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Subsidiaries' dual embeddedness and innovation-related competitive advantage[1]

Abstract: The foreign subsidiaries of multinational enterprises are involved in two types of networks: an internal (corporate) network within the company including the headquarters and sister subsidiaries, and an external (inter-organizational) network of cooperating partners. Based on the concept of "dual embeddedness," this paper proposes a model explaining the role of internal and external relationships in developing innovation-related competitive advantages. A path analysis was conducted based on data from the Community Innovation Survey's 2010–2012 sample of enterprises – members of capital groups from 10 EU member states, mostly CEE (post-transition countries). The results show the positive influence of dual embeddedness on subsidiaries' innovation, leading to competitive advantages based on cost and on differentiation. A mediating role for external knowledge in the link of internal integration and competitive advantage is posited. External and internal relationships are not mutually exclusive; on the contrary, together they reinforce each other's impact on innovation performance. Internal integration plays a decisive role in building innovation-related competitive advantages based on cost, whereas external

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relationships have stronger influence on differentiation-based advantages. Therefore, the management of such firms should promote both types of relationships, considering their distinct roles in the process of building competitive advantages.

Introduction

The snowballing volume of knowledge accessible from various sources in the globalized economy is one of the most significant drivers of change in a company's competitive strategies, and one which strongly affects its innovation activities. In this context, the greatest beneficiaries of globalization are multinational enterprises (MNEs). In this paper we use the threshold definition of MNE widely accepted in the literature: "A multinational (or transnational) enterprise is an enterprise that engages in foreign direct investment (FDI), and owns or, in some way, controls value-added activities in more than one country" [Dunning, Lundan, 2008: 3; Peng, Meyer, 2016: 5][2].

The MNE as a multi-unit organization has unique opportunities to generate, acquire, transform, and exchange knowledge both within its internal (corporate) network and resulting from the relationships of its units with external (independent) partners.

The literature highlights the growing role of the foreign subsidiary (FS) in knowledge creation, competence building, and enhancing innovation performance, based on the FS's own innovation capability as well as resulting from both its internal linkages within the MNE network and the FS's collaborative relationships with its external partners [e.g. Birkinshaw, Hood, 1998; Ambos et al., 2006; Phene, Almeida, 2008; Dunning, Lundan, 2008; Crespo et al., 2014]. The internal and external relationships (especially the embedded ones) of the FS are perceived as strategic assets that influence the MNE's capabilities and competitive advantages, and positively affect its overall business performance [e.g. Andersson et al., 2002; Narula, 2014].

Differences in the national innovative capacities of host countries [Furman et al., 2002] affect the abilities of FSs to build FS/MNE competitive advantages based on access to the knowledge of their local innovative partners. This influences the MNE's strategic motives for FS formation in each host market

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[2]   According to both cited authors, the two terms – multinational enterprise (MNE) and transnational company (TNC) – are nowadays often used interchangeably (see Dunning, Lundan, 2008: 765 [notes]; Peng, Meyer, 2016: 27). Given this definition, MNEs may pursue various strategic orientations in international business (international, multidomestic, transnational, or global).

and the mandates given to its FSs to engage in external and internal relationships as well as in specific innovation projects.

A firm's knowledge-based resources and innovation activities can generate competitive advantages based both on differentiation and low costs (cost leadership) [Porter, 1985]. Product and marketing innovations that raise the value proposition for customers are key elements of a differentiation strategy. Product innovations focused on low-cost design or the reduction of product features can lead to a cost advantage. The significant drivers of a firm's cost-based advantage are process innovations oriented toward cost reduction and productivity increases (e.g. through application of more efficient technology, reduced material usage/cost, lower labor input, or process development to enhance economies of scale). Process and organizational innovations can also contribute to differentiation-based advantages (e.g. through faster response time to orders, better product accessibility, or improved quality control procedures affecting product reliability). Research reveals an interplay between these types of innovation that positively affect a firm's competitive advantages [e.g. Martinez-Ros, Labeaga, 2009; Mothe, Nguen-Thi, 2010; Doran, 2012; Lewandowska et al., 2016].

The FS-focused perspective has recently gained considerable importance in MNE literature, with a growing number of both conceptual and empirical studies (see below). One of the most recent streams of research emphasizes the influence of the FS's relationships (and the level of FS embeddedness) with internal partners within the MNE network and with external actors with regard to the FS's knowledge creation, innovation performance, competitive advantage, and subsequent positioning within the MNE network. A further extension of empirical studies in these areas has been suggested [Cano-Kollman et al., 2016].

Empirical studies on the innovation performance of FSs located in the (post-) transition CEE economies are underdeveloped and have only recently been undertaken [e.g. Damijan et al., 2010; de Jong et al., 2014; Gołębiowski, Lewandowska, 2015; Bresciani, Ferraris, 2016; Demeter et al., 2016].

Our intention is to reduce these research gaps, and, in that context, the main objective of this paper is the assessment of the impact of knowledge flows resulting from the internal and external relationships of FSs (in their respective host countries) on the firms' innovation-related competitive advantages. We also investigate the interdependencies between both relationship modes in the context of these competitive advantages.

Path analysis models were built separately for each of ten European Union member states as well as for groupings of countries subdivided according to their relative levels of national innovativeness.

This paper is organized as follows: Section 1 presents an overview of studies on the influence of the internal and external relationships of FSs on innovation performance, leading to the formulation of hypotheses. In section 2 the research design is introduced. The results of our empirical study are presented in section 3 and discussed in section 4.

Theoretical background and development of hypotheses

The changing role of subsidiaries in MNE knowledge flows and innovation

The literature overview has underscored the changes both in parent-FS relationships and in the roles of FSs within MNE networks. Past conceptualization depicted the MNE as a hierarchy with a powerful parent firm (HQ) as the main source of knowledge transferred to the FS. The transnational model of the MNE highlighted the existence of an internal network within the MNE incorporating several competence centers where knowledge is created [Bartlett, Ghoshal, 1989; Holm, Pedersen, 2000]. The meta-national corporate model [Doz, Santos, Williamson, 2001] emphasized the emergence of the MNE's external network with the linkages of its FSs to their host country partners as an important source of knowledge contributing to the MNE's overall capabilities, innovation performance, and competitive advantages. The more recent view of the MNE built on the advances of a network-based theory of the firm describes the MNE as a federation of organizational units, a decentralized and flexible network with numerous competence centers where knowledge is created and can flow in all directions [Holm, Pedersen, 2000; Yang et al., 2008]. Nowadays, the MNE is conceptualized as a federation wherein not only is power contested, but ownership also does not guarantee enough controlling power to the parent firm [Ambos et al., 2010; Andersson et al., 2007].

The federative view is reflected in the definition of the MNE by Vahlne, Johanson [2013], who conceptualize the MNE as a firm (a business enterprise) that has the capability to build, develop, and coordinate value-creating *business network structures*, involving both internal and external actors. The MNE is fundamentally an integrator of knowledge, which requires capabilities to recombine diverse knowledge sets [Narula, 2014]. This view of the MNE assumes a growing role of FSs in the creation of the MNE's capabilities and increasing competitive advantages. This role depends to a great extent on the entrepreneurial orientation of its FSs, which can be characterized by (up to) five interrelated dimensions: proactiveness, innovativeness, a strong risk-taking propensity, competitive aggressiveness, and autonomy (to clarify a firm's entrepreneurial orientation construct, see Lumpkin, Dess, 1996; Gerschewski et al., 2016; Wach et al., 2018).

A FS proactively linked with external partners plays an increasingly important role in augmenting the MNE's knowledge, since much of the technological, market, and managerial knowledge and the resulting innovative solutions are attainable at the FS level [Rugman, Verbeke, 2001; Gnyawali et al., 2009]. Innovation capacity and performance are important sources of FS-specific advantages [Rugman, Verbeke, 2001] and a significant factor in the FS's position within the MNE network. The competencies and innovative solutions of the FS, which are highly valued by HQ, can be applied across the MNE network and – as they are difficult to imitate – boost the resource-dependency

power of the FS [Andersson et al., 2007; Mudambi, Pedersen, 2007] and may result in HQ granting the FS increased autonomy. That increased autonomy may enable the FS to pursue risky strategic initiatives aimed at the development of its capabilities and expansion, often without the prior approval of HQ [Delany, 2000; Cantwell, Mudambi, 2005; Strutzenberger, Ambos, 2014]. Once recognized by HQ, innovation-related solutions can be spread across the corporate network to build the MNE's competitive advantages [Gupta, Govindarajan, 2000; Williams, 2009]. Hence, the role of the entrepreneurial FS has shifted from implementer to (co-) shaper of the MNE's strategies [Cantwell, Mudambi, 2005; Najafi-Tawani et al., 2014; Kostova et al., 2016].

