

**Towards success in a competitive market:
The importance of entrepreneurship
and innovation**

Edited by

**Marcin Gębarowski
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The JOURNAL OF ENTREPRENEURSHIP, MANAGEMENT AND INNOVATION

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From the Editors

The nine papers published in this issue of the Journal of Entrepreneurship, Management and Innovation point to various problems which are important for effective management in a turbulent and dynamically changing contemporary market. The authors of the articles come from universities in the Czech Republic, Italy, the Republic of Moldova, Nigeria, Poland, Taiwan and Ukraine. The scientists present current and original views on issues related to: research & development expenditure and innovation levels in EU countries; the role of innovative entrepreneurship in economic development; the competitiveness of small innovative companies; social networking in family businesses; the connections between socioemotional wealth and competitive advantage of family firms; agrirural entrepreneurial alertness; the assessment of human resources` interactions; the impact of seasonality on employment in tourism; and socio-economic clients` requirements for food packaging. However, regardless of the subject matter, all the papers indicate an organizational framework and solutions for achieving success in a competitive market.

The first article, by Radka MacGregor Pelikánová, addresses R&D expenditure and innovations in the EU, which are the foundations for competitiveness in contemporary economies. The author focuses on the following three essential questions: How much is spent on R&D? How many patentable inventions are filed and succeed, and how many other ideas lead to innovations? Is it possible to imply a potential relationship and what are the trends? The described study entailed secondary data while exploring hard data sources, such as Eurostat and the European Patent Office databases, official or legislative documents, such as Europe 2020, and the academic literature. Furthermore, the author used direct observations, field search and her own experience, gained over 20 years by participating in many patent applications and other instruments protecting future innovations. Answering the questions, it was found that: the 3% threshold will not be met in the larger part of the EU, the number of patent applications and granted patents keep growing along with digitalization, and the possibility of a relationship between these factors and trends exists but is not conclusive or dramatically strong. The research challenge, taken by Radka MacGregor Pelikánová, requires an appreciation that, as she notes, "one of the limitations of the study was caused by the intangible,

ephemeral and hardly predictable nature of innovations, and the impossibility to collect and mathematically process all the involved phenomena.”

The second paper, written by Rodica Crudu, refers to the importance of entrepreneurship in driving innovation, economic growth and welfare, as well as job creation, and draws attention to the fact that innovation is seen as a driving force in the economic development of nations. Since innovative entrepreneurship has begun to be considered a key factor in modern economic development, finding a prominent place at the core of the European Union’s development strategy – Europe 2020, the author aims to analyse the role of innovative entrepreneurship in the economic development of EU member states by testing a model that captures new or young innovative firms as manifestations of innovative entrepreneurship along with determinants of economic growth rates. The key findings of the paper show that innovative entrepreneurs are more often present in countries with higher development levels and higher incomes, being motivated by the improvement opportunity they see in becoming entrepreneurs. However, a higher degree of entrepreneurship, especially in the creation of new firms, does not substantially contribute to accelerated economic development. This is explained by the variation in the motivation (necessity or improvement-oriented) of entrepreneurs across EU countries. In developed countries, entrepreneurs are most likely to be of Schumpeterian type, while in developing countries most of them are shopkeepers. The presented paper has significant practical implications for decision and policy-making authorities in terms of the possible directions of innovative entrepreneurship policy development, including friendlier and more efficient policies aimed at the creation of new firms and the development of SME-supporting tools.

Edward Stawasz, whose paper is based on the results of conducted research, carried out an analysis and evaluation of the importance of selected determinants of competitiveness of small innovative enterprises operating in international markets and using business advice services. The first part of this article is a comprehensive literature review concerning the identification of determinants of competitiveness of small enterprises and the characteristics of motives for using, as well as the areas and effects of using, business advice. The second part of the article presents an analysis of the results of a survey conducted among 67 small, innovative enterprises operating in international markets and at the same time using business advice services, carried out with the use of the CATI method. The conducted analysis has shown that the use of business advice extends the scope of determinants of competitiveness of enterprises operating in international markets. Business advice can be considered an effective factor in improving the competitiveness of enterprises already characterized by high competitiveness, which means that a high level of competitiveness favors the effectiveness of the use of business advice. An important conclusion reached

by the author is the existence of a positive relationship between business advice and enterprises' capacity to absorb business knowledge. Therefore, improving the competitiveness of enterprises requires using business advice and improving the business knowledge absorptive capacity.

The focus of the next article, written by Kenneth Chukwujiokwe Agbim, is the conceptual considerations regarding social networking and family businesses, presented in a review of the contribution of social networking to the financial and non-financial performance of family businesses. Based on an analysis of 55 peer-reviewed, published journal articles, the author identified the most frequently used social networking platforms, the measures of financial performance, the measures and proxies of non-financial performance, and the differences between the financial and non-financial performance. The study proposes the use of both financial and non-financial measures in assessing the performance of family businesses due to their complementary roles. Therefore, the presented research contributes to the family business literature by highlighting the importance of combining financial and non-financial measures in assessing family business performance, indicating that due to the specificity of a family business, its performance should be assessed in such a joint manner.

The research topic of the fifth article, by Katarzyna Bratnicka-Myśliwiec and Martyna Wronka-Pośpiech, is socioemotional wealth in the context of competitive advantages of family businesses. These authors argue that socioemotional wealth may trigger or limit family firms' strategic initiatives that ultimately shape their competitive advantage. The basic assumption is that, unlike non-family firms, family businesses have some unique qualities that should be considered. The research was conducted in almost two hundred firms through a telephone survey. The obtained results reveal that, indeed, socioemotional wealth and competitive advantage are partially associated, and socioemotional wealth can be regarded as an important strategic antecedent to firm performance. Therefore, the first main theoretical implication is the emphasis on the importance of socioemotional wealth as a strategic resource. The second main conclusion is the recommendation that socioemotional wealth is a relevant determinant of competitive advantage. Family businesses rely on more complex social dynamics than the dynamics of a pure market, where the informal sphere is critical for current functioning. Moreover, the connections between family business attributes and firm performance are by no means easy to understand. Consequently, this paper makes a significant contribution to the scientific literature.

In the next article Chaoyun Liang presents research on agrirural entrepreneurship and the results of a series of three studies conducted to develop a measure of entrepreneurial alertness in the agrirural environment which is empirically valid, easy to use, and can analyze how the personality

traits of agrirural entrepreneurs affect their entrepreneurial alertness. The results indicate that both extraversion and openness affect all of the dimensions of entrepreneurial alertness, whereas conscientiousness only influences scanning and searching, and agreeableness has an impact solely on evaluation and judgment. The presented findings also demonstrate the interactive relationships between extraversion and openness for all of the dimensions of entrepreneurial alertness. The research provides a new understanding of how agrirural entrepreneurial alertness can be assessed more practically and how personality traits can help predict various dimensions of agrirural entrepreneurial alertness. The author states that, due to the fact that agriculture remains the basis of socioeconomic development, governments worldwide are actively formulating relevant policies to aid in the restructuring and upscaling of their agricultural industries. Thus, providing essential guidance in agricultural entrepreneurship for diversifying rural regions should be their central concern. Therefore, recognizing and interpreting opportunities are the most crucial abilities that should be fostered in developing agrirural entrepreneurship.

The seventh paper is devoted to the subject of human resources, in particular interactions. The author of this text is Anna Pereverzieva, who indicates that there is a need to develop a methodological approach to the assessment of united communities' human resources' level of interactions. Hence, in light of the gap in the scientific literature, she tries to determine such an approach. The author's work is based on the example of a united community and a structural unit and, in addition, considers two determinants of human resources' interactions – the group size and the nature of labor. As a tool of the empirical study, the author used expert assessment and the application of certain mathematical dependencies that allowed the coefficient of interactions to be determined. It transpired that small groups with intellectual labor have higher levels of interactions than large groups with a predominance of manual labor. It is worth noting that the proposition of a methodical approach is universal and might be used by both communities and business entities. Moreover, an additional advantage of the study is the proposal of a 4-stage procedure for assessing the level of human resources' interactions.

The eighth paper, written by Aleksandra Grobelna and Katarzyna Skrzyszewska, connects tourism seasonality with employment in the travel and tourism sector. The issue, raised by these authors, is a current and important topic, since nowadays seasonality plays a decisive role in creating demand in the tourist industry. The problem is investigated from the perspective of tourism and hospitality students of higher educational institutions located in the northern part of Poland (Southern Baltic Sea Region). The main point of the authors' interest was the students' attitudes towards seasonality in tourism employment and its impact on students' tourism employment aspirations. As a research method, a direct questionnaire was used and the obtained data

were analyzed statistically. According to one of the conclusions, more students agree that seasonality contributes positively rather than negatively to tourism employment. The authors indicate that the depicted results of the research study can be of substantial importance to managers in the industry, which suffers from low employment status and experiences chronic shortages of skilled and well-qualified employees.

The last article by Agnieszka Cholewa-Wójcik, Agnieszka Kawecka, Carlo Ingraio and Valentina Siracusa presents interesting results of research on the requirements for packaging to answer contemporary consumers' needs. The study represents a holistic approach to the topic. The authors conducted a survey among clients of shopping malls in the Małopolska region of Poland. Analysis of the obtained data indicated the following order of priority of consumers' needs: ensuring safety, meeting legal regulations, wants related to lifestyle, improving consumers' life quality through added value, and protection of the environment. Furthermore, the team of authors proposed the model packaging. According to them, modern food packaging should be characterized by health (safety), simplicity (reduction, convenience), identity (belonging), aesthetics (design), and meaning (sustainability, intelligence). These conclusions have a managerial dimension because they might be valuable premises for developing packaging and introducing innovative solutions in this area. The paper confirms that both the design of food packaging systems and the production of such kinds of packaging should be developed after giving due consideration not only to the technical requirements but also to the socio-economic and the environmental ones.

As the editors of this issue, we would like to thank all the authors for their contribution, and for sharing their own theoretical considerations and the results of empirical research. We are convinced that the presented studies constitute a valuable contribution to management sciences in the area of effective organizational management in a turbulent environment. We would also like to thank the reviewers for their efforts in reviewing the articles for this issue, as well as their valuable comments and suggestions that have influenced its final shape. We hope that the articles presented in this issue will interest readers, scientists and researchers from around the world, in addition to inspiring them to conduct further research on the topics discussed.

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R&D expenditure and innovation in the EU and selected member states

Radka MacGregor Pelikánová¹ 

Abstract

Sustainable development and competitiveness cannot be achieved in our highly competitive global society without innovations. Innovations are typically the result of a financially demanding research process generating intellectual property assets, namely patented inventions or ideas for the digital setting and protected by copyright or otherwise. The EU is aware of it and its current strategy, Europe 2020, states that 3% of GDP should be allocated to R&D by 2020 at the latest and this should boost innovation levels and make the EU a top global economic leader. Undoubtedly, innovation is indispensable and needs to be financed. However, the relation of involved factors and the related dynamic are unclear and have not received sufficient scientific and academic attention. To make an initial step to address this vacuum, three research questions are addressed. Firstly, what fraction of GDP goes towards R&D, expressed by GERD, and what is the GERD trend in the EU and selected EU member states? Secondly, how many European patent applications were filed and patents granted, what was the success rate and how has digitalization been progressing in the EU and selected EU member states and what are the trends? Thirdly, can the possibility of a relationship be implied? These three questions are answered based on multi-disciplinary research employing hard data sources, such as Eurostat and EPO databases, official and/or legislative documents, such as Europe 2020, academic literature along with direct observation, field search and the own experience of the author. Such a conglomerate of diversified and multi-disciplinary data is to be processed by a myriad of appropriately matching methods, both of a quantitative and qualitative nature, and dominated by the holistic Meta-Analysis. Indices and indicators, such as GERD, EPO statistics and DESI, are comparatively employed while observing their time evolution in the entire EU and selected EU members. Their selection is made by the motivation to be representative and to face the (alleged) cliché about EU member states labeled as “good” (DE, FR), “lazy” PIGS (PT, IT, GR, SP), leaving (GB), particular Scandinavian (DK, FI, SW) and central (AT, CZ, PL). This highly original study answers all three questions – (i) the 3% threshold

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is not met in the larger part of the EU, (ii) the number of patent applications and granted patents keep growing along with digitalization, and (iii) the possibility of a relationship between these factors and trends exists, but is not conclusive or dramatically strong. This generates a set of original suggestions, such as that the differences between EU member states regarding innovations do not vanish and that although the Europe 2020 3% threshold is not met, the number of patented inventions and the practical digitalization can still grow across the EU. Further and deeper research is needed and should help the EU to change its approach to innovations and make it more effective and efficient.

Keywords: DESI, Europe 2020, GERD, innovation, intellectual property, R&D, research and development.

INTRODUCTION

For more than two decades, the EU has been proclaiming its ambition to become the most competitive and innovation-oriented economy in the world (EC, 2010) and its recognition that intellectual property (IP) is indispensable for that. IP involves intangible assets typically benefiting by industrial property protection, such as patents for inventions, and by copyright protection, such as a copyright for a creative and materialized idea, including software. The current EU strategy, called Europe 2020, sets as one of its five targets a threshold of at least 3% of the EU's gross domestic product (GDP) to be invested in research and experimental development (R&D) in 2020. R&D comprises creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society and the use of this stock of knowledge to devise new applications (OECD, 2015). Europe 2020 states that the satisfaction of a 3% threshold will inevitably lead to a boost in the competitiveness of the EU and EU businesses, especially the setting (EC, 2010) in line with the growth of corporate social responsibility (Pakšiová, 2016). The EU seems confident that the increase in spending on R&D will generate a rise in innovations. However, neither the EU and its representatives nor academia have been able to analyze, verify and explain the 3% threshold and this co-relation and its components in depth. It appears that they simply observe the increase of competitiveness in economies where the 3% threshold is targeted (USA) or even surpassed (Japan).

Inventions are vital for competitiveness in the 21st century (Terzić, 2017). They are products of costly processes requiring education and knowledge efficiency (Polcyn, 2018) along with direct and indirect financing and can lead to innovation, but this line is far from straight forward. Since an innovation means developing a new idea and putting it into the business (Kalanje, 2018), spending more money on R&D can, but not necessarily, lead to innovations.

On the one hand, many research projects wind up as dead ends, despite the amount of money spent. On the other hand, some ideas come at basically no cost and can lead to wonderful innovations. Since the quantification of the threshold of 3% is a mere following of patterns in different societies, economies and culture, the Europe 2020 confidence seems surprising – how can the EU be sure that the 3% threshold is going to be met in 2020 and that this will result in more innovations and increased competitiveness?

