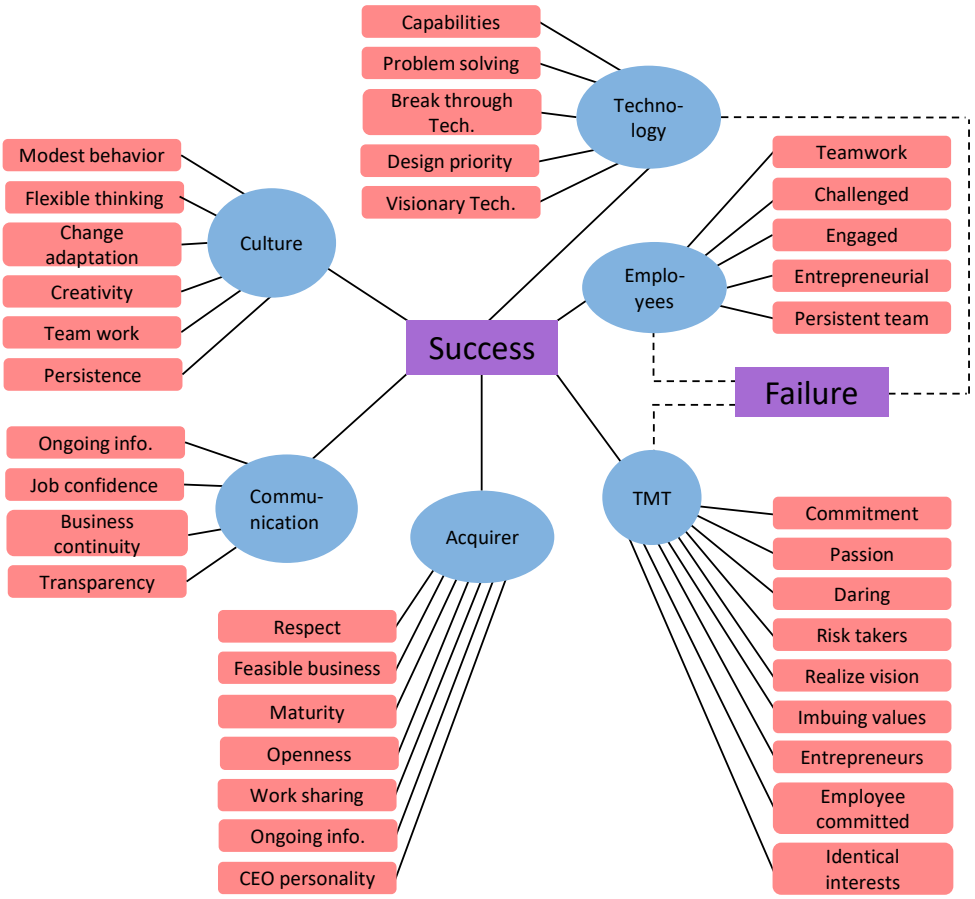

Figure 1. Network of analysed categories
Source: Zaks, 2016. Note: First order themes are in red boxes; Second order are in blue boxes and Major theme in Purple box

Further, the narratives that emerged from the interviewees who experienced successful M&A all pointed to success in the sense of the realisation and continuation of the founder's vision, of culture and product brand name preservation, of continuity in TMTs leadership as a modelling message for employees and of acquirer's openness and recognition in the acquired experience. Conversely, interviewees who had experienced M&A as a failure used expressions such as: '*It was always an option here*', '*there were not too many options – it was a 'force major'* ' and '*it was […] a case of leave or die. I sold the company because there was no progression with customers. Theology is an asset and if you don't continue to invest in it – the knowledge expires*'. In these cases, it is usually the technology and/or the knowledge that constitutes the acquired asset.

From the very beginning of a start-up firm the 'fuel' that generates its activity is related to the fact that '*people need to take risks, to give up on income, to take high risk*

decisions with high failure probability'. When it comes to considering a merger or an acquisition deal, start-ups usually have alternatives to choose from. The choice will usually be directed at joining *'[…] safe and stable companies that could be considered as a warm home for the employees*'. It appears that start-up leaders find it incredibly important to '*[…] maintain the culture, the identity and less the brand name's product*'. During the beginning of the PMI process there is usually a drive to '*satisfy the acquirer but simultaneously insist on our way [of doing things]. From our perspective this was about avoiding wars and doing what is convenient for everyone*'. It appears that if the acquired company's leadership is given a choice, it would usually take the following characteristics of potential acquirer into account: stability, good home, recognition of acquired performance, flexibility, personality of the acquirers' leadership and communication flow.

