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# *Managing Global Transitions*

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#### AIMS AND SCOPE

Transition is the widely accepted term for the thorough going political, institutional, organizational, social, and technological changes and innovations as well as economy-wide and sector changes in societies, countries and businesses to establish and enhance a sustainable economic environment.

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# *Micro-Business Owner-Managers' Growth Intentions in Sparsely Populated Areas in Northern Finland*

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This research provides new information on the prerequisites for micro-firms operating in sparsely populated areas. Micro-business constitutes a numerically dominant group in every economy. In recent years, small businesses and small and medium enterprises, the latter two of which form the backbone of many countries' economies, have attracted considerable research attention. This study has a twofold aim: (1) to highlight the scant attention paid by researchers to micro-enterprises and (2) to investigate the growth of independently owned micro-businesses and compare self-evaluated growth stages with the change in the turnover volume. This case study synthesises two empirical stage models into two self-evaluation frameworks used for 53 technology- and service-based firms. The results indicate that the selected growth stages correspond relatively well to the micro-businesses' growth.

*Key Words:* micro-enterprise, entrepreneurship, micro-business, stage of growth, framework

*JEL Classification:* D22, L21, L25, M51

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## **Introduction**

Undoubtedly, entrepreneurship plays an important role in the economies of most countries; small- and medium-sized enterprises (SMES) form the

backbone of the European Union's (EU) economy, producing most of the new jobs. However, rural businesses face significant constraints in their development, relating to proximity to customers and access to business advice (Keeble et al. 1992). In many studies, SMEs are often associated with a high rate of national economic growth (see Beck, Demirguc-Kunt, and Levine 2005; Reynolds 1997; Robson and Bennett 2000). Additionally, in 2014, SMEs in the EU employed 88.8 million people, which comprised 66.9% of all private-sector jobs and generated 58% of all private-sector added value (European Commission 2015). However, a large SME base does not directly cause economic growth and should be considered only one characteristic of a successful national economy.

Entrepreneurship signifies economic growth (Sexton and Bowman-Upton 1991). The relevant literature can be summarised in terms of the antecedents and the consequences of growth (Wiklund 1998). In this analysis, both technology- and service-based self-evaluation frameworks were used to determine each micro-firm's current growth stage, and the growth stages were then compared with the change in the turnover volume. This study used four stages for a technology-based firm's self-evaluation framework (Muhos 2011; Muhos et al. 2010). At stage 1, conception and development, the newly established firm is owner-dependent. At stage 2, commercialisation, there are early reference customers. At stage 3, expansion, manufacturing and technical feasibility and market acceptance lead to high growth and continual change. At stage 4, stability and renewal, the firm faces a slowing growth rate and intense competition in a maturing product market.

The condensed self-evaluation framework for the early stages of a service-based firm (modified from Muhos et al. 2017) is described as follows. At stage 1, the service-based start-up focuses on developing and delivering services and building its market identity to survive. At stage 2, as market acceptance leads a service-based firm to rapid growth and constant change, the primary emphasis turns to growth management. At stage 3, because of market saturation and increased competition, a service-based firm's attention shifts to improving profitability and efficiency by formalising rules, procedures and financial controls. At stage 4, to gain new momentum, a service-based firm concentrates on new service generation, whether in business areas or locations, and on the development of a uniform firm culture. Many micro-companies' lack of growth and lack of propensity to become involved in externally supplied training and development activities lie at the centre of the policy chal-

lenge (Devins et al. 2005). Businesses in more rural or peripheral regions may have more limited potential to develop collaborative arrangements or call for external inputs (Bennett, Robson, and Bratton 2001).

Knowledge has been identified as one of the most important resources that contributes to an organisation's competitive edge, providing a sustainable advantage in a competitive and dynamic economy (e.g., Foss and Pedersen 2002; Pan and Scarbrough 1999). The significance of innovation and knowledge transfer in the regional economic development process has increasingly been highlighted. Many studies have emphasised the importance of external knowledge for organisational learning (e.g., Anusornnitisarn et al. 2010). Correct knowledge is an asset to micro-business owner-managers and should be a platform for all business decisions.

This study aims to investigate the growth stage of independently owned technology- or service-based micro-firms that are less than 15 years old. This study's research question is as follows: How well does the micro-business owner's self-evaluated growth stage match the company's realised turnover development?

The following section provides the study's theoretical background via a review of the literature on regional development, business growth and sparsely populated areas (SPAs). The third section discusses the research method, while the fourth presents the results of the search for micro-business articles in the Scopus database. The fifth section covers the gross case analysis of self-evaluated growth stages. The last section includes the conclusions, limitations and suggested areas for further research.

### **Theoretical Background**

The regional level is an important aspect for understanding entrepreneurship and competitiveness, whereas a nation is often used as the unit of analysis in studies regarding economic development (Porter 2003; Verheul et al. 2002). Jokela, Niinikoski, and Muhos (2015) argue that innovations in micro-sized companies pose challenges to the regional innovation system, especially in how to reach innovators at the early stages of the process. Entrepreneurship has potentially short-, medium- and long-term consequences for regions, including the creation of employment and wealth (Fritsch and Mueller 2004; Mueller, Van Stel, and Storey 2008). A well-organised business will grow and survive, while an unproductive enterprise will decline and collapse (Audretsch and Keilbach 2004); therefore, the total effect on employment can be either positive or negative (Fritsch and Mueller 2004; Mueller et al. 2008).

The regions' ability to gain from the positive effects of entrepreneurship will depend on their institutional arrangements and social pay-off structures (Baumol 1990), along with their capacity to apply knowledge to regional growth through the creation and the dissemination of knowledge (Audretsch and Keilbach 2004).

The regions' competitiveness refers to the presence of the conditions that enable firms to compete in their chosen markets and to the firms' generated value to be captured within a region (Begg 1999; Huggins 2003). Hence, regions can influence entrepreneurial activities via a shared culture or a set of formal and informal rules (Werker and Athreye 2004).

Firm growth and its reason constitute an important and well-studied topic in economic literature (Brenner and Schimke 2015). Particularly, McKelvie and Wiklund (2010, 280) identify three research streams (growth as an outcome, the outcome of growth and the growth process) and three basic modes of growth (organic, acquisitive and hybrid). Regarding this issue, two fields are important in our study. First, some approaches aim to identify and analyse firms' growth stages and development paths (e.g., Delmar, Davidsson, and Gartner 2003). Delmar, Davidsson, and Gartner (2003) recognise different patterns of firm growth that are related to a firm's age, size and industry affiliation. Additionally, they focus their analysis on the variations of firm growth measures (i.e., relative, absolute sales growth and organic growth). Among the approaches are those concentrating on the sequence and the duration of growth phases during the life cycle of firms (e.g., Garnsey, Stam, and Heffernan 2006). They analyse new firms' growth paths that are categorised by patterns of survival, continuous growth, turning points, reversals and cumulative growth.

Gibrat's law, which states that firm growth is quite random, has been considered false by most of the current researchers (e.g., Lotti, Santarelli, and Vivarelli 2009). Nevertheless, other scholars seem to agree that firm growth, especially in the short term, is much more random (e.g., Liu, Tsou, and Hammitt 1999). It is commonly assumed that some determinants exert influence on firm growth. For example, Oliveira and Fortunato (2006) find that firms with higher foreign participation (e.g., export orientation) appear to grow faster than others. Other empirical studies examine whether firm growth can be explained by firm characteristics, such as size and industry affiliation (e.g., Bottazzi and Secchi 2006; Harhoff, Stahl, and Woywode 1998). Another important issue is the relation between strategic decision making and firm performance (e.g., Baum and Wally 2003). Baum and Wally (2003) suggest that, generally, the speed



of an entrepreneur's decision making predicts subsequent firm growth and profits.

According to the Eurostat (see [http://ec.europa.eu/eurostat/statistics-explained/index.php/Regional\\_typologies\\_overview](http://ec.europa.eu/eurostat/statistics-explained/index.php/Regional_typologies_overview)), a SPA (sparsely populated area) is defined as a region with a population density below 12.5 inhabitants per km<sup>2</sup>. The northern parts of Finland, Sweden and Norway and most of Iceland can be defined as northern SPAs (NSPAs). The NSPAs' characteristics are that they are peripheral, with cold climates, low population densities and dispersed settlement patterns (Gløersen et al. 2006). Businesses in SPAs tend to be small, and small businesses in rural communities face geo-demographic, sociocultural and economic concerns (Stathopoulou, Psaltopoulos, and Skuras 2004).

Empirical evidence suggests that, despite the higher competition in urban areas (Minniti 2011, 125), population density, growth and size increase entrepreneurship rates (Reynolds, Storey, and Westhead 1994; Shane 2003; Sternberg 2009). Many formal and informal economic institutions support urban entrepreneurship (Gløersen et al. 2006). In their literature review, Gløersen et al. (2009) cite higher returns, greater supply of ideas, more resources and differences in the local cultures and policies as reasons why entrepreneurship is superior in urban areas. Moreover, areas with higher population densities offer entrepreneurs (and potential ones) more observation possibilities (Shane 2003). This finding is confirmed by innovation scholars, who point out the importance of proximity for entrepreneurial dynamics due to a mode of innovation based on doing, using and interacting (Jensen et al. 2007).

Furthermore, entrepreneurs in their home areas (which may be rural) can benefit from their established professional networks and knowledge of their locations (Dahl and Sorenson 2012). While rural areas tend to have a lower demand for products and services, entrepreneurs may feel compensated by decreased living costs in general or a more tranquil lifestyle, which may be preferred (Freire-Gibb and Nielsen 2014).

The Finnish national strategy is to enhance the business sector and, with its comprehensive entrepreneurship support policy, the government aims to help foster businesses, particularly their growth ('Programme of Prime Minister' 2011). The framework of the self-evaluation growth stages provides a tool to improve the preconditions and the climate of business by supporting the research on micro-business. Based on the study of Saarela et al. (2015), a successful enterprise sector can be considered a vital contributing factor to growth, development and better living

conditions in SPAs. However, Shane (2009) argues that considerable evidence shows that these policies lead people to start marginal businesses that are likely to fail, have little economic impact and generate minimal employment.

### **Methodology**

This retrospective multiple-case study used a holistic research strategy (Saunders, Lewis, and Thornhill 2007; Yin 2003). Multiple data-collection techniques may be employed in case studies and are likely to be used in combination (Saunders, Lewis, and Thornhill 2007). Moreover, both qualitative and quantitative evidence can be shown in case studies (Yin 2003); in fact, Yin (2003) encourages using both techniques. In line with Yin's (2003) guidelines, we collected a combination of qualitative and quantitative evidence and focused on a qualitative analysis. At the data-collection phase, qualitative techniques may include focus groups, individual in-depth interviews and case studies (Cooper and Schindler 2010). The qualitative researcher often conducts content analysis of written or recorded materials. We divided the research process into three stages: research design, data collection and analysis, and cross-analysis and conclusion (figure 1).

This search was conducted by using methodical, rigorous standards typical of a systematic literature review (Fink 2004; Okoli and Schabram 2010). This search's inclusion criteria required selected keywords to appear in an article's title, abstract or its own list of keywords; the article to be indexed in the database searched (see [www.scopus.com](http://www.scopus.com)); and the article to be published in a peer-reviewed journal, as research presented in such journals is considered valid and more likely to have a greater effect in its field. Additionally, the study only included articles published in English between 2000 and 2015. Finally, although a number of other potentially relevant publications could be found using the keywords chosen, the study only included journal articles.

The keywords used were *micro-*, *small*, *medium-sized* and *large enterprise*. The subject areas searched were the social sciences and humanities, which included arts and humanities, business, management and accounting, decision sciences, economics, econometrics and finance, psychology, social sciences and multidisciplinary fields.

The case companies' data were collected from semi-structured interviews designed to capture information about economic indicators and the growth stages of the technology- and the service-based micro-firms.

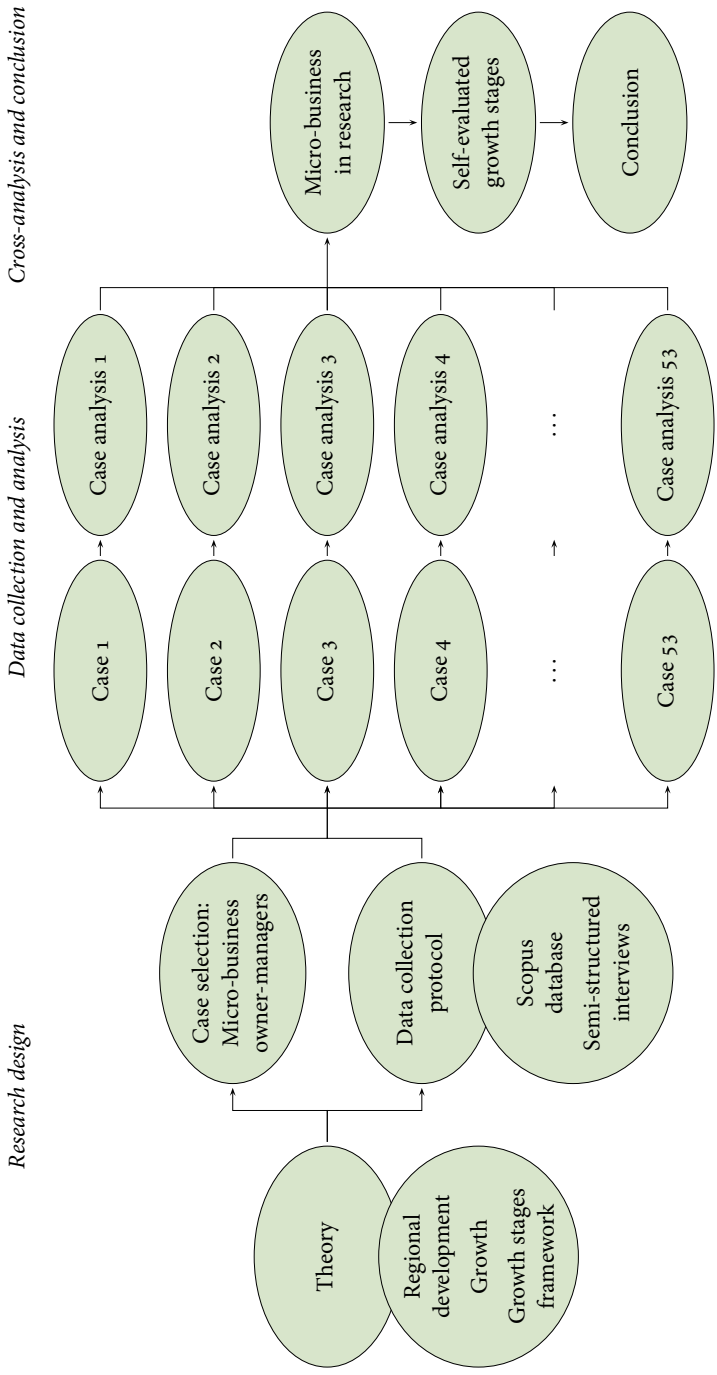


FIGURE 1 The Research Process

During each interview, the firm's age when the changes of a growth stage happen (year) and the turnover of the last 10 years, if applicable, were requested from the micro-business owner-manager. The interviews were constructed to allow interviewees to explain and clarify the topics discussed. The questionnaire, which included a description of the growth stages, was sent early enough to give interviewees time to review it in advance. In total, 53 micro-firm owner-managers operating in Northern Ostrobothnia, Finland, were interviewed by telephone, and each interview lasted up to half an hour. The interviewees' experiences and interests ensured high motivation and relevant knowledge of the topics discussed.

The positions of the interviewees were as follows: self-employed people (11), entrepreneurs (19), managing directors (18), board members (4) and other (1). Their work experiences ranged between 1 and 35 years, with an average of 11 years. The respondents comprised 32 males and 21 females. The firms were originally founded by 49 of the 53 respondents. The case firms' ages varied from 1 to 31 years, averaging 11 years. The legal types were as follows: limited (33), limited partnership (6), trade name (12) and open company (2). The numbers of employees in 2016 varied from 1 to 9, with an average of 3 employees. The firms' turnover figures varied from €10,000 to €1,500,000, with an average of €368,698.

### **Micro-Business in Research Articles from 2000 to 2015**

Across the EU28 countries in 2013, 21.6 million SMES in the non-financial business sector employed 88.8 million people and generated €3.666 trillion in added value. Expressed another way, 99 out of every 100 businesses in the non-financial business sector were SMES, 2 out of every 3 private-sector employees worked for SMES, and an SME contributed 58 cents of every euro of private-sector added value (European Commission 2014, 6).

According to Falk et al. (2014), it is well known that micro-companies form a dynamic group of firms, characterised by a large proportion of young enterprises and higher growth rates but high exit rates as well. The lack of studies on micro-firms is a result of the difficulty of obtaining the relevant firm-specific information (Falk and Hagsten 2015). However, an unambiguous finding in the literature is that micro-enterprises are most often not distinguished from larger SMES (Falk et al. 2014). Although SMES are rightly acknowledged as vital to every EU country, is the role of micro-enterprises sufficiently recognised?

Businesses in the EU28 countries in 2013 included the following: 92.4%

TABLE 1 Research Articles by Business Size and Publication Year

Keywords	No. of articles	2000–	2006–	2011–	%
		2005	2010	2015	
Micro enterprise	1,238	169	371	698	6
Small enterprise	9,587	1,499	3,206	4,882	44
Medium-sized enterprise	4,486	678	1,585	2,223	20
Large enterprise	6,536	1,065	2,220	3,251	30
Total	21, 847	3,411	7,382	11,054	100

micro-enterprises, 6.4% small, 1.0% medium and 0.2% large enterprises (European Commission 2014, 14). European Commission (2013) list 13 growth challenges for SMEs in the EU28 countries, as follows: administrative and regulatory burdens, access to capital, taxation, lack of skilled workers, access to public procurement contracts, unfair/too strong competition, labour laws, access to single markets, access to EU programmes, late payments, access to international markets, access to information and advice, and instability of the world economy/energy cost.

The definition of *enterprise* differs by country; thus, this study used the EU's definition. The research articles identified in the Scopus database totalled 21,874. The keyword *micro* returned 6% of the total, the keywords *small* and *medium-sized* together yielded 64% and the keyword *large enterprise* returned 30%. However, the keywords *small* and *medium-sized* might have returned some articles that were actually about micro-enterprises, although studies on small and medium-sized enterprises often exclude micro-enterprises (table 1).

As might be expected, the three countries that published the most English-language articles about business and entrepreneurship during the time period included in the study were the United Kingdom (UK) (3,838), the United States (US) (3,810) and Australia (1,223). The number of articles published by researchers in developing countries was insignificant.

The literature search identified 21,847 relevant journal articles from the Scopus database. The study did not analyse the contents of the articles. However, in 2013, micro-enterprises provided 29.1% of all private-sector jobs in the EU28 countries, followed by small enterprises with 20.6% and medium-sized enterprises with 17.2% (European Commission 2014, 14). In 2014, SMEs accounted for 71% of the employment growth in the non-financial business sector, including many sectors of the economy, except

financial services, government services, education, health, arts and culture, agriculture, forestry and fishing (European Commission 2015, 36).

Various studies use a wide range of definitions of small, medium-sized and large enterprises, making it difficult to directly compare study results. Additionally, some studies do not clearly state the definitions they are using for the various business sizes. For example, the definition of SME differs between the EU and the US. Therefore, the difference in definitions must be taken into account when comparing SME studies from these two sources. The US has no widely accepted common definition of SME, but in many cases, an SME is defined as having fewer than 500 employees. However, this definition differs, for example, by industry (Ayyagari, Beck, and Demircuc-Kunt 2007).

The search makes clear that micro enterprises play a relatively important role in terms of both economic contribution and employment. Therefore, it is odd that micro enterprises are not addressed in more studies. As table 1 shows, SMEs have attracted considerable research attention, accounting for 64% of the articles returned by the database search covering 2000–2015. About three-quarters of SMEs are active in the following five key sectors: wholesale and retail trade, manufacturing, construction, business services, and accommodation and food services (European Commission 2015). Additionally, the search results suggest that well-done research supports micro-entrepreneurs by providing them with much-needed data.

### **Self-Evaluated Growth Stage**

In this analysis, both technology- and service-based self-evaluation frameworks were used to determine the micro-firms' current growth stages. To create these frameworks, this retrospective multiple-case study synthesised two empirical stage models of technology-based (see Muhos 2011; Muhos et al. 2010) and service-based enterprise growth (Muhos et al. 2017). In this research, we used the four stages for the technology-based firm's self-evaluation framework (Muhos 2011; Muhos et al. 2010), which are condensed in table 2 (see the appendix for full stage descriptions).

Entrepreneurship has been recognised as fundamental to regional economic development, and it has been suggested that entrepreneurship policies should pay more attention to the various dimensions of different regions (Aoyama 2009; Audretsch et al. 2012).