Hence, three critical and, so far, not fully answered research questions at the EU level and the EU member state's level emerge – (i) how much is spent on R&D, (ii) how many patentable inventions are filed and succeed and how many other ideas lead to innovations, and (iii) can we imply a possible relationship and what are the trends? The general claims about difficulties to assess R&D spending and its trends and about the intangible nature and quantification impossibilities of inventions (MacGregor Pelikánová, 2014), patentable or copyrightable, along with the misunderstanding of the casual nexus line spending-idea-innovation do not justify the omission of appropriate studies and publications. Their lack excludes a deeper understanding and negatively impacts further work towards making the EU setting for innovation more effective and efficient. This vacuum is to be addressed while appreciating the dynamic interaction between spending and innovation at both the EU level and selected EU member state's level within the time period of Europe 2020. The stable and uncontested starting premises are that Europe 2020 demands 3% of GDP to be spent on R&D by 2020, that ideas produced by R&D can be predominantly patentable inventions or ideas usable in the digital environment (Polanski, 2015), and that there is a certain link between R&D and innovation.

The aim of this paper and the rationale for the study are bound to three research questions with respect to Europe 2020, namely the EU and selected EU member states. Firstly, what fraction of GDP is allocated to R&D and what is the trend? Secondly, how many applications were filed for patents on inventions, how many patents were granted, what was the success rate, how has digitalization progressed, and what are the trends? Thirdly, can we imply the possibility of a relationship and what are the trends? All three research questions deal with under-researched and not deeply analyzed issues and aspects which often, due to their intangibility, complexity and impossibility of straight quantitative measuring, are avoided and/or simplified. The EU believes in an automatic increase in innovation due to an increase in spending without offering any hard data, or at least critical elaborated analyses, to back up this supposition. Academic literature deals statically with individual aspects and issues in this arena but does not offer a holistic Meta-Analysis attempting to bridge the gap between these elements and to understand

their interaction in their own context, as well as in the time context expressed by trends. In sum, there are no dynamic studies attempting to describe and critically assess this intangible mechanism. This is deplorable because such a description and assessment are do-able. There is relevant data, even official and hard, which make this pioneering study and very original paper possible and scientifically grounded. It provides semi-conclusions vital for the EU, Europe 2020 and European endeavor working with probably the biggest assets of Europeans – their creativity and values translated into innovations.

LITERATURE BACKGROUND

Our post-modern, highly competitive, global society depends upon the use of information systems and information technology (IS/IT) (MacGregor Pelikánová, 2013) and consequently on the development and implementation of new technologies. In many aspects, the innovation process matches various already well-described project life cycles which are divided into several stages including initiation, planning, preparatory execution, real execution and closure (Siemieniako & Gebarowski, 2016).

Since innovations have become an integral part of policies to promote growth (Billon, Marco, & Lera-Lopez, 2017), the question of the effective and efficient setting of these policies (Turečková & Nevima, 2017) and their financing emerged. Financial support for R&D is both necessary and limited, not only by public and private budgetary constraints, limited public budgets and other public factors (Blind, Petersen, & Riillo, 2017) but also by other challenges embedded in modern technologies (Staníčková, 2015; Melecký, 2013). On one hand, it is assumed that R&D needs to be financed and that it should lead to innovation activities leading to the transposition and implementation of new technologies in the modern e-business setting and operation (Polanski, 2015). On the other hand, this process includes a myriad of risks and often ends with deadlock. Empirical studies confirm that just a fraction of innovation activities lead to practical results and suggest that often private sector creativity (Zollo, Rialti, Ciappei, & Boccardi, 2018) and the size of the support by private enterprise is pivotal (Damijan, Kostevc, & Rojec, 2017).

The EU is a result of economic and political integration focusing on the internal single market with the quartet of freedom of movement (MacGregor Pelikánová, 2017). The EU has always been dominated more by technocratic than political institutions (Lianos, 2010) and the supranational approach has prevailed over the intergovernmental approach. Therefore, the current EU strategy, i.e., the EU strategy for 2010-2020 (Europe 2020) is a supranational, technocratic planning project which sets an impressively ambitious strategic

goal “to become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth” (EC, 2010). Europe 2020 is determined to reach this goal via three mutually reinforcing priorities – smart, sustainable and inclusive growth, translated into five headline targets and seven flagship initiatives.

Europe 2020 was issued in 2010 and is marked by economic and other crises issues and by the slump of economic indicators back to 1990s levels (Çolak & Ege, 2013). Despite this rather deplorable setting, the EU leadership, led by the Barroso Commission, became confident that the EU can, under the auspices of Europe 2020 attain an even higher rate of economic growth than in the US (Balcerzak, 2015).

For the EU and EU policies, such as the European Cohesion Policy, innovation and the use of IS/IT are pivotal (Billon et al., 2017). Europe 2020 deals specifically with R&D, innovations and digitalization by including them across its five targets. The idea behind it is that economic growth is to be achieved by innovation in the digital environment (Terzić, 2017), which should be the result of the synergy of various EU and EU member state’s policies (Kordoš, 2016). In sum, the Barroso European Commission was convinced that without proper R&D spending, the EU would lose any chance to be amongst the world (economic) leaders (Walburn, 2010).

In 2010, R&D spending in the EU reached only 1.9% of GDP, while the rate in the US was 2.6% and in Japan 3.4% (Eurostat, 2018). The Barroso Commission was over-confident that 3% was do-able and key for the digital innovation dominance of the EU in 2020 (EC, 2010). However, eight years later, the reality seems to be different and instead of a dramatically growing trend from 1.9% to 3%, a rather stagnating trend barely passing 2% is to be observed at the EU level (Eurostat, 2018). Few studies and analyses have been published about it and its trends; and the reasons (EC, 201; 8b), along with its consequences, are even more obscure in the focus of the academic press (De Noni, Orsi, & Belussi, 2018; Dima, Begu, Vasilescu, & Masen, 2018; Potužáková & Öhm, 2018). In addition, the possibility of a relationship between R&D spending and innovations, in particular, e-innovations, has not earned any serious interest at all. Do we have a co-relation and what is the consequence of the digital innovation trend?

RESEARCH METHODS

Data, methods and processes employed in this paper are determined by its aim and the rationale for the study, i.e., they are bound to the three research questions about spending on R&D; patented inventions, digitalization and

their possible relation; and existing trends in the EU and in selected EU member states. The selection of EU member states for this study is made by the motivation to be representative and to face the (alleged) cliché about EU member states labeled as “good” (DE, FR), “lazy” PIGS (PT, IT, GR, SP), leaving (GB), particular Scandinavian (DK, FI, SW) and central (AT, CZ, PL).

The performed research entails secondary data while exploring hard data sources, such as Eurostat and the European Patent Office (EPO) databases, official and/or legislative documents, such as Europe 2020, and academic literature. A complementary and merely illustrative glossing is offered based on direct observation, field search and the experience of the author assisting with IP issues for clients for over 20 years and thus participating in many patent applications and other instruments protecting future innovations. Such a conglomerate of diversified and multi-disciplinary data is to be processed by a myriad of appropriately matching methods, both of a quantitative and qualitative nature, and dominated by the holistic Meta-Analysis. Data and methods will vary based on the features of each of the three research questions.

The first question will be addressed by using official data about the ratio of R&D spending on the GDP during the period 2010-2017 in the EU and selected EU member states, presented by the European Commission and Eurostat. The instrument to do so is the indicator which measures gross domestic expenditure on R&D as a percentage of the GDP gross domestic product (GERD). This rather numerical indicator will be presented in tables showing what fraction of GDP went on R&D in the EU and selected EU member states in different years, and so it will allow for both observing trends and to have a firm foundation for a further co-relation study.

The second question has two sub-parts, patented inventions and digitalization, which will be addressed consecutively. Due to the extent and “EU” focus of this study, only “EPO patents,” and not merely national patents applicable only in one EU member state, will be included. Namely, an inventor can seek for their invention only a national monopoly in one EU member state, i.e., only one national patent in one single EU member state for the invention. Such patented inventions are locally very limited and not covered by this study. In contrast, this study deals only with inventions filed nationally in one EU member state with a request via EPO for extended protection in other EU member states; i.e., via EPO the request for an “EPO patent” is processed leading to more national patents from various EU member states. The number of applications filed regarding patentable inventions and granted patents is offered by the EPO statistical database (EPO, 2018) and is shown in tables along with data regarding all applications and patents. The success rate calculation will be done on the assumption that the average EPO patent process takes four years (EPO, 2018). Digitalization as a reflection of

innovation generated, generally by other ideas than patentable inventions, is assessed based on the Digital Economy and Society Index (DESI) and the related Europe's Digital Progress Report (EDPR). DESI is a composite index that summarizes five relevant indicators about Europe's digital performance and tracks the evolution of EU member states in digital competitiveness (EC, 2018a). In other words, DESI is an overall index calculated as the weighted average of the following five main dimensions with the weights selected by the user: 1. Connectivity (25%), 2. Human Capital (25%), 3. Use of the Internet (15%), 4. Integration of Digital Technology (20%) and 5. Digital Public Services (15%) (EC, 2017). The EDPR report combines the quantitative evidence from DESI with country-specific policy insights (EC, 2017).

The third question focuses on the possibility of a relationship between the presented data and the evolution of trends across spending, patents, digitalization and innovation, i.e., GERD, EPO statistics, DESI and EDPR along with proposed less quantified information about innovation, such as observation, informal indices and even propositions presented in EU official documents and academic literature.

We have no perfect data, but we still have sufficient information to address all three questions and move to a higher level, to start to think not only about whether we have a relationship, but whether this is a co-relationship or possibly what kind of co-relationship do we have and whether ultimately Europe 2020 is set effectively, efficiently and realistically with respect to innovation as the foundation for competitiveness?

GERD, EPO and DESI and their trends for the entire EU

The data to address the three research questions include GERD, EPO statistics and DESI, their co-relation and their trends for the EU as such (see Tables 1, 2, 3). These mathematical indicators need to be critically and contextually commented on. The first to be analyzed is the GERD, which logically should grow, because crises have been overcome, more money for R&D should be available and Europe 2020 and other policies demand it be so.

The results differ from expectations and desires, i.e., GERD for the EU has been growing very little, if at all. Based on the observed trends, the starting point of 1.93% in 2010 will move to barely more than 2.05% in 2020 and definitely will not get close to the 3% threshold. This is an outright failure, which needs to be analyzed and a lesson should be learned from this disappointing experience. This disappointment does not need to have negative consequences if European patent statistics and DESI are satisfactory.

Table 1. GERD in EU

Year	GERD (%)	Comments
2010	1.93	End of crises, stagnation of GERD.
2011	1.97	Aftermath of crises and start of the slow growth of GERD. by 0.04%
2012	2.01	Aftermath of crises and continuation of the slow growth of GERD by 0.04%
2013	2.02	Aftermath of crises and continuation of the slow growth of GERD by 0.04%
2014	2.03	Crises overcome, but minimal growth of GERD by 0.01%
2015	2.04	Crises overcome, but minimal growth of GERD by 0.01%
2016	2.03	Crises overcome, but a decrease of GERD by 0.01%

Source: author based on publicly available data (Eurostat, 2018).

Table 2. EPO patents

Year	Applications from the EU	All applications	Share of applications from the EU of all applications	Granted patents for Inventions from the EU	All granted patents	Share of EU patents on all patents
2010	66637	151015	44%	27903	58117	48%
2011	64379	142822	45%	29594	62108	47%
2012	65171	148562	44%	29573	65655	45%
2013	65631	148027	44%	30426	66707	46%
2014	67393	152703	44%	29775	64613	46%
2015	67692	160004	42%	32894	68419	48%
2016	67405	159316	42%	44042	95940	46%
2017	69138	165590	42%	45888	105635	43%

Source: author based on publicly available data (EPO, 2018).

The number of patent applications, i.e., inventions from Europeans to the EPO with the request to grant patent protection for the EU, has been growing since 2011 with an annual increase of 1-2%. Since the total number of applications, i.e., applications from the entire world, has generally been growing faster and, e.g., from 2016 to 2017 even by 4%, the share of applications from Europeans filed with the EPO on the total bulk of applications dropped from 44% to 42%. This implies that, although the number of European inventions presented for patent protection in the EU has been growing, the number of inventions from other countries has risen even faster.

The number of granted patents, i.e., successful inventions from Europeans presented to the EPO with the request to grant patent protection for the EU, had been both increasing and decreasing until 2015. Since 2016, there is an unprecedented growth in the number of patents granted by

EPO to applicants from the EU, which exceeds even 33% annually. A similar trend is detectable by all granted patents. The share of patents granted to EU applicants from all patents granted by EPO has been dropping from 48% to 43%. Assuming that the average patent application proceedings takes four years (EPO, 2018), then the 66,637 applications from the EU applicants in 2010 have to be matched with 29,775 granted patents in 2014, i.e., a success rate of 45%. The data looks very different after 2015, and the 65,631 applications from the EU applicants in 2013 have to be matched with 45,888 granted patents in 2017, i.e., an unbelievable success rate of 70%. This rather wide-ranging data and related trends are confronted by data on other types of ideas for innovations covered by DESI.

Table 3. DESI for the EU

Year	DESI – all five indicators (%)	DESI - integration of digital technology (%)	Comments
2014	44	28	
2015	47	32	The importance of High-Performance Computing for the competitiveness of European science and industry.
2016	52	34	EU and EU member states have identified the uptake of digitization by industry as a priority.
2017	51	37	Social media, eInvoices and mobile applications have been driving the digital transformation of European businesses.
2018	54	40	

Source: author based on available data (EC, 2017 and EC, 2018a).

DESI, with all its five indicators, has been slowly growing. However, it is worthwhile observing that the 4th indicator, integration of digital technology, remains slightly behind, but grows faster. In other words, the trend has a higher progression speed, but the starting point was much lower for this particular indicator. This cannot be underestimated, because the 4th indicator includes business digitalization and e-commerce, which are pivotal for competitiveness on the global market (MacGregor Pelikánová, 2013). Naturally, this data provides a generalized, and not sufficiently deep, insight and hence needs to be complemented by data linked to the selected EU member states.