Further, the continuity of the product development seems to be more important to TMTs than other considerations such as retaining autonomy, revenues from exit, self- reputation, or similar motivations. A follow-up on the reviewed cases indicated that three out of the six M&A success stories are managed as separate units retaining a broad autonomy. The factors which limit autonomy are mainly related to purchasing, accounting reporting, hiring approval, legal issues and administrative regulation (e.g. travelling procedures, etc.). It can therefore be concluded that acquired start-ups do not necessarily insist on remaining autonomous and that retained autonomy is viewed as part of the negotiations' 'give and take' trade-offs.

The analysis of the qualitative interviews reveals, moreover, that mature start-ups, which had already raised money, developed a customer base and were treated by acquirers as 'businesses', were more successful in their M&A than those which were treated as technological assets or 'time to market' buying opportunities. In cases where the acquired firms remained local and somewhat independent or autonomous, the reported performance and satisfaction were higher than in acquired start-ups that were assimilated, relocated or transferred into other acquirers' business units.

Communication was found to be a significant factor influencing start-ups' success during M&A processes. The results of this research highlight the communication climate (comprising of factors such as openness, trust, supportiveness and interest of top managers in the employee's well-being) as a vital behavioural mechanism influencing post-acquisition performance. The present study also suggests that communication is key for increasing employee job satisfaction during a merger. We noted that such initiatives improve employees' perceptions of personal control, organisational commitment and job satisfaction, and reduce the likelihood of employee resignations or absence. Generally speaking, a carefully planned, employee-centred communication programme, coupled with a high level of employees' relationship-building exercises, is needed to gain the acquired employees trust (Nikandrou, Paplexandris, & Bourantas, 2000). Timely and honest communication, as well as different courses, workshops, and psychological preparation, were also suggested as means of dealing with the human challenge during M&A processes (Marks & Mirvis, 2001). According to the informants interviewed for this research, managers who are proactively involved in the M&A process and want the acquisition to succeed tend to do all that is in their power to keep their employees motivated throughout the merger or acquisition process. In particular, this research found that leaders should provide employees with reasons as to why the merger is necessary and a realistic perspective of actual and future continuity, as well as employ methods to reduce uncertainties resulting from the merger (Giessner *et al*.,

2006; Van Dick, Ullrich, & Tissington, 2006). Leaders should also pay attention to status differentials (for example, between employees of the acquiring and the acquired organisations). This is because employees of the lower-status merger partner (usually, the acquired entity) may have different concerns to those of the higher-status merger partner.

Given the high failure rate of M&A, as well as the stress and uncertainty experienced by acquired firms' employees, it is important that leaders and top managers of acquired firms understand, prepare, and better manage the employees-related CSFs, such as trust, communication and readiness and commitment to change, which were found to significantly influence M&A success. Although it may be difficult to isolate the relative contribution of each factor to the success of M&A, research findings (both of this research and of previous studies) have demonstrated that particularly 'soft', or 'human', factors contribute to the success of M&A. Leader's communication, furthermore, plays an invaluable role in facilitating the post-merger integration.

In a related quantitative study (Zaks, 2016) it was found that the retained autonomy level of the acquired company does not have a positive influence on M&A perceived success. Firstly, it is worth noting that another recent study by Zaheer Castañer, and Souder (2013) also found a significant but negative relationship between acquired firm post-acquisition autonomy and structural integration with related small and medium enterprises. Indeed, previous research into M&A implementation often focused on the challenge of balancing integration and autonomy. While post-acquisition integration and resource reconfiguration may be necessary in order to exploit potential synergies between the acquired and acquiring firms (Capron, 1999), the loss of autonomy that typically accompanies integration can itself be detrimental to acquisition performance (Very, Lubatkin, Calori, & Veiga, 1997). Moreover, effective integration of the acquired firm demands substantial commitment of managerial resources, a requirement that may distract the acquirer from its own core business (Schoar, 2002).