Similarly, a limited number of 25 empirically based models have been formed to clarify the early stages of service-based firms. The condensed

TABLE 2 The Main Stages of the Self-Evaluation Framework for the Early Stages of a Technology-Based Firm

At stage 1, growth through <i>conception and development</i> , the newly established firm is owner-dependent.
Stage 2, growth through <i>commercialisation</i> , begins with early reference customers. The objective is to create a firm and commercialise a product.
At stage 3, growth through <i>expansion</i> , manufacturing and technical feasibility and market acceptance lead to high growth and continual change. The main objective is to manage the firm towards growth and to increase its market share by manufacturing and marketing the product efficiently and in high volume.
At stage 4, growth through <i>stability/renewal</i> , the firm faces a slowing growth rate and intense competition in a maturing product market. Effort is needed to launch a second generation of the product and to address effectiveness and efficiency issues.

TABLE 3 The Main Stages of the Self-Evaluation Framework for the Early Stages of a Service-Based Firm

At stage 1, growth is through <i>market exploration and commercialisation of service(s)</i> . The service-based start-up focuses on developing and delivering services and building its market identity to survive.
At stage 2, growth is through <i>market acceptance</i> . Since market acceptance leads a service-based firm to rapid growth and constant change, the primary emphasis is on growth management.
At stage 3, growth is through <i>profitability and renewal</i> . Because of market saturation and increased competition, a service-based firm's attention shifts to improving profitability and efficiency by formalising rules, procedures and financial controls.
At stage 4, growth is through <i>diversification</i> . To gain new momentum, a service-based firm concentrates on new service generation (business areas and/or locations) and on the development of a uniform firm culture.

self-evaluation framework for the early stages of service-based firms is described in table 3 (modified from Muhos et al. 2017).

In the beginning of each interview, the micro-business owner-manager was asked to define his or her company's focus of business; it is either a technology-based or a service-based firm, regarding a portion of the turnover. Altogether, 51 of the 53 micro-firm owners self-evaluated their firms' current stage of growth, using the given framework (see table 2 and table 3). Two service-based firm owners did not find any of the stages appropriate. In this study, the real phases of growth of the participating micro-firms, which were stage 3 (expansion) for the technology-based firms and stage 2 (market acceptance) for the service-based firms, indicated the results we were looking for (see table 4).

TABLE 4 Characteristics of Case Companies' Self-Evaluated Stages of Growth

Main business focus	Stage 1	Stage 2	Stage 3	Stage 4	Total
Technology-based	1	3	8	2	14
Service-based	7	9	16	5	37
Total	8	12	24	7	51

TABLE 5 Development of Turnover in Technology-Based Firms

(1)	(2)	(3)	(4)	Turnover (1000 €/year)							(5)
				2009	2010	2011	2012	2013	2014	2015	
Q	6	2015	3	–	10	10	10	20	60	440	380
T	7	2015	4	–	280	360	549	622	705	920	215
BJ	15	2013	4	510	357	400	450	500	550	628	178
M	9	2015	3	244	227	200	201	193	102	260	158
N	4	2015	4	–	–	–	–	660	850	1000	150
BF	13	2010	4	270	270	270	270	300	300	335	65
C	7	2011	3	150	190	274	233	221	184	209	19

NOTES Column headings are as follows: (1) case ID, (2) firm age, (3) stage 3 reached, (4) stage 3 match, (5) change after stage 3 reached.

Next, we analysed in more detail what volume of turnover development materialised in those micro-firms that had reached stage 3 (see table 5). The research focused on companies no more than 15 years old. Eight micro-firms' current phases of growth reached stage 3 or expansion. The firms' ages varied from 4 to 15 years. They reached stage 3 during the years 2010–2015. Case BF had been in stage 3 for 7 years. Cases Q, T, M and N reached stage 3 in 2015. During the interviews, the owners evaluated how well each stage description of the framework corresponded to reality. The scale items were 1 (not at all), 2 (fairly well), 3 (relatively well), 4 (very well) and 5 (extremely well). The link between the self-evaluated expansion stage and the positive development of a firm's turnover was quite evident. Each case company had become capable of growth since stage 3 and had reached it. The technology-based firms' change in turnover was calculated using the following formula: year 2015 turnover – (year of stage 3 reached – 1 year). The change in the technology-based firms' turnover varied from €19,000 to €380,000 (table 5).

Second, we analysed the turnover development in service-based micro-firms that had reached stage 2 (see table e and table 6). The research fo-



TABLE 6 Development of Turnover in Service-Based Firms

(1)	(2)	(3)	(4)	Turnover (1000 €/year)							(5)
				2009	2010	2011	2012	2013	2014	2015	
J	3	2014	4	-	-	-	-	23	170	240	217
G	3	2015	2	-	-	-	-	5	68	166	98
AY	3	2014	4	-	-	-	-	236	334	334	98
AL	12	2010	4	65	82	80	68	62	88	142	77
P	2	2015	2	-	-	-	-	-	20	73	53
Z	11	2013	-	-	-	-	-	173	180	210	37
AT	4	2015	4	-	-	-	-	422	633	668	35
W	6	2015	3	-	5	60	60	35	35	30	-5

NOTES Column headings are as follows: (1) case ID, (2) firm age, (3) stage 2 reached, (4) stage 2 match, (5) change after stage 2 reached.

cused on companies no more than 15 years old. Eight micro-firms' current phases of growth had reached stage 2 or market acceptance. The firms' ages varied from 3 to 12 years. They reached stage 2 during the years 2010–2015. Case AL had been in stage 2 for 7 years. Cases G, P, AT and w reached stage 2 in 2015. During the interviews, the owners evaluated how well each stage description of the framework corresponded to reality. The scale items were 1 (not at all), 2 (fairly well), 3 (relatively well), 4 (very well) and 5 (extremely well).

The link between the self-evaluated expansion stage and the positive development of a firm's turnover was quite evident. Each case, except for Case w, had become capable of growth since stage 2 and had reached it. The service-based firms' change in turnover was calculated using the following formula: year 2015 turnover – (year of stage 2 reached – 1 year). The service-based firms' turnover growth varied from €35,000 to €217,000. In one company, Case w, the change in turnover was negative (€–5,000) (table 6).

### Conclusion

This research provides new information on the prerequisites for micro-firms operating in SPAS. Micro-businesses' substantial impact on the national economy is evident (European Commission 2015). Micro-businesses are numerically dominant in every country's economy. Although micro-firms account for a large majority of SMEs, they remain comparatively under-researched (Gherhes et al. 2016). The literature review in-

dicates a gap in research on micro-enterprises. In contrast, research on SMES is well represented. The lack of studies on micro-enterprises could be caused by researchers focusing on SMES to the exclusion of micro-enterprises. Additionally, the results show relatively few studies from developing countries. Micro-entrepreneurs need research studies to support their practices because limited data on business management and operations are available to them.

Various studies use a wide range of definitions of small, medium-sized and large enterprises, making it difficult to directly compare results. Moreover, some studies do not clearly state what definitions they are using for the various business sizes.

To study the growth stages of micro-businesses, we used two-, four-stage frameworks, one each for technology-based and for service-based firms, and interviewed 53 micro-business owner-managers located in an NSPA. First, we assessed all the micro-firms' current stages of growth. All owner-managers from technology-based firms (14 in total) were able to identify their firms' current stages of growth based on the framework provided. On the other hand, two of the owner-managers from the 39 service-based firms were unable to do so.

Second, we explored the link between the self-evaluated stage of growth and the actual turnover. There was a strong connection between micro-firm growth and how turnover developed. The relationship was stronger in technology-based micro-firms than in service-based ones. The micro-businesses selected for the research did not seek fast growth. Andersson, Tyler, and McCallion (2005) argue that business-service provision has one of the greatest impacts on rural business competitiveness.

Both self-evaluation frameworks may help researchers provide more accurate data on the growth of technology- and service-based micro-firms. Thus, this study creates new context-specific knowledge about the early stages of micro-firm growth, which is needed to strengthen business environments and develop business support services in NSPAs.

This study had several limitations. It included only business and entrepreneurship articles that were published in English in journals that were indexed in one database. From the search results, the percentage of articles relating to micro-enterprises (6%) might be lower than the actual number of articles on this topic, as some of them might have been included with the articles on SMES. The study did not analyse the contents of the articles. It was also limited to Northern Ostrobothnia and its two subregions, Oulu South and Raahe, both located in northern Fin-

land. This case study used turnover development; the turnover described the volume of business but not its profitability. It would be interesting to compare the results of a similar analysis of micro-firms in the rural areas of other EU countries, Asia or the US. More studies are needed to fill this gap and provide adequate data to support micro-enterprise owners.

### **Acknowledgments**

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### **Appendix 1: Questionnaire**

#### *Preliminary Information*

1. Interviewee's name
2. Name of company
3. Interviewee's position in the company
4. Work experience in the company (years)
5. Were you involved in setting up the company: (yes/no)
6. Year of foundation
7. Number of employees (in man-years, 2016)
8. Turnover (€, estimation for 2016)
9. Update the key economic indicators for the last 10 years (if applicable)
10. The company's main turnover is formed by the 1) sales of a technology/product(s) or 2) sales of services.

#### *Self-Assessment of Business Growth*

1. Read the following descriptions of the early stage of growth in technology/service companies.
  - Choose what stage best describes your company's current stage of growth.
2. How well did the descriptions you read correspond to your own experiences of the company's early stages of growth? Choose the appropriate options below:
  - Stages 1–4: (1) not at all, (2) only partially, (3) fairly well, (4) very well or (5) almost perfectly
3. When did the company transition's from one stage to another take place?
  - When did the company move from stage 1 to stage 2 (year and month)?

- When did the company move from stage 2 to stage 3 (year and month)?
- When did the company move from stage 3 to stage 4 (year and month)?
- When did the company move from stage 4 forward (year and month)?

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# *Development of Science and Technology Parks in Poland: Opportunities for New Modes of Cooperation in the Biopharmaceutical Industry*

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The aim of the article is to verify the development of science and technology parks in Poland as well as the opportunities of development of new forms of cooperation with the use of science and technology parks in the biopharmaceutical industry in Poland. The first section reviews the origins and definitions of science and technology parks in order to clarify and systematize the concepts used in existing research and practice. Subsequently, the ensuing sections discuss the evolution of science and technology parks and different organizational models of STPS. Further, the analysis centres on science and technology parks in Poland. Then the importance of science and technology parks for the development of new modes of cooperation in the biopharmaceutical industry is elaborated upon. The paper ends with a set of implications and conclusions.

*Key Words:* biotechnological cluster, science and technology parks, open innovation, open innovation alliance

*JEL Classification:* O32, O33

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## **Introduction**

The ability to create and implement innovation contributes to creating a competitive advantage for businesses, regions and countries. In this context, innovative and entrepreneurial support centres should play an important role in fostering innovation in the economy. The authors of this paper focus on science and technology parks (STPS), which in recent years have become a popular tool for implementing the innovation

policy of the European Union and individual countries. Technological parks, apart from industrial clusters, are considered to be the most advanced and comprehensive institutional form of the knowledge economy (Felsenstein 1994; Asheim and Coenen 2005; Matusiak and Bąkowski, 2008). Technological parks, as a tool of innovation policy of countries and regions, are to contribute to increasing the level of innovation, both at the local and national level.

In the literature of economics, economic geography or public policy, there is no clearly defined theory concerning the formation of technology parks. Link and Scott (2007) found that the most similar theory, to which the phenomena of technological parks may relate, is the concept of industrial clusters. Thanks to the proximity of a technology park, it is possible to streamline knowledge across companies, research institutes and universities, thus fostering innovation. Moreover, technology parks are often trying to attract companies from specific, highly specialized industries, which is analogous to industrial clusters.

The aim of the article is to verify the development of science and technology parks in Poland as well as the opportunities of development of new forms of cooperation with the use of science and technology parks in the biopharmaceutical sector in Poland. The paper is structured as follows. The first section reviews the origins and definitions of science and technology parks in order to clarify and systematize the concepts used in existing research and practice. Subsequently, the ensuing sections discuss the evolution of science and technology parks and different organizational models of STPS. Further, the analysis centres on science and technology parks in Poland. Then the importance of science and technology parks for the development of new modes of cooperation in the biopharmaceutical industry is elaborated upon. The paper ends with a set of implications and conclusions.

### **Science, Research and Technology Parks: Origins and Definitions**

The first parks, as a tool of scientific policy and later innovation policy, appeared in the 1950s. In the literature of the subject, the first unit of this type is listed Bohanson Research Park in Menlo Park, California, founded in 1948 (Wessner 2009). Most researchers consider the first actual technology park, however, to be Stanford Research Park, which was established in 1951 at Stanford University. It was around this park that the so-called Silicon Valley, an area of innovation and high technology, flour-

ished later on. One of the oldest parks in Europe is Cambridge Science Park, created in 1970 (<http://www.cambridgesciencepark.co.uk>), whole twenty years after the establishment of the Stanford Research Park.

For the first technology park in Poland should be recognized Poznan Science and Technology Park, founded on the initiative of the University of Adam Mickiewicz in Poznań in 1995 (Matusiak and Bąkowski 2008). In the 80's and 90's of the 20th century more and more units of this type began to appear, and research conducted cyclically by the International Association of Science Parks and Areas of Innovation (IASP) indicates that more than 50% of science and technology parks in the world were established after 2000 (IASP 2012). In the 80's and 90's of the 20th century, cities brought to life institutes called technology parks to support the process of reindustrialisation, to contribute to regional development, and to create synergies between companies located within parks (Castells and Hall 1994). The specific fashion for creating technology parks in Europe after 2000 may be the result of European Union policies. Many units of this type, also in Poland, were created thanks to the availability of EU funds allocated for the construction of infrastructure, management or development of an innovative environment.

In the literature of the subject there are many names referring to the concept of technology park: science parks, technology, research, science and research, science and technology, industry, industry and technology (Link and Scott 2007; Pelle, Bober, and Lis 2008; Link 2009; World Bank 2010; Matusiak 2011). The IASP conducted a study among these units and presented the following results on the naming (Matusiak and Bąkowski 2008):

- technology park – 30% of all parks,
- science park – 24%,
- science and technology park – 13%,
- research park – 10%,
- technopolis – 5%,
- other – 18%.

Differences in naming of parks result from cultural, legal and ownership differences. In Poland, the most commonly used name is technology park, in France technopolis, and in the United States research park, which is connected with the functioning of parks within the university or in its immediate vicinity. Their functions are convergent and focus on supporting innovation and entrepreneurship.

IASP has created a technology park definition in 2002, according to which a technology park is an organization run by qualified professionals whose aim is to increase the well-being of the community in which it operates by promoting a culture of innovation and competition among knowledge-based entrepreneurs and institutions (IASP 2012). To achieve the above park objectives:

- Stimulates and manages the flow of knowledge and technology between higher education institutions, R&D units, businesses and markets;
- Facilitates the creation and development of knowledge-based enterprises through incubation and budding;
- Adds value to companies through high-quality services and access to high-quality space and infrastructure (IASP 2012).

In the Polish legislation, there is also a definition of a technology park as a set of separated real estate with technical infrastructure, created to transfer knowledge and technology between scientific units and entrepreneurs, where entrepreneurs are offered modern technology services in the field of: consulting in the creation and development of enterprises. The transfer of technology and the transformation of research and development into technological innovation, as well as the creation of favourable business conditions by making available the real estate and technical infrastructure on a contractual basis ('Ustawa z dn. 20 marca' 2002).

The United Kingdom Science Parks Association (<http://www.ukspa.org.uk>) cites the following definition of a science park: A Science Park is a business support and technology transfer initiative that:

- Encourages and supports the start up and incubation of innovation-led, high-growth, knowledge-based businesses.
- Provides an environment where larger and international businesses can develop specific and close interactions with a particular centre of knowledge creation for their mutual benefit.
- Has formal and operational links with centres of knowledge creation such as universities, higher education institutes and research organisations.

The Association of University Research Parks (<http://www.aurp.net>), operating in the United States, defines a university research park as a property-based venture, which:

- Master plans property designed for research and commercialization;

TABLE 1 Main Features of Science and Technology Parks

Goal	Enhancing knowledge transfer from universities to business.
Infrastructure	High quality, low building construction ratio, coupled with a wide range of business support services.
Links	University or a suitable R&D centre must be formally committed to collaborate with the science park and firms (normally, universities should have an important role in the science parks management).
Access	Restricted to knowledge activities, with possible sectoral preferences (if knowledge base is significant across different scientific fields and there is entrepreneurial critical mass – not likely in many ‘followers’ regions).

NOTES Adapted from Almeida, Santos, and Silva (2009, 5).

- Creates partnerships with universities and research institutions;
- Encourages the growth of new companies;
- Translates technology;
- Drives technology-led economic development.

Regardless of naming, parks play a similar role – they stimulate the flow of knowledge and enable the development of entrepreneurship and innovation. The definitional differences result from ownership, legal and cultural determinants. The tasks and services of the park initiatives remain similar and their common features are shown in table 1.

Access to infrastructure, connections with scientific research units and developed organizational structures in an ideal, modelled situation allow realizing the following benefits (Matusiak 2008):

- Research institutions offering new technological solutions and innovative companies seeking new development opportunities;
- Rich business environment in the areas of finance, consulting, training and support for the development of innovative companies;
- Para-bank institutions financing high-risk ventures;
- High quality of infrastructure and environmental values;
- High entrepreneurial potential and business climate, attracting creative people from other regions;
- Government, regional and local programs to support entrepreneurship, technology transfer and the development of new technology companies.

The combination of the aforementioned elements is intended to enable specific objectives to be set before technology parks, namely:

- Incubation of start-up companies – supporting entrepreneurship in general as well as high technology companies is one of the core tasks of technology parks. Typically, incubated companies receive an offer to rent space on preferential terms. Support also covers training, management, legal and accounting services.
- Business services – this service includes advice on business start-up and registration, business plan development, and fundraising. The service is not limited to incubation companies, it is available both to park tenants and outside companies.
- Leasing of office, production, and laboratory and production space – the area may be offered to companies located at the end of the incubation process within the park as well as to outside companies.
- Research services – this applies to services provided by laboratories located in the park.
- Technology transfer services – this is also one of the fundamental objectives of the operation of technology parks. Technology transfer between enterprises and R&D units is carried out when the park can provide specialist services such as innovative project management, marketing services, market research.
- Management of investment areas – some of the parks have the investment space they use for developing businesses.
- Training and education – this is a key issue for incubated businesses and a form of support for existing companies. These companies are often just learning how to operate in the market, so training in running a business, raising capital or marketing is beneficial to them (Matusiak and Bąkowski 2008).

These goals are universal, regardless of the name, legal form or function model adopted by the individual. Over the past 60 years of existence, the concept of technology parks has changed, and the above objectives relate mainly to the so-called parks. In this work, the name for the concept of science, technology, research parks is the technology park, which is the most frequently used name in Poland.

### **Evolution of Science and Technology Parks**

Similar to the case of science and innovation policy, the concept and functions of technology parks have evolved. The literature on the subject lists three generations of technology parks. First-generation science

parks, created in the 1950s and 80s, were aimed at reindustrialisation, industrial development and the transfer of knowledge. Creation of innovative products was treated as an additional function but not as a significant effect of park tenants' activity (Staszków 2013). The parks in those years were located in or near the university campus, while they were mainly established by the university. They decided to set up parks because they wanted to earn money on unused areas of university buildings. Space rental offer was adapted over the years to the needs of new companies that were no longer subject to the reindustrialisation process. The offer was broadened to research laboratories and other specialized facilities, as well as equipment that enabled companies to create new technologies. At the same time universities, seeing the potential inherent in the concept of science parks, turned their attention to the more commercial use of research, often in cooperation with technology park tenants. Consciously created first generation turned out to be a great success. The best example of this statement is Stanford Research Park, which was initiated by Dr. Ted Terman (Matusiak 2011). During his studies at the Massachusetts Institute of Technology, Terman saw the independent concentration of innovative companies around the university. When he became the chancellor at the Stanford University, he had to cope with the financial problems of the university. He designated an industrial zone for small and medium-sized businesses. Thanks to that, the technology park was established, around which the Silicon Valley was founded with its most innovative companies, including Apple, Intel or AMD.

The success of the first parks caught the attention of public authorities, who began to think of technology parks as a tool of innovation policy. Such approach led to the creation of second-generation parks, mainly in the 1990s. Second generation technology parks, in addition to their existing infrastructure functions, provide broadly defined business services, targeted at the development of innovative companies from specific industries, including IT, biotechnology, and medicine. At first, the concentration on the specific industry was the result of the specialization of the 'parent' university, but with time, the politicians came to the floor. Recognizing certain industries as more forward-looking and more profitable, politicians decided to create specialized science and technology parks, and from this time not only at the universities (Henneberry 1984). This is one of the key points in the evolution of the concept of parks – universities have been ceased to be crucial and parks can be established by commercial companies. The specialization of the park activity brings

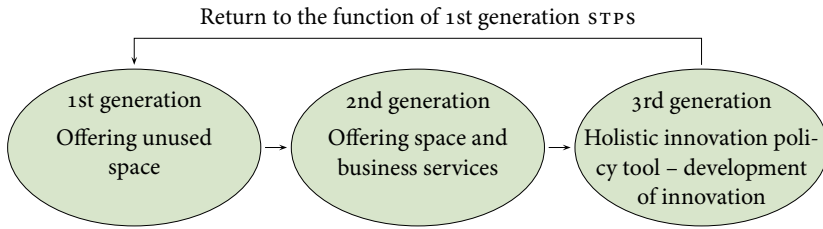


FIGURE 1 Changes in Technology Parks' Functions in Particular Generations

many benefits, such as the concentration of companies in a given industry in one place, which facilitates the flow of knowledge and enables cooperation. Next advantage is the adaptation of the park offer to the needs of a specific group of customers. Another feature of second-generation science parks was their incubation function. Efforts have been made to allow students and graduates to develop their businesses through financial and management support, which is crucial in the early stages of business. Business incubation was possible thanks to the public subsidies. Critics of the concept of parks emphasize that such subsidies weaken the mechanism of market regulation (Pelle, Bober, and Lis 2009). Some of the technology parks have been probably created only because the funding was available, but on the same time, the main objectives of the science park concept went down. As a result, some of the park initiatives, after the EU project is finished, may return to the function of first generation parks, i.e. to offer commercial space for businesses on a regular basis (figure 1). This applies to both second and third generation parks.