GERD, EPO and DESI and their trends for selected EU member states

First to be analyzed is the GERD indicator for the selected EU member states while keeping in mind that the expected 3% threshold seems unrealistic at the EU level, i.e., the average for the EU was 1.93% in 2010 and climbed only

to 2.03% in 2016 (see Table 4). So how did selected EU member states do, shall we find differences between them and what are their trends?

Table 4. GERD in EU member states (%) – note: NC = not confirmed

	AT	CZ	DE	DK	ES	FI	FR	GB	GR	IT	PL	PT	SW
2010	2.73	1.34	2.71	2.92	1.35	3.73	2.18	1.67	0.60	1.22	0.72	1.53	3.22
2011	2.67	1.56	2.80	2.94	1.33	3.64	2.19	1.67	0.67	1.21	0.75	1.46	3.25
2012	2.91	1.78	2.87	2.98	1.29	3.42	2.23	1.60	0.70	1.27	0.88	1.38	3.28
2013	2.95	1.9	2.82	2.97	1.27	3.29	2.24	1.65	0.81	1.31	0.87	1.33	3.31
2014	3.07	1.97	2.87	2.91	1.24	3.17	2.23	1.67	0.83	1.34	0.94	1.29	3.15
2015	3.05	1.93	2.92	2.96	1.22	2.90	2.27	1.67	0.97	1.34	1.00	1.24	3.27
2016	3.09	NC	2.94	NC	1.19	2.75	NC	1.69	1.01	NC	NC	1.27	3.27

Source: author based on publicly available data (Eurostat, 2018).

Both the GERD indicator and its evolution trends were dramatically different in the selected EU member states. From 2010 to 2015, resp. 2016, the GERD indicator grew (AT, CZ, DE, PL), stagnated (DK, FR, GB, SW) and even fell (ES, FI, PT). The difference between the best and worst from the sample for 2010 was 3.22 (SW) – 0.60 (GR) = 2.62 and from the sample for 2015 was 3.27 (SW) – 0.97 (GR) = 2.30. Generally, the differences have diminished just gently and, except for Scandinavia, Germany and Austria, the 3% threshold seems unattainably high. This means that even model EU member states, such as France, breach Europe 2020 targets and under-financed R&D, i.e., they jeopardize the innovation process. Does this (allegedly) insufficient financial support cripple patentable innovations, i.e., inventions, and/or other innovations, especially in the digital universe?

At the EU level, presenting an invention and filing it with EPO with a request for granting a patent, does not automatically point to the innovation boost (Table 5). Nevertheless, it is a component of the innovation landscape. Since, pursuant to the GERD indicator, there is not a dramatic increase in the financial support for both, patent and digital, branches of R&D leading to materialized inventions, it is valuable to observe the number of “patent attempts” in the selected EU member states during the observed period of 2010-2017.

The differences between the GERD indicators are just miniscule compared to differences between filed patent applications. In 2010, only 83 applications from Greece were to be contrasted with 27,328 applications from Germany and in 2017, only 100 from Greece compared with Germany’s 25,490. This means that 329 times, resp. 255 times more applications for an EPO patent came from Germany.

Table 5. EPO patent applications filed by applicants from selected EU member states

	AT	CZ	DE	DK	ES	FI	FR	GB	GR	IT	PL	PT	SW
2010	1744	167	27328	1872	1430	1617	9575	5381	83	4078	205	81	3590
2011	1734	162	26202	1782	1404	1548	9617	4746	78	3970	246	81	3638
2012	1874	140	27249	1605	1544	1851	9897	4716	79	3744	383	76	3581
2013	1993	151	26510	1942	1504	1894	9835	4587	68	3706	372	95	3674
2014	1964	167	25663	1983	1471	2182	10614	4764	95	3649	482	113	3873
2015	1989	213	24807	1920	1581	1993	10760	5051	91	3986	566	141	3839
2016	2046	190	25012	1869	1560	1820	10504	5188	74	4172	411	158	3555
2017	2213	205	25490	2114	1676	1818	10559	5313	100	4352	469	149	3728

Source: author based on publicly available data (EPO, 2018).

Until 2015, the number of applications grew, but filing for a patent does not mean one is granted. So how many EPO patents were granted?

Table 6. EPO granted patents based on applications filed by applicants from selected EU member states

	AT	CZ	DE	DK	ES	FI	FR	GB	GR	IT	PL	PT	SW
2010	671	45	12550	515	392	679	4540	1851	16	2287	44	28	1460
2011	737	56	13578	592	381	587	4802	1946	29	2286	45	26	1489
2012	796	56	13315	565	405	669	4804	2020	31	2237	80	30	1572
2013	837	67	13425	608	395	665	4910	2064	30	2353	95	26	1789
2014	891	66	13086	599	467	633	4728	2072	23	2274	108	22	1705
2015	1040	74	14114	698	511	744	5426	2094	22	2476	151	46	1936
2016	1370	95	18728	1033	752	1081	7032	2931	39	3207	180	59	2661
2017	1465	123	18813	1076	805	1230	7325	3116	36	3111	216	68	2903

Source: author based on publicly available data (EPO, 2018).

The number of granted patents, i.e., successful inventions from selected EU member states presented to the EPO with the request to grant patent protection for the EU, had been both rising and falling until 2015 (see Table 6). Then there was a jump between 2015 and 2016, which in the majority (but not all, see, e.g. Italy) of the selected states continued with an increase in 2017. Assuming that the average patent application proceedings takes 4 years (EPO, 2018), then e.g. 1,744 (AT), 27,328 (DE), 9,575 (FR) or 205 (PL) applications in 2010 have to be matched against 891 (AT), 13,086 (DE), 4,728 (FR) or 108 (PL) granted in 2014, i.e., the success rate is 51% (AT), 48% (DE), 49% (FR) or 52% (PL). Is this matched as well by other ideas leading to innovation?

Table 7. DESI index (all five indicators) in selected EU member states in 2014-2016

	AT	CZ	DE	DK	ES	FI	FR	GB	GR	IT	PL	PT	SW
2014	46	42	49	65	44	59	45	52	31	33	36	44	63
2015	48	46	51	68	49	62	48	55	36	36	38	46	66
2016	58	50	57	68	52	67	51	61	37	40	43	53	67

Source: author based on publicly available data (EC, 2015).

DESI, with all its five indicators, has been growing in the EU and in all selected EU member states (Table 7). The speed of growth varies both across the EU and across time, while the spread (difference) remains similar, e.g., between Greece and Sweden, it was $63-31=32$ in 2014 and $67-37=30$ in 2016. Not only Greece but Italy as well remained, regarding digitalization, far behind the Czech Republic and Poland. For the EU sadly, Great Britain did better than the EU internal tandem (DE and FR). Regarding digitalization and innovations, the EU should think twice before criticizing the allegedly “problematic” Great Britain and “behind post-communistic” Czech Republic and Poland, before showing any admiration with respect to “creative” France and “hard-working” Germany and before playing other national stereotypes (Hřebíčková, Mottus, Graf, Jelinek, & Realo, 2018), and before treating the PIGS states, especially Greece, as digitalization-eager destinations. The proclaimed harmonization is not matched by the results and, if a model should be followed, then it should be the Scandinavian one. However, wouldn't that be too expensive? Let's examine the relationship between spending, patents, digitalization and innovations in general.

The co-relation of GERD, EPO and DESI and related trends in the EU and selected EU member states

Considering the nature of IP and the fact that innovations are significantly generated by patented inventions and/or ideas for the digital universe, and that they usually all need strong financial support, the data provided above is highly relevant. Nevertheless, the ephemeral features of IP, and the inherent difficulty to describe and measure all aspects of such unpredictable outcomes as inventions, point to the inconclusiveness and partial weakness of the provided propositions. To offset this unavoidable imprecision, the provided statistical and time review is complemented by a dynamic review focusing on the possible relationship of this data and trends. Firstly, an overview of all involved data for each year (2014, 2015, 2016) is presented, employing the GERD, patent applications and patent grant number, and DESI (see Tables 8, 9, 10). Secondly, an overview of their growth, stagnation and decrease will

be presented. This will allow one to assess their possible relationship and pertinent trends.

Table 8. GERD, EPO and DESI in the EU and selected EU member states in 2014

2014	EU	AT	CZ	DE	DK	ES	FI	FR	GB	GR	IT	PL	PT	SW
GERD	2.03	3.07	1.97	2.87	2.91	1.24	3.17	2.23	1.67	0.86	1.34	0.94	1.29	3.15
Pat.	67393	1964	167	25663	1983	1471	2182	10614	4764	95	3649	482	113	3873
App.														
Pat.	29775	891	66	13086	599	467	633	4728	2072	23	2274	108	22	1705
Gran.														
DESI	44	46	44	51	65	45	60	46	54	31	34	38	46	65

Source: author based on publicly available data (Eurostat, 2018 and EPO, 2018).

Regarding 2014, it needs to be pointed out that the GERD was way under the threshold of 3% for the vast majority of EU member states and even the EU as such and even the DESI often stayed below 50. The ratio between patent applications and patents granted was 2:1, i.e., an EPO patent success rate of 50% (naturally, this should be further re-calculated based on the expected four years' proceeding gap). The following year, 2015, provides a similar insight.

Table 9. GERD, EPO and DESI in the EU and selected EU member states in 2015

2015	EU	AT	CZ	DE	DK	ES	FI	FR	GB	GR	IT	PL	PT	SW
GERD	2.04	3.05	1.93	2.92	2.96	1.22	2.90	2.27	1.67	0.97	1.34	1.00	1.24	3.27
Pat.	67692	1989	213	24807	1920	1581	1993	10760	5051	91	3986	566	141	3839
App.														
Pat.	32894	1040	74	14114	698	511	744	5426	2094	22	2476	151	46	1936
Gran.														
DESI	47	48	46	51	68	49	62	48	55	36	36	38	46	66

Source: author based on publicly available data (Eurostat, 2018 and EPO, 2018).

Indeed, in 2015, the GERD remained far from 3%, while the DESI was slowly getting close to 50 and the EPO success rate stayed with 50%. However, 2016 saw a big change.

Table 10. GERD, EPO and DESI in the EU and selected EU member states in 2016

2016	EU	AT	CZ	DE	DK	ES	FI	FR	GB	GR	IT	PL	PT	SW
GERD	2.03	3.09	NC	2.94	NC	1.19	2.75	NC	1.69	1.01	NC	NC	1.27	3.27
Pat.	67405	2046	190	25012	1869	1560	1820	10504	5188	74	4172	411	158	3555
App.														
Pat.	44042	1370	95	18728	1033	752	1081	7032	2931	39	3207	180	59	2661
Gran.														
DESI	52	58	50	57	68	52	67	51	61	37	40	43	53	67

Source: author based on publicly available data (Eurostat, 2018 and EPO, 2018).

Although in 2016, the GERD and DESI stayed the same or increased by an insignificant margin, the patent success rate made a historic and unprecedented jump. A good visualization is provided by Table 11, which does not repeat the above data but for the period 2014-2016 merely puts “+” if there is an increase in the given parameter (GERD, patent applications, patent granted, DESI), “0” if there is stagnation or an insignificant increase or decrease and “-” if there is a drop.

Table 11 presents an important insight regarding the spending on R&D and an ephemeral possibility relationship with innovation trends in the EU and selected member states. Based on this overview, innovations, based both on patents and digitalization, are growing despite the lack of growth in spending on R&D and in patent applications. However, it would be superficial and controversial to stop here. This data is correct, but it needs to be understood holistically and the full Meta-Analysis must be performed, appreciated and discussed in the context of other data, especially that provided by academic literature.

Table 11. GERD, EPO and DESI in the EU and selected EU member states – trend 2014-2016 – note: evolution of the given parameter “+” (increase), “0” (stagnation), “-” (decrease)

	EU	AT	CZ	DE	DK	ES	FI	FR	GB	GR	IT	PL	PT	SW
GERD	0	0	-	+	+	-	-	+	+	+	0	+	0	+
Pat. App.	0	+	0	0	-	0	-	0	+	0	+	0	+	-
Pat. Gran.	+	+	+	+	+	+	+	+	+	+	+	+	+	+
DESI	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Source: author based on publicly available data (Eurostat, 2018 and EPO, 2018).

RESULTS AND DISCUSSION

The performed research, extraction and presentation of data along with other information, often dispersedly presented in EU official or semi-official documents and academic literature, allows for laying out solid academic results, implied and accompanied by a proper discussion done consecutively and based on the three research questions. In addition, patterns can be observed while considering EU member state particularities and this suggests that in the diversified world of innovation the EU member states’ drive, commitment, effectiveness and efficiency to innovations is growing (De Noni

et al., 2018), while R&D spending and differences between EU member states do not change dramatically.

First off, there is no doubt that public and private R&D symbiosis is pivotal for innovation (Hammadou, Paty, & Savona, 2014) and that a smaller fraction of GDP went, goes and will continue to go towards R&D in the EU, and in the majority of EU member states, than in the USA or Japan. The Europe 2020 threshold of 3% is a chimera and the GERD evolution does not create any legitimate grounds for hope for a dramatic change. Similarly, a plain academic and field observation (Bourgeois & Gebhard, 2015), and recent news and issues in the EU, do not offer any reasons or foundations for a jump from 2% to 3% by 2020. Even more interestingly, and beyond the issue of innovation, is the implied impression that EU-required parameters might be more likely met by those states that are not labeled as model states, rather than by the ‘illustrious tandem,’ France-Germany. In 2015, the EU had on average only 2.04%, France only 2.27% and the allegedly highly improving Greece 0.97%, while the Scandinavia was close to or even above 3%. This confirms previous predictions that the full satisfaction of targets of Europe 2020 will not be met in 2020 (MacGregor Pelikánová, 2017). However, this does not imply per se that innovations (Roszkowska-Menkes, 2017) and competitiveness in the EU must be jeopardized (Jones & Tahri, 2011). For such dramatic conclusions, we would need to see “bad” data regarding patents and digitalization (Polanski, 2015) with a declining trend.

Secondly, the number of patent applications has not changed dramatically during the observed period and the implied trend indicates stagnation, while the number of granted patents increased dramatically and the success rate jumped from 40-50% to over 70%. This asymmetric evolution in one innovation branch (patent), which was probably caused by the internal EPO policy changes, is paralleled by the steady, though slow, growth in another innovation branch (digitalization – DESI).