In the federative MNE, a significant responsibility of HQ is to support its FSs' rational innovative initiatives through resource allocation decisions, incentives, and coordination, while HQ still keeps its role as a provider and an integrator of innovative solutions [Gupta, Govindarajan, 2000; Buckley, Hashai, 2009; Ciabuschi et al., 2011]. Depending on its innovation capacities and initiatives, the mandate of the FS in innovation activities may range from innovation adopter, to local implementer/innovator, to a center of excellence and a strategic leader with a worldwide mandate [Frost et al., 2002; Harzing, Noorderhaven, 2006].

The literature emphasizes the impact of the company's internal innovation efforts and its external sources of knowledge on its innovation performance [e.g. Veugelers, 1997; Frenz, Ietto-Gilles, 2009] and the impact of its innovation cooperation on that performance as well [e.g. Bell, 2005; Prahalad, Krishnan, 2008; Van Beers, Zand, 2014; De Beule, Van Beveren, 2019].

Subsidiaries' internal relationships and innovation-related competitive advantages

The FS's internal linkages with HQ and other units (sister subsidiaries) within the MNE network enable the actors to access knowledge that fosters organizational learning and contributes to the development of innovative solutions, as well as to their transfer and diffusion across the network [e.g. Buckley and Carter, 1999]. In these relationships a FS can potentially play the role of both recipient and creator/provider of knowledge and innovative solutions. Considering their innovation capacities and initiatives in competence/knowledge development, two broad categories of FSs can be identified, reflecting the dominant direction of knowledge flows: competence/innovation-receiving (exploiting) FSs and competence/innovation-creating FSs [Cantwell, Mudambi, 2005; Achcaoucaou et al., 2014].

Linkages with the parent company or regional headquarters have been assessed as especially valuable for a FS playing the role of knowledge recipient [Birkinshaw et al., 1998]. Linkages with the parent company are crucial for the underperforming FS when it is forced to rely on HQ's resource support and knowledge transfer and is unable to use its specific advantages to strengthen its position within the MNE network [Gnyawali et al., 2009]. Therefore, close

links to the parent firm and alignment with HQ's strategy may increase the FS's chance of survival and growth [Reilly et al., 2012].

Research suggests, in general, that the knowledge transfer to FSs resulting from linkages with the parent company has positive impact on their innovation performance [Ciabuschi et al., 2011; Achcaoucaou et al., 2014]. In addition, relationships with sister FSs generate knowledge flows that may contribute to their competence-building, improved innovativeness, and overall performance [Gnyawali et al., 2009; Crespo et al., 2014]. This is all particularly important when the business environment in a host country does not offer access to competitive resources [Ambos, Ambos, 2009].

Numerous studies on the internal relationships of FS have focused on competence-developing FSs (knowledge creators/providers) and are dedicated to the transfer of knowledge and innovative solutions from the FS to HQ ("reverse knowledge transfer") as an emerging phenomenon in recent decade(s) [e.g. Ambos et al., 2006; Yamin, Andersson, 2011; Rabbiosi, Santangelo, 2013; Mudambi et al., 2014; Najafi-Tawani et al., 2014]. Reverse knowledge flows result, at least partially, from the increasing internationalization of R&D by knowledge-seeking MNEs [Michailova, Zhan, 2015; Zhang et al., 2015; Lim et al., 2017].

The concept of firm embeddedness has been applied to stress the vital role of FS relationships to other actors as a driver of FS success and position in the MNE [e.g. Birkinshaw et al., 2005; Yamin, Andersson, 2011; Ciabuschi et al., 2011]. Embedded business relationships are characterized by a greater number of functional areas of the firm (here the FS) being involved with business partners, the high intensity and sustainability of these linkages, more adaptations made between partners, higher dependence on partners, mutual commitment, and trust [Holm et al., 1995; Schmid, Schurig, 2003; Forsgren et al., 2005]. Research reveals that strong internal embeddedness is positively related to FS performance, as it facilitates knowledge transfer and learning processes and fosters FS entrepreneurship and innovativeness [Tsai, 2001; Gnyawali et al., 2009; Yamin, Andersson, 2011; Gammelgaard et al., 2012; Ciabuschi et al., 2014].

It should be noted that studies examining the FS as an innovation recipient are not advanced; examples include Hallin et al. [2011] and Bresciani, Ferraris [2016]. Moreover, studies on innovation in FSs located in CEE countries – still knowledge recipients rather than creators/ providers – are also underdeveloped [Narula, Guimont, 2010; Filippov, Duysters, 2014; Bresciani, Ferraris, 2016]. In an attempt to reduce this research gap, we posit the following hypothesis, which is, to a great extent, related to FSs located in CEE countries (due to the available research sample):

- **H1.** The internal relationships in a FS's innovation activities have a positive influence on the FS's innovation leading to competitive advantages based on cost (**H1a)** and based on differentiation **(H1b)**.

Subsidiaries' external relationships and competitive advantages related to innovation performance

External (inter-organizational) relationships are the firm's linkages with its independent partners: customers, suppliers, competitors, research institutions, governmental and local agencies, etc. Research indicates the positive influence a firm's external knowledge has on its innovation performance [e.g. Veugelers, 1997; Lavie, 2006; Frenz, Ietto-Gilles, 2009; Van Beers, Zand, 2014]. The growing role of FSs in knowledge creation resulting from their external collaborative relationships in a host country has been highlighted in international business research [e.g. Andersson et al., 2002; Schmid, Schurig, 2003; Andersson et al., 2005; Ambos et al., 2006; Mu et al., 2007]. FSs absorbing knowledge accessible in a host market can develop location-specific competencies [Rugman, Verbeke, 2001]. Extensive external links positively affect a FS's market performance in its host country as they reduce the liability of foreignness and the liability of outsidership [Johanson, Vahlne, 2009]. Understanding the host country environment facilitates the diffusion of innovative solutions to be implemented by the focal FS as well as those developed elsewhere within the MNE [Bresciani, Ferraris, 2016].

The literature suggests that external embeddedness on the part of the FS is necessary to access valuable tacit knowledge and facilitate accumulation of external knowledge; additionally, it improves the FS's absorptive capacity [Gammelgaard et al., 2012]. More strongly embedded FSs are able to absorb and transfer more knowledge to other units of the MNE than FSs having weaker external linkages [e.g. Forsgren et al., 2005; Narula, 2014]. The literature suggests that external embeddedness results in greater FS competence development and better innovation performance [e.g. Andersson et al., 2002; Achcaoucaou et al., 2014; Ciabuschi et al., 2014; Ferraris et al., 2017], leading to sustainable competitive advantages for the FS/MNE [Ha, Giroud, 2015]. Considering the foregoing, we predict the following:

- **H2.** The external relationships in a FS's innovation activities have a positive influence on the FS's innovation leading to competitive advantages based on cost (**H2a**) and based on differentiation (**H2b**).

Interdependencies between a FS's internal and external linkages; dual embeddedness

As stated above, both the internal and external relationships of the FS are perceived as factors positively affecting its innovation and business performance. The literature indicates interdependencies between these two relationship modes and suggests the need for their integration (dual embeddedness) [e.g. Figueiredo, 2011; Gammelgaard et al., 2012; Ciabuschi et al., 2014]. The FS that is active in knowledge creation, acquisition, and exchange in both internal and external networks is likely to gain an advantage from the presence of the positive interdependencies between them. Research has revealed

that dual embeddedness not only increases a FS's ability to develop and transfer an innovation, but it also positively affects the FS's ability to receive an innovation and successfully adapt and exploit it in the local context [Bresciani, Ferraris, 2016].

The literature suggests that the MNE needs to balance the two modes of FS linkages both to exploit their complementarities and to manage the conflicts and trade-offs between them [Gammelgaard, Pedersen, 2010; Meyer et al., 2011; Ciabuschi et al., 2014; Narula, 2014].