Third generation parks are designed to implement innovation policy objectives. They are a part, a tool of regional and national innovation systems. It is emphasized that parks are a tool that will contribute to the increase of the level of innovation and the competitiveness of the economy. They are also intended to help in implementing the Europe 2020 Strategy. As far as functions are concerned, the incubation activity has been complemented by the networking role. Second-generation parks, due to the intensive development of commercial units of this type, have reduced the role of universities. Third-generation parks strongly underline the role of universities in creating knowledge and innovation. Building relationships between park tenants and universities is one of the most important tasks facing the parks.

They are also considered the place where science connects to business, students as well as researchers can realize their ideas through the sup-



TABLE 2 Evolution of Science Parks over Time

1950–1980	1990s	2000 and beyond
<ul style="list-style-type: none"> <li>• Real-estate operations</li> <li>• Campus-like environment, selling single parcels of land</li> <li>• Focus on industrial recruitment</li> <li>• Few, if any, ties between tenants and university or federal laboratories</li> <li>• Little business assistance and few services provided</li> </ul>	<ul style="list-style-type: none"> <li>• Anchor with R &amp; D facilities aligned with industry focus of park</li> <li>• Innovation centres and technology incubators more common</li> <li>• Multitenant facilities constructed to accommodate smaller companies</li> <li>• Some support for entrepreneurs and start-up companies provided directly</li> </ul>	<ul style="list-style-type: none"> <li>• More and more mixed-use development, including commercial and residential</li> <li>• Increased focus and deeper service support to start-ups and entrepreneurs</li> <li>• Less focus on recruitment – formal accelerator space and plans for technology commercialization roles emerging</li> <li>• Greater interest on part of tenant firms in partnering with universities</li> <li>• Universities more committed to partnering with research park tenants</li> <li>• Amenities from day care to conference and recreational facilities added</li> </ul>

NOTES Adapted from World Bank (2010).

port and experience of the university, on the one hand, and the capital of private entrepreneurs located in the park on the other hand. The most important features and functions of technology parks in the three stages of the park concept evolution are presented in table 2.

At present, the parks, both mature and in the early stages of development, are assumed to be third generation parks. This is primarily due to the functions to which they were appointed, and to the assumptions of the innovation policy of which they are part. In this paper, the described aspects also apply to third generation parks.

### Different Organizational Models of STPS

Professor John Allen, a long-time director of Manchester Science Park and a two-time UKSPA president, has identified four models defining the formation of technology parks, which to some extent determine the nature of the unit (Allen 2007):

- alliance-driven,
- university-driven,
- company-driven, and

TABLE 3 Four Models of Creation of STPS' and Their Main Features

Model	Main features
Partners	<ul style="list-style-type: none"> <li>• Partners – two or more partners (both public and private) work together to develop a technology park.</li> <li>• The common goal is an economic development based on knowledge transfer and innovation development.</li> <li>• Public funding enables park construction and infrastructure development.</li> <li>• A separate organization is established that manages the park develops, develops and implements strategic objectives.</li> </ul>
University	<ul style="list-style-type: none"> <li>• Technology park operates within a university campus, the university owns land or infrastructure, thus earning revenue.</li> <li>• A significant portion (usually over 40%) of tenants are spin-off or start-up companies, also founded by students and university graduates.</li> <li>• A large number of researchers are involved in the activities of park tenants, as directors, mentors, partners, etc.</li> <li>• Entrepreneurship and management are an important part of university study programs.</li> <li>• Incubation service for spin-off companies operating in the local environment is offered.</li> </ul>

*Continued on the next page*

- cluster-driven.

The models mentioned above are primarily related to the park's stakeholders. It is also the most common cause of differences in naming and defining technology parks. The characteristics of each model are shown in table 3.

The most commonly used model in Poland is the partnership approach in which the decision to launch a park is undertaken by public bodies. Examples of parks operating on the basis of partnership approach are Technopark Gliwice (the founder were the Gliwice city, Silesian University of Technology and Katowice Special Economic Zone), Lodz Regional Science and Technology Park (Łódź City and Marshal's Office, as well as three biggest public universities: Lodz University of Technology, Lodz University and Medical University, and representatives of business: Lodz Chamber of Commerce and Industry), Torun Technology Park (regional and local authorities and Nicolaus Copernicus University in Toruń). In all of the above examples, the founders are also higher education institutions, but in this case, we cannot talk about the university model, as the main initiators and stakeholders are local government units. Furthermore, the parks are not located in or near an academic campus. An ex-

TABLE 3 *Continued from the previous page*

Corporate	<ul style="list-style-type: none"> <li>• Anchor tenant, usually a firm with a well established market position, occupies the majority of the park property.</li> <li>• The presence of a large player attracts other tenants, including the participants of the main tenant supply chain.</li> <li>• In the contacts between the main tenant and other tenants, the open innovation model is used.</li> <li>• In the case of a university affiliation, the principal tenant has a strong influence on research, often involving products or services that he creates.</li> <li>• The university also adapts the program to the specific characteristics of the principal tenant's activities, enabling graduates to find work in one of the companies located within the park.</li> </ul>
Group	<ul style="list-style-type: none"> <li>• The park is made up of a group of companies from a given sector, close to the geographical distance.</li> <li>• This type of partnership is designed to provide a service tailored to the needs of the group members.</li> <li>• The links to knowledge builders are created by the demands of companies, and are not forced by government policy or university specialization.</li> <li>• There is no single landowner or infrastructure owner.</li> <li>• This is a concept that supports economic development through the creation of science cities.</li> </ul>

NOTES Authors' elaboration based on Allen (2007).

ample of a park operating based on a university model is the Poznań Science and Technology Park, which is the first technology park in Poland, and was founded as the initiative of the Adam Mickiewicz University in Poznan. The managing body is the Foundation of Adam Mickiewicz University in Poznan. The current president of the foundation and director of the park is Professor Jacek Guliński. The park authorities also have other university researchers, which is consistent with the characteristics of the university park approach described above. The incubation function is strongly developed, which focuses on economic activity of students, postgraduates and graduates, as well as academics, mainly from high technology industries such as biotechnology and IT. The university model is most common in the United States and the United Kingdom. This is due to the previously mentioned stages of the evolution of the parks that were originally established within the universities.

### Science and Technology Parks in Poland

The first technological park in Poland was the Poznań Science and Technology Park, founded in 1995 on the initiative of the Adam Mickiewicz



FIGURE 2

Location of Science and Technology Parks in Poland (authors' elaboration based on Bąkowski and Mażewska 2015)

University. According to the Association of Organizers of Innovation and Entrepreneurship Centers (SOOIPP), which are considered equivalent to AURP or IASP, there are currently 42 technology parks in Poland. SOOIPP also conducts cyclical research on technology parks and other Innovation Support Centres in Poland. The last study was held in 2014 and the data contained in this section are taken from the report, edited by Aleksander Bąkowski and Marzena Mażewska (2015).

Until 2000, only 9% of the 42 identified technology parks were created in Poland. 36% were appointed in 2001–2005, another 33% in 2006–2010, 21% in 2011–2014. The noticeable decrease in the emergence of parks is due to the limited resources available from European funds for this purpose. Some of the initiatives in previous years have been suspended, three parks have not started, and two have been liquidated. There are many reasons for this – first and foremost, the misidentified need to locate the park at a given location, the lack of demand for technology parks, the failure to tailor the service portfolio to potential clients, and, for example, the incorrect management of the park.

Parks are located in all voivodships; their location is shown in figure 2. The layout of technology parks is not uniform; six units of this type are located in the Wielkopolska Region and Śląskie voivodeships, five in the Lower Silesian voivodeship, in other voivodships there are one to three parks. The fact that there are six technology parks in Wielkopolska does not affect the development of the entire region, as they are located in or around Poznań itself. In Poznań, or close neighbourhood, there are:

- Poznań Science and Technology Park of the Foundation of the Adam Mickiewicz University;
- Nickel Technology Park Poznan (YouNick) – a park located in Złotniki near Poznań, it is the first non-public technology park in Poland;

TABLE 4 Infrastructural Potential of Technology Parks in Poland

Usable area of buildings at the disposal of the institution in total (m <sup>2</sup> )	373654
Office space for own use (m <sup>2</sup> )	22001
Usable area for rent (m <sup>2</sup> )	154490
Own laboratory surface (m <sup>2</sup> )	14090
Laboratory space for rent (m <sup>2</sup> )	20383
Didactics/seminar rooms (number)	129
Meeting rooms (number)	92
Computer laboratories (number)	18

NOTES Adapted from Bąkowski and Mażewska (2015).

- Eureka Technology Park in Dąbrówka near Poznań;
- Poznań Industrial and Technological Park, where the main shareholder is the city of Poznań;
- Noble Tower Technology Center;
- Luvena Technology Park in Luboń.

Such a high concentration of technology parks in one place is unfavourable and may contribute to lowering the efficiency of the operation. High competition means that parks want to fill free spaces do not use specialization, accepting tenants from each industry. Some of the parks have no formal connection with the university, only Poznań Science and Technology Park operates in conjunction with the Adam Mickiewicz University, and Poznań Industrial Technology Park works in agreement with Poznań University of Technology.

Most parks in Poland operate based on an integrated model, which determines their ownership structure. 52% of parks operate as a limited liability company, 24% operate as a joint stock company, 19% as a budgetary unit, 2% as a foundation, 2% within the university. However, the links with the university are noticeable because the equity in the parcels are covered by 18 universities, similarly as with the IASP data, information on the volume of shares is not available.

The infrastructure of the Polish technology parks is well developed, mainly thanks to funds obtained from EU. Offices are tailored to the latest trends that foster creativity and knowledge flow. Twelve parks also have laboratories adapted for biotechnological research. The infrastructural potential of Polish parks is presented in table 4.

The scope of services provided to park tenants coincides with the port-

TABLE 5 Services Offered by Polish Technology Parks (%)

Service	2011	2013
Help with contacting the technology vendor or customer	32	50
Consultation and selection of innovative ideas	–	44
Prepare a bid or ask for technology	18	36
Collaboration abroad – internationalization	–	36
Market analysis and definition of market potential and technical development possibilities of the idea	–	36
Consultancy on the protection of intellectual property rights for companies	45	33
Advisory support in technology deployment	32	28
Technological audit	–	28
Develop a plan for implementing an innovative solution	–	28
Help in developing prototype solution, product or ready for product testing	–	22
Help in negotiating and concluding contracts between the customer and the technology provider	18	22
Park did not implement this type of service in 2013	–	22
Searching for specific technologies according to companies orders	27	17
Monitor technology implementation or contract implementation	14	14
Evaluation of technology on behalf of companies	9	14
Defining the transfer object	32	11
Market tests of prototypes of products/services	–	6
Certification of solutions/technology/products	–	3

NOTES Adapted from Bąkowski and Mażewska (2015).

folio of technology parks in the United States and presented in the IASP report (table 5). However, the fact that the most popular service (assistance with contacting the supplier or technology user) is offered only in the 50% of surveyed parks may indicate that the offer of many entities is not adjusted to the needs of their tenants. The lack of availability of such activities means that the role of technology parks is often limited to the role of an office building. Another reason for this may be the lack of competence of technology park workers to provide specialized services. The solution should be to outsource some tasks to specialist businesses, or to attract companies that could provide services to other tenants.

In 2013 in technology parks in Poland 1,072 tenants were identified, compared to 656 in 2011. This trend is positive, but only 50% of tenants

are considered to be innovative companies. Within the group 25% are IT companies, the remaining 25% are professional, scientific and technical. 12.35% of companies operate in the trade, 17.2% in manufacturing, 3.97% in construction, and 16.3% other industries. Such a structure of tenants should be considered as unfavourable from the point of view of innovation policy assumptions, in which technology parks should support companies from highly regarded industries. The average annual budget of the technology park in 2013 was PLN 7.19m, and revenues are generated mainly from rental space (32.51%). National and local grants are also very popular, accounting for around 36% of the park's budget, while in 2011 they accounted for approximately 53%.

In the next few years, the budget structure should change as most parks in Poland are in a growth phase, so the budget should be more financed from rental space and additional services. The decline in the number of technology parks may be a result of the exhaustion of EU funds, while the remaining revenues are not enough for the current operation of the park and the repayment of loans. At present, the revenues from services and training are negligible, so in the next few years technology parks may be closed and converted into premium class offices.

### **The Importance of Science and Technology Parks for the Development of New Modes of Cooperation in the Biopharmaceutical Industry**

Following the results of PwC study, any innovative pharmaceutical company participates on average in at least five projects aimed at building a coalition inside the industry. In Poland, we can find number of clusters and numerous science and technology parks (STPS) that offer the infrastructure for the development of innovative biotechnological and pharmaceutical products – in particular, the laboratory space. Science and technology parks (STPS) also contribute to the development of biotechnology and pharmacy in Poland. STPS promote the transfer of knowledge from universities to business (Staszków 2013). We can distinguish following clusters and STPS operating in biopharma in Poland: Poznan Science and Technology Park, Nickel Technology Park Poznan, Wielkopolska BioRegion, Gdansk Science and Technology Park, Pomeranian Science and Technology Park, InnoBioBiz Lodz Cluster, BioTechMed Technology Centre, Lodz Technopark, Polish Technological Platform of Innovative Medicine, Biocentre Ochota Consortium, NutriBiomed Cluster, Wrocław Research Centre EIT+, Wrocław Technology Park, LifeScience Cluster

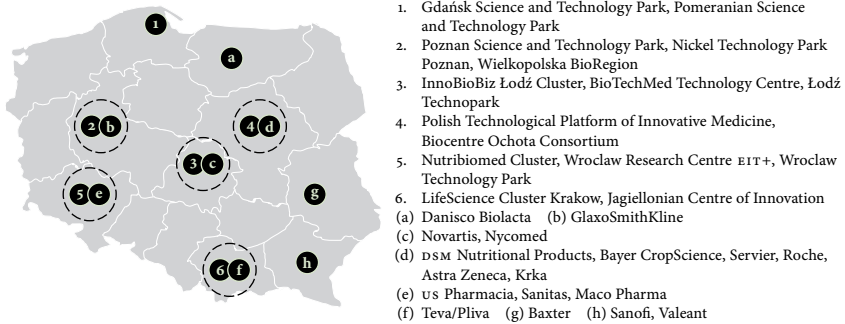


FIGURE 3 The Biggest FDI in the Pharmaceutical Industry and Location of Biopharmaceutical Clusters (letters) and STPs (numbers) and Possible Open Innovation Alliances (OIA, dashed circles) in Poland (based on PAIIZ 2012)

Krakow, Jagiellonian Centre of Innovation (Puślecki and Staszków 2015; Staszków 2013) (figure 4).

Taking into account the number of entities involved in Polish biopharmaceutical industry, especially pharmaceutical companies, STPs, universities and research institutes and clusters, it can be concluded that they can successfully apply the model of cooperation based on open innovation alliances.

### Conclusions

Technological parks are differentiated in terms of age and ownership structure, and their names change depending on the country they are in. However, the merit of all park initiatives is the goals they should pursue. These are:

- Creation of a friendly environment supporting the development of innovation and entrepreneurship;
- Offering space for researchers and students to collaborate with business;
- Creation and development of knowledge-based enterprises through financial and management support;
- Creating new jobs and, as a result, contributing to increasing the well-being of the society.

Technological parks, as a tool of innovation policy of countries and regions, are to contribute to increasing the level of innovation, both at the local and national level. On the other hand, these are business entities



that operate and compete on the market with other entities, and therefore equally important, though rarely mentioned, are economic objectives such as raising EU funds or making a profit. The specific objectives are conditioned by the stage in which the technological park is located. In the beginning phase, the most important issue is the raising of funds and the time and cost of building the park. Only in the later stage, in the growth and maturity phase the political objectives are gaining in importance – the development and incubation of new companies or the creation of jobs.

Examples of parks in the United States show that they are capable of meeting their statutory goals. The major source of success is the high involvement of universities in park development and management, which is not the case for Polish entities. Due to the public nature of the parks in the United States, the issue of profit seems to be less important, so the main goal is to implement the political and social assumptions. Polish parks are characterized by a diversified ownership structure, but their objectives should be consistent with regional innovation policy, so it is worthwhile to focus on building relationships and networking of the park among all its stakeholders, including regional innovation systems, research units, independent experts and financial institutions. As far as finances are concerned, Polish units focus mainly on local or EU funding, but in the longer run, it is necessary to balance the budget with rents and additional services. An element of great concern of American park managers is the industry profile of tenants. It is also an aspect that should be noted in Polish parks. However, in order to attract tenants with the right profile, parks need to increase the number of pro-innovation services actually provided. They should be provided not only to tenants, but also to external clients, which will help diversify the budget. Managers of American parks and academics stress the importance of defining a strategy for the development of a technology park, as well as the selection of managerial staff who will understand the specific function and objectives of technology parks.

Taking into account the above elements in the development of technology parks and regular evaluation of their effectiveness can contribute to the better functioning of parks in Poland. In result a successful cooperation with academia and science and technology parks will make it possible for biopharmaceutical companies in Poland to reduce the risks, costs of research (preserving and protecting intellectual property), and above all increase the likelihood of better therapeutic treatment for pa-

tients, and to develop new modes of cooperation like open innovation alliances.

### Notes

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# *How Much Do Employees Matter? Comparison of Foreign and Domestic Firms' Management*

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People management will be the biggest challenge for companies in the next 10 years according to EIU/SHRM survey. There are different scenarios for future work, which are influenced by economic, technological, environmental, institutional and demographic factors. This paper analysed the effect of internationalisation on human resource management based on the Hungarian Competitiveness Research Surveys 2013, 2009, 2004 and 1999. Generally, the research did not confirm that internationalisation generates higher attention towards employees, although we can find some positive tendencies. Foreign owned companies paid more attention to performance evaluation and trainings. The research identified some factors, which can be improved. For example educational cooperation with colleges and universities.

*Key Words:* human resource management, internationalization, export, competitiveness research

*JEL Classification:* F23, M50

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## **Introduction**

Globalisation is one of the most dominant trends nowadays, which affects our life in several ways. The advantages and disadvantages of this change had been analysed from several aspects, but this paper will focus only on employees. According to the survey of the SHRM Foundation (2014), which involved 636 executives, the top challenges that organizations will face in 5 to 10 years, will be people management. PwC (2014) described three different scenarios for future work. (1) The 'blue world,' where the corporate is the king, the driving goal is improving profits, growth and market leadership. It means 'job security and long-term service with an organisation in returns for employee commitment and flexibility' (PwC 2014, 10). (2) The 'green world,' where consumers and employees force change. The driving goal is being socially and environmentally beneficial. Social responsibility dominates the corporate agenda. Employees get life balance in return for loyalty towards the organisation. (3) The 'orange

world,' where big is bad, small is beautiful. The driving goal: maximising flexibility and minimising fixed costs at the same time. Employee value: 'Flexibility, autonomy and varied challenges in return for working on a short-term contractual basis.' (PWC 2014, 18). Which dominant trend will affect the main characteristics of HR management in the future? It depends on several economic, technological, environmental, institutional and demographic factors. In this paper, we focused only on the internationalisation process. We compared the practices of the foreign companies to the domestic owned firms. Some previous researches pointed out the higher efficiency of foreign owned firms. Does a higher level of corporate social responsibility mean higher efficiency of companies, which are becoming international? Does internationalisation support spreading the 'Blue' or 'Green' worlds?

Our other focus is on the internationalisation behaviour of domestic firms. The owners'/managers' crucial role in the internationalization process of small and medium size companies has been pointed out by several researches. The role of the management seems evident in the company's success. But what about employees? How do managers think about them? Several successful managers stated that they were only one member of a successful team, and they could not achieve the success without committed employees. Nowadays more and more attention is paid to human resource management. Do managers consider employees as crucial resources or not? This question is discussed in this paper in connection with internationalisation. The research was based on the Hungarian Competitiveness Research Surveys 2013, 2009, 2004 and 1999.