Thirdly, two plausible relationships were established – (i) between patent applications and patents granted (see, e.g. Greece and Germany) and (ii) between GERD and DESI (see Scandinavia). However, the related trends weaken the importance of these relations, because the patent success rate jumps and DESI grows for all, i.e., even with a decrease in GERD, an increase in DESI takes place over time. It can merely be proposed that the possibility of the relationship is rather weaker and that, due to the observed trends, increased spending on R&D in the EU is only one of many various factors and preconditions for innovation. In addition, results and trends in the EU are nationally particular and these particularities (Hammadou et al., 2014) do not often match well-known clichés. Based on the parameters explored by this paper, Scandinavia appears more effectively and efficiently oriented

towards innovations than France, while central European countries (AT, CZ, PL) have been progressing better towards innovations than good “old” EU members from the South (ES, GR, IT, PT). Nevertheless, some well-known generalization statements can be confirmed by this paper. For example, the German drive towards filing for patents and getting patents (Germany has 2 times more than France, 5 times more than Italy and 20 times more than Spain) matches with the German organization and determination regarding innovations and even in other fields. A less optimistic example of the confirmation of a generalized statement is the sad revelation that the “PIGS” states (PT, IT, GR, ES) are lagging behind, with respect to Eurozone crises and other financial issues, in addition to innovation.

In sum, GERD values and trends are smaller, slower and more diversified than perhaps generally expected, while numbers of patents and digitalization are growing, the alleged relationship between R&D and patent statistics and DESI/EDPR seems more ephemeral, i.e., the R&D spending curve is only partially paralleled by curves indicating innovation trends. An increase in R&D spending might, but does not need to, generate an increase in innovation trend in the EU. This all contributes to the conclusion that the EU is less harmonized and harmonization-ready for innovation than expected (MacGregor Pelikánová, 2017) and desired by EU leaders and policymakers. Europe 2020 was probably set effectively (a 3% threshold is correct and in tune with world recommendations) and efficiently (putting innovation in a strategic document Europe 2020 is the right process), but hardly efficiently and realistically. Innovations are critical for the EU’s competitiveness and the success of the single internal market and the reduction of differences and the general progress in both patents and digitalization in all EU member states is highly desirable. This all seems rather far away from now and the selected pathway seems to fit it rather poorly.

CONCLUSION

Innovation is clearly indispensable for global competitiveness and its, often expensive, foundation can take many shades and shapes and can be a product of academic, business and even users activities (Roszkowska-Menkes, 2017). Innovation is often protected as invention by patent or as an idea transformed in copyrightable work. The data is not perfect, but there is still sufficient information to address all three questions and move to a higher level; to start to think not only whether there is a possible relationship, but also what values and kinds of co-relations already exist and whether they are desirable in the EU and its member states.

Based on the performed multi-disciplinary search and holistic Meta-Analysis, the following answers to all three research questions are proposed. Firstly, the 3% threshold is not going to be met in the larger part of the EU, large differences in GERD between EU member states remain, and the model is to be found in Scandinavia rather than in the internal top EU tandem (DE, FR). Secondly, despite the lack of an increase in the fraction of GDP allocated to R&D spending, the number of granted patents via EPO keeps growing along with digitalization across the EU. Hence, the failure to meet the 3% threshold and to see a growing GERD is not bad per se for innovations in the EU. Thirdly, the possibility of a relationship between these factors and trends appears to exist, but this is not conclusive or dramatically strong. Spending more money and filling more patent applications, etc. appears to contribute to the innovation trend in the EU but it is not per se self-salvaging.

These answers are proposed and definitely are inconclusive due to the limitations of the performed and presented study. One set of limitations is inevitably caused by the intangible, ephemeral and hardly predictable nature of innovations and the impossibility to collect and mathematically process all involved phenomena. In addition, due to the limited scope of this paper and the availability of Eurostat and EPO data, the presented study focused only on innovations reaching the status of European innovations and reflecting inventions or digitalization during the past few years. It included neither innovations linked to other IP assets, such as trade secrets or design or utility models, or certain types of copyright, nor strictly national innovations, such as national patents, which may grow to EU importance, nor information regarding 2017 and 2018. Nevertheless, the dynamics offered by the research and the provided cross-support of data and arguments leading to answers to all three research questions make the provided propositions academically acceptable and offers the potential for further research study, which should reduce the mentioned limitations and shortcomings.

Further, the presented results and discussion generate additional original suggestions, such as that the differences between EU member states regarding innovations do not vanish, that although the Europe 2020 3% threshold is not going to be met, that the number of patented inventions and the practical digitalization can still grow across the EU, and that EU member states carry many over-looked, nationally-based particularities (De Noni et al., 2018). This implies a number of new burning questions need to be answered in order to enhance awareness, to re-adjust the EU approach to innovations and to EU member states' potential to generate innovations, and to make the innovation process in the entire EU more effective and efficient.

Right now, the targets set by Europe 2020, such as the 3% threshold, are perhaps effective but are definitively not efficient and realistic. Innovations

are foundations for competitiveness and at the same time they are the result of creative endeavors reflecting authors and inventors. After all, work is an image of its author, the European civilization is based on Christianity and creative work, and over-regulation suffocates creative activities which money cannot overcome. The motto of the EU “*In varietate concordia*” (United in diversity) matches perfectly to it.

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Abstrakt

Zrównoważonego rozwoju i konkurencyjności nie da się osiągnąć w naszym wysoce konkurencyjnym, globalnym społeczeństwie bez innowacji. Innowacje są zazwyczaj wynikiem wymagającego finansowo procesu badawczego, który generuje aktywa związane z własnością intelektualną, a mianowicie opatentowanych wynalazków lub pomysłów na cyfryzację i chronionych prawem autorskim lub w inny sposób. UE zdaje sobie z tego sprawę, a jej obecna strategia, Europa 2020, stwierdza, że 3% PKB powinno zostać przeznaczony na badania i rozwój najpóźniej do 2020 r., co powinno zwiększyć poziom innowacyjności i uczynić UE czołowym światowym liderem gospodarczym. Niewątpliwie innowacja jest niezbędna i musi być finansowana. Jednak związek między zaangażowanymi czynnikami a związaną z tym dynamiką jest niejasny i nie otrzymał wystarczającej uwagi naukowej i akademickiej. Aby uczynić pierwszy krok do rozwiązania problemu, należy odpowiedzieć na trzy pytania badawcze. Po pierwsze, jaką część PKB przeznacza się na badania i rozwój, wyrażonych przez GERD, i jaki jest trend GERD w UE i wybranych państwach członkowskich UE? Po drugie, ile złożono europejskich wniosków patentowych i przyznano patenty, jaki był wskaźnik sukcesu i jak postępuje cyfryzacja w UE i wybranych państwach członkowskich UE i jakie są trendy? Po trzecie, czy można implikować możliwość związku między nimi? Odpowiedzi na te trzy pytania opierają się na interdyscyplinarnych badaniach wykorzystujących twarde źródła danych, takich jak bazy danych Eurostatu i EPO, dokumenty urzędowe i / lub legislacyjne, takie jak Europa 2020, literatura naukowa wraz z bezpośrednią obserwacją, wyszukiwanie w terenie i własne doświadczenia autor. Taki konglomerat zróżnicowanych i multidyscyplinarnych danych może być przetwarzany przez niezliczoną ilość odpowiednio dopasowanych metod, zarówno o charakterze ilościowym, jak i jakościowym, i zdominowany przez holistyczną meta-analizę. Wskaźniki, takie jak GERD, statystyki EPO i DESI, są porównywalnie wykorzystywane, obserwując ewolucję ich czasu w całej UE i wybranych państwach członkowskich UE. Ich wybór wynika z motywacji do reprezentacji i stawienia czoła (domniemanemu) stereotypowi na temat państw członkowskich UE oznaczonych jako „dobre” (DE, FR), „leniwe” PIGS (PT, IT, GR, SP), pozostawiając (GB), w szczególności skandynawskie (DK, FI, SW) i centralne (AT, CZ, PL). To oryginalne badanie odpowiada na wszystkie trzy pytania: (i) próg 3% nie jest spełniony w większej części UE, (ii) liczba wniosków patentowych i przyznanych patentów rośnie wraz z cyfryzacją, oraz (iii) możliwy związek między tymi czynnikami i trendami istnieje, ale nie jest rozstrzygający ani drastycznie silny. Generuje to zestaw oryginalnych sugestii, takich jak różnice między państwami członkowskimi UE w zakresie innowacji nie znikają i mimo że próg 3% dla strategii Europa 2020 nie zostanie osiągnięty, liczba opatentowanych wynalazków i praktyczna cyfryzacja mogą nadal rosnąć w całej UE. Konieczne są dalsze i pogłębione badania, które powinny pomóc UE zmienić podejście do innowacji i sprawić, by była bardziej skuteczna i wydajna.

Słowa kluczowe: DESI, Europa 2020, GERD, innowacje, własność intelektualna, R&R, badania i rozwój.

Biographical note

Radka MacGregor Pelikánová received her Ph.D. in Private Law from the Law School at Charles University in Prague (CZ), LL.M. in Corporate and Finance from Wayne State University in Detroit (USA) and MBA from National American University (USA). She is an academic researcher and lecturer at Metropolitan University Prague. Her research interest is in Intellectual Property Law and its trends; and in current economic, legal and IT business issues. She is the author of almost one hundred academic articles published in several international journals included in WoS and Scopus databases, such as *Oeconomia Copernicana*, *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, *Scientific Papers of the University of Pardubice*, *Czech Yearbook of International Law – CYIL*, *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, *Lawyer Quarterly*, etc.

The role of innovative entrepreneurship in the economic development of EU member countries

Rodica Crudu¹ 

Abstract

In the specialized literature, entrepreneurship has been acknowledged to have a salient role in driving innovation, economic growth, and welfare, in addition to its effect on job creation. Researchers have expressed different views about the relationship between economic development and entrepreneurship throughout time. It is also considered that innovation is a driving force in the economic development of nations. Therefore, innovative entrepreneurship started to be considered a key factor in modern economic development. For instance, SMEs and innovation lay at the core of the European Union's development strategy - Europe 2020 strategy. The aim of the article is to analyze the role of innovative entrepreneurship in the economic development of EU member states. Taking into consideration that both processes: economic development and innovative entrepreneurship are multifaceted, the article comes to express the relationship between the two phenomena and its specifics in EU member countries. Given the nature of contemporary highlights of the literature review and the stated research objective, in this article, a model was tested that captures the new or young and innovative firms, as aspects of innovative entrepreneurship and determinants of the economic growth rates. The research method used is regression model analysis. For the statistical data analysis and processing, Stata and SPSS software tools were used. The key findings of the paper show that innovative entrepreneurs (being measured by the Total Early-stage Entrepreneurial Activity (TEA) innovation level) are more present in countries with higher development levels and higher incomes, being motivated by the improvement opportunity they see in becoming entrepreneurs. However, a higher degree of entrepreneurship, especially new firms' creation, does not substantially contribute to accelerated economic development. This is explained by the variation in the motivation (necessity or improvement oriented) entrepreneurs across EU countries.

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In the developed countries, the entrepreneurs are most likely to be the Schumpeterian type, while in developing countries most of them are shopkeepers. Consequently, it is clear that EU member countries need friendlier and more efficient new firms' creation policies, as well as SME supporting tools. The paper has significant practical implications for decision and policy-making authorities in terms of possible directions for innovative entrepreneurship policy development.

Keywords: innovation, entrepreneurship, new firms' creation, European Union, economic growth.

INTRODUCTION

In the last decades, especially after the 2008 global crisis, entrepreneurship and innovation have become one of the main concepts in the business fields and public development policies. Its relevance has increased, as entrepreneurship is more often associated with the ability to create new products or services, to innovate. There is a large growing body of research that shows that there is an interrelation between entrepreneurship, innovation and economic development. Researchers have expressed different views about the relationship between entrepreneurship and economic development during this time. However, in the latest period, more and more importance has started to be assigned to the role of innovative entrepreneurs in economic development enhancement. Innovative entrepreneurs are considered to be those entrepreneurs that manage to transform innovative ideas into high-demand, marketable products, services or technologies and, therefore, innovations play a specific role for them as an instrument in earning innovative incomes. Innovative entrepreneurship has sparked increased interest among academia and politics as well. For instance, SMEs and innovation lay at the core of the European Union's development strategy - Europe 2020 strategy.

Despite its relevance, in the specialized literature, there is little empirical evidence on the contribution of those entrepreneurs that are considered to be innovative to the economic development of EU member countries. There are several studies, both theoretical (e.g., Holmes & Schmitz, 1990; Shane, 2003; Acs, Audretsch, & Lehmann, 2013) and empirical (e.g., Evans & Leighton, 1989), determining the drivers of entrepreneurship development and the contribution of entrepreneurial activity to economic performance. However, the gap is determined by the constraints in the theoretical framework of innovative entrepreneur approach and the measurement of its impact at the national level. Most of the studies assess the economic performance at the level of the firm (Audretsch, 1995; Caves, 1998; Sutton, 1997) and show a positive relation between entrepreneurial activity and growth (i.e., new innovative firms become larger than existing large ones).

Another fact that emerged from the existing literature analysis is that the relationship between entrepreneurial activity and economic development covers mostly geographic regions. Few studies tie the link of entrepreneurship in different regions to their economic performance (e.g., Audretsch & Fritsch, 2002; Acs & Armington, 2003) and only the Global Entrepreneurship Monitor (GERA, 2017) is linking entrepreneurship to economic performance at the national level. However, despite numerous research studies that endorse the relationship between entrepreneurship and economic growth, there is a relative hole in the literature regarding the assessment of the contribution and role of innovative entrepreneurship in the economic development of EU member countries.

The present paper has the objective to research the role of innovative entrepreneurship in the economic growth of EU member states. Taking into consideration that both processes: economic growth and innovative entrepreneurship are multifaceted, this paper analyzes the relationship between the two phenomena and its specifics in EU member countries, which are heterogeneous too. Consideration is also given to the fact that there is a reversed causality, in that the quality of entrepreneurial activity is influenced by the level of economic development.

The second section of this paper presents the literature literature on the relation and effects of entrepreneurship on economic development. Firstly are analyzed the studies that measure the effect of entrepreneurs on economic growth through job creation and the transformation of ideas into marketable products and welfare. Afterward, new trends in assessing the role of innovative entrepreneurs and their contribution to the economic growth acceleration are described. In the third section, the hypothesis to be tested are formulated, the data used in the hypothesis' testing are described and the model for regression analysis is designed. The analysis of the model and the findings are presented in the fourth section, and conclusions and final remarks are presented in the fifth section.