There is ongoing debate regarding the character of the interplay between the two types of linkages. Numerous studies on knowledge-creating FSs (located primarily in mature economies) emphasize the significance of the knowledge accessible from the external network (see above). Having acquired valuable and unique external knowledge, a FS is able to increase its specific advantage and subsequently increase its dependency power over sister FSs and HQ. The dissemination of tacit knowledge across the MNE network usually requires an increase in internal linkages (i.e. stronger internal embeddedness) [Gammelgaard et al., 2012]. Ciabuschi et al. [2014] revealed the complementarity between a FS's external and internal embeddedness, indicating that the FS's external embeddedness directly affects its innovation-related performance. They argue that external embeddedness is closely associated with market partners who, owing to their extensive linkages with the FS, become strongly involved and committed to innovation creation/adoption. They also suggest that innovation performance is indirectly related to the FS's internal embeddedness via the influence on FS innovation investment which strengthens its influence within the MNE.

Some authors suggest an opposite but also positive link between internal and external relationships [e.g. Ferraris, 2014; Horn et al., 2014; Demeter et al., 2016]. They suggest that the FS willing to solve its performance problems tries initially to supplement the necessary knowledge from the MNE internal network, which is usually simpler than acquiring it from independent external sources. In addition, studies on supply chain management indicate that intra-firm links or internal network relationships are prerequisites for external linkages [Zhao et al., 2011; Horn et al., 2014; Demeter et al., 2016]. The innovation-receiving FS is dependent on knowledge inflows and support from HQ and its sister subsidiaries, which implies extensive internal relationships [Bresciani, Ferraris, 2016]. In addition, as stated above, when the host country environment does not offer valuable knowledge, a FS is forced to rely more on internal sources of knowledge. Knowledge acquired by the FS from the MNE internal network often cannot be directly implemented in the host country context but it must be recombined and shared with external partners (e.g. value chain partners) in order to adjust the innovative solution to the local environment [Zhao et al., 2011; Demeter et al., 2016]. Demeter et al. [2016] indicate that external embeddedness mediates the positive influence of internal embeddedness.

In this context and since most FSs in the research sample are established in countries ranked low in terms of national innovativeness – implying a relatively low propensity to acquire local (host country) technological knowledge – we posit the next hypotheses:

- **H3.** A FS's internal relationships related to innovation activities have a positive impact on its innovation-related external relationships in firms with competitive advantages based on cost (**H3a**) and based on differentiation (**H3b**).
- **H4.** The impact of a FS's internal relationships related to innovations leading to competitive advantages based on cost (**H4a**) and based on differentiation (**H4b**) is strengthened by the FS's external relationships.

The interrelationships between variables and hypotheses are presented in Figure 1.

Figure 1. Theoretical model of a subsidiary's external and internal relationships and their impact on competitive advantages
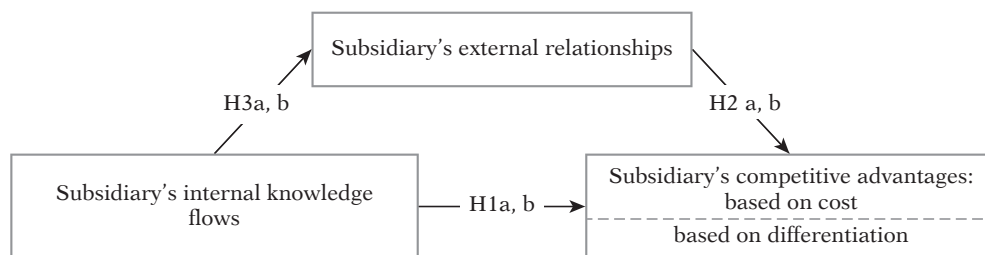
Source: own elaboration.

Sample description, variables operationalization, methods applied

Sample description

The empirical component of this study employs data from the Community Innovation Survey (CIS 2012) covering the period 2010–2012[3]. These are currently the latest anonymized microdata available from Eurostat for research purposes. The CIS is a questionnaire regarding the innovative activities of enterprises in the industrial and service sectors and is based on guidelines and methodologies developed by European Union and OECD experts and included in the Oslo 2005 Manual. Achieving full comparability of the data provided by the individual countries participating in the creation of the CIS is possible thanks to the adoption of a common understanding as to the classification of innovation-related phenomena.

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[3] This paper is based on CIS 2012 microdata obtained from Eurostat, based on the "*Contract on the use of the Community Innovation Survey (CIS) micro data for research purposes – 148/2016-CIS*" signed with the European Commission.

The CIS aims to obtain information on the innovative activity of companies as well as data on the costs of their process and product innovations, the public financial support for innovative activities, sources of information and cooperation within innovative projects, and their innovation goals. The CIS also contains data regarding implementation of organizational and marketing innovation.

The study of innovative activity is conducted for the needs of CIS on companies classified according to NACE Rev.2 in sections from B to M (Commission Implementation Regulation).

Research covers enterprises entered on the official business registers in force in the countries providing data for CIS purposes that are maintained by state statistical offices or other institutions designated for that purpose by the state authorities. Companies with more than 10 employees are surveyed. The study extends across the whole enterprise population, or randomly selected samples, or there may be a compilation of both approaches. Homogeneous sub-groups are separated from the set of enterprises examined for the needs of the CIS, and stratification of the examined set is carried out according to the type of activity conducted (according to NACE Rev.2, with indication of the nature of the activity); the number of employees (10–49, 50–249, and 250 and up); and the regional location (according to NUTS 2 classification).

To refine the sample size, an indication that a firm (i.e. a subsidiary) was a member of a capital group was used as a filter variable. Only enterprises located in a different country than the HQ of the capital group were considered. From the initial sample of 96,056 small, medium, and large firms from 14 EU countries[4], 14,754 enterprises were refined (it should be noted that 801 records had missing data). The refined sample covered N=1,152 firms from Bulgaria, N=426 from Romania, N=1,414 from the Czech Republic, N=147 from Cyprus, N=302 from Estonia, N=5,093 from Spain, N=463 from Hungary, N=650 from Hungary, N=274 from Lithuania, N=1,694 from Portugal, N=284 from Slovakia, N=784 from Norway, N=453 from Slovenia, and N=1,618 from Germany (see Table 1 for details). Unfortunately, microdata for Polish enterprises are not available.

Table 1. Initial sample – description

Country	Abbr.	Initial sample (number)	Initial sample (percent)	Members of foreign capital group (number)	Members of foreign capital group (percent)	Level of national innovativeness (2016)
Bulgaria	BG	14,296	14.9	1,152	7.8	Modest innovator
Romania	RO	7,670	8.0	426	2.9	Modest innovator
Czech Rep.	CZ	5,449	5.7	1,414	9.6	Moderate innovator
Cyprus	CY	1,205	1.3	147	1.0	Moderate innovator

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[4]   This data set was previously used and presented in the publication by Lewandowska, Rószkie-wicz, Weresa [2018].

Country	Abbr.	Initial sample (number)	Initial sample (percent)	Members of foreign capital group (number)	Members of foreign capital group (percent)	Level of national innovativeness (2016)
Estonia	EE	1,723	1.8	302	2.0	Moderate innovator
Spain	ES	32,120	33.4	5,093	34.5	Moderate innovator
Croatia	HR	3,193	3.3	463	3.1	Moderate innovator
Hungary	HU	5,152	5.4	650	4.4	Moderate innovator
Lithuania	LT	2,231	2.3	274	1.9	Moderate innovator
Portugal	PT	6,840	7.1	1,694	11.5	Moderate innovator
Slovakia	SK	2,897	3.0	284	3.9	Moderate innovator
Norway	NO	5,083	5.3	784	5.3	Strong innovator
Slovenia	SI	1,869	1.9	453	3.1	Strong innovator
Germany	DE	5,328	5.6	1,618	11.0	Innovation leader
Total	UE	96,056	100.0	14,754	100.0	Total

Source: own calculations based on micro data from CIS 2010–2012.

Next, only firms having the complete data set needed for the path analysis were selected, which resulted in the final number of N=7,278 enterprises. Due to missing data, firms from the Czech Republic, Germany, Spain, and Norway were excluded.

The total sample of EU 10 countries was then subdivided according to the level of innovativeness of each country as presented in the Innovation Union Scoreboard 2016. These subsamples were: Modest Innovators (Bulgaria and Romania); Moderate Innovators (Cyprus, Estonia, Croatia, Hungary, Lithuania, Portugal, and Slovakia) and Strong Innovators (Slovenia).

The data were introduced into separate models relating to the two types of competitive advantage. After completing this step, both refined samples consisted of the same enterprises, except for one.