### **Theoretical Starting Points**

The goal of this paper is not to make a systematic literature review. We only highlights some concepts, which contribute to understand the changing role of employees in globalisation. The first step is to answer the question why companies enter foreign markets, why they bear liability of foreignness. Some models emphasize the role of 'push' mechanisms, while others stress on the 'pull' mechanism. Fundamentally, four factors influence the process of internationalization (Yip 2003): governmental and regulation factors, market factors, cost factors (including economies of scale, learning and experience curves, favourable logistics, differences in country costs and skills, and product development costs) and competitive factors. Strategic goals of entering foreign markets are resource-seeking, market-seeking, improving efficiency, and improving strategic

tools. Dunning's (1980) eclectic or OLI paradigm explains establishment of subsidiaries by ownership-specific advantages, location-specific advantages and internalization advantages. In theory, subsidiaries should operate with higher efficiency than domestic firms due to the competitive advantages of the parent company but this depends on the types of ownership-specific advantages, characteristics of host countries and the location-specific advantages.

Our opinion is that we have to make a complex review to describe the process. It is not enough to discuss the efficiency. We have to take pay attention to sustainable development as well. Dunning and Fortainer (2007) analysed multinational enterprises' effect on sustainable development in a systematic way. Direct effects: increasing host countries' savings and investments, building up sectors or industries, recapitalising inefficient local firms, effect on output, productivity, employment, working conditions, reporting system, quality standards, and level of pollution. Dunning and Fortainer (2007) highlighted that according to the 2005 KPMG survey about '70 percent of the largest 250 firms worldwide actively promote workforce diversity and equal opportunities, good working conditions, and effective training schemes' (p. 38). Passive effects are known as spillovers or multiplier effects (Csengődi 2011). FDI might have both positive and negative effects on domestic firms, which are influenced by the host countries' political-economic regulations, market characteristics, as well as the nature of capital invested and the motivation behind the investments. The effects can arise via different mechanisms. Navaretti and Vanables (2004) distinguish competition, factor price, and technology spillover effects as main mechanisms transmitting the effects of FDI in the host economy.

Several empirical researches verified that multinationals and their subsidiaries are the largest and the most effective companies in industries, but Konings (2001) found that foreign firms do not perform better than domestic ones in Bulgaria and in Romania. Although multinationals' advantages had been verified by most studies, explanations of this phenomenon were different. One general explanation can be that higher efficiency of subsidiaries might derive from ownership-specific advantages of parent companies (advanced technology, expertise, and knowledge capital). According to another explanation, multinationals generally enter the most profitable, highly concentrated market so an adverse selection mechanism can also explain the different efficiency. The entrance of multinationals affects market structure of host countries and influences the

competition. Multinationals might push the less profitable companies out of the market due to their competitive advantages. The average industry productivity might be increased due to the competitive effect, but a higher market concentration has a negative effect on competition. Additional demand for resources are generated by multinationals, which has a positive effect through supply chain. However, because of the high market concentration they are able to push down the purchase price due to their bargain power. The emergence of multinational firms puts competitive pressure on domestic firms, which eventually leads to an increase in efficiency. On the other hand, local firms are able to learn from multinationals. Békés, Kleinert, and Taubal (2009, 1409) argued that the impact of multinationals on domestic firms depends on three factors: the intensity of the linkage, domestic firms' absorptive capacity and their ability to face competition. Békés, Kleinert, and Taubal (2009) investigated 11 767 Hungarian firms between 1993 and 2002. They found that 'the presence of multinationals in the same industry increases competition on goods and factor markets and reduces the productivity of the least productive firms. More productive firms benefit more from horizontal spillovers' (2009, 1429).

Most recent Hungarian research related to this topic is by Reszegi and Juhász (2014). They compared the financial performance of 2766 domestic and 1876 foreign owned companies between 2008 and 2011. Their research did not underpin that foreign majority-owned firms were generally more productive and more profitable than the investigated domestic owned firms were. They concluded that the dual structure could be observed within foreign owned companies as well. The 'advanced' foreign owned companies had outstanding productivity, capital efficiency, technical capability and more than double average wage level compared to the other groups. The characteristics of 'low-wage' foreign owned firms lagged behind 'Advanced' companies' and were not better than Hungarian firms were. So, two significantly different company groups can be identified within foreign owned companies according to productivity and profitability. Investigating domestic firms, exporters had higher productivity and capital efficiency and paid higher wages than firms focusing on the domestic market.

In our opinion, it is not enough to concentrate on the differences between the foreign-owned and the domestic companies. If we compare a small group of effective, companies, which are becoming international to a heterogeneous crowd we can get a misleading result. It is



a common view that exporting companies' competitiveness is behind national export competitiveness. Several researches focused on small and medium-sized companies' export activities and their influencing factors. Miocevic and Crnjanak-Karanovic (2011) concluded that cognitive and information-based capabilities influenced export performance. Sui and Baum (2014) analysed 1959 newly established Canadian SMEs, they found that the gradually internationalised firms have the highest export market survival. They concluded that although resources were crucial for all SMEs, the relative importance of slack resources and innovation resources were the most important for born-global firms. Stoian, Rialp, and Rialp (2011) used regression analysis to investigate the influencing factors on export performance of Spanish SMEs. They concluded that managers' language skills, knowledge about international business, the firms' export commitment, and technological intensity of the industry are the most influential in export performance. DiPietro and Anoruo (2005) investigated the relation between creativity, innovation, and export performance. They discovered a positive relationship between a country's export performance and a country's creativity. Inzelt (2011a; 2011b) found positive correlation between innovation and internationalisation. Research of Halpern and Muraközy (2012) found the positive correlation among export profitability, export-intensity and innovation.

Several researches focused on the key success factors of export activities. The role of proper strategy, resources and capabilities as well as relationships were highlighted. Within resources and capabilities, the crucial role of management was emphasised by Stoian, Rialp, and Rialp (2011) and Ábel and Czakó (2013). Ruzzier et al. (2007) the research underpinned the significant effect of entrepreneurs' human capital on internationalisation. They highlighted the importance of entrepreneurs' international orientation and environmental risk perception as the two most influential factors of internationalisation. They did not find a strong positive correlation between international business skills, management expertise, and internationalisation.

The role of management in companies' success was underpinned by Bloom, Sadun, and Reenen (2012). They concluded that quarter of the cross-country and the within-country total factor productivity gaps can be accounted for by management practices. Within management practices, they focused on goal setting, motivation and control. Almost every research confirms the role of management in export success. Many researches emphasised the importance of knowledge and innovation but

relatively few focused on employees in a direct way. For introducing the role of employees in the export success, we applied Ábel and Czakó (2013) qualitative research, which included 10 case studies. All firms had Hungarian majority ownership, were established after 1990, their export-intensity was higher than 25%, employed more than 50 employees and/or had an income over one billion HUF. The case studies were based on interviews made with managing directors. Nine out of ten managers mentioned the employees' significant role in the success of the company. Two of them (managers of Csaba Metal and Bakony Művek) highlighted the shortage of skilled workers, which meant a significant obstacle to the companies' growth possibilities. The importance of investing in human capital was emphasised by managers of Pilsé Nagy, Sanatmetal and Agrofeed. The crucial role of employees' learning process was highlighted by managers of Sanatmetal, Agrofeed and Euronet. Two of them mentioned the importance of trust between employees and managers (Agrofeed and Hajdu Autotechnika Ipari Zrt). Establishing new corporate culture proved to be crucial at Gránit and at Hajdu Autotechnika Ipari Zrt. Discussing the success factors of Csaba Metal, it was mentioned that Béla Majoros, the founding owner and the CEO of the firm, could gather excellent experts, whose knowledge can be continuously broadened (Kiss 2013). It was emphasised that improvements should not stop at technology and HR, which are significant element of the company's success. All managers concluded that adequate strategy and luck were not enough for export success. Skilled and committed were needed to implement.

### **Research Methodology and Database**

The research is based on the Hungarian Competitiveness Research databases of 2013, 2009, 2004, and 1999 launched by the Competitiveness Research Centre. All competitiveness research surveys had the same structure, containing four questionnaires (more than 100 pages altogether): top management, marketing, production, finance. As a rule, all three surveys were aimed at incorporated companies with more than 50 employees in order to build a corporate sample. The main objective was to make a database consisting of about 300 firms in all surveys. Understanding the main characteristics of the samples is crucial for making conclusions. Firms in the sample belonged to different industries, excluding the financial sector. Manufacturing companies were dominant in all databases, although the rate of them decreased from 71% to 45%. The rate of service companies gradually increased from 21% to 34.7% but they were still

under-represented because of the fact that the micro-companies were excluded from the surveys. Companies operating in the building industry, agriculture, food industry were represented in every sample. Medium sized companies dominated all databases. Their rate gradually increased; in 1999, it was 61.4%, in 2013 72.7%. In parallel with this increase, the rate of large companies fell from 32.4% to 16.7%. Regarding ownership structure, the domestic owned companies dominated in all databases, the rate of them was the highest in 2009 (72.6%), followed by 71.3% in 2013. The highest rate of foreign companies (23%) could be observed in 2013. The rate of state owned companies decreased to 5.7% (for the descriptions of the samples of the questionnaire surveys, see Chikán, Czakó, and Zoltayné Paprika (1999; 2004; 2009), Chikán, Czakó, and Wimmer (2014), Matyusz (2011; 2014), and Lesi (2005). Managerial self-evaluations and subjective assessments dominated in the questionnaires beside financial data. The comparison of subjective assessments might cause distortion but the distortion itself reflects priority, value preference and different viewpoints.

The literature of international human resources management is broad, but the focus point is how to handle the challenges deriving from international circumstance. The other main topic is the cooperation between the HR sections of the parent company and the subsidiary (Kelly 2001) furthermore if the complexity of HR managers' roles and the required competencies increased with an increasing level of internationalisation (Kohont and Brewster 2014). The present research aims to answer if the foreign-owned firms deal with the human resources in a different way, if they establish a more advanced practice.

In connection with human resource management, three hypotheses were set:

- H1 *Generally, there are no differences between foreign and domestic owned companies regarding the importance of employees.*
- H2 *Foreign owned companies are characterised by higher wages than domestic ones.*

This hypothesis is based on Csengődi (2009) and Earle-Telegdy (2009). They concluded that foreign-owned companies paid higher wages than domestic ones in Hungary. It is an important factor. On one hand, the high salary is one of the motivation tools. It is an effective way of appreciation of the employees' performance. However, we have to take into consideration that workforce is one of the goods on the labour market,

and the salary is the price. If the market value is high, we can be sure that the companies consider the human resources as a critical element.

H3 *Foreign owned companies are more aware of the importance of human resource management.*

These companies bring their own corporate culture with them. They use formal performance evaluation systems more frequently and spend more money on training than domestic ones. These facts does not automatically mean higher salary. Salary is more influenced by the labour market than corporate culture.

In our research, we combined two dominant research directions of the international literature forming a common method. The most commonly used method is exporters' and non-exporters,' and domestic and foreign owned companies' comparison. We used two-level comparison in this research. At first, the differences between foreign and domestic owned firms were investigated. Since the earlier researches verified the high efficiency only of foreign companies, the comparison of highly efficient multinational companies (or their subsidiaries) with very heterogeneous domestic firms might result misleading conclusions. Therefore, other comparison has been conducted. The second level is the comparison of exporting foreign firms and domestic firms. More than 70% of foreign owned companies had export activities in the sample. In case of domestic firms, the presence of export activities is a significant quality criterion. The hidden research question is whether the reason of the different companies' characteristics is the owner structure or the internationalization process.

### **Declared Values**

The first hypothesis was that there are no differences between foreign and domestic owned companies regarding the importance of employees. Two questions were selected to test this hypothesis. The first one is: How much must the interests, rights and expectations of the stakeholders be taken into account in decision-making? The managers had to evaluate the importance of stakeholder groups (owners, managers, employees, customers, suppliers, government, unions, civil society, natural environment and media) on a five-point Likert scale. According to corporate leaders, the interests of owners are those, which have to be given the highest priority when economic decisions are made. Following the owners' interests, customers,' managers,' suppliers,' employees,' and natural environment's

interests were in the first six positions of the ranking hierarchy. Focusing on the employees' interests, unambiguous conclusions are difficult to be drawn. Comparing the given points, managers of domestic firms considered the employees' interests more important in decision-making than managers of foreign firms in 2013, 2009, and 1999, but in 2004, a reverse connection can be observed. Moreover, the ranking hierarchies suggested a slightly different picture, due to the different evaluation of other stakeholders' group. The best position of employees' interests was the fourth rank after owners, customers, managers in 2013 according to foreign companies' managers.

A significant improvement can be observed in case of domestic firms, employees' interests were placed in the sixth and seventh rank in 2009 and 2004, but in 2013, it gained the fifth position after suppliers.' During the recession, the interests of natural environment and government were considered more important, which could boggle the mind. Similar tendencies can be observed in case of foreign firms; in 1999, the importance of employees' interest in decision-making was evaluated 2.91, while in 2013 this rate increased to 3.61. We got the lowest rank (7) in recession time too (see table 1).

Similar tendencies can be observed in case of exporting firms. Employees' interests were considered the most important in 2013 (3.67, 3.53) compared with the other years, which indicates a positive tendency, they were ranked after owners', customers', and managers' interests and in case of domestic firms, after suppliers.' Overall, the analysis of the first question revealed some differences between domestic and foreign owned companies, but it cannot be verified that one company group considers the employees' interests more important in decision-making than another group due to the controversial results.

The managers were asked to rank three important resources: capital and financial possibilities; the organisations' capabilities for adaptation and change and committed, excellent employees, according to their importance between 2009 and 2012. Only 14.5% of managers considered the committed and excellent employees the most important resources, 61% of them ranked employees at the third place. The highest rate of the first rank (16.9%) can be observed in case of domestic and exporting domestic firms. In general, the managers of domestic firms emphasised the importance of financial resources, foreign managers considered them crucial as well, but they gave slightly more emphasis to the organisations' capabilities for adaptation and change (table 2).

TABLE 1 How Much the Interests, Rights and Expectations of the Stakeholders Must Be Taken into Account in Decision-Making?

Stakeholders' groups	Survey of 2013		Survey of 2009	
	D ( <i>n</i> = 207)	F ( <i>n</i> = 67)	D ( <i>n</i> = 185)	F ( <i>n</i> = 42)
Owners	(1) 4.33	(1) 4.60	(1) 4.55	(1) 4.72
Managers	(3) 4.27	(2) 4.23	(2) 4.25	(3) 4.14
Employees	(5) 3.75	(4) 3.61	(6-7) 3.25	(7) 3.08
Customers	(2) 4.28	(3) 4.21	(3) 4.15	(2) 4.28
Suppliers	(4) 3.81	(5) 3.57	(4) 3.53	(6) 3.22
Government	3.32	3.10	(6-7) 3.25	(5) 3.26
Unions	2.28	2.61	2.47	2.50
Civil society	2.98	2.63	2.82	2.69
Natural environment	3.54	3.51	(5) 3.28	(4) 3.46
Media	2.36	2.57	2.48	2.27
Stakeholders' groups	Survey of 2004		Survey of 1999	
	D ( <i>n</i> = 137)	F ( <i>n</i> = 55)	D ( <i>n</i> = 160)	F ( <i>n</i> = 46)
Owners	(1) 4.68	(1) 4.75	(1) 4.68	(1) 4.85
Managers	(3) 4.09	(3) 4.04	(2) 4.19	(2) 4.11
Employees	(7) 3.13	(5) 3.29	(5) 3.22	(6) 2.91
Customers	(2) 4.14	(2) 4.20	(3) 4.15	(3) 4.05
Suppliers	(5) 3.21	3.16	3.21	(5) 3.02
Government	(6) 3.14	3.00	3.07	2.84
Unions	2.40	2.64	2.59	2.47
Civil society	2.46	2.30	2.46	2.42
Natural environment	(4) 3.59	(4) 3.47	(4) 3.40	(4) 3.21
Media	2.31	2.62	2.31	2.51

NOTES D – domestic, F – foreign. Answers on 5-point Likert scale (5 – significant, 1 – not at all significant).

Overall, the first hypothesis cannot be verified or denied due to the controversial results. Independent *t*-test underpinned statistically significant differences between domestic and foreign owned companies, but when we changed our methodology, we get controversial results. Nonetheless, some findings are relevant. Differences can be found between the way of thinking of foreign and domestic owned firms' managers but it cannot be stated firmly that one company group turns more attention towards their employees than others do. Although the importance of employees'

TABLE 2 What Was the Most Important Resource of Your Company between 2009 and 2012?

	Rank 1		Rank 2		Rank 3	
	D ( <i>n</i> = 167)	F ( <i>n</i> = 55)	D ( <i>n</i> = 167)	F ( <i>n</i> = 55)	D ( <i>n</i> = 167)	F ( <i>n</i> = 55)
(1)	46.8	43.2	31.0	27.3	29.5	29.5
(2)	28.1	38.2	65.9	41.8	6.0	20.0
(3)	16.9	9.1	16.1	47.7	66.1	43.2

NOTES Row headings are as follows: (1) capital and financial possibilities, (2) the organisations' capabilities for adaptation and change, (3) committed, excellent employees. D – domestic, F – foreign. In percent.

interest increased between 1999 and 2013, managers considered capital and financial resources more important than committed and excellent employees did in the period 2009–2012.

### Compensation of Employees

The question is addressed whether the higher profitability and effective operation of foreign firms provide benefits for employees or the source of higher profitability is the exploitation of human resources. Results of former researches verified that foreign-owned companies pay higher wages than domestic ones in Hungary (Csengődi 2009; Earle and Telegdy 2009). Reszegi and Juhász (2014) emphasised the double duality in Hungarian economy, in their analysis they divided the foreign owned firms into two groups based on level of average wage. About two thirds of foreign owned companies belonged to the company group, which could be characterised by the above average wages, and a trained workforce.

Managerial self-evaluation as well as calculated figures were used to verify the second hypothesis. According to managerial self-evaluation, a higher proportion of foreign owned firms stated that they paid above industry average wages than domestic ones. In 2004 and 2013, the differences were significant. Parallel with this, the rate of firms who paid wages below the industry average was higher in case of domestic firms (see table 3). Higher wages of exporting firms cannot be verified according to managerial self-evaluation.

Calculated figures were used only to underpin the managerial self-evaluation. Figures indicated higher wages by foreign firms in the full sample, which are consistent with the managerial self-evaluation. The managerial self-evaluation did not underpin the exporting firms' higher wages. As a conclusion, we can state that hypothesis 2 was verified by

TABLE 3 Average Wages Compared to the Industry Average: Full Corporate Sample

	Survey of 2013		Survey of 2009		Survey of 2004	
	D ( <i>n</i> = 173)	F ( <i>n</i> = 57)	D ( <i>n</i> = 153)	F ( <i>n</i> = 39)	D ( <i>n</i> = 135)	F ( <i>n</i> = 56)
> 125	5.2	5.3	2.6	2.6	2.2	5.4
110–125	7.5	19.3	8.5	15.4	8.9	26.8
90–110	56.1	54.4	63.4	56.4	43.0	44.6
75–90	23.1	15.8	17.0	23.1	29.6	17.9
< 75	8.1	5.3	8.5	2.6	17.0	7.1

NOTES D – domestic, F – foreign. In percent.

managerial self-evaluation and calculated figures as well. This is in line with previous researches' findings.

### HR Practices

46% of foreign owned companies owned an independent HR department; this rate was only 26.3% at the exporting domestic firms, and 22.7% in the group of all domestic companies. Although the existence of independent HR departments depends on the size of the company, it is worth investigating the functions of HR departments more deeply.

Managers were asked to evaluate the human resources management's contributions to organisations. They were asked to evaluate eight different statements on a 5-point Likert scale according to what extent they characterised their organisations. Some differences can be observed between domestic and foreign owned companies. 'Assisting in executing organizational changes' was the most important HR contribution in case of foreign companies (4.17), the second one was conflict management (3.91) and the third one was being the communicational channel for representing employees' interests. Similar opinions can be observed in case of foreign owned exporters (table 4). The managers of domestic companies did not evaluate the HR management's role in change and conflict management as high as foreign companies' managers did. They emphasized the client oriented, flexible, transparent and reliable operation (3.72). The 'weakest' point of the HR management was making action plans, not just reacting to events (between 3.24 and 3.3) in case of domestic firms. Foreign owned companies are supposed to be better at making action plans (3.62). The 'weakest' point of foreign owned companies was the HR supporting roles in decision-making (3.47, 3.48), regarding this function the independent *t*-test did not verify differences between foreign and do-



TABLE 4 Functions of HR Management in 2013

The role of HR	Full sample		Exporting firms	
	D (n = 54)	F (n = 34)	D (n = 30)	F (n = 30)
It makes the decision-making process more efficient	3.43	3.47	3.53	3.48
It is an accepted partner in making strategy decision	(5) 3.56	(5) 3.69	(4) 3.60	3.73
It does not just react to events but it can make action plans	3.30	3.62	3.24	3.62
It assist in executing organizational changes	(3) 3.63	(1) 4.17	(1) 3.77	(1) 4.20
It creates and operates such communicational channel, which helps representing the employees' interests	(4) 3.59	(3) 3.86	(5) 3.57	(3) 3.86
In the case of conflicts it assists in reaching solutions	(6) 3.50	(2) 3.91	(2) 3.67	(2) 3.97
It operates in a client oriented – flexible and reliable ways	(1-2) 3.72	(4) 3.80	3.57	(4) 3.83
It operates in such a system that is necessary for all organizations members.	(1-2) 3.72	3.69	(3) 3.63	3.70

NOTES D – domestic, F – foreign.

mestic firms (table 4). Aside from the general satisfaction with human resources management, the managers of foreign owned companies emphasised the assisting role in change management, in conflict management and providing a communicational channel between employees and the company. Strategic decision-making role appeared in the first three functions only in two sub-groups (all domestic companies and exporting domestic firms).