LITERATURE REVIEW

In the last decades, entrepreneurship has sparked salient interest and is considered an important driver of economic development, inclusive society, welfare, and as a source of innovation creation. In the economic literature, there are two trends in assessing the effects of entrepreneurship on economic development. One is based on horizontal innovation growth models and an increasing range of product (e.g., Romer, 1990). The other one relies on vertical innovation growth models and increasing quality (e.g.,

Schumpeter 1934, 1942; Aghion & Howitt, 1992), being mostly explained by Joseph Schumpeter's famous "creative destruction" argument, according to which, when an entrepreneur introduces on the market a new product or a technological innovation, it pulls out from the market the less productive firms, and, therefore, creates a more competitive environment that leads to higher productivity and economic growth (Schumpeter, 1934). Since then, Acs, Braunerhjelm, Audretsch and Carlsson (2009) and Pontus et al., (2010) have completed the economic literature with the knowledge spillover theory of entrepreneurship. The authors induce the idea that economically relevant knowledge is the one that matters the most, with entrepreneurship playing the role of nexus between the knowledge and commercialization and economic growth.

The influence of innovation on economic growth is largely addressed in the economic literature. In the scholars' debates, the existent approaches, i.e., the evolutionary approach and the neoclassical "endogenous growth theory," are argued as having rooted differences. The evolutionary approach takes into consideration the historical environment, the causality between events and mechanisms, and treats economic growth as being far from a constant equilibrium. Whilst the neoclassical theory approaches economic growth as a state phenomenon, the cause and effects were analyzed as separate aspects (Fagerberg, Mowery, & Nelson, 2009)

When assessing the role of innovation in economic growth, researchers more often use input (i.e., R&D expenditures) or output (i.e., patents) measures (Griliches, 1990) and try to analyze the technological innovation's contribution, specifically at the firm and industry level. They are primarily based on a neo-classical approach established by Solow (1956) and use a Cobb–Douglas production function to establish the impact of the innovation on economic growth. It is worth mentioning that the studies that use neo-classical models of economic growth do not approach the entrepreneurship issue, which is the main trigger of technological innovation.

Recent scholarly debates try to endogenize the contribution of innovation to economic performance, referring to several forms of innovation: pedagogical innovation, active learning and learning by doing (Romer, 1986); human capital (Lucas, 1988); R&D in innovative goods, services or processes (Romer, 1990; Aghion & Howitt, 1992); and public infrastructure (Barro, 1990). The new growth theories seek to try out whether the elasticity of the output, with respect to broad capital (measured in one of the four forms revealed above), is higher than its share in value added or gross-output (Cameron, 1996). The endogenous growth models acknowledge the role of entrepreneurship in economic growth, by explaining the invention process and the main reasons that motivate firms to innovate (Uppenberg, 2009).

Many studies that focused on assessing the impact of entrepreneurship on economic development rely on the contribution of entrepreneurship to job creation. Entrepreneurship, measured by the self-employment rate, is seen to positively and robustly influence annual GDP growth (Pontus et al., 2010). Additionally, new firms' creation is found to have a positive impact on employment growth (Folster, 2000; Acs & Armington, 2004). Despite the theoretical arguments supporting the positive role of entrepreneurship in economic development, the heretofore unequivocally positive impacts of small and medium enterprises (SMEs) on job creation, have been recently thrown in relative uncertainty. Not all researchers have found positive correlations between entrepreneurship and job gains, with small firms having a disproportional contribution to net job creation (Birch, 1987; Shane, 2005; Henrekson & Johansson, 2010; Neumark, Wall, & Zhang 2011; Naudé, 2011; Haltiwanger, Jarmin & Miranda 2013). Some researchers also suggest that entrepreneurship has a negative impact on economic growth. Using econometric and statistical techniques, it has been found that entrepreneurship, measured by the self-employment rate, in more than half of the OECD countries analyzed, had a negative impact on real GDP growth in the period 1966-1996 (Blanchflower, 2000) and on GDP per capita in the period 1980-1995 (Salgado-Banda, 2007). Carree van Stel, Thurik and Wennekers' (2007) findings display a non-linear effect, suggesting that the effect of entrepreneurship on economic growth is insignificant.

In addition to its effect on job creation, entrepreneurship is seen as a fertile environment for innovation creation and, therefore, has been acknowledged as a key mechanism for economic growth acceleration and welfare (Wennekers & Thurik, 1999; Audretsch & Thurik, 2001; Audretsch, Bönte, & Keilbach, 2008; van Praag & Versloot, 2007; Acs, Astebro, Audretsch, & Robinson, 2016). However, according to Scott Shane (2009), the winner of the 2009 Global Award for Entrepreneurship Research, not all firms contribute to job creation and economic growth. He finds an interrelation between the motivation of becoming an entrepreneur and its effect on job generation and innovation creation. In those cases where self-employment is driven by necessity (the lack of a job or salary), these entrepreneurs are not likely to create job places, are likely to generate low incomes and are less likely to innovate. Hence, the author contends that mostly young firms, rather than small ones, contribute to job creation and contribute the most to economic growth and welfare acceleration (Shane, 2009). Business owners are not necessarily innovative and innovative entrepreneurs represent only a small fraction of them. This idea is also supported by & van der Velde (2014) that suggests that industries dominated by small and young firms are more innovative than industries dominated by large firms. Furthermore, some

studies demonstrate that, when employing analysis oriented to measure the impact of entrepreneurship on economic growth using data about firms that assimilate innovations (Levine & Rubinstein, 2013), innovative and high growth entrepreneurs (Shane, 2009) or firms that use venture capital for their development (e.g., Lerner 1994), the results of the measurements show positive correlations.

Therefore, innovation comes to be treated as the “golden ingredient” of entrepreneurship in the quest for increased competitiveness and represents the main function of the highest-level entrepreneurs, who generate bright ideas and convert these ideas into marketable products which, consequently, are the most likely to create growth. The concept of innovative entrepreneurship has started to be used by researchers more often while trying to establish the effects of entrepreneurship, innovation and economic development. Some researchers call the innovative entrepreneurs “Schumpeterian entrepreneurs” (Block, Fisch, & van Praag, 2017; Szabo & Herman, 2012) as they are inspired by Schumpeter, one of the most influential economists of the twentieth century, his *Theory of Economic Development* (1911), and his conceptualization of “entrepreneur as innovator” – a key to accelerating economic development.

However, van Praag and Versloot (2007) allege that there is a dearth of evidence of differences between those young innovative firms that do create the aforementioned benefits for society and the economy, and their counterparts. A review of the economic literature helped us to systematize the main differences between traditional and innovative entrepreneurs. These differences rely on 1) Different sources of opportunities. In his book, *A General Theory of Entrepreneurship*, Scott Shane mentions that innovative entrepreneurship originates from a nexus of individuals and opportunities (Shane, 2003), and, in the case of the innovative entrepreneur, these opportunities are research-driven and knowledge/technology-based (Acs et al., 2009); 2) Academic education and technological background (Koellinger, 2008). Blanchflower (2000) suggests that the relationship between education and self-employed individuals features a U-shaped curve, meaning that the least and most educated have the highest percentage of self-employed individuals. His study is realized on a sample of 19 OECD countries and the findings prove to be robust across data sources, time periods and sample countries; 3) The ecosystem in which they operate, i.e., the existence of networks, clusters that would facilitate technology and knowledge transfer, availability of a skilled labor force, financial resources, supporting institutions, etc. (Kressel & Lento, 2012).

Despite the theoretical arguments supporting the positive role of innovative entrepreneurship in fostering economic growth, the empirical

evidence regarding its effects on economic growth is mixed. Even if there are studies that found a positive correlation between innovative entrepreneurship and economic growth, a complex causal relationship between them is not sufficiently acknowledged. Indeed, establishing the effects of entrepreneurship on economic development and innovation creation is technically challenging. In reality, entrepreneurship may not only affect innovation, but innovation may, in turn, affect entrepreneurship outcomes and access to critical resources (Block, Fisch, & van Praag, 2017).

Empirical research has shown that there are interrelated effects between economic development and entrepreneurship, as there are between the innovation and economic outcomes. For instance, Wennekers, van Wennekers, Thurik and Reynolds (2005) found a positive correlation between entrepreneurial activity and innovative capacity in developed countries. An increased level of entrepreneurial activity can lead to an enhanced ability to 'produce a stream of commercially relevant innovations' (Wennekers et al., 2005, p. 297), and, therefore, to higher productivity and knowledge spillovers (Acs et al., 2009; Acs, Audretsch, & Lehmann, 2013). On the other hand, Aghion and Howitt (1992) and Carree and Thurik (2008) found that an innovative entrepreneurship's impact on economic development is often and that the variables used to establish this impact are not understood well enough or convincingly determined. Additionally, Barro (1991) considers that in cross-sectional regression analysis, developed countries tend to register lower growth rates in comparison to the developing or emerging economies and, therefore, the interpretation of the results can lead to mixed effects.

The mixed evidence is also in part due to a lack of consensus about the definition of entrepreneurship and different empirical proxies. Most empirical measurements use the self-employment rate or business ownership rate to capture the risk-taking aspect of entrepreneurship, as emphasized in Knight (1921), but very few of them capture the defining feature of entrepreneurship in Schumpeter (1934) — innovation. Therefore, we can say that many researchers use entrepreneurship proxies that ignore innovation, although only a fraction of these so-called entrepreneurs innovates (Low & Isserman, 2015). Hence, entrepreneurs are differentiated, being seen as managerial and innovative. Moreover, some studies (e.g., Wong, Ping, & Erkkö, 2005; Acs, 2006; Shane, 2009; Global Entrepreneurship Research Association, 2017) suggest that the motivation for becoming entrepreneurs in different countries and industries is different. In countries with higher levels of economic development, individuals are driven to become entrepreneurs by a perceived business opportunity or by the motivation for self-improvement; while in countries with lower development levels, entrepreneurs are mostly necessity-driven individuals who find themselves with no other options for

work than self-employment. The improvement opportunity-to-necessity entrepreneurship ratio, or motivation Index, as it is entitled by the Global Entrepreneurship Research Association in its Global Entrepreneurship Monitor (GEM), was used by some authors as the indicator to determine the relationship between the entrepreneurship ratio and GDP per capita (Acs, 2006; Szabo & Herman, 2012). In order to evaluate the effects of innovative entrepreneurship on economic growth, Wong et al. (2005) embedded in a model the GEM dataset for 2002 (total early age entrepreneurs (TEA), opportunity TEA, necessity TEA, and high growth potential TEA). Szabo & Herman (2012) also use the GEM dataset in their study, but their analysis, however, is limited to bivariate correlations covering short term periods, with no attempt to control for other factors.

To sum up, the economic literature has yielded mixed results regarding the effects of (innovative) entrepreneurship on economic growth. Most of the studies have acknowledged the salient role of entrepreneurship in driving innovation, economic growth, and welfare (in addition to its effect on job creation), but also a vice-versa effect. Innovation may impact entrepreneurial activity and its outcomes. Therefore, it can be contended that there are interrelations between economic growth and entrepreneurship, as well as between innovative entrepreneurship and economic outcome. Additionally, the literature on innovative entrepreneurship is somewhat scattered across the innovation and entrepreneurship disciplines, and not much cross-referencing occurs (Block, Fisch, & van Praag, 2017). Also, there is no clear empirical evidence on the effect of innovative entrepreneurship on the economic growth of EU countries. The benefits of entrepreneurship and innovation on economic growth have sparked increased interest, not only in research but also in policy-making. Consequently, more and more governments have developed and adopted programs and policies that aim to foster entrepreneurship and spur innovation. Not by chance, entrepreneurship and innovation rely on the core of the European Union's development strategy – Europe 2020. According to the European Commission, Europe's economic growth and jobs depend on its ability to support the growth of enterprises. By promoting entrepreneurship, the creation of new companies is encouraged, which, consequently, foster job creation, open up new markets, and nurture new skills (European Commission, 2015).

In the given context, the present paper's objective is to assess the effects of innovative entrepreneurship on economic growth, taking the European Union (EU) member countries as a case study.

RESEARCH METHODS

Given the nature of contemporary highlights of the literature review and the stated research objective, in this paper, we want to test a model that captures the new or young and innovative firms, as aspects of innovative entrepreneurship and determinants of economic growth rates. This approach is in line with the view of several researchers (Wennekers & Thurik, 1999; Davidsson, 2003; Wong et al., 2005, etc.) that consider business creation and innovation as separate aspects of entrepreneurship and, therefore, determinants of economic growth in its macroeconomic formulation. Both strands of the economic theory, the horizontal innovation growth models (Romer, 1990) and the vertical innovation growth models (Schumpeter 1934; Aghion and Howitt, 1992, etc.), acknowledge the salient role of innovation in accelerating economic growth. Following these theories, the first hypothesis of the present paper is:

H1: EU member countries with higher levels of innovation performance have higher economic growth rates.

To gauge the innovation performance of the EU countries, the Summary Innovation Index (SII) dataset from the European Innovation Scoreboard is used. Several empirical studies suggest that not all new firms contribute equally to economic growth. That is why, in order to assess the effects of innovative firms, the share of SMEs introducing product or process innovations to one of their markets (percentage of SMEs) and the share of the SMEs introducing marketing or organizational innovations (percentage of SMEs) are embedded in the model. Technological innovation is a key ingredient to innovation in manufacturing activities. Higher shares of technological innovators should reflect higher levels of innovation activities. Many firms, in particular in the service sectors, innovate through other non-technological forms of innovation. Examples of these are marketing and organizational innovations. The data about the SMEs introducing technological and non-technological innovations are taken from the European Innovation Scoreboard dataset. GDP data are taken from the Eurostat database.

The recent findings supporting the idea that mostly young innovative firms are those contributing the most to economic growth, lead us to the idea to use the data on Total Early-stage Entrepreneurial Activity (TEA), provided by the Global Entrepreneurship Monitor, to measure those new or young firms. According to the Global Entrepreneurship Monitor, TEA measures the percentage of the adult population between the ages of 18 and 64 years who are in the process of starting a business (a nascent entrepreneur) or are

owner-managers of a new business which is less than 42 months old (GEM, 2016 -2017). Therefore, the next hypothesis to be tested is:

H2: Countries with higher total early-stage entrepreneurial activity register faster growth rates.