The dilemma between integration and autonomy may be especially important in acquisitions of technology firms. Such acquisitions are often motivated by the desire to obtain and transfer tacit and socially complex knowledge-based resources (Ranft & Lord, 2002). However, integration may ultimately lead to the destruction of the acquired firm's knowledge-based resources through employee turnover and the disruption of organisational routines (Puranam, Singh, & Zollo, 2002). Larsson (2005) suggests a co-competence integration approach whereby best practices from both the acquiring and the acquired company may be combined during the integration process. Consequently, it is essential to mutually identify and respect the competencies of the other firm in order to pursue the superior co-competence approach for organisational integration. Ranft and Lord (2002) suggest practices that may reduce the integration-autonomy tension by reducing the negative effects of integration. These practices include engaging in frequent, rich communication with acquired employees and placing acquired leaders in influential positions in the combined firm.

At this point, it is worth exploring some observations from the interviews conducted in this study:

1. Start-ups' TMTs can be graded on a scale ranging from having 'successful business orientation' with active and enthusiastic managers to having 'unsuccessful business orientation' with less active managers.

2. The successful managers (those with 'successful business orientation') had the vision, leadership and strategic capabilities to formulate priorities and goals which led to desired M&A configuration. The unsuccessful managers (those with 'unsuccessful business orientation') focused, and insisted, on certain details or elements (such as a specific technology or technological capability) while overlooking the greater picture and giving up options to negotiate over other sources of revenues or benefits.
3. Most of the merger or acquisition preparation work was personally conducted by the leader on the part of the acquired firm. The leader planned the forthcoming negotiation priorities hierarchy which was comprised of (in order of importance): the continuation of the business; the people; remaining as a united project team; and, finally, remaining autonomous.
4. The style of successful leaders is characterised by self-efficacy and flexibility. Unsuccessful leaders, on the other hand, are more willing to accept the terms of the acquirer in order to avoid, or minimise, clashes and confrontation.

Due to the heterogeneity and the small size (10 interviewees) of our sample, it is impossible to reach to any generalisable conclusions regarding attitudes towards autonomy. Nevertheless, it seems that, even with managers who have previous experience with M&A, the recognition of the importance of autonomy retention often only arises post-mortem, after discussions regarding autonomy have been neglected or continuously postponed in the negotiations process. This observation takes into account that while negotiating, managers must deal with a vast number of considerations simultaneously in order to highlight their attractiveness to the acquirer. Even though autonomy is expected to be a subject of great importance to start-ups, before, during and after M&A Israeli TMTs treat retained autonomy as one of many items listed on their negotiation checklist. During the negotiating process they tend to adopt a pragmatic approach prioritising certain topics over others. During this process the subject of autonomy is at times dropped out of the list of items that the acquired company wishes to insist on. In retrospect, during the post-merger phase, acquired managers may come to regret their approach towards autonomy retention during the negotiation process.

Finally, we found that effective knowledge transfer to the acquired company is one of the essential determinants of success. In fact, scholars generally point to a positive relationship between post-acquisition performance and effective knowledge transfer. Several factors were identified as affecting the success or failure of knowledge transfer, such as an individual's perception of the quality of the merging partner, whether the individual feels that the sharing of knowledge might translate into losing power in the organisation, or the social relationships between the employees of both firms, which can influence their willingness to engage in knowledge transfer (Björkman, Stahl, & Vaara 2007). In our study, acquired managers (our informants) who had a successful M&A experience report positive feelings and praise the acquirers' manner of transferring knowledge (one even called those procedures 'the Bible'). Other informants were more selective in sharing knowledge with their counterparts and they declare that they 'kept some cards close to the heart'. Some of the informants who expressed doubts regarding knowledge transfer mentioned that they avoided making 'enemies' within the acquirers' internal politics by choosing the 'wrong' person to share knowledge with. They therefore

preferred to remain passive. Others mentioned that they did not want to be 'buried under some organisational structure' and decided to 'keep their distance' from any initiative aimed at improving procedures or methods. Finally, one informant mentioned difficulties in understanding the acquirer's complexities and 'basic dynamics'.

CONCLUSIONS

The present study makes an additional contribution to the ongoing debate on the success factors of cross-border M&A by building on the empirical setting of multinational corporations acquiring Israeli start-up companies in high-tech sectors and by exploring and presenting the success factors on the part of acquired firms. Hence, it draws attention of acquiring firms to the relevance of ensuring several success factors related to the acquired companies. Several closing remarks can be made in order to summarise the findings presented in the preceding chapters.

Firstly, M&A also require a clear business plan which is based on realistic needs. A major fault in many start-ups is focus on technology rather than on strategy. The present study found that companies that invested in strategic thinking were more respected and appreciated by buyers than companies that focused on the technology alone.