The HR manager's role in managing organisational changes and handling conflicts is evident. Its role in strategic decision-making depends on corporate culture and corporate governance. So far, we dealt with the declared value of the importance of employees' interests and the compensation system more deeply. Only two other functions have been selected to be investigated more deeply, these are the formal performance evaluation system and trainings.

A higher rate of foreign owned companies used a formal performance evaluation system than domestic ones; the differences were underpinned

TABLE 5 Proportion of Companies Having a Formal Performance Evaluation System in 2013

Existence of a formal performance evaluation system for	Full sample		Exporting firms	
	D ( <i>n</i> = 198)	F ( <i>n</i> = 65)	D ( <i>n</i> = 55)	F ( <i>n</i> = 89)
Wide range of employees	33.3	43.1	36.0	43.6
Key employees	32.2	49.2	36.7	56.4
Managers	32.0	47.7	37.1	54.5

NOTES D – domestic, F – foreign. In percent.

TABLE 6 Proportion of Companies Using the Output of a Formal Performance Evaluation System for Specific Purposes in 2013

Purposes for which the output of the perf. evaluation system was used	Full sample		Exporting firms	
	D ( <i>n</i> = 149)	F ( <i>n</i> = 57)	D ( <i>n</i> = 70)	F ( <i>n</i> = 49)
Compensation	74.5	73.7	74.3	75.5
Promotions	52.8	67.9	43.3	64.6
Other administrative decision	29.0	22.6	37.5	26.7
Trainings	30.7	41.8	35.9	44.7
Inner communication	40.9	37.7	33.3	37.8
Not used	17.0	17.6	13.3	21.4

NOTES D – domestic, F – foreign. In percent.

by an independent *t*-test. More than half of companies in all subgroup have no formal performance evaluation system for a wide range of employees. The highest rate (56%) could be observed in case of foreign owned exporters. Foreign owned companies focused on measuring key employees' performance (49.2%), after that the managers' performance (47.7%), and only 43.1% of them have a formal performance evaluation system for a wide range of employees (table 5).

In every group the usage of such output for compensation purposes was the most frequent, and following that were promotion, training and inner communicational purposes, but the application rates were different based on statistic tests (see table 6).

The other selected area is training program. More than half of the interviewed domestic companies had any training plan and this proportion was over 70% in case of foreign owned firms. It is consistent with KSH (2007) survey, which pointed out that 49% of Hungarian companies with more than 10 employees supported trainings, and almost every large company did it. The proportions of external and internal trainings

TABLE 7 Proportion of Different Types of Trainings Based on the Competitiveness Research Survey of 2013

Different types of trainings	Full sample		Exporting firms	
	D (n = 197)	F (n = 63)	D (n = 57)	F (n = 90)
Continuous external trainings	32.5	30.2	46.7	35.2
Continuous internal trainings (own teachers and programs)	39.1	76.2	47.8	75.9
Educational cooperation with colleges or universities	12.3	4.8	16.7	5.6
Ethics trainings	17.6	25.0	12.1	27.8

NOTES D – domestic, F – foreign. In percent.

were different in case of foreign and domestic firms. In all domestic sub-groups the application rate of external and internal trainings were very similar. Foreign owned companies preferred internal trainings, applied twice as external trainings. Less than third of the companies had ethics trainings in all sub-groups, the highest rate (27.8%) can be observed at foreign owned exporters. The weak point of foreign firms is the educational cooperation with colleges or universities, less than 10% had any cooperation. In this area, the domestic firms proved to be the better (table 7).

### Conclusion

The paper was addressed to investigate the effect of internationalisation on human resource management based on the Hungarian Competitiveness Research Surveys 2013, 2009, 2004, and 1999. The research was limited to Hungarian located companies.

Considering employees' interests, the longitudinal analysis showed an improving tendency. The research revealed some differences between domestic and foreign owned companies, but it cannot be verified that one company group considers the employees' interests more important in decision-making than another group. Although several managers and authors emphasised the crucial role of human resources in company success, our survey did not confirm this general opinion. Only 14.5% of managers considered the committed and excellent employees as the most important resources. The majority of them emphasised the importance of financial resources, which is consistent with the fact that owners' interest proved to be the most important in decision making according to managers.

The second hypothesis, that foreign owned companies are charac-

terised by higher wages than domestic ones was verified, which is consistent with previous researches.

In case of foreign companies, managing organisational changes and handling conflicts were the most common characteristics of HR management. The managers of domestic companies did not evaluate the HR management's role in change and conflict management as high as foreign companies' managers did. They emphasized the client oriented, flexible, transparent and reliable operation. HR role in decision-making should be improved in both groups. A higher rate of foreign owned companies used a formal performance evaluation system than other subgroups. A higher rate of foreign owned companies provided trainings. Foreign owned companies preferred internal training. The weak point of foreign firms is the educational cooperation with colleges or universities, less than 10% had any cooperation.

Although more and more attention has been turned toward human resource management in theory, the findings show controversial pictures. Numerous successful managers claimed that financial resources are more important than human resources are. In this area, we expect a change in the future, although it depends on the institutional and market environment. The research highlighted different characteristics of firms. The implementation of a formal performance evaluation system is recommended for beyond a certain company size, for everyone. Foreign owned companies should measure not just the key employees' performance, but a wider range of employees.' This might lead to an increase in efficiency. The role of HR management in decision-making should be increased. Presumably, domestic firms can learn from foreign owned companies about how to organize internal trainings, but foreign companies should build up more connections with universities and colleges.

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# *The Relation between Different Open Innovation Practices and Firm's Innovation Performance*

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Case study representations and quantitative research in the field of open innovation indicate significant association of open innovation with a firm's innovation performance. However, open innovation is not dichotomous, it consists of several distinct practices. This study aims to contribute to the existing knowledge on open innovation in organisations by disentangling among different open innovation practices, (i.e. inward IP licensing and external participation, outsourcing R&D and external networking, customer involvement, employee involvement, and venturing) and indicating their relation to a firm's innovation performance. We conceptualize a model in which we propose that all open innovation practices significantly relate to a firm's innovation performance. We tested the model on a sample of 693 companies from three countries, and found the most significant relation between employee involvement and firm's innovation performance. Based on a semi-structured interview with a head of open innovation at renowned multinational company, we provide suggestions on how to implement open innovation. We conclude the paper with the discussion of the results for business practitioners, suggesting effective approaches for incorporation of open innovation in their business practice.

*Key Words:* open innovation, innovation performance, employee involvement

*JEL Classification:* O31, O32, O33

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## **Introduction**

The concept of open innovation has received substantial attention in the recent decade, from case study representations to in-depth scientific research among large as well as small and medium sized enterprises (SMES). The main idea of open innovation is collaboration with external partners, exploration of their knowledge and technology, and exploitation of internal resources (Chesbrough 2003; 2006). The link between open innovation and business performance is most evident from case studies of

renown multinationals. For example, Procter & Gamble (P&G) has, in the last decade, recorded incredible boosts of innovation performance due to the creation of an open business model named Connect & Develop (C&D). The C&D model was established in 2000 with the aim of saving the company from downturn and accelerating business growth (Chesbrough 2007).

The goal of C&D has been to find good ideas, bring them inside to enrich and exploit internal capabilities, explore external resources and consequently create new products, connecting what was not obvious (Huston and Sakkab 2006). As P&G's Dr. Mike Addison stated: 'Innovation is all about making new connections. Most breakthrough innovation is about combining known knowledge in new ways or bringing an idea from one domain to another' (Dodgson, Gann, and Salter 2006, 337). The success of C&D has been in addition to the other aspects of innovation – those related to product costs, design, and marketing, evident also in the productivity of P&G's R&D activities, which has improved almost by 60%. The success in innovation has more than doubled, and the R&D investment has dropped by 30% (Huston and Sakkab 2006). The competitive advantage of involving external partners in the innovation process is apparent also in the case of Apple, which attracted many third-party applications and services that created novel experiences for Apple users; 'even perfectionist Steve Jobs realised the value of letting others into the Apple innovation process' (Chesbrough 2011, 19).

Nevertheless, open innovation is not unidimensional (Dahlander and Gann 2010; Chesbrough 2003). It consists of several distinct practices, such as collaboration with various partners, customer involvement, venturing, IP in-licensing, and IP out-licensing (Chesbrough 2003; van de Vrande et al. 2009). Despite these multiple practices, the multidimensional phenomenon of open innovation has been rarely explored as a whole. Instead, existing research has focused mostly on one of its practices. With this study, we aim to contribute to the existing knowledge on open innovation in organisations in the following ways.

First, in contrast to existing studies that only focus on partial aspects of open innovation, we take an integrative perspective and provide a comprehensive overview of open innovation activities. Drawing from an in-depth literature review of open innovation, we have grounds to evaluate and compare the utility of each activity in attaining innovation-related outcomes in organisations. We provide a systematic description of the multiple practices of open innovation and in this way help managers to



understand the complexity of this phenomenon and its activities, which have been fragmented and dispersed across several studies. Understanding contributions of individual open innovation practices is important in implementing effective decision making processes in organisations, specifically by CEOs in organisations that compete in dynamic business environments in which the innovation imperative is even more important (Zhou, Kin, and Tse 2005).

To disentangle the relative importance of a particular open innovation practice to an organisation's innovation performance, we performed quantitative analysis on a large sample of companies from three countries. In so doing, we provided evidence as to which open innovation practices should be given the most attention and be stimulated the most. Furthermore, with an aim to get additional insights on the key challenges and important elements for successful open innovation implementation within organisations, we carried out a semi-structured interview with a head of open innovation at a renowned multinational company.

The paper proceeds as follows. We first summarize existing literature on open innovation practices in relation to a firm's innovation performance. On this basis, we propose the conceptual framework and develop hypotheses. We then tested the proposed model on a sample of 693 companies from three countries. What follows is a discussion on the importance of employee involvement in firm's innovation performance and guidelines for successful implementation of open innovation. We conclude with the discussion of implications for theory and practice, limitations of our study and future research opportunities.

### **Open Innovation and a Firm's Innovation Performance**

Although existing research on open innovation is prevalently limited to qualitative studies, more empirical studies have recently emerged. For example, Laursen and Salter's (2006) findings based on the UK innovation survey suggested a curvilinear relationship between external search breadth and external search depth and innovation performance. In another study on a sample of 141 companies from three countries, Inauen and Schenker-Wicki (2011) showed that openness of the outside-in process positively relates to a firm's innovation performance; in particular, collaboration with customers and universities positively relates to product innovations, while openness towards suppliers, competitors, and universities is linked to process innovations.

However, only a few studies have considered the multidimensionality

of a firm's open innovation process. In their study, Van de Vrande et al. (2009) cluster analysed 605 companies from Netherlands into three clusters regarding their intensity on several practices of open innovation to find three distinct clusters of companies. The first (and smallest) cluster of companies was high on all open innovation practices; the second cluster of companies was intense on open innovation activities associated with employee and customer involvement and external networking; and the third cluster of companies implemented solely customer involvement practice. These authors did not analyse the relationship between open innovation practices and innovation performance.

Similarly, Schroll and Mild (2011) cluster analysed 180 European companies into groups based on their inbound open innovation cooperation, acquisition, and outbound open innovation. Although the authors observed different practices of open innovation, the study mainly pointed to the dynamics of adoption of inbound and outbound open innovation activities across European companies, without implying how open innovation relates to their innovation performance. Lazzarotti, Manzini, and Pellegrini (2010) examined different models for opening up the innovation process, taking into consideration partner variety (the number and type of partners with whom the company collaborates) and phase variety (the number and type of phases of the innovation process open to external collaborations). They identified four groups of companies: open innovators, who cooperate with a wide set of partners in many phases of the innovation process; specialised collaborators, who open only a small part of the innovation process to a wide variety of partners; integrated collaborators, who cooperate with a limited set of partners along the whole innovation funnel; and closed innovators, who open a very small part of the innovation funnel to a very limited set of partners.

Additionally, these authors analysed the relation between the two open innovation practices and a firm's innovation performance to find that open innovators had superior innovation performance as compared to companies in the other three groups. According to the authors, their findings need to be interpreted with caution and are not representative of open innovation phenomenon as a whole because they are based on a small sample of 99 companies analysing one specific practice of open innovation.

In summary, prior research of open innovation has lacked empirical evidence of how particular open innovation practices relates to a firm's innovation performance. Moreover, existing literature does not provide

suggestions on how different open innovation activities can be effectively implemented by taking into account the human centeredness of open innovation. Below, we build a theory to support our arguments about relationships between open innovation practices and a firm's innovation performance.

#### DIFFERENT PRACTICES OF OPEN INNOVATION

First, to establish particular relationships between open innovation practices and a firm's performance, we summarise existing open innovation literature that suggests that open innovation involves two important facets – inbound and outbound open innovation, and several activities associated with either two.

Open innovation consists of two parts: the first one indicates that firms should open up to leverage the discoveries of others, and the second part stresses the importance of sharing internal knowledge and technology with external partners (Chesbrough 2006). Inbound open innovation can be acquired with open innovation practices, such as external participation, inward IP licensing, external networking, outsourcing R&D, and customer involvement; in contrast, outbound open innovation can be realised through outward IP licensing, employee involvement, and venturing activities (van de Vrande et al. 2009).

#### THE RELATION BETWEEN THE SEPARATE PRACTICE OF OPEN INNOVATION AND A FIRM'S INNOVATION PERFORMANCE

Existing research provides overall support for the argument that there is a relationship between inbound and outbound open innovation activities and innovation performance (Chesbrough and Crowther 2006; Chesbrough 2003). This strong support is evident because inbound open innovation enables firms to reach external sources of knowledge and technology, which facilitate internal innovation processes; on the other hand, outbound open innovation generates additional value in the innovation by reaching external channels to market outside the traditional business of the firm (Chesbrough 2006).

Given the overall support for the relationship between open innovation and innovation performance, we develop arguments for specific relationships among open innovation practices: outsourcing R&D and external networking, customer involvement, inward IP licensing and external participation, employee involvement, and venturing and innovation performance.

### *Outsourcing R&D and External Networking*

Organisations that rely upon a greater number of external search channels have a superior capability to sustain exchanges and collaborations with external partners. This approach facilitates the gain and exploitation of innovative opportunities available to them, which positively relates to the firm's innovation performance (Laursen and Salter 2006). The overall positive effect of external networks on innovation has been also shown by Inauen and Schenker-Wicki (2011). Among resources in the networks, creativity, fresh ideas on product innovation, and know-how to implement such innovations (Schroll and Mild 2011) significantly contribute to market push innovations (Nijhof, Krabbendam, and Looise 2002). In collaborating with universities, companies also gain new technological and scientific capabilities that are accessible through specialised and expertise knowledge of scientists (Bishop, D'Este, and Neely 2011). Prior literature has suggested a positive relationship between a firm's innovation performance and its technological and scientific capabilities (Fabrizio 2006). We propose:

- H1 *There is a direct positive relationship between outsourcing R&D and external networking and innovation performance of a firm.*

### *Customer Involvement*

Customer involvement was in prior research shown to positively relate to a firm's innovation performance (Inauen and Schenker-Wicki 2011). This positive association emerged from customers' expressing their needs, which can be a great source of innovative ideas for new products and services and for continuously improving existing ones (Chesbrough 2003). The involvement of customers in the innovation process can be direct, such as by developing products based on their specifications (van de Vrande et al. 2009), or indirect, such as by equipping customers with toolkits for the development and testing of prototypes so that they can improve prototypes until the products match their requirements (von Hippel and Katz 2002). The innovative engagement of customers is long-standing and evolving, and some of their creations may be attractive to other customers (Prugl and Schreier 2006). The case of 3M shows that the innovations developed by customers have delivered sales 8 times higher than innovations developed in the traditional manner (Von Hippel 2005).

This evidence leads us to propose:

### *Managing Global Transitions*

- H2 *There is a direct positive relationship between customer involvement and innovation performance of a firm.*

### *External Participation and Inward IP Licensing*

Formalised relationships among companies, such as joint ventures, positively relate to patent results (Santamaría, Nieto, and Barge-Gil 2009). In case of complex innovation process, specific interdisciplinary knowledge and capabilities are required, which are hard to gain through market-based resources and are therefore attained through more heterogeneous alliances, for example non-equity alliances with more than one type of partner (Santamaría, Nieto, and Barge-Gil 2009). In addition, IP in-licensing enables the focal firm to save on time and development costs, and therein gain already verified technologies that enable the development of more sophisticated products (Tao and Magnotta 2006). Based on this evidence we hypothesise:

- H3 *There is a Direct Positive Relationship between External Participation and Inward IP Licensing and Innovation Performance of a Firm.*

### *Employee Involvement*

Innovation process can be stimulated via employee involvement, exploiting the knowledge and ideas of employees who are not involved in the R&D activities (van de Vrande et al. 2009). Employees can facilitate new innovations via internal collaboration among divisions that facilitate sharing and borrowing of ideas (O'Connor 2005). Another approach to employee involvement is their stimulation of searching for patentable ideas within and outside the organisation (Chesbrough 2003). Absorptive capacity enables firms to attain, integrate, transform and exploit knowledge with an aim of sustainable competitive advantage (Zahra and George 2002).

It relates to the ability of identification and exploitation of specific technological knowledge, its assimilation and application to commercial ends (Cohen and Levinthal 1989; 1990). Highly competent employees have greater absorptive capacities and superior abilities to transfer perceptions inside the company, and in this way they facilitate innovation activities (Knudsen 2007). We hypothesise:

- H4 *There is a Direct Positive Relationship between Employee Involvement and Innovation Performance of a Firm.*

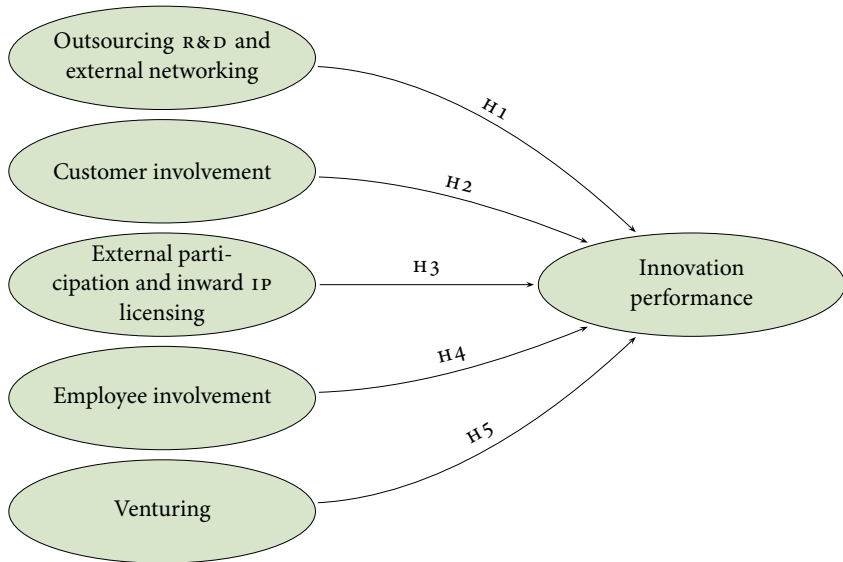


FIGURE 1 The Hypothesised Relations Between Open Innovation Practices and Firm's Innovation Performance

### *Venturing*

Internal technological capabilities can be commercialised with venturing (van de Vrande et al. 2009) that helps organisations to enter new markets and industries (Block and MacMillan 1995) and reach information about imminent technologies and market prospects (Chesbrough 2003). In these ways, organisations provide potential opportunities for innovation breakthrough. We anticipate:

*H5 There is a Direct Positive Relationship between Venturing and Innovation Performance of a Firm.*

The hypothesised relations come together in the model presented in figure 1.

### **Methodology and Data Analysis**

We chose three distinct national contexts for gathering data for the research: Italy, a cultural, political, and religious centre of Western civilisation; Slovenia, a young, small economy with a socialist past, and Belgium, a sovereign state with a rich political history and a complex system of governance. Despite being a part of European Union, some specific contextual differences exist in their business environment. For example,

according to Hofstede's country comparison, Slovenia scored much lower in the individualism and masculinity dimensions than Italy and Belgium. On the other side, Slovenia scored higher than the two countries in the power distance dimension. Moreover, the Innovation Union Scoreboard 2016 classified Belgium among the best countries within the Strong Innovators group. Slovenia ranked at the bottom of this group (with the innovation performance below the EU average), but outperformed Italy, which classified among Moderate Innovators.