The motivation driving the decision to become an entrepreneur is also taken into account, in order to see if there is a correlation between the level of economic development and their motivation index (percentage of those involved in TEA that is improvement-driven opportunity motivated, divided by the percentage of TEA that is necessity-motivated). Therefore, the 3rd and 4th hypotheses to be tested are:

H3: The motivation to become an entrepreneur is directly determined by the level of development.

Furthermore, as innovation is the key ingredient in the success of entrepreneurial activity and innovative entrepreneurs tend to contribute more substantially to economic growth, the final hypothesis to be tested is:

H4: Countries with higher economic development levels tend to have more innovative entrepreneurs.

These hypotheses are tested in a data set of 28 EU member countries over the period 2010-2016. The model used in this paper for testing the established hypotheses represents an extension of the neo-classical growth model. Because of the relatively small sample of cases, we have been quite parsimonious in selecting the independent variables. Therefore, the control variables in our model are: 1) Lagged GDP per person employed (to test the concept of relative convergence, where the coefficient is expected to be negative, consistent with the theory), and 2) Growth in Capital per worker. The variables of interest predictors are Total Early-stage Entrepreneurial Activity (TEA), SMEs introducing technological innovations and SMEs introducing non-technological innovations. These independent variables are embedded decidedly as determinants or predictors of economic growth, representing characteristics of innovative entrepreneurship and being considered as augmenting factors of production. Consequently, TEA represents a form of entrepreneurial capital, while technological and non-technological innovations measure knowledge capital.

Therefore, the generic equation of the regression model is:

$$\Delta \ln(y_{i,t}) = \alpha_{0,i} + \alpha_1 \ln(y_{i,t-1}) + \alpha_2 \Delta \ln(K/L)_{i,t} + \beta_1 TEA_{i,t} + \beta_2 TI_{i,t} + \beta_3 NTI_{i,t} + \varepsilon_{i,t}$$

Where:

- $\Delta \ln(y_{i,t})$ is the Rate of Economic Growth (the dependent variable) being measured by the increase in the real GDP growth per worker of country i , in the time period t . GDP per worker captures economic growth due to productivity gains, after controlling for differences in labor participation rates across EU member countries. The GDP data and the number of persons employed in the 28 EU member countries are taken from Eurostat;
- $\ln(y_{i,t-1})$ represents the Lagged Real GDP per person employed in logarithmic form. This variable was embedded into the equation to control the “conditional beta-convergence” effect, which occurs when developing economies tend to grow faster than developed countries. This is in line with the suggestion of Barro (1991), according to which, in cross-country regression models, rich economies tend to register lower economic growth rates;
- $\Delta \ln(K/L)_{i,t}$ is the growth rate in the Capital per worker of the country i , in the time period t . Growth in capital per worker is included to control the economic growth that is determined by the increase of capital as a factor of production. Data for Gross Fixed Capital Formation (GFCF) for EU member countries is obtained from the Eurostat database;
- *TEA* – Total Early-stage Entrepreneurial Activity – measures new firms’ creation or the percentage of the adult population between the ages of 18 and 64 years who are in the process of starting a business or who have just started a business which is less than 42 months old. TEA is used to capture the new and young firms that, according to several studies mentioned above, contribute the most to economic growth;
- *TI* – *TechInno* stands for technological innovation, being measured by the percentage of firms that introduced either a product and/or a service that is new to the market or to the firm itself. According to the OECD (2009), product innovation is the introduction of a good or service that is new or has significantly improved characteristics or intended uses; a process innovation refers to the implementation of a new or significantly improved production or delivery method. The data regarding the percentage of SMEs that introduced product or process innovations that are new to the market were taken from the European Innovation Scoreboard database;
- *NTI* – *Non-TechInno* stands for the share of firms who introduced a new marketing innovation and/or organizational innovation to one of their markets. Besides technological innovations, many firms, especially in the tertiary sector, have a tendency to introduce marketing and/or organizational

innovations. This indicator tries to gauge the share of SMEs that innovate through non-technological innovations;

- $\alpha_{0,i}$ is the constant, standing for the individual effects of every country;
- α_1, α_2 are coefficients for control variables;
- β_1, β_2 are coefficients for innovation activity;
- $\varepsilon_{i,t}$ is the error term.

For empirical estimation of the model, data presented in the form of natural logarithm were used. Therefore, the growth rate is presented as:

$$\Delta \ln(y_t) = \ln(y_t) - \ln(y_{t-1}) = (y_t - y_{t-1})/y_{t-1}$$

For the regression analysis model panel data were used, covering all EU member countries for the period 2010-2016. The timeframe was limited to this period due to the lack of data for all analyzed countries in earlier years (especially for TEA). Additionally, the empirical research relies on a statistical method, using Stata software for panel data analysis.

ANALYSIS AND RESULTS

Overall, the constructed equation seems to be reasonably defined, with significant F and t statistics. Collinearity statistics show that there is no problem of multicollinearity between independent variables, except the causality between TechInno and Non-TechInno variables (See appendix 1). This could be explained by the fact that the firms that introduce the product and/or process innovations might be the same firms that introduce organizational or marketing innovations. Nevertheless, as soon as the NonTechInno is not statistically significant in the regression analysis, we still maintained it in the model as an independent variable, just to test its role in economic growth so far.

Table 1 exhibits the result of the four regressions using three different estimation methods (Pool Ordinary Least Squares, random effects, fixed effects and GMM).

After performing the Hausman test, we found that fixed effects (FE) regression is the model that is appropriate for our analysis. The difference in the coefficients is systematic because the P value for the chi2 test is less than 0.05. This means that the fixed effects (FE) model is preferable over the random effects (RE) model.

Fixed effects explore the relationship between predictor and outcome variables within an entity (EU countries in our case). Each country has its

own individual characteristics that may or may not influence the predictor variables. When using fixed effects, we assume that something within the individual may impact or bias the predictor or outcome variables and we need to control for this. This is the rationale behind the assumption of the correlation between a country's error term and predictor variables. Fixed effects remove the effect of those time-invariant characteristics so we can assess the net effect of the predictors on the outcome variable. Another important assumption of the fixed effect model is that those time-invariant characteristics are unique to the individual and should not be correlated with other individual characteristics. Each country is different. Therefore the country's error term and the constant (which captures individual characteristics) should not be correlated with the others.

The regression analyses show that the Total Early-stage Entrepreneurial Activity is not statistically significant. This result corroborates with the findings of Carree et al. (2007) that suggest that entrepreneurship (expressed by the self-employment rate) has insignificant effects on economic growth. Taking into consideration that in the initial estimation model (see appendix 2), not all variables are statistically significant, we decided to re-estimate the model, as presented in Table 1.

The control variables proved to be significant and explain around 67% of national economic growth in the 28 EU member countries. The correlation of Lagged GDP per person employed () confirms the conditional convergence effect. Additionally, as was expected, growth in capital per worker has a positive convergence effect and is statistically significant. The TI variable proves to be statistically significant. However, it has a relatively small influence on the dependent variable (Real GDP Growth per worker), registering values of -0,002%.

The interpretation of data says that a 1 percentage point increase in the share of SMEs introducing technological innovations results in a 0,002% decrease in the growth of real GDP per worker, which is in contradiction with the theory, but not with the results of some studies (Wong et al., 2005; Carree et al., 2007). This result might be explained by the argument that the new product and/or process innovations introduced by European firms required substantial investments and did not prove to have a big impact on economic growth. Also, taking into consideration that the analysis covers a relatively short period of time, it might be argued that these innovations would result in positive effects on economic growth in the long run, taking firms a longer time to recover their investments and increase their productivity.

Table 1. Results of estimation models

	(Pool OLS) $\Delta \ln(y_{i,t})$	(RE) $\Delta \ln(y_{i,t})$	(FE) $\Delta \ln(y_{i,t})$	(GMM) $\Delta \ln(y_{i,t})$
$\ln(y_{i,t-1})$	-	-0.003*	-0.177***	-0.143**
Std error		(0.002)	(0.038)	(0.125)
Prob.		0.101	0.000	0.050
$\Delta \ln(K/L)_{i,t}$	0.274***	0.276***	0.175***	0.258*
Std error	(0.022)	(0.041)	(0.024)	(0.084)
Prob.	0.000	0.000	0.000	0.101
TI	-	-	-0.002**	0.002
Std error			(0.001)	(0.003)
Prob.			0.046	0.573
NTI	-0.001***	-0.001**	0.001*	0.004***
Std error	(0.000)	(0.000)	(0.000)	(0.001)
Prob.	0.000	0.040	0.110	0.005
_cons	0.040***	0.049***	0.703***	-
Std error	(0.000)	(0.000)	(0.142)	
Prob.	0.001	0.005	0.000	
N	154	154	154	154
R-sq	0.464	0.470	0.673	J-statistic 21.9

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The rescue packages launched by the European countries' governments to "save" their hard-hit-by-the-crisis economies, led to a slight recovery in 2010 but was followed by a contraction in 2012. After then, positive growth rates were registered, except for the last year of the analysis. These findings are in line with the Eurostat (2017) data regarding labor productivity per person employed, suggesting that labor productivity differs across the countries and sectors, but increased over the years (except 2012) in almost all EU member countries, except Greece, Italy, Croatia, Luxembourg and Finland (no data are available for Malta) (Eurostat, 2017). The brief analysis of the summary statistics, confirm the above-mentioned statement.

Taking into consideration that in our model (1) there is a lagged dependent variable and individual effects vary across countries, we should consider the dynamic panel bias. In order to mitigate the dynamic panel bias, we use Generalized Method of Moments (GMM). In our case, we employ the Arellano Bond method to transform all the elements of the model into the first differences. As instruments for explaining the variables, their values for previous periods of time (i.e., t-2 period) were used. The results are represented in Table 1, column (GMM). In this model, the most significant factors for determining the development of economic growth is the growth rate of Gross Capital Formation per employed person () and non-technological innovations (NTI). When evaluating a dynamic model using GMM, a larger number of instrumental variables are included in the model. In the GMM

model used, there may be a correlation between the first differences of error (ϵ) and regressors (predictors), which can lead to biased, inefficient and inconsistent estimates. As a result, additional variables are included in the model, including late differences for the dependent variable and a specific set of instrumental variables. To verify the necessity of including additional conditions, a Sargan test was performed, which confirmed that the hypothesis about the fulfillment of additional moment conditions is accepted.

Therefore, the first hypothesis, that EU member countries with higher innovation levels have higher economic growth rates, is not fully supported by our model, the variables measuring the technological innovations (TI), even if it has a relatively positive effects on our dependent variable, it is not statistically significant. However, when running bivariate correlations between the summary innovation index and the GDP/capita of the EU member countries for 2016, we have found a strong and significant causality, with a Pearson coefficient of +0,793 (see Figure 2).

As shown in Figure 2, innovative performance is a driver of economic development in EU member countries. These findings attest our supposition and suggest that countries with a higher level of economic development are characterized by an increased level of innovation performance, and, therefore, highlight the need of the developing countries to put more effort into this area and spur innovative firms' development.

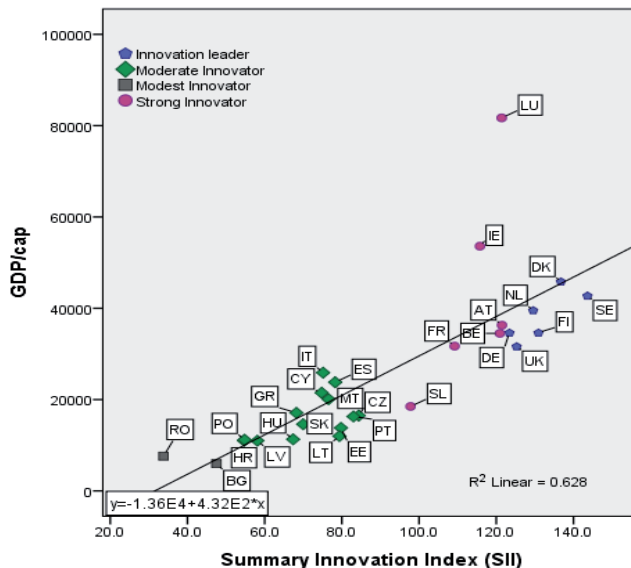


Figure 2. Correlation between the GDP/capita and Innovation performance of EU member countries, 2016

The model does not support our second hypothesis, that countries with higher TEA register faster growth rates, the variable measuring it being insignificant. The insignificance of TEA could be explained by the fact that the analysis covers countries with different levels of development and TEA depends on the state of development of each economy. Therefore, countries with lower levels of economic growth tend to have fewer newly created firms. Moreover, new firms are created in the countries in which the government supports and promotes firms' creation. Hence, it is directly influenced by the business and entrepreneurship policies, financial tools and programs that these governments promote, which, in most of the cases, is consistent with the level of development. Moreover, advanced countries place a larger focus on the quality of entrepreneurship rather than its respective quantity (Peris-Ortiza, Ferreirab, & Fernandesc, 2017). This might also be explained by the fact that the types of entrepreneurs vary across countries. In the developed countries the entrepreneurs are most likely to be of a Schumpeterian type, while in developing countries most of them are shopkeepers (Block, Fisch, & van Praag, 2017). Consequently, it is clear that EU member countries need friendlier and more efficient new firms' creation policies, as well as SME-supporting tools.

Additional regression analyses with types of TEA motivations resulted in insignificant correlations for Opportunity TEA and Necessity-driven TEA (see appendix 3). However, the signs of the coefficients (the Pearson coefficient for Opportunity-driven TEA is +0.42, while for the Necessity-driven TEA it is -0.55) suggest that entrepreneurs' motivation is consistent with the development level of the economy (entrepreneurs from countries with a higher development level are more opportunity and improvement-driven motivated, while entrepreneurs from countries with lower levels of economic development, tend to be Necessity-driven motivated). Hence, these findings support the third established hypothesis, according to which the motivation to become an entrepreneur is directly determined by the level of development (see Figure 3), and they corroborate with the findings of Birch et al. (1987), Shane (2009) and Andreeva, Simon, Karkh and Glukhikh (2016) who contend that opportunity-driven entrepreneurs are most likely to contribute to economic growth acceleration.

TEA (especially Opportunity-driven TEA) has positive effects on entrepreneurship, while entrepreneurship could contribute to innovation creation, this idea indeed being supported by various studies (Wennekers & Thurik, 1999; Wennekers et al., 2005; Wong et al., 2005; Welter & Lasch, 2008; Peris-Ortiza, et al., 2017). In the last years, the Global Entrepreneurship Report started to calculate the innovation level of Total Early-stage Entrepreneurial Activity. This indicator gauges the percentage of those involved in TEA who have indicated that their product or service is new to at least some customers

and that few, or no, firms offer the same product/service. The TEA innovation level shows a significant and positive correlation with the GDP per capita in 22 EU member countries (for 6 EU countries, TEA innovation levels data are not available) (see Figure 4), this being proved by the relatively high Pearson coefficient (+0.732).