Variables and their operationalization, the methods applied

The profile of CIS data determined the operationalization of the selected variables (see Table 2 for a detailed description).

The causal relationship between the independent variables and the dependent variable was analyzed by path analysis (a form of hierarchical multiple regression) developed by Sewall Wright (Wright, 1921, 1934). The results of the path analysis are usually presented on a graph (path diagram) in which relations between variables are portrayed using arrows extending from the explanatory variable to the explained variable [Konarski, 2010]. In the analysis it is assumed that all relations between variables are linear, which means that the arrowheads on the diagram have only one end (Wright, 1960). Path analysis enables the measurement of the strengths of these relationships, which can be direct or indirect [Schumacker, Lomax, 2004]. It should be noted that this type of analysis often provides new paths that can explain research questions

that were not considered previously (Kline, 2011). Later, bootstrap – Bradley Efron's method [Efron, 1979] for estimating the distribution of estimation errors using multiple draws with returning from the sample – was applied. Bootstrap was followed by correction Bootstrap for Goodness-of-Fit Measures [Bollen-Stine, 1992]. The Generalized Least Squares (GLS) method, with the module AMOS 23, program PS IMAGO was used for all calculations[5].

Table 2. Description and construction of variables

Filter variables – "was a member of a capital group"		
"1" if the firm is a member of a capital group; "0" otherwise. A group consists of two or more legally defined enterprises under common ownership. Each enterprise in the group can serve different markets, as with national or regional subsidiaries, or serve different product markets. The head office is also part of an enterprise group. Only enterprises located in a different country from the headquarters (HQ) of the capital group were considered.		
Dependent variable – "A subsidiary's competitive advantage"		
a competitive advantage based on cost	The variable concerning strategic goals: reduction of the cost of in-house operations; reduction of the cost of purchased materials. It can take 0–6: 0-not relevant; 1-low importance of one goal; 2-low importance of two goals; 3-medium importance of one goal; 4-medium importance of two goals; 5-high importance of one goal; 6-high importance of two goals.	
a competitive advantage based on differentiation	The variable concerning strategic goals: introduction of new or significantly improved goods or services; improvement of the marketing of goods and services; increase in the flexibility/responsiveness of the organization. It can take 0–9: 0-not relevant; 1-low importance of one goal; 2-low importance of two goals; 3-low importance of three goals; 4-medium importance of one goal; 5-medium importance of two goals; 6-medium importance of three goals; 7-high importance of one goal; 8-high importance of two goals; 9-high importance of three goals.	
Exploratory endogenous variables – "a subsidiary's internal knowledge flows"		
The variable concerning the use of an internal information source within the enterprise or the enterprise group. It can take 0–3: 0-not used; 1-low importance; 2-medium importance; 3-high importance.		
Exploratory exogenous variables – "a subsidiary's external relationships"		
The variable concerning a declaration of cooperation with the host and international suppliers, clients, competitors, consultants, universities, research institutes. It can take 0–3, where 0-no cooperation; 1-cooperation with domestic actors (within the EU); 2-cooperation with international actors (from the US, China, India, other countries); 3-cooperation with domestic and foreign actors.		

Source: own elaboration and operationalization based on questionnaire CIS 2010–2012.

Results

Our model is saturated, meaning that the number of distinct sample moments is equal to the number of estimated distinct parameters. As a result, the model is unstable. In order to assign measures of accuracy to sample estimates, the model was bootstrapped with 10,000 repetitions.

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[5] A similar method was used and presented in the publication by Lewandowska, Rószkiewicz, Weresa [2018].

Analysis of the standardized estimates for paths in the model shows that for the subject enterprises (i.e. units of capital groups) most paths are statistically significant at least at the level of p < 0.05.

The analysis resulted in the following outcomes: An Integrated Model (the full sample); a model for Modest Innovators (Bulgaria and Romania); a model for Moderate Innovators (Cyprus, Estonia, Croatia, Hungary, Lithuania, Portugal, and Slovakia); and a model for Strong Innovators (Slovenia).

Results for the **Integrated Model** (the complete sample of firms) show that both internal (InternalRel) and external relationships (ExtRel) have a positive influence on the cost-based advantage (CostAdv), with figures of .182*** and .047*** respectively, whereas in the case of the differentiation-based advantage (DiffAdv), the figures were .211*** and .091***, respectively. The relation between the internal and external relationships was also positive and attained .172*** in both models. Thus, **for the Integrated Model the hypotheses: H1a, H1b, H2a, H2b, H3a, and H3b were supported**.

Details of the results for the models for Modest Innovators, Moderate Innovators, and Strong Innovators are presented in Table 3.

Table 3. Results of the path analysis for the internal and external relationships of subsidiaries located in Europe and their influence on the subsidiaries' cost-based competitive advantage and differentiation-based competitive advantage; complete sample and split based on the level of the countries' innovativeness

Results of models for European subsidiaries' internal and external relationships and their influence on subsidiaries'cost-based competitive advantage										
Parameter			Hypothesis	Integrated Model		Modest Innovators		Moderate Innovators		Strong Innovators	
				Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Internal Rel	→	CostAdv	H1a	.313 (.182)***	.020	.358 (.192)***	.046	.134 (.086)***	.026	.147 (.071)	.098
ExtRel	→	CostAdv	H2a	.078 (.047)***	.019	.073 (.032)	.057	-.009 – (.007)	.023	.097 (.086)	.053
Internal Rel	→	ExtRel	H3a	.178 (.172)***	.012	.040 (.049)*	.020	.191 (.169)***	.018	.244 .132**	.086
Results of models for European subsidiaries' internal and external relationships and their influence on subsidiaries' differentiation-based advantage										
Parameter			Hypothesis	Integrated Model		Modest Innovators		Moderate Innovators		Strong Innovators	
				Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Internal Rel	→	DiffAdv	H1b	.486 (.211)***	.027	.604 (.223)***	.066	.314 (.143)***	.036	.370 (.142)**	.122
ExtRel	→	DiffAdv	H2b	.203 (.091)***	.026	.226 (.068)**	.081	.176 (.090)***	.032	.041 (.030)	.066
Internal Rel	→	ExtRel	H3b	.178 (.172)***	.012	.040 (.049)*	.020	.191 (.169)***	.018	.244 (.132)**	.086

Notes: * > 0.05; ** > 0.01; *** > 0.001.

Source: own calculations in AMOS 23, program PS IMAGO. Standardized values are shown in parentheses.

In the Integrated Model, the direct (unmediated) effect of the internal relationship (InternalRel) on the cost-based advantage (Cost Adv) is .313. Thus, due to the direct (unmediated) effect of InternalRel on Cost Adv, when InternalRel increases by 1, Cost Adv increases by .313. The indirect (mediated) effect of InternalRel on Cost Adv is .014. That is, due to the indirect (mediated) effect, when InternalRel increases by 1, Cost Adv increases by .014. This is in addition to any direct (unmediated) effect that InternalRel may have on Cost Adv. The total (direct and indirect) effect of InternalEmb on Cost Adv is .327. That is, due to both direct (unmediated) and indirect (mediated) effects, when InternalRel increases by 1, Cost Adv increases by .327.

In the case of the Integrated Model for the differentiation-based competitive advantage, the direct (unmediated) effect of the internal relationship (InternalRel) on the differentiation-based advantage (Diff Adv) is.486. The indirect (mediated) effect of InternalRel on DiffAdv is.036. The total (direct and indirect) effect of InternalRel on DiffAdv is.522. That is, due to both direct (unmediated) and indirect (mediated) effects, when InternalRel increases by 1, DiffAdv increases by.552. Thus, for the **Integrated Model hypotheses: H4a and H4 b were supported**.

Details on the verification of hypotheses H4a and H4b for all models are presented in Table 4.