However, according to the Eurostat statistics, the company structure of these countries is very similar to the European Union average, having more than 99% of SMES among active enterprises in the country, with the highest number of companies classified to distributive trades, following by professional, scientific and technical activities, construction and manufacturing. Therefore, the aim of incorporating different national contexts is to provide greater consistency of the results (and not making them country-specific).

The data were obtained via online surveys administered to CEOs of Italian, Slovenian, and Belgian companies. 1250 Italian companies were randomly selected from the Amadeus database in October 2012, 2000 Slovenian manufacturing and service firms from the PIRS database in May 2013, and 1500 Belgian companies from the Bel-First database in June 2013. The response rates were as follows: 99 valid responses in Italy (7.9% response rate), 421 valid responses in Slovenia (21.1% response rate), and 173 valid responses in Belgium (11.5% response rate), composing the total sample of 693 companies from three countries. The sample included different firm's sizes and a wide range of industries (the majority belonging to manufacturing, information and communication, and service activities). The sample composition is presented in table 1.

#### INDEPENDENT VARIABLES

We used proclivity for open innovation scale developed and validated by Rangus, Drnovšek, and Di Minin (2016) to measure the following open innovation practices: inward IP licensing and external participation, outsourcing R&D and external networking, customer involvement, employee involvement, and venturing. All responses were evaluated on a 7-point Likert scale (e.g. 1 = strongly disagree; 7 = strongly agree). To validate the dimensionality of the measure, we conducted CFA using Lisrel 8.80 and checked for their internal consistency using Cronbach's alphas (calculated using IBM SPSS Statistics 20).

TABLE 1 Sample Composition (%)

Category		(1)	(2)	(3)	(4)
Size	Micro (0–9 employees)	33.3	11.5	23.3	26.4
	Small (10–49 employees)	46.6	38.2	27.3	41.7
	Medium (50–249 employees)	11.9	27.2	16.2	16.3
	Large (250 employees or more)	8.3	23.1	33.3	15.6
Industry	Agriculture and mining	2.4	4.00	3.0	2.9
	Manufacturing sector	34.0	34.1	35.4	34.2
	Service sector	41.6	42.2	41.4	41.7
	Construction	9.5	10.4	9.1	9.7
	Public sector	12.6	9.2	11.1	11.5

NOTES Column headings are as follow: (1) Slovenian sample ( $n = 421$ ), (2) Belgian sample ( $n = 173$ ), (3) Italian sample ( $n = 99$ ), (4) sample composition ( $n = 693$ ).

Due to low standardised loadings, we excluded four items from further analysis. The excluded items were: (a) ‘To ensure successful development of new products/services, we usually buy the IP of other companies,’ which belongs to factor Inward IP licensing and external participation; (b and c) ‘In order to acquire new know-how/technology, we cooperate with consultancy companies’ and ‘In order to acquire new know-how/technology, we cooperate with competitors,’ both of which belong to factor Outsourcing R&D and external networking; and (d) ‘Members of our staff include idea seekers who look for potentially useful know-how/technologies outside the company,’ which belongs to factor Employee involvement.

Cronbach’s alphas of the five practices ranged between 0.77 and 0.86 and were consistent with the previous research of Rangus, Drnovšek, and Di Minin (2016) that reported the range of Cronbach’s alphas from 0.76 to 0.88.

#### DEPENDENT VARIABLE

We measured innovation performance with Jiménez-Jiménez and Sanz-Valle (2011) measure. With this measure, respondents evaluated various aspects of a firm’s innovation performance against the major competitors in the industry in the last 3 years on a 7-point Likert scale ranging from *much worse than competitors* to *much better than competitors*. The construct exhibited high internal consistency with the Cronbach’s alpha of 0.91.



TABLE 2 Results of the Regression Analysis

Variable	(1)	(2)	(3)	(4)	(5)
Employee involvement	0.365	0.036	0.376	100.286	0.000
Venturing	0.114	0.034	0.125	30.325	0.001
Outs. R&D and external networking	0.081	0.032	0.090	20.538	0.011
Firm size	0.078	0.034	0.079	20.272	0.023
Customer involvement	0.075	0.034	0.079	20.233	0.026

NOTES Column headings are as follows: (1) *B*, (2) standard error (unstandardized coefficients), (3)  $\beta$  (standardized coefficient), (4) *t*, (5) significance.

We reduced the data and built the final practices constituting the components for regression analysis using summated scales. We also checked for the potential of high correlation between the practices using correlation analysis, where no correlation exceeded the value of 0.5.

CONTROL VARIABLES

We included three control variables in the model. We controlled for the differences in the national context differentiating among the three countries (Slovenia, Belgium, and Italy). At the firm level, we controlled for firm size (measured with the number of employees) and firm industry (differentiating among agriculture and mining, manufacturing sector, service sector, construction, and public sector).

Results

The regression analysis was performed using IBM SPSS Statistics 20. We evaluated the relationship between a specific practice of open innovation and a firm’s innovation performance using linear regression analysis. We used stepwise estimation model to include the variables into the model, as this method starts by selecting the best predictor of the dependent variable, and continues by including other variables according to the incremental explanatory power they can add to the model and dropping the variables with insignificant level of predictive power (Hair et al. 2010). Results of the regression analysis are presented in table 2 and excluded variables in table 3.

The regression analysis supported the hypotheses with the following results: outsourcing R&D and external networking ( $\beta = +0.09, p \leq 0.05$ ), customer involvement ( $\beta = +0.08, p \leq 0.05$ ), employee involvement ( $\beta = +0.38, p \leq 0.001$ ), and venturing ( $\beta = +0.13, p \leq 0.001$ ),

TABLE 3 Excluded Variables

Variable	(1)	(2)	(3)
External participation and inward IP licensing	0.054	10.309	0.191
Firm industry	0.033	0.974	0.331
Country	0.049	10.371	0.171

NOTES Column headings are as follows: (1)  $\beta$ , (2)  $t$ , (3) significance.

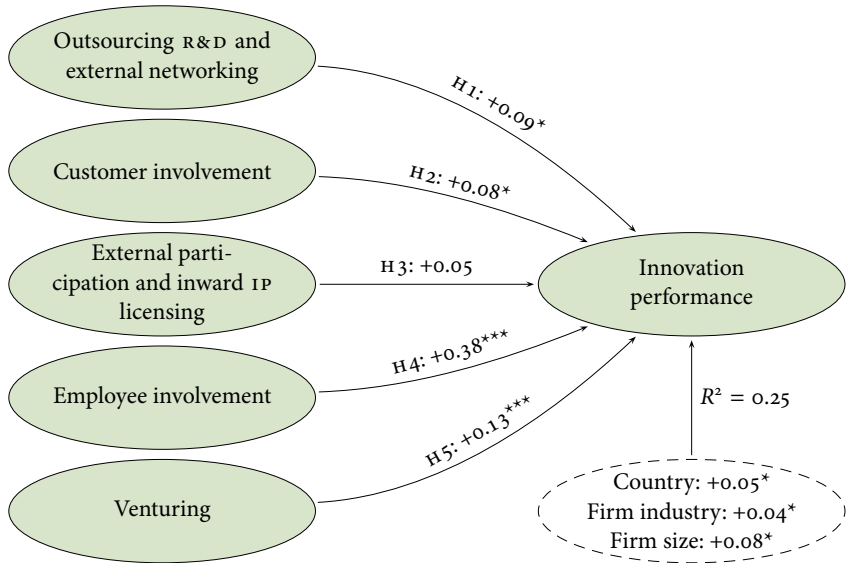


FIGURE 2 Results of the Hypothesised Relations (\* significant at  $p \leq 0.05$ , \*\*\* significant at  $p \leq 0.001$ )

with the exception of Hypothesis 3 that proposed a positive relationship between inward IP licensing and external participation and a firm's innovation performance (the relationship was positive but not significant). The results of the regression analysis (presented in figure 2) exhibited the strongest relationship between employee involvement and a firm's innovation performance.

Among the control variables only firm size exhibited significant (positive) relation with the innovation performance of a firm. In particular, the results suggest, that the larger the firm the superior the innovation performance. This may be due to the fact that larger firms possess the resources for R&D investments and consequently develop more innovations (in terms of new product/service development) (Damanpour 1992).

## **Findings**

An important aspect raised in this study is the importance of the employee involvement practice. This practice turned to have the most significant relationship with a firm's innovation performance among the selected open innovation practices. Previous studies showed that high performance work practices, which include employee recruitment, incentive compensation, employee involvement, and training, are associated with lower employee turnover, greater productivity, and corporate financial performance (Huselid 1995). Our study adds to the existing evidence on the importance of employee involvement by displaying their significant relation to innovation performance. Therefore, managers have to dedicate special attention to the development and personal growth of employees.

As we emphasised earlier in the paper, the absorptive capacity of employees to identify, integrate, and combine externally acquired knowledge and technology facilitates innovation outcomes. Moreover, the greater the employees' competences, the greater their absorptive capacities (Knudsen 2007). Competences of employees may be raised by forming rotational assignments through which different interactions internally and externally enhance the sharing and borrowing of ideas (O'Connor 2005). Another important aspect is raising awareness, especially among researchers, about the business side of innovation and rewarding them for identifying patentable ideas within as well as outside the firm's boundaries (Chesbrough 2003).

Furthermore, with an aim to get additional insights on how to effectively implement open innovation process within organisations, we executed a semi-structured interview with Lucia Chierchia, head of open innovation at Electrolux. In her view, 'the key challenge of open innovation is the creation of synergies between people inside and outside the company.' Therefore, the implementation of open innovation should first start with the identification of an open innovation network – that is, the network of partners outside the trusted network of the company (i.e., the network of long-standing partnerships with associates they know and trust). Collaboration with the trusted network 'is not open innovation, but a normal way of business.' So 'the challenge is to reach and interact with people/organisations that we don't know; and because we don't know them we cannot trust them. This is open innovation.'

The network should consist of different partners, including suppli-

ers, customers, companies from different industries, start-ups, universities, research institutes, laboratories, individual researchers and inventors, venture capitals, etc. These partnerships can be established informally by way of a 'facial or virtual word of mouth approach,' connecting with new partners through acquaintances or more formally by way of platforms/online communities (such as Nine Sigma, Innocentive, etc.) that can help at identification of the right partner for new product/service development. 'The challenge is to put the ideas on innovation every day; to transfer ideas into running projects of a company [...] but in parallel we need to constantly enlarge and reinforce the open innovation network.'

However, the grounds for the successful implementation of open innovation are establishment of the open mindsets of internal and external participants. Hence, the human centeredness of open innovation is crucial, and companies need to invest into activities that nurture open mindsets. 'Open innovation is a model of interaction among people – is about people. So it is crucial to consider also the psychological part.' The way they grow open innovation mindsets in Electrolux is through workshops and trainings, motivating employees to overcome the 'Not invented here' syndrome. In addition, they externally promote open innovation mindsets through free webinars for external partners and are also often invited by other organisations to share their knowledge and experiences on open innovation and explain their ways of implementation.

### **Discussion**

The aim of this research was to contribute to a deeper understanding of how different practices of open innovation relate to a firm's innovation performance and disentangle their relative importance. Using a multidimensional measure related to open innovation enabled us to determine the importance of individual dimensions with regard to a firm's innovation performance; these relationships may be unseen when using a unidimensional scale. Based on a sample of companies from three different countries, we performed regression analysis, underscoring the relation of the individual practice of open innovation with a firm's innovation performance. Our empirical findings suggest that all open innovation practices are positively associated with a firm's innovation performance, with the strongest link of employee involvement. Since the importance of this practice was emphasised through interviews as well, we have discussed it in more detail in a separate subsection.

In general, the findings suggest that stimulating any open innovation practice may strengthen a firm's innovation performance. The exception to this finding was the practice of the inward IP licensing and external participation, which did not turn out to be significant. This result may denote that solely buying or licensing external technology does not create benefits; firms must have the capabilities to incorporate it and turn this technology into innovation opportunities. This finding supports the notion already emphasized by scholars highlighting the importance of internal R&D for open innovation.

While open innovation promotes collaboration among different partners and exploration of outside knowledge and technology, it does not advise to rely solely on external sources. As stated by Chesbrough and Crowther (2006, 235): 'the concept of open innovation ought not to be interpreted to imply the outsourcing of the entire R&D function. Leveraging external research may function more as a complement than as a substitute in the performance of internal R&D activities.' A central implication of this study is thus the finding that while searching and collaborating with external environment, organizations should not forget about the internal organizational mechanisms that play a vital part in successful open innovation implementation. Besides the stimulation of the internal development of technology and the search for external resources and collaboration, managers have to pay greater attention to the personal development of employees, nurturing their open mindsets through different trainings, workshops, open communication and collaboration.

Besides determining the relationship of individual dimension with a firm's innovation performance, the multidimensional measure also enables firms to define the interactions of separate dimensions with various internal and external factors that may present fruitful avenues for future research (incorporating distinct boundary conditions in the model). Control variables included in the model denoted significant relation with firm size, supporting the notion that larger companies tend to have superior innovation performance, i.e. are able to innovate faster as they have greater financial resources and capabilities. On the other side, the association with industry type and country was not significant. In terms of open innovation, results are in line with the existing literature which emphasize the significant relation of open innovation with firm size rather than industry (van de Vrande et al. 2009). Van de Vrande and colleagues indicated that manufacturers tend to use R&D outsourcing and outward IP licensing more often and venturing activities are employed more by

service firms which is an important observation. Open innovation activities which may consequently lead to better innovation performance are thus important for all companies regardless of firm industry. The non-significant difference among countries may be related to the fact that the motives for business (e.g. profit motives) and overall aims of innovation performance (e.g. competitive advantage, growth, etc.) may be similar regardless of national context (Spithoven 2013). However, there are several differences in innovation performance of the analysed countries evident, for example from the European Innovation Scoreboard, therefore future research should also devote special attention to the factors which may reveal these hidden differences among industry and national specificities.

Besides the mentioned shortcomings, there are also other limitations of the study, which may present opportunities for future research. One of the main drawbacks relates to the use of cross-sectional data, observing subjects only at one point of time. Incorporating longitudinal analysis may reveal how the use of open innovation practices evolve and change over time. Another limitation relates to the small marginal samples of the companies from Italy (and Belgium). To support the findings of our study, additional research from these national contexts is needed. Another limitation is related to the common method bias, collecting data from a single respondent of a company. We tried to minimize this bias by paying special attention in the research design development and implementation phase. For example, we performed pre-test phase for validating the understanding and objectiveness of the survey instrument, and when sending survey invitations, we searched for the direct addresses of the CEOs. Furthermore, future research should include relative importance analysis that withdraws the problem of correlations among the predictor variables and may therefore contribute to the better understanding of the roles played by each predictor in a regression equation.

Since our research highlighted the importance of the human part of open innovation, future research may devote special attention to these aspects. Future studies may examine the leadership competences and tactics that enable successful open innovation, or competences and skills of employees needed for execution of different open innovation practices. Moreover, research connecting different levels of analysis (e.g. individual, team and leadership levels) are needed to provide evidences on how to successfully lead and manage internal organization for open innovation.

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# *Are Banks and Stock Markets Complements Or Substitutes? Empirical Evidence from Three Countries*

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This paper has tested whether bank-based financial development and market-based financial development are complements of, or substitutes for, one another in enhancing economic growth in the USA, Brazil and Kenya during the period from 1980 to 2012. These three countries represent a modest cross-section of the general financial structure prevalent in many developed and developing countries. Unlike some of the previous studies, the study employs the newly developed ARDL-Bounds-testing approach to carry out the test. The study also employs the method of means-removed average to construct both bank-based and market-based financial development indices. The results of this study show that while in the USA and Brazil, bank-based and market-based financial systems complement each other in enhancing economic growth; in Kenya, the two financial systems seem to be substitutes rather than complements.

*Key Words:* bank-based financial development, market-based financial development, economic growth, Unites States of America, Brazil, Kenya

*JEL Classification:* G10, G20, O16

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## **Introduction**

While it has been widely acknowledged that financial development is important in propelling economic growth, it is still debatable whether bank-based and market-based financial development are complements or substitutes for one another in stimulating economic growth. The relationship between financial-sector development and economic growth has received considerable attention for many decades: in both the developing and the developed economies. However, the vast majority of the previous studies have focused mainly on the relationship between financial intermediaries

and economic growth (see, among others, Ahmed and Ansari 1998; Allen and Ndikumana 2000; Christopoulos and Tsionas 2004; Zang and Kim 2007; Güryay, Şafakli, and Tüzel 2007; Kargbo and Adamu 2009; Hassan, Sanchez, and Yu 2011; Adu, Marbuah, and Mensah 2013).

Empirical studies on market-based financial development and economic growth are scanty; so are studies on bank-based and market-based financial development and economic growth. Thus, very few studies have put to the test the three financial structure views – the bank-based view, which postulates that a bank-based financial system is better than a market-based system in promoting economic growth; the market-based view, which places a high level of importance on market-based financial development in propelling economic growth; and the financial services view, which minimises the importance of the bank-based versus the market-based debate, and stresses the importance of the complementarity of the two financial systems in providing sound financial services.

It is against this backdrop that this study attempts to examine the dynamic relationship between bank- and market-based financial development in propelling economic growth in the United States of America (USA), Brazil and Kenya, using the newly developed ARDL-Bounds-testing procedure. The three selected countries represent a modest cross-section of the general financial structure prevalent in many developed and developing countries. Specifically, the study attempts to establish whether bank-based financial development and market-based financial development complement each other, or substitute each other in driving economic growth. The interaction of bank- and market-based financial development is captured by the interaction term – comprising the bank-based financial development and market-based financial development proxies – in a standard growth model. The study hypothesises that bank- and market-based financial development complement one another in driving economic growth.

In order to incorporate the various proxies of bank-based and market-based financial development in the empirical analysis, the current study employs the method of the means-removed average, in order to construct a bank-based financial development index, from  $M_2$ ,  $M_3$  and credit provided to the private sector; and a market-based financial development index, from stock market capitalisation, the total value of stocks traded and the turnover ratio (see also Demirguc-Kunt and Levine 1996).

Bank-based and market-based financial development, investment, savings and trade openness are additional variables employed in the stan-

dard growth model, in order to control for other potential determinants of economic growth in the regressions (see also Beck and Levine 2004).

The rest of this paper is organised as follows: the second section gives an overview of the financial sector reforms and development in the study countries. The third section highlights the theoretical and empirical literature review on bank-based and market-based financial development and economic growth. The fourth section deals with the empirical model specification, the estimation technique, and the empirical analysis of the regression results. The fifth section concludes the study.

### **Financial Sector Reforms and Development in the USA, Brazil and Kenya**

By any standard, modern or otherwise, the USA has a highly developed financial sector, which ranks very highly in terms of the development and sophistication of its bank and non-bank financial institutions – and also of its financial markets, as well as the size, depth and access available to its financial services. The USA was ranked number 1 in 2010 and number 2 in 2011, in terms of financial development, based on the Financial-Development Index rankings (World Economic Forum 2011).

The USA had several stock exchanges, which gradually acquired one another and/or merged over the years to form three big stock exchanges – the biggest one being the NYSE Euronext, followed by the NASDAQ OMX, which is two-thirds the size of the NYSE Euronext by market capitalisation, followed by the Chicago Stock Exchange (CHX) (<http://www.chx.com>; <http://usequities.nyx.com>; <http://www.nasdaq.com>). Although these three are the most visible stock exchanges in the USA, there are numerous other exchanges that specialise in financial instruments, other than stocks. The USA's financial system is generally referred to as a market-based financial system.

The Brazilian financial system, on the other hand, is the largest and most sophisticated in Latin America (World Bank 2007). The sector consists of both the banking segment and the capital market segment. Although both segments are still developing by international standards, the capital market segment plays an important role in driving economic growth, alongside the banks. The Brazilian financial system is, therefore, commonly referred to as a 'market-based' financial system (Demirguc-Kunt and Levine 2001).

The history of the stock market in Brazil dates back to as early as 1817, when the first Brazilian stock exchange (now the inactive Sal-

vador Exchange) was inaugurated. Several stock exchanges gradually emerged over the years. However, these gradually acquired one another, and/or merged over the years, to form one big stock exchange, the BM&FBOVESPA, which is Latin America's leader in the securities and derivatives segments (see <http://www.bmfbovespa.com.br>).

Unlike the USA and Brazil, which are dominated by a market-based financial system, Kenya's financial sector is dominated by a bank-based financial system. Although Kenya has the largest financial sector in East Africa – from both the bank-based and the market-based fronts – it is still young and developing by the standards of advanced economies. The country has one stock market, known as the Nairobi Securities Exchange – formerly the Nairobi Stock Exchange (see <http://www.centralbank.go.ke>; <http://www.nse.co.ke>).

As early as the 1930s, the USA embarked on the financial sector reform journey to keep pace with the national demands for development, and the global demands for modernisation, with Brazil and Kenya joining in during the 1980s. However, the 21st Century saw the intensification of these reforms, both in the respective banking sectors and the stock markets. In the banking sectors, these reforms have focused on improving the legal, regulatory, judiciary and supervisory environments; reducing financial repression; restoring bank soundness; and rehabilitating the financial infrastructure; and they have also included programmes designed to encourage new entrants (Central Bank of Brazil 2009; FSD Kenya 2010; see also <http://www.fdic.gov>).