Countries with a higher GDP/cap and innovation performance tend to have more innovative entrepreneurs. This supports our last hypothesis and might be explained by the positive relationship between innovation and innovation-friendly implementation policies and the state of economic development of the countries (Peris-Ortiza et al., 2017).

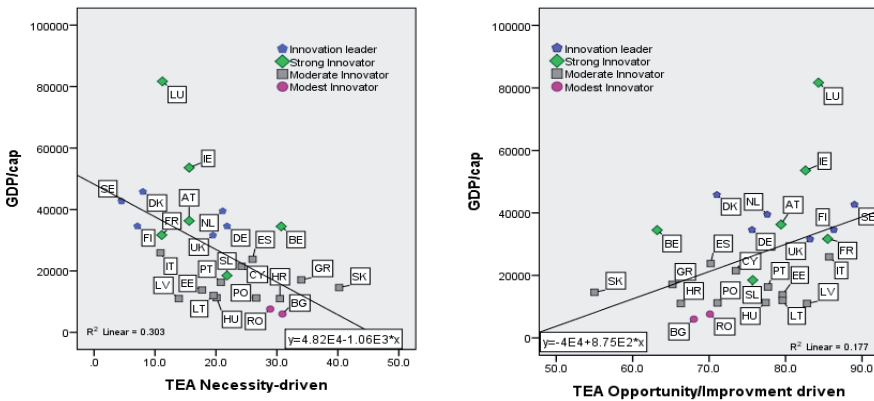


Figure 3. The correlations between the GDP/cap and motivation of becoming entrepreneurs in EU member countries, 2016

Advanced countries allocate large amounts for innovation and entrepreneurial policies and the tools to implement them, being expected to influence the quality of entrepreneurship and economic growth. For instance, Fritsch and Mueller (2007) found that the regional variation in the innovation and entrepreneurial climate in Germany explains the overall regional business development performance. Consequently, we may suggest that in order to foster economic growth and spur entrepreneurship and innovation creation, EU countries need efficient entrepreneurship and innovation policies.

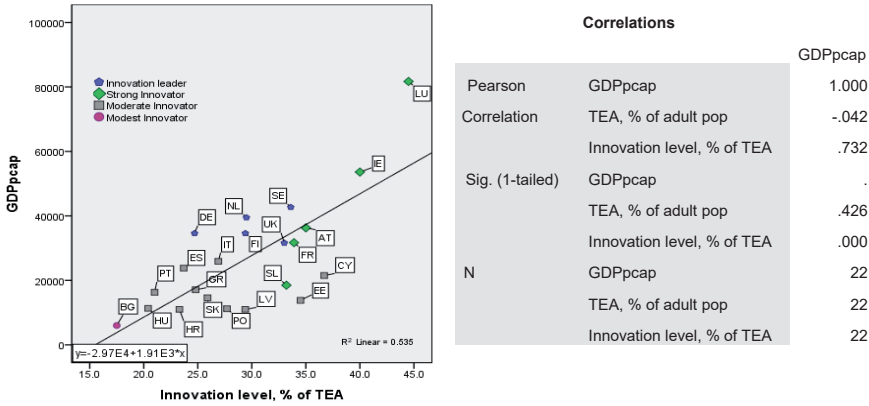


Figure 4. The correlations between the GDP/cap and TEA Innovation level in EU member countries, 2016

CONCLUSION

The results of the regression analysis suggest that a higher degree of entrepreneurship, especially in new firms’ creation, does not contribute substantially to accelerated economic development (the TEA variable being insignificant). Taking into account the timeframe of the analysis, these results might be explained by the fact that firms tend to contribute to economic growth in the long-run, rather than generating short-term effects. Another reason could rely on several other factors of entrepreneurship (rather than firms’ creation) that might accelerate economic growth. Another finding of the paper suggests that entrepreneurs’ motivation is consistent with the development level of the economy. Results show that innovative entrepreneurs (being measured by the TEA innovation level) are more present in countries with a higher development level and higher incomes, being motivated to become entrepreneurs as they see an improvement opportunity. This also suggests that policies promoted by the governments of these countries are more efficient (fund-intensive) in building attractive and productive entrepreneurial and innovation climates. This conclusion is also supported by the results of the regression analysis, suggesting that opportunity or improvement-driven motivation is positively correlated with the level of development. The interrelation of the above-mentioned ideas, gives us support to contend that the most significant contribution to economic growth is made by “emerging” firms, rather than new firms in general (Birch et al., 1987; Andreeva et al., 2016).

The findings of this research help us conclude that the differences in EU member states' economic growth rates could be explained by the diffusion of new firms with high growth potential. Still these countries undertake other forms of entrepreneurial activity, but these do not differentiate countries with varying growth rates. This nurtures the idea that entrepreneurship and innovation policies, which are more focused on efficiency, are more appropriate than those based on quantity.

Moreover, taking into consideration that entrepreneurship and innovation are facets of innovative entrepreneurship, the need for a holistic approach towards innovation and entrepreneurship policies is imperative (Crudu, 2017). However, the high complexity of the governance of EU innovation policy, the overlap between funding instruments and too many decision-makers, lead to outcomes that fall below EU expectations (Anvert, Granieri, & Renda, 2010). The policy and institutional environment is an important determinant of innovative behavior. Government support for innovation is important. There should be the promotion of entrepreneurship in general, and policies ought to be framed to focus on increasing innovative activities among existent, as well as new growing firms. The policy may aim to correct market failures (e.g., failures arising from informational imperfections and positive externalities of knowledge creation) that negatively affect the performance of innovative entrepreneurs. Therefore, the soundness of government intervention's foundations and achievements need to be scrutinized ex-ante and ex-post.

Having this in mind, we aim to shed light in our future research on the role of the policies adopted by governments in supporting innovative entrepreneurship and their nature. Taking into consideration that the quality of innovative entrepreneurs does not depend only on the quality of policies and their manner of implementation, further empirical research should also approach the identification of the correlation between entrepreneurial education, entrepreneurship performance and economic growth; establishing a benchmarking tool for measuring innovative entrepreneurs and identifying industries with higher concentrations of innovative firms, that mostly contribute to economic growth acceleration.

Additionally, further research is needed to consider more carefully the impact of TEA on innovation performance and the economic growth of countries, which might be explained by factors that fall beyond the scope of this study.

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Appendixes

Appendix 1. Correlation of the regression model's variables

	$\Delta \ln(y_{i,t})$	$\ln(y_{i,t-1})$	$\Delta \ln(K/L)_{i,t}$	TEA	TI	NTI
$\Delta \ln(y_{i,t})$	1					
	196					
$\ln(y_{i,t-1})$	-0.115	1				
	0.1085					
	196	196				
$\Delta \ln(K/L)_{i,t}$	0.626	0.0617	1			
	0	0.3902				
	196	196	196			
TEA	0.1733	-0.3933	0.2158	1		
	0.031	0	0.007			
	155	155	155	155		
TI	-0.1705	0.7506	-0.0036	-0.4004	1	
	0.0169	0	0.9598	0		
	196	196	196	155	196	
NTI	-0.1837	0.7417	0.0038	-0.41	0.8485	1
	0.01	0	0.9576	0	0	
	196	196	196	155	196	196

Appendix 2. Results of initial estimation models

	(Pool OLS)	(RE)	(FE)	(GMM)
	$\Delta \ln(y_{i,t})$	$\Delta \ln(y_{i,t})$	$\Delta \ln(y_{i,t})$	$\Delta \ln(y_{i,t})$
$\ln(y_{i,t-1})$	-0.0045	-0.0045	-0.197***	-0.415**
Std error	(0.007)	(0.007)	(0.044)	0.196
Prob.	0.547	0.548	0.000	0.036
$\Delta \ln(K/L)_{i,t}$	0.311***	0.301***	0.225***	0.194*
Std error	(0.028)	(0.027)	(0.032)	0.117
Prob.	0.000	0.000	0.000	0.101
TEA	-0.0011	-0.0012	-0.001	0.002
Std error	(0.001)	(0.001)	(0.002)	0.004
Prob.	0.612	0.306	0.607	0.654
TI	-0.0004	-0.0002	-0.002***	-0.005
Std error	(0.001)	(0.001)	(0.000)	0.004
Prob.	0.919	0.656	0.004	0.309
NTI	-0.004	-0.0004	0.0001*	0.006*
Std error	(0.001)	(0.001)	(0.0001)	0.003
Prob.	0.354	0.404	0.100	0.007
_cons	0.053*	0.063**	0.789***	-
Std error	(0.026)	(0.027)	(0.164)	-
Prob.	0.403	0.019	0.000	
N	154	154	154	154
R-sq	0.435	0.458	0.612	J-statistic 10.61

Note: standard errors in parentheses; * p<0.10, ** p<0.05, *** p<.01

Appendix 3. Results of Regressions per types of TEA Motivation

	(Overall TEA) ln(y _{i,t-1})	(Opportunity TEA) ln(y _{i,t-1})	(Necessity TEA) ln(y _{i,t-1})
ln(y _{i,t-1})	-18.04***	-22.23***	-21.30***
	(4.650)	(4.611)	(4.850)
Δln(K/L) _{i,t}	0.250***	0.211***	0.228***
	(0.0322)	(0.0371)	(0.0349)
TEA	-0.274		
	(0.230)		
TI	-0.294***	0.0105	-0.0228
	(0.104)	(0.105)	(0.105)
NTI	0.0801	-0.173*	-0.194**
	(0.0939)	(0.0970)	(0.0963)
OpportunityTEA		0.0332	
		(0.0254)	
NeccesityTEA			-0.0398
			(0.0696)
cons	78.96***	90.83***	91.95***
	(17.40)	(16.97)	(19.44)
N	155	93	93
R-sq	0.458	0.550	0.540

Note: standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01

Abstrakt

W literaturze specjalistycznej uznano, że przedsiębiorczość odgrywa istotną rolę w napędzaniu innowacji, wzrostu gospodarczego i dobrobytu, a także wpływa na tworzenie miejsc pracy. Badacze wyrażali różne poglądy na temat związku między rozwojem gospodarczym a przedsiębiorczością w czasie. Uważa się również, że innowacje są siłą napędową rozwoju gospodarczego narodów. Dlatego też innowacyjna przedsiębiorczość zaczęła być uważana za kluczowy czynnik nowoczesnego rozwoju gospodarczego. Na przykład MŚP i innowacje leżą u podstaw strategii rozwoju Unii Europejskiej - strategii „Europa 2020”. Celem artykułu jest analiza roli innowacyjnej przedsiębiorczości w rozwoju gospodarczym państw członkowskich UE. Biorąc pod uwagę, że oba procesy: rozwój gospodarczy i innowacyjna przedsiębiorczość są wielopłaszczyznowe, artykuł przedstawia związek między tymi dwoma fenomenami a ich specyfiką w krajach członkowskich UE. Biorąc pod uwagę charakter współczesnego przeglądu literatury i określony cel badawczy, w niniejszym artykule przetestowano model, który obejmuje nowe lub młode i innowacyjne firmy, jako aspekty innowacyjnej przedsiębiorczości i determinanty tempa wzrostu gospodarczego. Zastosowana metoda badawcza to analiza modelu regresyjnego. Do analizy i przetwarzania danych statystycznych wykorzystano narzędzia programów Stata i SPSS. Najważniejsze wnioski z tej pracy pokazują, że innowacyjni przedsiębiorcy (mierzeni poziomem innowacji we wczesnej fazie przedsiębiorczości (TEA)) są bardziej obecni w krajach o wyższym poziomie rozwoju i wyższych dochodach, motywowani przez możliwości poprawy, które widzą w byciu przedsiębiorcami. Jednak wyższy stopień przedsiębiorczości, zwłaszcza tworzenie nowych firm, nie

przyczynia się znacząco do przyspieszonego rozwoju gospodarczego. Wyjaśnia to zmienność motywacji (konieczność lub zorientowanie na poprawę) przedsiębiorców w krajach UE. W krajach rozwiniętych, przedsiębiorcy najprawdopodobniej są typem Schumpetera, podczas gdy w krajach rozwijających się większość z nich to właściciele sklepów. W związku z tym uważa się, że państwa członkowskie UE potrzebują bardziej przyjaznej i skutecznej polityki tworzenia nowych firm, a także narzędzi wspierających MŚP. Artykuł ma istotne praktyczne implikacje dla władz i decydentów w zakresie możliwych kierunków rozwoju innowacyjnej polityki przedsiębiorczości.
Słowa kluczowe: *innowacja, przedsiębiorczość, tworzenie nowych firm, Unia Europejska, wzrost gospodarczy.*

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Factors that shape the competitiveness of small innovative companies operating in international markets with a particular focus on business advice

Edward Stawasz¹ 

Abstract

The aim of the presented paper is to identify the significance of selected determinants of the competitiveness of small, innovative enterprises operating in international markets that use business advice. The achievement of this goal required identifying the determinants of the competitiveness of small companies (characteristics of managers, characteristics of enterprises) as well as examining the motives, areas and effects of using business advice. The issue of business knowledge absorptive capacity as a determinant of the competitiveness of small enterprises and the effectiveness of using external business knowledge was also presented. The second part of the paper presents the results of empirical research conducted using the CATI technique on a sample of 67 small, innovative Polish enterprises operating in international markets and simultaneously benefiting from business advice. The conducted research confirmed the hypothesis of a significant, moderating influence of business advice on the system of competitiveness determinants of enterprises. The hypothesis concerning a positive relationship between business advice and enterprises' capacity for absorbing business knowledge, and indirectly their competitiveness, was also confirmed. Improving the competitiveness of enterprises requires using business advice and enhancing their business knowledge absorptive capacity.