Secondly, core team expertise, diversified knowledge and flexibility are essential for the success of start-ups. Many angels, VCs and potential buyers highlight the assessment of the core team in making investment decision. Very often start-ups are founded by young people who are reluctant to hire suitable, experienced managers despite the fact that they lack management skills and experience themselves. This creates difficulties in both R&D and the marketing processes. In certain cases, start-ups' lack of managerial expertise may decrease or harm the growth potential of the business and the probability of being acquired. This study presented a few examples of M&A failure cases in order to illustrate this situation.

Thirdly, most start-ups are established and staffed by engineers and scientists who often believe, erroneously, that a good product will sell. Marketing is not always viewed as a profession within itself and founders, especially those with high technological capabilities but no marketing experience, may take on the role of marketers and lead the firm in a wrong direction. In such cases marketing departments are established very late (often too late) and are frequently treated as an area for cutting costs. The findings of the present study, based on qualitative interviews, suggest that start-ups that have a pre-prepared, detailed vision and business agenda are more attractive to, and more respected by, potential acquirers than those that do not.

Fourthly, firms acquiring unfamiliar products tend to rely on the acquired institutional structure and leadership by allowing greater autonomy and decision-making authority to the acquired firm's management team (Haleblian & Finkelstein, 1999). This may be the case when firms acquire other firms in order to expand their organisational knowledge.

The conclusions of this study may be limited to the Israeli culture of start-up organisations. Therefore, it is assumed that interviewees reflect their own domestic culture and this impacts their perceptions regarding the role of leaders' communication during the post-merger or post-acquisition integration stage. Thus, examining the influence of national cultures on the acculturation of international M&A might yield different conclusions than those reached in this study. Future study could therefore be extended to include an

analysis of cross-border M&A, focusing on the construct of 'national culture' and examining the impact of this construct on leaders' communication and employee identification during the cultural integration of the post-M&A period.

Acquisitions by, and of, international and non-domestic, nationally different firms could add an additional cross-cultural element to the perception of autonomy and the PMI process. Cultural differentiation in acquisitions, in relation to the organisational type, could also provide interesting and additional cross-cultural insights to perceived autonomy, acquisition integration and performance relationships. The small sample utilised in this study did not include Israeli buyers and, therefore, we were not able to explore the cross-cultural element. Nevertheless, to the best of the authors' knowledge, start-up leaders' background, attitude and orientation is global and therefore we have not noticed any major nationality differences that may have created 'noise'. The TMTs treat cross-cultural issues as trivial or as a marginal side effect.

Several other limitations of this study are noteworthy. The sample of the study included mainly executives. It was impossible to reach out to more employees of acquired companies, as their acquirers refused to participate in the research. While we strove to include a wide variety of high-tech industries in the research, the results of this study cannot be generalised to sectors not represented by the sample. In addition, we were not able to add more cases to the study because of shortage in start-up companies willing to participate in the research. This was partly due to the ethical restrictions regarding anonymity and confidentiality we adopted.

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Authors

The contribution share of authors is equal and amounted to 33% each of them.

Ofer Zaks

PhD, lecturer and researcher at the Department of "Management of Service Organizations" in the Jerusalem Hadassah college, Israel. He was previously employed as a management team member (VP HR) in various firms – low & high-tech. In his research he concentrates on factors that influence the success of M&A processes- mainly in high- tech & start-ups companies & on Industry 4.0.
Correspondence to: zaks-@013.net.il

Jan Polowczyk

Habilitated doctor, Associate Professor at the Poznań University of Economics and Business, Department of International Competitiveness. He spent 15 years in the corporate sector, holding senior managerial positions in Polish affiliates of international companies. The main field of his interests is strategic management. He is a member of Strategic Management Society.
Correspondence to: jan.polowczyk@ue.poznan.pl

Piotr Trąpczyński

PhD, Assistant Professor at the Poznań University of Economics and Business, Department of International Competitiveness. He acts as one of directors at the Knowledge Transfer Company of the same university, supporting firms in their international expansion. In his research work, he concentrates on the performance outcomes of firm internationalisation. His work has been published inter alia in the Journal of World Business, International Business Review, or the European Management Journal. He is board member and co-founder of the AIB-CEE Chapter.
Correspondence to: piotr.trapczynski@ue.poznan.pl

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