On the stock market side, the reforms have addressed the legal, regulatory, judiciary as well as supervisory aspects of the business, as well as the general modernisation of the trading environment.

The rigorous reforms over time have given rise to a developed and well-regulated financial system in the USA, with Brazilian standards trailing behind those of the USA, and the Kenyan standards trailing behind the Brazilian developmental standards. The development of the banking sector in the countries of study is evidenced by the growth in private sector credit, the increasing number of Automated Teller Machines (ATMs), low levels of non-performing loans, and strong legal rights (see <http://data.worldbank.org/topic/financial-sector>).

In terms of the credit extended to the private sector by the banking sector, the USA started and finished off in the best position of the three economies, reaching a peak of almost 250% in 2007; while Kenya had the worst performance – with the lowest credit extended to the private sec-

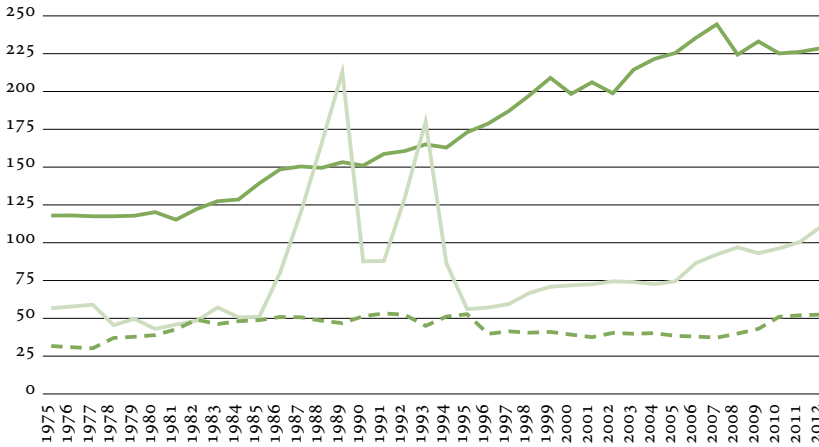


FIGURE 1 Trends in the Banking Sector Growth in the USA (dark), Brazil (light) and Kenya (dashed) (1975–2013; based on World Bank Development Indicators, <http://data.worldbank.org/topic/financial-sector>)

tor throughout the period – and never exceeding the 75% mark. Figure 1 illustrates the trends in banking sector growth, as shown by credit extension to the private sector in the USA, Brazil and Kenya during the period 1975–2013.

On the stock market front, the reforms gave rise to an increased number of listed companies, a remarkable increase in stock market capitalisation, total value traded and turnover ratio up to the early 2000s (see <http://data.worldbank.org/topic/financial-sector>). Overall, Kenya has relatively the smallest and most inactive stock market of the three study countries, in all respects, i.e. in terms of the number of listed companies, stock market capitalisation, the total value of stocks traded and the turnover ratio. The USA, on the other hand, has the biggest and the most liquid stock market in general. Figures 2–4 track and compare stock market size and activity for the USA, Brazil and Kenya during the period 1988 to 2012. Despite this growth, these countries’ financial systems still face some challenges. Although these challenges differ in dimension and magnitude, financial inclusion, reduced bank profitability, the Eurozone contagion, and stock market liquidity, seem to top the list.

### **Bank-Based Financial Development, Market-Based Financial Development and Economic Growth**

Generally, a financial system consists of two components; the bank-based component and the market-based component. According to Demirguc-

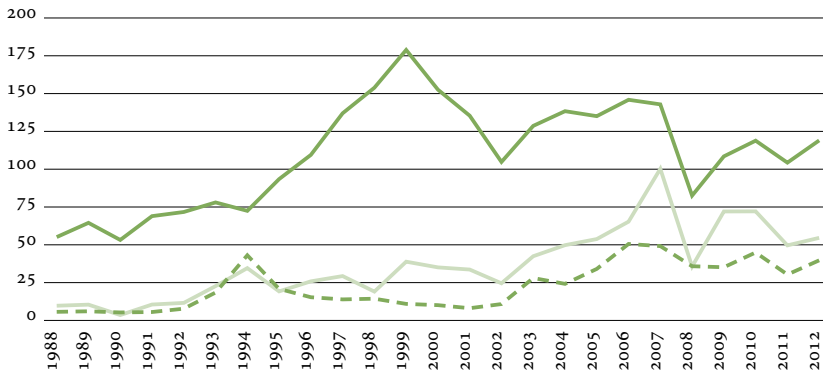


FIGURE 2 Trends in Stock Market Capitalisation in the USA (dark), Brazil (light) and Kenya (dashed) (1988–2012; based on World Bank Development Indicators, <http://data.worldbank.org/topic/financial-sector>)

Kunt and Levine (2001), if an economy is driven by financial intermediaries – like banks and bank-like financial institutions more than it is driven by financial markets – like stock markets and bond markets, that economy’s financial system is generally referred to as ‘a bank-based financial system.’ However, if securities markets share centre stage with banks in driving economic growth *via* savings mobilisation and allocation, exerting corporate control, and easing risk management, that economy’s financial system is generally referred to as ‘a market-based financial system’ (Demirguc-Kunt and Levine 2001).

There exists a considerable debate in the literature on the relative merits of a bank-based versus a market-based financial system in fostering economic growth. In line with the bank-based view, most economists still believe that a bank-based financial system is better than a market-based system. In particular, it is argued that economic growth could be encouraged more in the bank-based system, since it can induce longer-term investment in the real sector; whereas investment in the market-based system is too sensitive to the stock market prices with short-term investment (Hoshi, Kashyap, and Scharfstein 1990).

On the other hand, the market-based view places a high importance on market-based financial development in propelling economic growth; and it highlights the positive role markets play in enhancing risk management, information dissemination, corporate control, and capital allocation (Levine and Zervos 1998). This view also stresses the problems associated with banks, arguing that powerful banks can stymie innova-



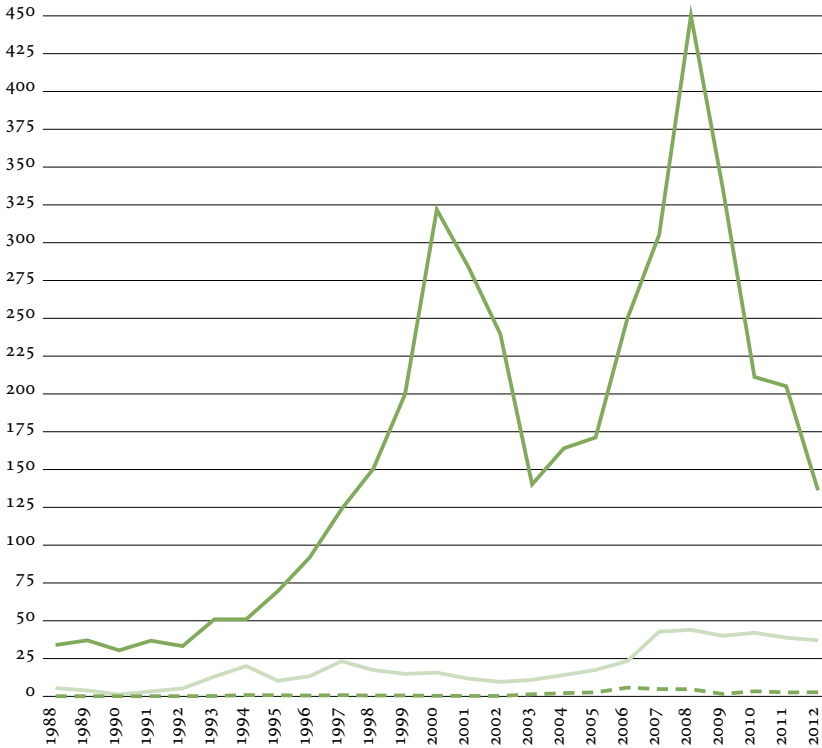


FIGURE 3 Trends in Total Value of Stocks Traded in the USA (dark), Brazil (light) and Kenya (dashed) (1988–2012; based on World Bank Development Indicators, <http://data.worldbank.org/topic/financial-sector>)

tion by extracting informational rents and protecting established firms with close bank-firm ties from competition (Rajan 1992).

In addition to these two competing views, there is a third view called the financial-services view. This view, as articulated by Merton and Bodie (1995) and Levine (1997), minimises the importance of the bank-based versus the market-based debate. Rather, it stresses that financial arrangements – contracts, markets, and intermediaries – arise to ameliorate market imperfections and to provide financial services (Levine 2002). Thus, according to this view, the main issue is neither banks nor markets, but creating an environment in which intermediaries and markets complement each other in providing sound financial services.

Contrary to the commonly held belief that bank-based financial development is better in propelling economic growth, the empirical literature, although largely supportive of the two financial systems being com-

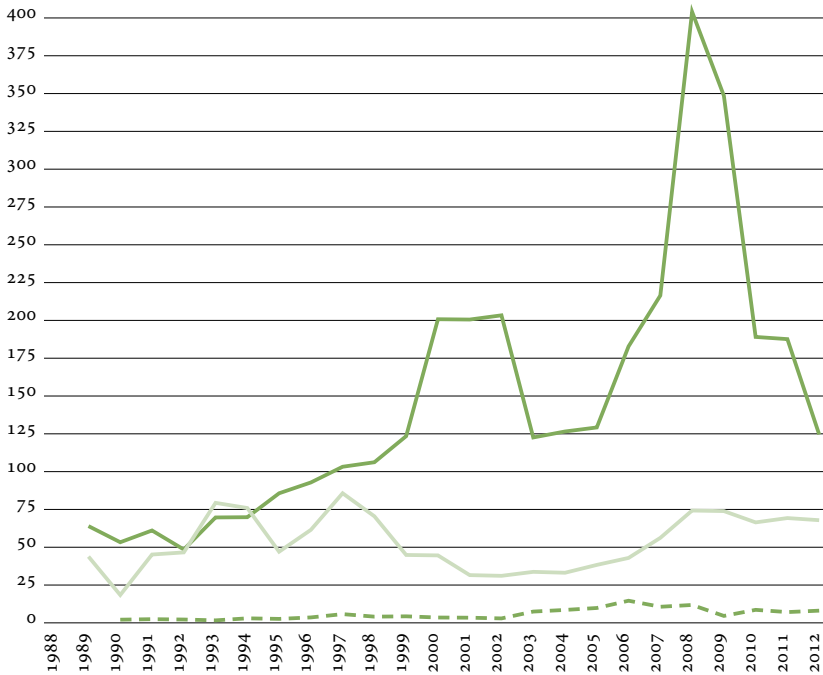


FIGURE 4 Trends in Turnover Ratio of Stocks Traded in the USA (dark), Brazil (light) and Kenya (dashed) (1988–2012; based on World Bank Development Indicators, <http://data.worldbank.org/topic/financial-sector>)

plements, has also shown that the market-based view is valid in some countries. Thus, to date, the question of whether bank-based and market-based financial systems are complements or substitutes is still debatable.

Levine (1999) selectively reviewed evidence on banks, markets and financial structures. Although he found that establishing a legal environment that rigorously protects the right of investors is fundamentally more important than any considerations involving comparisons between bank-based and market-based systems, he also concluded that both banks and markets provide complementary services to the economy – with positive implications for economic performance.

Beck and Levine (2002) empirically assessed the impact of financial structure on economic growth, industrial growth, new establishment formation, and capital allocation across industries for 42 countries and 36 industries. They found evidence for neither the market-based nor the bank-based hypothesis; and they concluded that having a bank-based or market-based system *per se* does not seem to matter much – but rather,

it is the legal system's efficiency and overall financial development that boost industrial growth, new establishment formation, and efficient capital allocation.

Levine (2002) empirically assessed competing theoretical views on whether bank-based or market-based financial systems are better at promoting long-run economic growth – using a wide assortment of 48 developed and developing countries. The results indicated that although overall financial development is robustly linked to economic growth, there is no support for either the bank-based or the market-based view. The two systems are rather complementary.

Levine (2004) reviewed, appraised, and critiqued theoretical and empirical research on the connections between the operation of the financial system and economic growth. While subject to ample qualifications and countervailing views were noted throughout the study, the predominance of evidence led Levine to suggest that both financial intermediaries and markets impact growth in their own ways, thereby complementing each other.

Yonezawa and Azeez (2010) empirically examined whether bank-based or market-based financial systems are better at promoting economic performance – using a panel dataset on 40 countries for the period 1990–2003. They found that market-based financial system induces capital accumulation more efficiently; whereas a bank-based financial system and a financially developed economy are more effective in promoting productivity. Furthermore, the bank-based system was found to promote capital accumulation in the past. Thus, the two financial systems were found to complement each other.

Ujunwa and Salami (2010) examined the channels through which banks and markets promote economic growth in Nigeria. Using bank size, bank activity, bank efficiency, market size, market activity and market efficiency as measures of bank-based and market-based financial development, the authors found evidence in support of banks and markets being complements of each other. In conclusion, the study relegated the financial structure arguments to the shadows, and recommended a favourable macro-economic environment that would allow for the development of the financial system.

Masoud and Hardaker (2012) analysed the relationship between financial development and economic growth for 42 emerging markets, over 12 years, using an endogenous growth model. The results suggested that stock market development and banking sector development have a signif-

ificant effect on economic growth. The authors further found that the stock market and the banking sector in the emerging economies are complementary to – rather than substitutes for each other – in promoting the economy.

Odhiambo (2014) examined the relationship between banks, stock markets and economic growth in South Africa, in an attempt to answer one critical question: Are stock markets and banks complementary to one another in the process of enhancing economic growth? Using stock market capitalisation, stock market traded value and stock market turnover as market-based financial development proxies – against the ratio of bank credit to the private sector, a proxy for bank-based financial development – the study found that complementarity between stock market development and bank-based financial development is sensitive to the variable used as a proxy for stock market development. Complementarity was found to exist when the stock market capitalisation was used as a proxy for stock market development. However, in general, the complementarity between stock market development and bank-based financial development in South Africa was found to be weak.

In the finance-growth literature, although scarce, there is also empirical evidence suggesting the outright importance of one financial system, and the insignificance of the other financial system – in fostering economic growth in an economy. Dey (2007) examined the determinants of stock market and bank liquidity in an economy in which stock market turnover and available bank credit denoted access to long- and short-term capital, respectively. It was found that these two variables are interdependent, and the errors are correlated. The results suggested that available bank credit and stock market turnover are inversely related to each other, confirming their substitutability relationship.

### **Estimation Techniques and Empirical Analysis**

#### **CO-INTEGRATION: ARDL BOUNDS-TESTING PROCEDURE**

This study utilises the newly proposed autoregressive-distributed lag (ARDL) bounds testing approach, which was initially introduced by Pesaran and Shin (1999), and later extended by Pesaran, Shin, and Smith (2001), to test the complementarity or substitutability of bank-based and market-based financial development in enhancing economic growth. This test has numerous advantages over previous co-integration tests, such as the residual-based technique by Engle and Granger (1987), and

the Full-Maximum Likelihood (FML) test, based on the work of Johansen (1988; 1991), and on the study by Johansen and Juselius (1990).

Firstly, unlike these other tests, the ARDL approach can be applied to test the existence of a relationship between variables – regardless of whether the underlying regressors are integrated of order one [I(1)], order zero [I(0)], or fractionally integrated. Thus, the ARDL-bounds testing approach does not impose the restrictive assumption that all the variables under study must be integrated of the same order. Secondly, while other co-integration techniques are sensitive to the size of the sample, the ARDL test is suitable even when the sample size is small. Thus, the ARDL test has superior small sample properties, when compared with the Johansen and Juselius (1990) co-integration test (Pesaran and Shin 1999).

Thirdly, the ARDL technique generally provides unbiased estimates of the long-run model and valid *t*-statistics – even when some of the regressors are endogenous. Fourthly, while conventional co-integration methods estimate the long-run relationship within the context of a system of equations, the ARDL method employs only a single reduced-form equation (Pesaran and Shin 1999). Consequently, this approach is considered appropriate for analysing the underlying relationship; and it has been increasingly used in empirical research in recent years.

The empirical model used in this study, to test whether bank-based financial development and market-based financial development are complements or not in promoting economic growth is expressed in the ARDL form as follows:

$$\begin{aligned}
 \Delta \text{GDP}_t = & \lambda_0 + \sum_{i=1}^n \lambda_{1i} \Delta \text{GDP}_{t-i} + \sum_{i=0}^n \lambda_{2i} \Delta \text{BFD}_{t-i} \\
 & + \sum_{i=0}^n \lambda_{3i} \Delta \text{MFD}_{t-i} + \sum_{i=0}^n \lambda_{4i} [\Delta (\text{BFD}^* \text{MFD})]_{t-i} \\
 & + \sum_{i=0}^n \lambda_{5i} \Delta \text{INV}_{t-i} + \sum_{i=0}^n \lambda_{6i} \Delta \text{SAV}_{t-i} + \sum_{i=0}^n \lambda_{7i} \Delta \text{TOP}_{t-i} \\
 & + \sigma_1 \text{GDP}_{t-1} + \sigma_2 \text{BFD}_{t-1} + \sigma_3 \text{MFD}_{t-1} + \sigma_4 (\text{BFD}^* \text{MFD})_{t-1} \\
 & + \sigma_5 \text{INV}_{t-1} + \sigma_6 \text{SAV}_{t-1} + \sigma_7 \text{TOP}_{t-1} + \sigma_t,
 \end{aligned} \tag{1}$$

where GDP is the growth rate of real gross domestic product – a proxy for economic growth - this proxy has been used extensively in literature (see, among others, Wood 1993; Odedokun 1996; Shan and Jianhong 2006; Majid 2008); BFD is an index of bank-based financial development, which

is a means-removed average of  $M_2$ ,  $M_3$  and credit provided to the private sector by financial intermediaries – a proxy for bank-based financial development (see also Demirguc-Kunt and Levine 1996);  $MFD$  is an index of market-based financial development, which is a means-removed average of stock market capitalisation, stock market traded value and stock-market turnover – a proxy for market-based financial development (see also Demirguc-Kunt and Levine 1996).  $BFD^*MFD$  is the interaction term between bank-based and market-based financial development;  $INV$  is the share of the investment in gross domestic product;  $SAV$  is the share of the savings in gross domestic product;  $TOP$  is trade openness;  $\lambda_0$  is a constant;  $\lambda_1 - \lambda_7$  and  $\sigma_1 - \sigma_7$  are regression coefficients;  $\Delta$  is the difference operator;  $n$  is the lag length and  $\varepsilon_t$  is the white noise-error term.

The error correction model is specified as follows:

$$\begin{aligned} \Delta GDP_t = & \lambda_0 + \sum_{i=1}^n \lambda_{1i} \Delta GDP_{t-i} + \sum_{i=0}^n \lambda_{2i} \Delta BFD_{t-i} \\ & + \sum_{i=0}^n \lambda_{3i} \Delta MFD_{t-i} + \sum_{i=0}^n \lambda_{4i} [\Delta (BFD^*MFD)]_{t-i} \\ & + \sum_{i=0}^n \lambda_{5i} \Delta INV_{t-i} + \sum_{i=0}^n \lambda_{6i} \Delta SAV_{t-i} + \sum_{i=0}^n \lambda_{7i} \Delta TOP_{t-i} \\ & + \xi ECM_{t-1} + \varepsilon_t. \end{aligned} \quad (2)$$

### DATA SOURCES

This study utilised annual time-series data, covering the period from 1980 to 2012. The annual data used in the study were obtained from the World Bank Economic Indicators (see <http://data.worldbank.org/topic/financial-sector>), except for the market-based financial development proxies (stock market capitalisation, stock market traded value, and stock market turnover) for the period 1980 to 1988, which were obtained from the Emerging Stock Markets Factbook (International Finance Corporation 1991) and the countries' stock exchanges. All of the model estimations were computed using Microfit 5.0 software.

### STATIONARITY TESTS

Before any analysis was conducted, the variables were first tested for stationarity, using the Dickey-Fuller generalised least-square (DF-GLS) and the Phillips-Perron (PP) tests. To cater for possible structural breaks

within the dataset, the Perron (1997) test for unit root (PPUR-Root) was also utilised as the third unit-root testing method.

The DF-GLS lag length was selected automatically by SIC; the PP truncation lag was selected automatically on the Newey-West bandwidth; and the PPU-Root break years were also automatically selected; and these dates ranged from 1987 to 2006, depending on the variable. The results of DF-GLS, PP and the PPU-Root stationarity tests for all the variables are presented in table 1.

The results reported in table 1 show that after differencing the variables once, all the variables were confirmed to be stationary. Even though the ARDL test does not require the pre-testing of variables, the unit-root test provides guidance as to whether ARDL is applicable or not, as it is only applicable for the analysis of variables that are integrated of order zero  $I(0)$ , or order one  $I(1)$ . In this instance, the variables are conclusively stationary, after being differenced once; hence, the ARDL bounds-testing procedure can be satisfactorily performed.