Table 4. Direct, mediated, and total result for independent variable "Internal Relationships" on cost- and differentiation-based advantage

Direct, mediated, and total result for independent variable InternalRel	Causal influences – results for cost-based competitive advantage			
	Integrated Model	Modest Innovators	Moderate Innovators	Strong Innovators
The direct effect on the dependent variable	.313 (.182)	.358 (.192)	.134 (.086)	.147 (.071)
The mediated effect on the dependent variable	.014 (.008)	.003 (.002)	-.002 (-.001)	.024 (.011)
Total effect on the dependent variable (H4a)	.327 (.190)	.361 (.194)	.132 (.085)	.171 (.082)
Independent variable InternalRel	Causal influences – results for differentiation-based competitive advantage			
	Integrated Model	Modest Innovators	Moderate Innovators	Strong Innovators
The direct effect on the dependent variable	.486 (.211)	.604 (.223)	.314 (.143)	.370 (.142)
The mediated effect on the dependent variable	.036 (.016)	.009 (.003)	.033 (.015)	.010 (.004)
Total effect on the dependent variable (H4b)	.522 (.227)	.613 (.227)	.348 (.158)	.380 (.146)

Source: own calculations in AMOS 23, program PS IMAGO. Standardized values are shown in parentheses.

Details concerning the verification of hypotheses H1-H4 for all country groups as well as for each of the surveyed countries separately are presented in Table 5.

Table 5. Hypotheses – summary

	H1a Internal Rel -->CostAdv	H2a Ext Rel -->CostAdv	H3a Internal Rel -->ExtRel	H4a Internal Rel -->ExtRel-->CostAdv	H1b Internal Rel -->DiffAdv	H2b Ext Rel -->DiffAdv	H3b Internal Rel -->DiffAdv	H4b Internal Rel -->ExtRel-->DiffAdv
Integrated Model	(+)***	(+)***	(+)***	(+)	(+)***	(+)***	(+)***	(+)***
Modest Innovators	(+)***	NoRel	(+)*	(+)	(+)***	(+)***	(+)***	(+)***
Moderate Innovators	(+)***	NoRel	(+)***	(−)	(+)***	(+)***	(+)***	(+)***
Strong Innovators	NoRel	NoRel	(+)**	No Mediating Effect	(+)***	NoRel	(+)***	(+)***
Bulgaria BG	(+)***	(+)***	(+)***	(+)	(+)***	(+)***	(+)***	(+)
Romania RO	NoRel	NoRel	NoRel	No Mediating Effect	(+)*	NoRel	NoRel	No Mediating Effect
Cyprus CY	(+)**	NoRel	NoRel	No Mediating Effect	NoRel	(+)**	NoRel	No Mediating Effect
Estonia EE	NoRel	NoRel	(+)***	No Mediating Effect	NoRel	NoRel	(+)***	No Mediating Effect
Croatia HR	(+)***	NoRel	(+)***	No Mediating Effect	(+)***	(+)***	(+)***	(+)
Hungary HU	NoRel	NoRel	(+)***	No Mediating Effect	(+)*	NoRel	(+)***	No Mediating Effect
Lithuania LT	NoRel	NoRel	(+)***	No Mediating Effect	(+)*	(+)*	(+)***	(+)
Portugal PT	(+)***	NoRel	(+)***	No Mediating Effect	(+)***	(+)**	(+)***	(+)
Slovakia SK	NoRel	(+)*	NoRel	No Mediating Effect	(+)**	(+)***	(+)***	(+)
Slovenia SI	NoRel	NoRel	(+)**	No Mediating Effect	(+)**	NoRel	(+)**	No Mediating Effect

NoRel – No relation between variables was found.

Attention: Due to space limitations here, the exact results of the path analysis for individual countries are available from the authors on request.

Source: own elaboration based on path analysis results for country groups and individual countries.

Discussion and concluding remarks

The primary objective of this paper was to investigate how knowledge flows resulting from a FS's internal and external relationships determine its innovation-related competitive advantages, both cost- and differentiation-based. The interdependencies between both types of relationships in the context of competitive advantages were also investigated. Path analysis models were built separately for each of the 10 EU member states as well for groups of countries subdivided according to their relative levels of national innovativeness, and for the FSs located in each of the surveyed countries.

We revealed that internal knowledge flows have a positive and statistically significant influence on the FS's innovation-related advantages both in the case of cost-based advantages (for all groups of countries except for the Strong Innovators) and in the case of differentiation-based advantages. The influence is stronger for firms that follow strategies based on differentiation.

Moreover, our study revealed the positive and statistically significant influence of external relationships on innovation-related competitive advantages for the whole sample in respect to both cost-based and differentiation-based advantages, but only in the case of the differentiation-based advantages for Modest and Moderate Innovators. Again, we noted that this influence is stronger in firms that implement differentiation-based strategies. We also found that the relation between internal and external linkages is positive and statistically significant for all enterprise groups distinguished by the level of their host country's innovativeness.

Our last finding indicates that the influence of internal linkages on competitive advantages is fully mediated by external relationships (except for the Strong Innovators in the case of the cost-based advantages).

The results confirm the findings of the international business literature suggesting that interdependencies between external and internal relationships positively influence a FS's innovation performance [Gammelgaard et al., 2012; Ciabuschi et al., 2014; Bresciani, Ferraris, 2016] that results in its contributions to FS/MNE competitiveness.

In general, the extent to which a FS engages in internal and external relationships depends on two groups of factors: subsidiary-level determinants and host-country determinants. Among host country determinants are the size and importance of the host country market, the level of the nation's innovativeness, and the quality of its institutions and local partners. Our focus was on the influence of national innovativeness. Analysis shows that this factor does not (fully) determine a FS's extent of external relationships in a host country. We revealed the extensive linkages of FSs that are oriented toward building differentiation-based competitive advantages and are located in (post-)transition CEE countries.

This finding seems to contradict the results of other studies suggesting that the knowledge available in less advanced (emerging), less innovative economies is traditionally perceived by the MNE as less valuable [Ambos, Ambos, 2009],

which reduces a FS's propensity to build local linkages to knowledge-creating, up-stream partners especially in the context of highly-advanced R&D projects and radical product innovation significant for the MNE [Narula, Guimon, 2010; Dahms, 2017]. FSs located in all the surveyed countries very rarely gain the status of a strategic innovative leader with a worldwide mandate. Therefore, we assume that the external linkages can be predominantly related to technological and marketing innovations aimed at adaptation of the FS's offering to host market demand. However, foreign investors lately seem to be valuing somewhat more highly the technological competencies of CEE partners, which is reflected in the dynamics and industry structure of FDI located in this region including R&D projects driven by international software firms [E&Y, 2016].

Figure 2. Impact of internal and external relationships on EU subsidiaries' competitive advantage; results of path analysis conducted for 10 EU countries
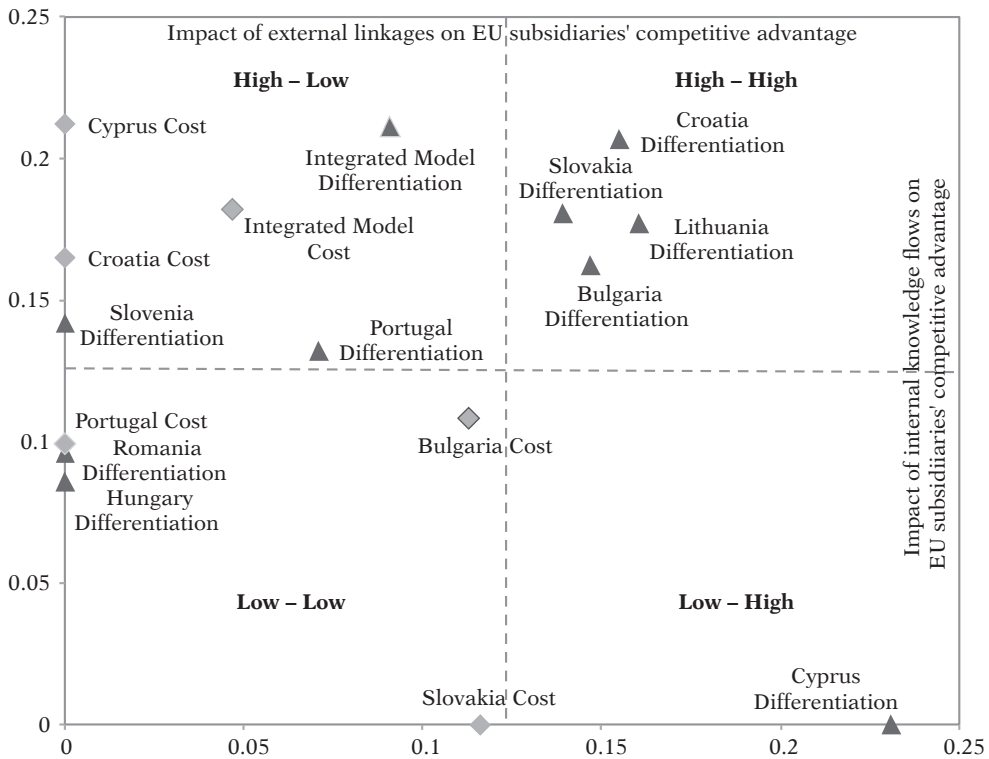
Source: own elaboration based on standardized values derived from path analysis models created for selected EU countries in AMOS 23, program PS IMAGO.