#### CO-INTEGRATION AND ARDL-BASED ECM MODEL

In this section, the long-run relationship between the variables is examined, using the ARDL bounds-testing procedure. The first step is to get the order of lags on the first differenced variables in equations (1) by using the Akaike Information Criterion and the Schwartz-Bayesian Criterion. This is followed by the application of a bounds  $F$ -test to equation (1) to establish a long-run relationship between the variables in the study. The results of the bounds  $F$ -test are reported in table 2.

The results of the  $F$ -test suggest that there exists a long-run relationship between GDP and BFD, MFD,  $BFD * MFD$ , INV, SAV and TOP. Following the estimation of the ARDL model and the use of AIC or SIC for optimal lag-length selection, the SIC-based ARDL(2,3,2,3,3,3,1), ARDL(2,0,1,1,2,1,0) and ARDL(2,1,0,0,2,0,2) models were selected for the USA, Brazil and Kenya, respectively, because they were more parsimonious than the AIC-based alternatives. The long-run results of the selected models are reported in table 3 panel A; and the short-run results are reported in table 3 panel B.

The results reported in table 3 show that the complementarity/substitutability between bank-based and market-based financial development is both country- and time-variant. In the USA and Brazil, bank-based and market-based financial development have been found to be complements; while in Kenya, they were found to be substitutes. While the com-

TABLE 1 Stationarity Tests of all Variables

Variable	United States			Brazil			Kenya					
	1a	1b	2a	2b	1a	1b	2a	1a	1b	2a	2b	
<i>Dickey-Fuller Generalised Least Square (DF-GLS)</i>												
GDP	-3.401***	-3.937***	-	-	-4.197***	-5.013***	-	-	-3.060***	-3.283**	-	-
BFD	0.024	-2.641	-2.772***	-7.684***	-1.897	-2.169	-6.690***	-6.742***	-2.190**	-2.764	-6.714***	-7.327***
MFD	-1.244	-2.927*	-4.219***	-4.368***	-0.926	-3.194**	-7.387***	-7.419***	-1.257	-2.916*	-6.259***	-6.284***
BFD* MFD	-3.265***	-3.320**	-	-	-3.265***	-3.320**	-	-	-3.265***	-3.320**	-	-
INV	-2.415**	-2.980*	-4.166***	-4.184***	-1.978**	-2.264	-5.105**	-4.164***	-2.634**	-2.668	-5.454***	-5.516***
SAV	-1.018	-2.563	-4.453***	-5.020***	-3.061***	-3.101*	-	-	-3.227***	-3.498**	-	-
TOP	0.153	-2.854	-6.009***	-6.667***	-1.176	-2.133	-5.004***	-5.115***	-1.846*	-2.379	-5.684***	-5.957***
<i>Phillips-Perron (PP)</i>												
GDP	-4.022***	-4.281***	-	-	-5.697***	-5.851***	-	-	-3.310**	-3.331*	-	-
BFD	-0.588	-2.359	-7.627***	-7.502***	-2.907*	-2.670	-7.179***	-7.094***	-2.769*	-2.819	-7.795***	-7.747***
MFD	-1.593	-2.255	-4.044***	-4.032**	-1.115	-3.178	-7.367***	-7.237***	-1.466	-2.845	-6.280***	-6.162***
BFD* MFD	-3.096**	-9.547***	-	-	-3.096**	-3.008**	-	-	-3.096**	-3.227*	-	-
INV	-0.900	-1.201	-3.475**	-3.303**	-2.495	-2.245	-5.152***	-5.514***	-2.547	-2.572	-7.571***	-8.456***
SAV	-1.440	-2.055	-5.197***	-5.097***	-3.030**	-2.982	-8.611***	-8.439***	-3.098**	-3.323*	-	-
TOP	1.225	-3.045	-6.557***	-7.580***	-1.209	-2.412	-4.968***	-4.948***	-2.054	-2.468	-5.760***	-6.423**
<i>Perron 1997 (PPU-Root)</i>												
GDP	-4.665	-4.870	-7.412***	-8.934***	-4.822	-4.540	-6.952**	-6.775***	-4.311	-4.500	-6.183***	-6.593**
BFD	-3.683	-3.804	-9.127***	-8.969***	-3.671	-3.353	-6.541***	-6.461***	-4.842	-5.136	-8.585***	-8.481***
MFD	-2.404	-3.780	-5.345**	-5.936**	-3.494	-3.436	-7.604***	-7.849***	-4.049	-4.411	-7.213***	-6.893***
BFD* MFD	-8.824***	-9.551***	-	-	-8.824***	-9.551***	-	-	-8.824***	-9.551***	-	-
INV	-4.468	-4.150	-5.271**	-5.682**	-3.455	-3.252	-6.695**	-7.800***	-4.324	-5.129	-6.015***	-6.392***
SAV	-3.684	-3.664	-6.752***	-6.742***	-4.913	-4.736	-6.725**	-6.963***	-4.353	-4.893	-8.838***	-8.770***
TOP	-4.075	-4.436	-6.493***	-6.476***	-4.040	-3.690	-6.400***	-6.657***	-3.654	-3.769	-7.143***	-7.063**

NOTES 1a - stationarity of all variables in levels, without trend, 1b - stationarity of all variables in levels, without trend, 2a - stationarity of all variables in first difference, without trend, 2b - stationarity of all variables in first difference, with trend; \*, \*\*, and \*\*\* denotes stationarity at 10%, 5% and 1% significance levels respectively.



TABLE 2 Bounds *F*-test for Co-integration

Country	Dep. variable	Function	<i>F</i> -statistic	Co-int. status	
USA	GDP	$F(\text{GDP} \text{BFD}, \text{MFD}, \text{BFD}*\text{MFD}, \text{INV}, \text{SAV}, \text{TOP})$	4.9629***	Cointegrated	
Brazil	GDP	$F(\text{GDP} \text{BFD}, \text{MFD}, \text{BFD}*\text{MFD}, \text{INV}, \text{SAV}, \text{TOP})$	6.4118***	Cointegrated	
Kenya	GDP	$F(\text{GDP} \text{BFD}, \text{MFD}, \text{BFD}*\text{MFD}, \text{INV}, \text{SAV}, \text{TOP})$	3.4766*	Cointegrated	
Asymptotic critical values		1%	5%	10%	
Pesaran, Shin, and Smith (2001, 300)		I(0) 3.15	I(1) 4.43	I(0) 2.45	I(1) 3.61
				I(0) 2.12	I(1) 3.23

NOTES \*\*\* and \* denotes statistical significance at 1% and 10% level, respectively.

TABLE 3 Estimation of Long-Run and Short-Run Coefficients

Regressors	Coefficient ( <i>t</i> -statistic)		
	USA ARDL(2,3,2,3,3,3,1)	Brazil ARDL(2,0,1,1,2,1,0)	Kenya ARDL(2,1,0,0,2,0,2)
<i>Panel A: Estimated Long-Run Coefficients (dependent variable: GDP)</i>			
C	28.0132 (6.1388)***	16.3305 (2.2787)**	-9.2477 (-1.9081)*
BFD	0.0138 (2.5987)**	-0.0093 (-2.1203)**	0.0647 (0.6772)
MFD	0.2218 (3.8721)***	0.0100 (0.3086)	0.6589 (2.2473)**
BFD*MFD	0.6590 (4.5784)***	0.2445 (1.9063)*	-0.0147 (-1.9415)*
INV	-0.6374 (-4.2212)***	-1.1425 (-2.3300)**	0.9574 (4.5662)***
SAV	0.4279 (4.9249)***	0.76016 (2.3486)**	-0.0197 (-0.3859)
TOP	-0.9940 (-5.3616)***	-0.2617 (-1.9287)*	-0.1545 (-2.5931)**

Continued on the next page

plementarity of the bank-based and market-based financial development applies both in the short-run and in the long-run for the USA, the nature of the relationship between the two (complements/substitutes) for Brazil and Kenya has been established only in the long run. This is confirmed by the coefficient of [BFD\*MFD], which is: statistically significant and positive for the USA, both in the long run and in the short run; statistically significant and positive for Brazil, only in the long run; but insignificant

TABLE 3 *Continued from the previous page*

Regressors	Coefficient ( <i>t</i> -statistic)		
	USA ARDL(2,3,2,3,3,3,1)	Brazil ARDL(2,0,1,1,2,1,0)	Kenya ARDL(2,1,0,0,2,0,2)
<i>Panel B: Error Correction Representation for the Selected ARDL Model (dependent variable: DGDP)</i>			
DGDP (-1)	0.4480 (4.1936)***	0.0215 (0.1002)	0.8653 (1.9862)*
DGDP (-2)	–	–	–
DBFD	0.1673 (3.3092)***	-0.0111 (-1.7473)*	-0.0567 (-0.4115)
DBFD (-1)	0.1540 (2.9779)**	–	–
DBFD (-2)	0.0468 (0.9949)	–	–
DMFD	0.1062 (3.9421)***	-0.0729 (-1.0713)	0.2109 (1.8968)*
DMFD (-1)	0.0206 (0.9373)	–	–
D (BFD*MFD)	0.0014 (4.7340)***	0.2100 (1.3702)	-0.0270 (-1.2242)
D (BFD*MFD) (-1)	0.4652 (2.4113)**	–	–
D (BFD*MFD) (-2)	0.3145 (3.6702)***	–	–
DINV	0.5435 (1.7301)	0.4533 (1.8700)*	0.5265 (2.8710)***
DINV (-1)	0.7290 (2.0632)*	0.0037 (0.0082)	-0.4542 (-0.9036)
DINV (-2)	0.8731 (2.0528)*	–	–
DSAV	0.9509 (5.6223)***	0.3978 (2.4935)**	-0.0362 (-0.3678)
DSAV (-1)	0.8597 (5.2374)***	–	–
DSAV (-2)	0.5838 (4.5496)***	–	–
DTOP	-0.5165 (-3.1023)**	-0.60522 (-3.0551)***	-0.2557 (-2.3119)**
DTOP (-1)	–	–	-0.0269 (-0.3425)
ECM (-1)	-0.9664 (-5.4015)***	-0.7914 (-2.7665)**	-0.8377 (-3.0826)***
R-squared	0.9973	0.8031	0.6512
F-statistic	110.1610	20.0314	14.1872
Prob (F-statistic)	0.000	0.000	0.000
DW statistic	2.0230	1.9639	2.0252

NOTES \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

in the short run; and statistically significant and negative for Kenya, only in the long run, but insignificant in the short run.

The other results show that the relationship between economic growth and the remaining regressors differ significantly from country to country – and over time as well. Both in the short and long run, bank-based financial development is found to have a positive impact on economic

growth in the USA, a negative impact on economic growth in Brazil, and no impact at all in Kenya. Market-based financial development, on the other hand, is found to have a positive impact on economic growth, both in the short and in the long run, in the USA and Kenya; but it has no impact in Brazil. While investment was found to be negatively related to economic growth in the long run in the USA and Brazil; it was found to be positively associated with economic growth in these two countries in the short run: and in Kenya, both in the short run and in the long run. In the USA and Brazil, savings are positively associated with economic growth, both in the short and long run; but they are not consistently related with economic growth in Kenya. Trade openness was found to be consistently detrimental to economic growth in all the three countries. The coefficient of  $ECM(-1)$  was also found to be negative and statistically significant, as was expected in all the study countries.

Based on both the short-run and long-run results, bank-based and market-based financial development were found to complement each other in enhancing economic growth in middle and high-income countries (the USA and Brazil); but they were found to substitute each other in the low-income country (Kenya). Thus, the policy implication of these results is that for the USA and the Brazilian economies, it does not matter much where policy makers are directing their efforts – towards the banking sector or the stock market – because ultimately, the two complement each other in enhancing economic growth.

However, in Kenya, where policy-makers channel their efforts matters a lot; since the banking sector and the stock market substitute each other in the economic growth process. Furthermore, since it is market-based, rather than bank-based financial development, that drives economic growth in Kenya, it is recommended that the policy-makers in this economy channel their efforts towards developing the market-based segment of the financial sector – in an effort to boost economic growth.

On the diagnostic tests, the results displayed in table 4 show that the model passes all the diagnostic tests performed against serial correlation, functional form, normality and heteroscedasticity in all the study countries.

## **Conclusion**

This paper has tested whether bank-based financial development and market-based financial development are complements or substitutes in enhancing economic growth in the USA, Brazil and Kenya during the period from 1980 to 2012. Although a number of studies have been con-

TABLE 4 ARDL-VECM Diagnostic Tests

LM Test Statistic	USA	Brazil	Kenya
Serial Correlation: CHSQ(1)	0.6631 [0.416]	0.3814 [0.984]	0.0699 [0.792]
Functional Form: CHSQ(1)	0.7626 [0.383]	0.0413 [0.839]	0.8262 [0.363]
Normality: CHSQ(2)	2.1739 [0.337]	0.8117 [0.666]	0.4067 [0.816]
Heteroscedasticity: CHSQ(1)	0.0129 [0.910]	1.5794 [0.209]	0.2025 [0.653]

ducted on financial development and economic growth, the majority of these previous studies were mainly based on the causal relationship between financial development and economic growth. Very few studies have examined in any detail the relative impact of both bank-based and market-based financial development on economic growth.

Of these few studies that split financial development into bank-based and market-based financial development, only a handful tested whether these two components of the financial sector complement or substitute each other in enhancing economic growth. This study, therefore, has attempted to reduce this existing gap. In addition, the majority of the previous studies relied mainly on the residual-based co-integration test and the maximum-likelihood test to test for co-integration. However, it is now known that these techniques may not be appropriate when the sample size is too small.

Thus, unlike the majority of the previous studies, the current study uses the newly developed ARDL-Bounds-testing approach to test the complementarity/substitutability of bank- and market-based financial development in the economic growth process in the three study countries. The study has also employed the method of means-removed average to construct both bank-based and market-based financial development indices from a number of proxies, in order to cater for the shortfalls of using only one proxy to measure the level of development of each financial sector component. The results of this study show that, in the USA and Brazil, bank-based and market-based financial systems complement each other in enhancing economic growth; in Kenya, however, the two financial systems are found to be substitutes.

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### **Namen rasti lastnikov mikropodjetij – managerjev v redko poseljenih območjih na severu Finske**

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Raziskava prinaša nove informacije glede predpogojev za mikropodjetja, ki delujejo na redko poseljenih območjih. Mikroposlovanje v vsakem gospodarstvu predstavlja številčno dominantno skupino. V zadnjih letih so mala podjetja in mala ali srednje velika podjetja, od katerih zadnji dve vrsti sestavljata hrbtenico gospodarstva številnih držav, pritegnila veliko pozornosti. Ta študija ima dva cilja: (1) poudariti pozornost, ki jo raziskovalci namenjajo mikropodjetjem, in (2) raziskati rast mikropodjetij, ki so v zasebni lasti, in primerjati ocenjene stopnje rasti s spremembo obsega prometa. Študija primerja sintezi dveh empirično scenskih modelov z dvema okviroma samoevaluacije, ki se uporablja za 53 tehnoloških in storitvenih podjetij. Rezultati kažejo, da izbrane faze rasti razmeroma dobro ustrezajo rasti mikropodjetij. Oba okvira lahko pomagata raziskovalcem in javnim svetovalcem zagotoviti natančnejše podatke o rasti mikropodjetij, temelječih na tehnologiji in storitvah. Na splošno je v prispevku prikazano, kako se lahko modeli rasti uporabljajo za podporo rasti mikropodjetij.

*Ključne besede:* mikropodjetništvo, podjetništvo, mikropodjetja, stopnja rasti, okvir

*Klasifikacija JEL:* D22, L21, L25, M51

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### **Razvoj znanstvenih in tehnoloških parkov na Poljskem: priložnosti za nove modele sodelovanja v biofarmaceutski industriji**

*Michał Staszaków, Łukasz Puślecki in Piotr Trąpczyński*

Namen članka je preveriti razvoj znanstvenih in tehnoloških parkov na Poljskem, ter možnosti za razvoj novih oblik sodelovanja z uporabo znanstvenih in tehnoloških parkov v biofarmaceutski industriji na Poljskem. V prvem poglavju so opisani izvori in opredelitve znanstvenih ter tehnoloških parkov, s čimer želimo razjasniti in sistematizirati pojme, ki so uporabljeni v obstoječih raziskavah in praksi. Kasneje sledijo poglavja, ki obravnavajo razvoj znanstvenih in tehnoloških parkov v različnih organizacijskih modelih STP-ja. Poleg tega se analiza osredotoča

na znanstvene in tehnološke parke na Poljskem. Izpostavljen je tudi pomen znanstvenih in tehnoloških parkov za razvoj novih modelov sodelovanja v biofarmaceutski industriji. Prispevek se zaključuje z navajanjem vrste posledic in sklepov.

*Ključne besede:* biotehnoški grozdi, znanstveni in tehnološki parki, odprte inovacije, odprto inovacijsko sodelovanje

*Klasifikacija JEL:* O32, O33

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### **Koliko so pomembni zaposleni? Primerjava upravljanja tujih in domačih podjetij**

*Annamaria Kazai Ónodi*

Upravljanje ljudi bo glede na raziskavo EIU/SHRM največji izziv za podjetja v naslednjih 10 letih. Obstajajo različni scenariji za prihodnje delo, na katere vplivajo gospodarski, tehnološki, okoljski, institucionalni in demografski dejavniki. Ta članek je analiziral učinek internacionalizacije na upravljanje človeških virov in temelji na madžarskih raziskavah o konkurenčnosti v letih 2013, 2009, 2004 in 1999. Na splošno raziskave niso potrdile, da internacionalizacija daje več pozornosti zaposlenim, čeprav lahko najdemo nekaj pozitivnih teženj k temu. Podjetja v tujini so namenila več pozornosti vrednotenju in usposabljanju. Raziskava je identificirala nekatere dejavnike, ki jih je mogoče izboljšati, na primer izobraževalno sodelovanje z visokimi šolami in univerzami.

*Ključne besede:* upravljanje človeških virov, internacionalizacija, izvoz, raziskave konkurenčnosti

*Klasifikacija JEL:* F23, M50

*Managing Global Transitions* 15 (1): 43–60

### **Odnos med različnimi praksami odprte inovacije in inovacijsko uspešnostjo podjetij**

*Kaja Rangus*

Predstavitve študij primerov in kvantitativne raziskave na področju odprtih inovacij kažejo na znatno povezavo odprtih inovacij z inovacijsko uspešnostjo podjetja. Vendar pa odprta inovacija ni dihonomna, ampak je sestavljena iz več različnih praks. Namen te študije je prispevati k obstoječemu znanju o odprtih inovacijah v organizacijah, s preučitvijo različnih odprtih inovacijskih praks (tj. notranje IP-licenciranje in zunanja udeležba, zunanje izvajanje R & D ter zunanje mreženje, vključevanje strank, sodelovanje zaposlenih in pospeševanje) ter navajanjem njihove

povezave z inovacijsko uspešnostjo podjetja. Konceptualiziramo model, v katerem nakažemo, da se vsi odprti inovacijski postopki znatno nanašajo na inovacijsko uspešnost podjetja. Model smo naredili na vzorcu 693 podjetij iz treh držav in ugotovili, da je najpomembnejša povezava med udeležbo zaposlenih in inovacijsko uspešnostjo podjetja. Na podlagi polstrukturiranega razgovora z vodjo odprtih inovacij v priznani multinacionalni družbi oblikujemo predloge o tem, kako izvajati odprto inovativnost v organizaciji. Raziskavo zaključimo z razpravo o rezultatih za poslovne strokovnjake in predlagamo učinkovite pristope za vključitev odprtih inovacij v njihove poslovne prakse.

*Ključne besede:* odprte inovacije, inovativnost, vključenost zaposlenih

*Klasifikacija JEL:* O31, O32, O33

*Managing Global Transitions* 15 (1): 61–79

### Ali so banke in borzni trgi dopolnitve ali zamenjave?

#### Empirični dokazi iz treh držav

*Sheilla Nyasha in Nicholas M. Odhiambo*

Članek je preveril, ali se finančni razvoj na podlagi bank in tržni finančni razvoj med letoma 1980 in 2012 medsebojno dopolnjujeta ali zamenjujeta za krepitev v gospodarski rasti v ZDA, Braziliji in Keniji. Te tri države predstavljajo skromen presek splošne finančne strukture, ki prevladuje v številnih razvitih državah in državah v razvoju. Za razliko od nekaterih prejšnjih študij ta študija uporablja nov način pristopa z razvojem testiranja ARDL-Bounds, ki se ga tudi uporabi za izvedbo tega testa. Študija uporablja tudi metodo srednjeročnega povprečja za izdelavo indeksov finančnega razvoja, ki temeljijo na bankah in trgu. Rezultati kažejo, da se bančni in tržni finančni sistemi v ZDA in Braziliji med seboj dopolnjujeta pri krepitevi gospodarske rasti; v Keniji pa se zdi, da sta dva finančna sistema bolj nadomestna kot dopolnilna.

*Ključne besede:* finančni razvoj na podlagi bank, tržni finančni razvoj, gospodarska rast, Združene države Amerike, Brazilija, Kenija

*Klasifikacija JEL:* G10, G20, O16

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