Our findings regarding differentiation-based advantages show that FSs located in most of the surveyed countries are also highly internally embedded, which may indicate the net inflow of differentiation-building knowledge

from MNE units, as these FSs are predominantly technological innovation recipients rather than knowledge/innovation creators. This may also be caused by the fact that many manufacturing FSs located in the CEE region offer the majority of their products on international markets via their MNEs' distribution networks. MNEs coordinate product or marketing innovations (developed either at the MNE or the FS level) from the perspective of regional or global differentiation-based competitive advantages, rather than an advantage on the host market that might require increased external relationships to adapt the offering.

As for the importance of internal knowledge flows for cost-based strategies pursued by FSs, our findings clearly indicate that the importance of internal linkages is higher than that of external linkages for most of the surveyed countries. This may result from the fact that the process and organizational innovative solutions which are the main sources of cost-based advantages are provided by the parent company or other units within the MNE network in order to increase the technological or organizational assets/competencies of the focal FS. Such a mechanism is especially reasonable for a FS formed via acquisition and aimed at increasing the operational efficiency of the acquired unit (typically the case in the early years of transformation in the CEE region). Moreover, internal relationships are needed for the technological and organizational integration of value-creating activities within the MNE's internal value chain and to further the smooth introduction of internally developed innovations.

The MNE's strategic motives for FDI determine its FSs' activities. Singh [2012] suggests that the transition economies provide opportunities for MNEs to engage in all four motives, i.e. market seeking, factor seeking, efficiency seeking, and strategic asset seeking (with focus on knowledge). The relative importance of these motives determines the volume and structure of the assets allocated by the MNE to a FS, as well as the scope of value-creation activities assigned to the FS. These assets influence both the scope and characteristics of FS innovation, and internal and external relationships (e.g. selection of appropriate cooperation partners). Morschett and Schramm-Klein [2011] argue that FSs established in the CEE countries for reasons of efficiency seeking appear to be more successful. In addition, high performing FSs in this region are involved in more complete value chains. Consistent with the efficiency-seeking argument, top performing FSs deliver more products to other subsidiaries and are more strongly integrated within MNE networks, which is also reflected in knowledge flows. Knowledge flows from HQ to FSs prevail over reverse flows, as well as over knowledge flows between sister FSs. The significance of the efficiency-seeking motive explains the importance of relationships that affect cost-based competitive advantages. Additionally, research indicates that the global crisis (from 2008 on) forced many MNEs to focus on cutting costs, improving efficiency, and centralizing strategic decisions [Schuh, 2012] that might reduce their FSs' autonomy in innovation activities and might negatively affect external linkages.

To sum up, the outcomes of our research complement previous studies on the positive influence of FSs' internal and external relationships on their innovation performance leading to competitive advantages. Moreover, our study supports results from other studies revealing a positive impact of the interdependencies between these two types of relationships on FSs' innovation-related competitive advantages.

Another contribution of our study arises from the fact that our research is one of the few studies on innovation performance of FSs located in the CEE (post-) transition economies. The dominant part of the research sample comprised FSs located in this region. Moreover, due to specific operating conditions in this region that still negatively affect FSs' opportunities to acquire valuable knowledge from host country sources, our research is one of the few projects to analyze the relationship issue from the perspective of innovation-receiving subsidiaries.

It should also be noted that the study was based on representative samples (in each host country) of small, medium, and large FSs, which enabled an international comparison.

We are aware of the limitations of our study, some of which were caused by the structure of CIS data, in particular the lack of information on FSs' dominant value-creation activities and the age and ownership structure of the FSs, as well as the MNEs' strategic motives for FS formation and the levels of FS autonomy. Equally problematic was the lack of information on the qualitative aspects of FS relationships which is necessary to assess the strength of FS embeddedness. Considering the last factor, we avoided using the term "embeddedness" in this paper; instead preferring the term "relationships".

Another limitation related to the CIS questionnaire was the inability to directly use the detailed information on knowledge flows (e.g. the content of innovation-related knowledge, knowledge-sharing partners, and other qualitative aspects of knowledge management).

Finally, in our simple model we did not consider the possible influence of numerous exogenous factors including those related to a FS's host country-specific environment (apart from the level of national innovation performance). Hence, additional variables should be added to the models in subsequent studies explaining the various dimensions of FSs' internal and external relationships and their impact on FSs' innovation-related competitive advantages.

As regards managerial implications, we suggest the need at both HQ and the FS level for application of a holistic approach to knowledge management processes [Claver-Cortes et al., 2018]. These processes should be focused, e.g. on building commitments to create, acquire, and transfer knowledge, to identify the interdependencies between internal and external relationships, and to integrate the knowledge that results from these linkages to strengthen the competitive advantages of the FS/MNE.

References

Achcaoucaou F., Miravitlles P., Leon-Darder F. [2014], Knowledge sharing and subsidiary R&D mandate development: A matter of dual embeddedness, *International Business Review*, 23(1): 76–90.

Ambos B., Ambos T.C. [2009], Location choice, management and performance of international R&D investments in peripheral economies. *International Journal of Technology Management*, 48(1): 24–41.

Ambos T.C., Ambos B., Schlegelmilch B.B. [2006], Learning from foreign subsidiaries: an empirical investigation of headquarters' benefit from reverse knowledge transfers, *International Business Review*, 15(2): 294–312.

Ambos T.C., Andersson U., Birkinshaw J. [2010], What are the consequences of initiative-taking in multinational subsidiaries?, *Journal of International Business Studies*, 41: 1099–1118.

Andersson U., Björkman I., Forsgren M. [2005], Managing subsidiary knowledge creation: the effect of control mechanisms on subsidiary local embeddedness, *International Business Review*, 14: 521–538.

Andersson U., Forsgren M., Holm U. [2002], The strategic impact of external networks – Subsidiary performance and competence development in the multinational corporation, *Strategic Management Journal*, 23(11): 979–996.

Andersson U., Forsgren M., Holm U. [2007], Balancing subsidiary influence in the federative MNC: A business network view, *Journal of International Business Studies*, 38(6): 802–818.

Bartlett C.A., Ghoshal S. [1989], *Managing Across Borders: The Transnational Solution*, Harvard Business School Press, Cambridge, MA.

Bell G.G. [2005], Clusters, networks, and firm innovativeness, *Strategic Management Journal*, 26: 287–295.

Birkinshaw J., Hood N. [1998], Multinational subsidiary evolution: capability and charter change in foreign-owned subsidiary companies, *The Academy of Management Review*, 23: 773–795.

Birkinshaw J., Hood N., Jonsson S. [1998], Building firm-specific advantages in multinational corporations: The role of Subsidiary Initiative, *Strategic Management Journal*, 19: 221–241.

Birkinshaw J., Hood N., Young S. [2005], Subsidiary entrepreneurship, internal and external competitive forces, and subsidiary performance, *International Business Review*, 14(1): 227–248.

Bollen K.A., Stine R.A. [1992], Bootstrapping Goodness-of-Fit Measures in Structural Equation Models, *Sociological Methods Research*, November, 21(2): 205–229.

Bresciani S., Ferraris A. [2016], Innovation-receiving subsidiaries and dual embeddedness: impact on business performance, *Baltic Journal of Management*, 11(1): 108–130.

Buckley P., Carter M.J. [1999], Managing cross-border complementary knowledge, *Studies of Management and Organization*, 29(1): 80–104.

Buckley P., Hashai N. [2009], Formalizing internationalization in the eclectic paradigm, *Journal of International Business Studies*, 40(1): 58–70.

Cano-Kollman M., Cantwell J., Hannigan T., Mudambi R., Song J. [2016], Editorial: Knowledge connectivity: An agenda for innovation research in international business, *Journal of International Business Studies*, 47(3): 255–262.

Cantwell J., Mudambi R. [2005], MNE competence-creating subsidiary mandates, *Strategic Management Journal*, 26: 1109–1128.

Ciabuschi F., Dellestrand H., Martín Martin O. [2011], Internal embeddedness, headquarters involvement, and innovation importance in multinational enterprises, *Journal of Management Studies*, 48(7): 1612–1639.

Ciabuschi F., Holm U., Martin Martin O. [2014], Dual embeddedness, influence and performance of innovating subsidiaries in the MNC, *International Business Review*, 23(5): 897–909.

Claver-Cortes E., Zaragoza-Saez P., Ubeda-Garcia M., Marco-Lajara B. [2018], Strategic knowledge management in subsidiaries and MNC performance. The role of the relational context, *Journal of Knowledge Management*, 22(5): 1153–1175.

Commission Implementing Regulation (EU), No. 995/2012 of 26 October 2012, laying down detailed rules for the implementation of Decision No. 1608/2003/EC of the European Parliament and the Council concerning the production and development of Community statistics on science and technology. *Official Journal of the European Union* L 299/18, 27.10.2012, https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:299:0018:0030: EN:PDF

Crespo C.F., Griffith D.A., Lages L.F. [2014], The performance effects of vertical and horizontal subsidiary knowledge outflows in multinational corporations, *International Business Review*, 23(5): 993–1007.

Dahms S. [2017], Determinants of foreign-owned subsidiary performance in emerging economies: Evidence from Taiwan, *Management Research Review*, 40(6): 626–647.

Damijan J.P., Kostevc C., Rojec M. [2010], Does foreign subsidiary's network status impact its innovation activity?, *MICRO-DYN, EU Sixth Framework Programme*, Working Paper No. 27/10.

De Beule F., Van Beveren I. [2019], Sources of open innovation in foreign subsidiaries: An enriched typology, *International Business Review*, 28(1): 135–147.

De Jong G., Van D.V., Beugelsdijk S., Jindra B. [2014], The future of successful MNC: subsidiary decision-making autonomy, embeddedness and innovation, *Proceedings of the 40th EIBA Annual Conference*, Uppsala, Sweden.

Delany E. [2000], Strategic development of the multinational subsidiary through subsidiary initiative taking, *Long Range Planning*, 33: 220–244.

Demeter K., Szasz L., Racz B-G. [2016], The impact of subsidiaries' internal and external integration on operational performance, *International Journal of Production Economics*, 182: 73–85.

Doran J. [2012], Are differing forms of innovation complements or substitutes? *European Journal of Innovation Management*, 15(3): 351–371.

Doz Y.L., Santos J., Williamson P. [2001], *From Global to Metanational: How Companies Win in the Knowledge Economy*, Harvard Business School Press, Cambridge, MA.

Dunning J.H., Lundan S.M. [2008], *Multinational Enterprises and the Global Economy*, 2nd ed., Edward Elgar, Cheltenham, UK.

Efron B., [1979], Bootstrap Methods: Another Look at the Jackknife, *The Annals of Statistics*, 7(1): 1–26.

E&Y [2016], *How can Europe's investors turn resilience into growth?*, EY's attractiveness survey Europe 2016.

Ferraris A. [2014], Rethinking the literature on 'multiple embeddedness' and subsidiary-specific advantages, *Multinational Business Review*, 22(1): 15–33.

Ferraris A., Santoro G., Dezi L. [2017], How MNC's subsidiaries may improve their innovative performance? The role of external sources and knowledge management capabilities, *Journal of Knowledge Management*, 21(3): 540–552.

Figueiredo P.N. [2011], The role of dual embeddedness in the innovative performance of MNE subsidiaries: Evidence from Brazil, *Journal of Management Studies*, 48(2): 417–440.

Filippov S., Duysters G. [2014], Exploring the drivers and elements of subsidiary evolution in several new EU members states, *International Journal of Emerging Markets*, 9(1): 120–146.

Forsgren M., Holm U., Johanson J. [2005], *Managing the Embedded Multinational: A Business Network View*, Edward Elgar, Cheltenham, UK.

Frenz M., Ietto-Gilles G. [2009], The impact on innovation performance of different sources of knowledge: evidence from the UK Community Innovation Survey, *Research Policy*, 38: 1125–1135.

Frost T., Birkinshaw J., Ensign S. [2002], Centres of excellence in multinational corporations, *Strategic Management Journal*, 23(11): 997–1018.

Furman J., Porter M.E., Stern S. [2002], The determinants of national innovative capacity, *Research Policy* 31: 899–933.

Gammelgaard J., McDonald F., Stephan A., Tüselmann H., Dörrenbächer C. [2012], The impact of increases in subsidiary autonomy and network relationships on performance, *International Business Review*, 21(6): 1158–1172.

Gammelgaard J., Pedersen T. [2010], Internal versus external knowledge sourcing of subsidiaries and the impact of headquarters control, in Andersson U. and Holm U. (eds), *Managing the Contemporary Multinational: The Role of Headquarters*: 211–230, Edward Elgar, Cheltenham, UK.

Gerschewski S., Lindsay V.J., Rose E. [2016], Advancing the entrepreneurial orientation construct: the role of passion and perseverance, *Review of International Business and Strategy*, 26(4): 446–471.

Gnyawali D., Signal M., Mu S. [2009], Knowledge ties among subsidiaries in MNCs: A multilevel conceptual model, *Journal of International Management*, 15(2): 387–400.

Gołębiowski T., Lewandowska M.S. [2015], Influence of internal and external relationships of foreign subsidiaries on innovation performance. Evidence from Germany, Czech Republic and Romania. *Journal of East European Management Studies*, 20(3): 304–327.

Gupta A.K., Govindarajan V. [2000], Knowledge flows within multinational corporations, *Strategic Management Journal*, 21(4): 473–496.

Ha Y.J., Giroud A. [2015], Competence-creating subsidiaries and FDI technology spillovers, *International Business Review*, 24(4): 605–614.

Hallin C., Holm U., Sharma D.D. [2011], Embeddedness of innovation receivers in the multinational corporation: effects on business performance, *International Business Review*, 20(3): 362–373.

Harzing A-W., Noorderhaven N. [2006], Knowledge flows in MNCs: An empirical test and extension of Gupta/Govindarajan's typology of subsidiary roles, *International Business Review*, 15(3):195–214.

Holm U., Johanson J., Thilenius P. [1995], Headquarters knowledge of subsidiary network context in the multinational corporation, *International Studies of Management and Organization*, 25 (1–2): 97–120.

Holm U., Pedersen T. [2000], *The Emergence and Impact of MNC Centers of Excellence: A Subsidiary Perspective*, Macmillan, London.

Horn P., Scheffler P., Schiele H. [2014], Internal integration as a pre-condition for external integration in global sourcing: asocial capital perspective, *International Journal of Production Economics*, 153: 54–65.

Johanson J., Vahlne J.E. [2009], The Uppsala internationalization process model revisited: From liability of foreignness to liability of outsidership, *Journal of International Business Studies*, 40(9): 1411–1431.

Kline R.B. [2011], *Principles and Practice of Structural Equation Modeling*, The Guilford Press, New York.

Konarski R. [2010], *Modele równań strukturalnych*, Wydawnictwo Naukowe PWN, Warszawa.

Kostova T., Marano V., Tallman S. [2016], Headquarters-subsidiary relationships in MNCs: fifty years of evolving research, *Journal of World Business*, 51(1): 176–184.

Lavie D. [2006], The competitive advantage of interconnected firms: An extension of the resource-based view, *Academy of Management Review*, 31: 638–658.

Lewandowska M.S., Rószkieiwcz M., Weresa A.M. [2018], Additionality from public support to R&D and innovation in the European Union, in *Strengthening the Knowledge Base in the European Union*, Weresa M.A. (ed.), PWN, Warsaw.

Lewandowska M.S., Szymura-Tyc M., Gołębiowski T. [2016], Innovation complementarity, cooperation partners, and new product export: Evidence from Poland, *Journal of Business Research*, 69(9): 3673–3681.

Lim C., Hemmert M., Kim S. [2017], MNE subsidiary evolution from sales to innovation, *International Business Review*, 26(1): 145–155.

Lumpkin G.T., Dess G.G. [1996], Clarifying the entrepreneurial orientation construct and linking it to performance, *Academy of Management Review*, 21: 135–172.

Martinez-Ros E., Labeaga J. [2009], Product and process innovation: Persistence and complementarities, *European Management Review*, 6(1): 64–75.

Meyer K., Mudambi R., Narula R. [2011], Multinational enterprises and local contexts: the opportunities and challenges of multiple embeddedness, *Journal of Management Studies*, 48(2): 235–252.

Michailova S., Zhan W. [2015], Dynamic capabilities and innovation in MNC subsidiaries, *Journal of World Business*, 50(3): 576–583.

Morschett D., Schramm-Klein H. [2011], Chapter 8 Successful subsidiary strategy in different environments – A configurational perspective, in Verbeke A., Tavares-Lehmann A.T., Van Tulder R. (eds.), *Entrepreneurship in the Global Firm*, (Progress in International Business Research, Vol. 6: 167–195, Emerald, Bingley, UK.

Mothe C., Nguyen-Thi T.U. [2010], The link between non-technological innovations and technological innovation, *European Journal of Innovation Management*, 13(3): 313–332.

Mu S.C., Gnyawali R.D., Hatfield D.E. [2007], Foreign subsidiaries' learning from local environments: An empirical test, *Management International Review*, 47(1): 79–102.

Mudambi R., Pedersen T. [2007], Agency theory and resource dependency theory: Complementary explanations for subsidiary power in multinational corporations, in Pedersen T., Volberda H. (eds.), *Bridging IB Theories, Constructs, and Methods across Cultures and Social Sciences*, Palgrave-McMillan, Basingstoke.

Mudambi R., Piscitello L., Rabbiosi L. [2014], Reverse knowledge transfer in MNEs: Subsidiary innovativeness and entry modes, *Long Range Planning* 47(1): 49–63.

Najafi-Tawani Z., Giroud A., Andersson U. [2014], The interplay of networking activities and internal knowledge actions for subsidiary influence within MNC, *Journal of World Business*, 49(1): 122–131.

Narula R. (2014], Exploring the paradox of competence-creating subsidiaries: balancing bandwidth and dispersion in MNEs, *Long Range Planning*, 47 (1–2): 4–15.

Narula R., Guimont J. [2010], *The R&D activity of multinational enterprises in peripheral economies: Evidence from the EU new member states*, UNU-MERIT Working Papers, No. 2010–048.

Peng M., Meyer K. [2016], *International Business*. 2nd ed., Cengage Learning EMEA, Andover, UK.

Phene A., Almeida P. [2008], Innovation in multinational subsidiaries: the role of knowledge assimilation and subsidiary capabilities, *Journal of International Business Studies*, 39: 901–919.

Porter M.E. [1985], *Competitive Advantage*: *Creating and Sustaining Superior Performance*, The Free Press, New York.

Prahalad C.K., Krishnan M.S. [2008], *The New Age of Innovations. Driving Co-created Value through Global Networks*, McGraw-Hill, New York.

Rabbiosi L., Santangelo G.D. [2013], Parent company benefits from reverse knowledge transfer: The role of the liability of newness in MNEs, *Journal of World Business*, 48(1): 160–170.

Reilly M., Scott P., Mangemetin V. [2012], Alignment or independence? Multinational subsidiaries and parent relations, *Journal of Business Strategy*, 33(2): 4–11.

Rugman A.M., Verbeke A. [2001], Subsidiary-specific advantages in multinational enterprises, *Strategic Management Journal*, 22(3): 237–250.

Schmid S., Schurig A. [2003], The development of critical capabilities in foreign subsidiaries: disentangling the role of the subsidiary's business network, *International Business Review*, 12(6): 755–782.

Schuh A. [2012], Strategy review for Central and Eastern Europe: Strategic responses of foreign multinational corporations to the recent economic and financial crisis, *Journal of East-West Business*, 18(2): 185–207.

Schumacker R.E., Lomax R.G. [2004], *A beginner's guide to Structural Equation Modeling*, Lawrence Erlbaum Associates.

Singh D. [2012], Emerging economies and multinational corporations: An institutional approach to subsidiary management, *International Journal of Emerging Markets*, 7(4): 397–410.

Strutzenberger A., Ambos T.C. [2014], Unravelling the subsidiary initiative process: a multilevel approach, *International Journal of Management Reviews*, 16: 314–339.

Tsai W. [2001], Knowledge transfer in intra-organizational networks: effects of network position and absorptive capacity on business innovation and performance, *Academy of Management Journal*, 44(5): 996–1004.

Vahlne J.E., Johanson J. [2013], The Uppsala model on evolution of the multinational business enterprise – from internalization to coordination of networks, *International Marketing Review*, 30(3): 189–312.

Van Beers C., Zand F. [2014], R&D cooperation, partner diversity, and innovation performance: An empirical analysis, *Journal of Product Innovation Management*, 31(2): 292–312.

Vernaik S., Midgley D.F., Devinney T.M. [2005], Dual paths to performance: the impact of global pressures on MNC subsidiary conduct and performance, *Journal of International Business Studies*, 36(6): 655–675.

Veugelers R. [1997], Internal R&D expenditures and external technology sourcing, *Research Policy*, 26(3): 303–315.

Wach K., Głodowska A., Maciejewski M. [2018], Entrepreneurial orientation, knowledge utilization and internationalization of firms, *Sustainability*, 10(12), 4711: 1–23.

Williams C. [2009], Subsidiary-level determinants of global initiatives in multinational corporations, *Journal of International Management*, 15(1): 92–104.

Wright S., [1921], Correlation and causation, *Journal of Agricultural Research*, 20: 557–585.

Wright S. [1934], The method of path coefficients, *Annals of Mathematical Statistics*. 5(3): 161–215. doi:10.1214/aoms/1177732676.

Wright S. [1960], Path Coefficients and Path Regressions: Alternative or Complementary Concepts?, *Biometrics*, 16(2) (June): 189–202, https://www.jstor.org/stable/2527551

Yamin M., Andersson U. [2011], Subsidiary importance in the MNC: What role does internal embeddedness play?, *International Business Review*, 20(2): 151–162.

Yang Q., Mudambi R., Meyer K.E. [2008], Conventional and reverse knowledge flows in multinational corporations, *Journal of Management*, 34: 882–902.

Zhang F., Jiang G., Cantwell J.A. [2015], Subsidiary exploration and the innovative performance of large multinational corporations, *International Business Review*, 24(2): 224–234.

Zhao X., Huo B., Selen W., Yeung J.H.Y. [2011], The impact of internal integration and relationship commitment on external integration, *Journal of Operational Management*, 29(1): 17–32.

Dualne zakorzenienie filii zagranicznych a przewaga konkurencyjna wynikająca z innowacji

Streszczenie: Zagraniczne spółki zależne (filie zagraniczne) angażują się w dwa rodzaje współpracy: współpracę wewnętrzną (korporacyjną: z firmą matką oraz innymi filiami córkami) i współpracę zewnętrzną (międzyorganizacyjną). Opierając się na koncepcji „dualnego zakorzenienia", niniejszy artykuł proponuje model wyjaśniający rolę relacji wewnętrznych i zewnętrznych w budowaniu przewagi konkurencyjnej wynikającej z innowacji. W opracowaniu opisano wyniki analizy ścieżek, wykonanej przy wykorzystaniu danych z kwestionariusza Community Innovation Survey 2010–2012 na próbie przedsiębiorstw – członków grup kapitałowych z 10 państw UE, w większości krajów Europy Środkowo-Wschodniej. Wyniki pokazują pozytywny wpływ podwójnego zakorzenienia na innowacyjność filii zagranicznych, prowadzącego do budowania przewagi konkurencyjnej opartej zarówno na kosztach, jak również wyróżnianiu się. Wiedza pozyskiwana z zewnątrz jest mediatorem związku między relacjami wewnątrz korporacji a budowaną przewagą konkurencyjną. Relacje zewnętrzne i wewnętrzne nie wykluczają się nawzajem, wręcz przeciwnie – jeśli występują jednocześnie, wzmacnia to ich wpływ na innowacyjność. Integracja wewnętrzna odgrywa decydującą rolę w budowaniu przewagi konkurencyjnej wynikającej z innowacji nakierowanej na obniżanie kosztów, podczas gdy relacje zewnętrzne mają większy wpływ na przewagę konkurencyjną wynikającą z różnicowania. Kierownictwo przedsiębiorstw powinno więc promować oba typy relacji, uwzględniając ich odrębne role w procesie budowania przewagi konkurencyjnej.

Słowa kluczowe: przewaga konkurencyjna, filie zagraniczne, kraje Europy Środkowo-Wschodniej, dualne zakorzenienie, analiza ścieżek

Kody klasyfukacji JEL: L21, L25, O32