Keywords: *small business, determinants of competitiveness in international markets, business advice, business knowledge absorptive capacity.*

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INTRODUCTION

The issue of determinants that shape the competitiveness of small innovative enterprises is still poorly recognized in management literature (Sipa, Gorzeń-Mitka, & Skibiński, 2015; Adamik, 2011; Ciszewska-Mlinaric, Mlinaric, & Obłój, 2011). This situation seems particularly important for enterprises that are increasingly more active in international markets (Bianchi, Glavas, & Mathews, 2017; Stoian, Rialp, Rialp, & Jarvis, 2016). The scope and intensity of the impact are very diverse due to numerous industry-related determinants, the scale and age of enterprises, prevailing attitudes and development orientations, the level of business knowledge and business management skills, as well as the innovative and knowledge absorptive capacity, or the role of business advice (Navarro & Eldridge, 2016; Blackburn, Hart, & Wainwright, 2013; Stawasz, 2013; Gudkova, 2008; Wiklund & Shepherd, 2003). There is no in-depth empirical material concerning the role of particular factors in relation to small enterprises operating in the Polish economy which is characterised by a lower level of experience of small companies compared to the EU's old countries, mainly due to the relatively short development period of the SME sector (25-30 years) and the unsatisfactory state of business advice development. For this reason, it may be interesting to examine the role of management-related factors, with particular emphasis on business advice and business knowledge absorptive capacity, in the process of shaping the competitiveness of small innovative enterprises operating in international markets.

Business advice is considered as an important factor in improving management, especially in the case of small innovative entities, both in the area of reducing barriers to their development and in the field of development management. Managers rarely have all the knowledge necessary for conducting effective and successful business activity (Mole, North, & Baldock, 2017). The necessary knowledge they are lacking can be obtained from the environment, from advisors, in the form of professional and independent services. Their aim is to help managers and enterprises achieve their goals by solving management problems as well as by assisting them in identifying and exploiting new opportunities, learning and implementing changes.

The use of business knowledge for shaping the competitiveness of small enterprises forces the company management to face challenges, the more so given that small companies usually do not have the appropriate management structure or professional managers. Business knowledge absorptive capacity, including the ability to recognize the value of new knowledge, and assimilate and transform it into a commercial outcome, plays an important role in this respect (Grabowski & Stawasz, 2017; Zahra & George, 2002). These are

particularly important and difficult to obtain capabilities in technologically advanced and innovative industries (Patterson & Ambrosini, 2015).

The paper is devoted to discussing the role of factors shaping the competitiveness of small innovative enterprises operating in international markets in the context of specific characteristics of their managers and the enterprises themselves. The moderating influence of business advice and business knowledge absorptive capacity in this process was also discussed. The hypothesis was adopted about a positive and significant impact of business knowledge and managerial skills on the competitiveness of enterprises strengthened by business advice and business knowledge absorptive capacity. The second part of the paper presents the results of empirical research conducted in 2016 with the use of the CATI technique on a sample of 67 small, innovative Polish enterprises operating in international markets. The analysis of the research results confirms the existence of a relationship between management-related factors and the competitiveness of enterprises. Using business advice and increasing the capacity for the absorption of business knowledge obtained through advisory services can broaden the scope of the determinants of enterprises' competitiveness and can be considered as an effective factor in improving competitiveness, especially in the case of enterprises characterized by an already high level of competitiveness.

LITERATURE REVIEW

Factors shaping the competitiveness of small innovative enterprises

Competitiveness is a feature of an efficiently operating enterprise which is related to the process of competition in which companies compete with one another (Adamik, 2011; Liao, Rice, Lu, & I-Ch, 2015). Competitiveness of companies is defined as their ability to function in a competitive environment (Sipa et al., 2015; Dzikowska & Gorynia, 2012) in which other entities operate. It is the ability to design, manufacture and sell products and services on the market where similar products and services are offered by other business entities. Thus, multidimensional competition between entities understood as access to resources in order to transform them into products and services that meet broad consumer requirements, is a feature of the market (Stankiewicz, 2002). Being competitive ensures companies' sustainable development.

In the classical approach, determinants of competitiveness are divided into external and internal ones (Carvalho & Costa, 2014; Piatkowski, 2012). External factors result from the fact that the company is affected not only by the competitive environment (other enterprises) but also by the general,

macroeconomic, mesoeconomic and microeconomic environment (Lisowska, 2015). Internal factors are related to the ability of enterprises to develop their own competitiveness (their own competitive advantages). The explanations in this regard are provided by the modern trends in the theory of enterprises: resource, competence and knowledge-based ones (Freiling, Gersch, & Goeke, 2008; Plawgo, 2004), which have emerged as a response to the departure from the classic strategies of cost leadership, differentiation and focus which concentrated on the basic external factors, mainly market ones, but which did not form the basis for sustainable competitiveness of small enterprises (Zvirblis & Buracas, 2012; Karpacz, 2011; Man, Lau, & Snape, 2008). Internal capabilities of small entities, which are key to their competitiveness, occur at both the strategic and organizational levels (Chaston, 2010). The former include the ability of the company to achieve a special market position that gives it a cost advantage or an advantage in diversifying products as well as the ability to use it effectively. It is, therefore, the ability to identify emerging opportunities and formulate an effective strategic response. Key organizational skills include knowledge, innovation, productivity and human resources (Wach, 2017; Stanisławski, 2013).

A conceptual model illustrating the factors shaping the competitiveness of small innovative enterprises in international markets is presented in Figure 1. In line with the currently dominant resource-based approach and competence-based theories of the firm in shaping the development of enterprises and their competitiveness, a total of fourteen factors were distinguished for research purposes: the age of enterprises, the level of management, the industry in which the enterprises operate and innovations. Among the management-related factors, the following were distinguished: the number of people on the board, family relations among the management, managers' experience, managers' education profile, managers' level of business knowledge, business knowledge absorptive capacity, business development priorities, the form of planning and business advice.

The development of the business knowledge base, development orientation and improvement of the management level, as well as building knowledge absorptive capacity and its use for shaping the competitiveness of enterprises may require external support in the form of state aid or professional business advice, important especially for small innovative entities (Caiazza, Richardson, & Audretsch, 2015; Sciascia, D'Oria, Bruni, & Larraneta, 2014; Stawasz, 2013).

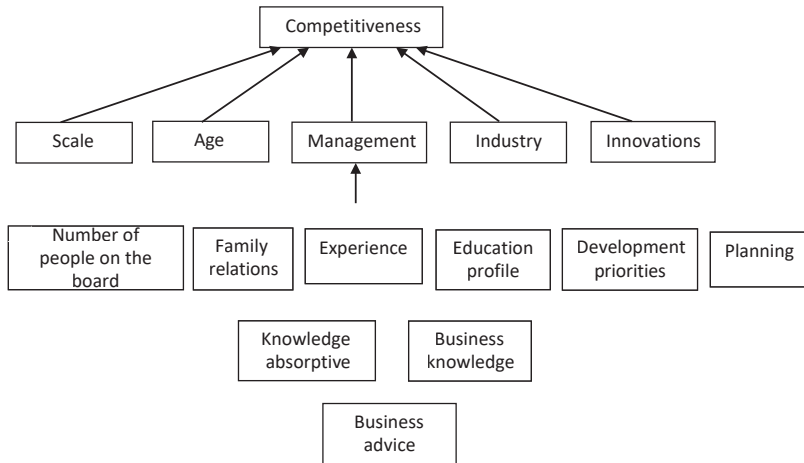


Figure 1. Factors determining the competitiveness of small enterprises – a conceptual model

The issue of the role of business advice in the management of small innovative enterprises is still poorly explored in the literature (Głodek, Łobacz, Stawasz, & Niedzielski, 2016; Robson & Bennett, 2000). The results of research are ambiguous. On the one hand, there are studies showing a positive impact of business advice on management and business performance (Grabowski & Stawasz, 2017; Delanoe, 2013; Mole et al., 2017; Malinowski, 2017). On the other hand, there are also studies indicating a limited influence of business advisors on the pro-development orientation of managers and business competitiveness (Johnson et al., 2007; Bennett & Robson, 2003). For this reason, it may be interesting to examine the impact of business advice on management, including the creation of knowledge in the field of management and shaping the competitiveness of enterprises.

Business advice

Business advice is one of the elements of external support for enterprises. Its aim is to help managers and enterprises achieve their goals by solving problems in the sphere of management, identifying and exploiting new opportunities, as well as learning and implementing changes (Yusoff, 2010; Ajmal, Nordstrom, & Helo, 2009). It includes the transfer of information on conducting business activity, both in terms of current and strategic management (Blackburn et al. 2013), serving as a potential source of competitive advantage (Gooderham, Tobiassen, Doving, & Nordhaug, 2004).

Its scope covers such management areas as the organizational structure, marketing and market analysis, accounting systems, motivation and personnel policy, planning, innovations, etc. Advisory services are provided by professional consultants from the public or commercial sphere, taking on various forms, starting from providing general knowledge through specialized training to coaching and mentoring (Mole et al. 2017; Johnson, Webber, & Thomas, 2007; Bennett & Robson, 2003). The sources of business advice are usually accountants, suppliers, bank employees, customers or other business partners. Due to the fact that the general approach to management in small enterprises is usually informal, entrepreneurs often also use informal sources of advice that are cheap and easily available, including friends and family or other advisors in their own environment (Soriano & Castrogiovanni, 2012; North, Baldock, Mole, Wiseman, & Binnie, 2011).

Benefits of business advice in enterprises can be divided into 'soft' ones, resulting from business support in dealing with problem solving, formulating development strategies or improving managerial abilities, and 'hard' ones, such as obtaining economic and market results (profits, turnover, costs) or improving the competitive position (Ramsden & Bennett, 2005). With regard to shaping competitiveness as a benefit resulting from business advice, it is possible to distinguish between a direct and indirect impact. The direct impact concerns the provision of strategic advice for improvement of innovativeness, growth and development of the company. The indirect impact, on the other hand, includes the provision of business support in the form of solutions and procedures aimed at increasing the amount of knowledge, managerial experience and practice of the enterprise and its managers useful for strategic management, as well as support for strengthening the relationship between managers' knowledge and formulating development strategies (Łobacz & Głodek, 2015; Ramsden & Bennett, 2005).

External advisory services seem to be necessary for small enterprises, as such services can help them overcome numerous barriers, contribute to their survival and the achievement of market success (Gooderham et al., 2004; Bennett & Robson, 2003). This is due to the fact that they have small and limited resources, in particular knowledge and skills as well as management experience, which has a direct impact on the difficulties of solving emerging problems (Blackburn et al., 2013; Supyuenyong, Islam, & Kulkarni, 2009). The use of external sources of business advice is generally stimulated by the gap between the internal resources of business knowledge and the resources necessary to achieve business objectives. It seems to be particularly important for innovative companies operating in international markets, especially when their competitive situation is perceived in terms of dependence on the possibility of effective access to knowledge resources

(Piatkowski 2012; Kang & Kang, 2009). It is indicated that the use of business advice is diversified due to the specificity of business, market, technology, sector or geographic location (Blackburn et al., 2013; Mole et al., 2017).

The attributes of small enterprises related to their size, however, may create barriers to the use of business advisory services such as: low awareness of the possibility of using advisory services, difficulties in evaluating the quality of consulting services, an unclear benefit/cost ratio and, hence, a weak interest in such services (Yusoff, 2010), difficulties with identification of problems and formulation of the demand for external advisory services, problems with choosing the right advisor, fear of losing control over the company and revealing one's own limited management competences, and problems with the limited capacity for absorption of the acquired knowledge (Chen, Chen, & Lee, 2008). These barriers are usually much higher in small enterprises than in the case of larger enterprises and are mainly internal in nature.

Among the factors that may determine a positive relationship between the use of advisory services and the level of knowledge of enterprises along with their competitiveness, the following ones should be mentioned: factors characterizing the manager (education and age, position in the enterprise), factors related to the enterprise (scale of activity, age, industry, location, profile of activity) and factors related to development orientation (having a development strategy, knowledge gap). These factors and their interconnectedness differentiate the sector of small enterprises (Dobrea & Maioreescu, 2015).

Business knowledge absorptive capacity

For the assessment of the importance of business advice for the competitiveness of small enterprises, the concept of knowledge absorptive capacity may be useful. In the management literature, knowledge absorptive capacity is defined as the ability of enterprises to recognize the value of new knowledge, and assimilate and transform it into a commercial outcome (Zahra & George 2002). It is a dynamic ability, as it can influence gaining a competitive advantage in a dynamic environment by supporting, among others, the process of innovation and strategic flexibility (Matejun, 2015; Volberda, Foss, & Lyles, 2010).

Todorova and Durisin (2007) distinguish five components of knowledge absorptive capacity, i.e.: (i) the ability to evaluate external knowledge, (ii) the ability to acquire knowledge, (iii) the ability to assimilate knowledge, (iv) the ability to transform knowledge, and (v) the ability to exploit knowledge (see Figure 2). Distinguishing these capabilities is important for the evaluation of their unique contribution to creating innovation and competitive advantage

of enterprises – it helps to explain why enterprises differ, why some are more effective than others in acquiring and using knowledge (Chen et al., 2008). The system of interdependencies between the various components of absorptive capacity is complicated; there is no consistency in the literature as to their order or strength of connections and their importance depending on the area of activity, dynamics of the environment or development strategy (Patterson & Ambrosini, 2015).

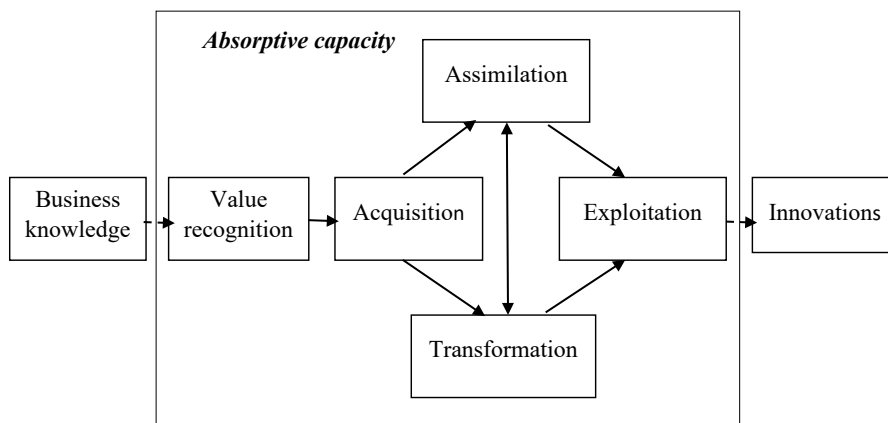


Figure 2. Business advice and business knowledge absorptive capacity

Source: own elaboration based on Todorova and Durisin (2007).

The use of business knowledge by small innovative enterprises to improve their competitiveness in international markets forces them to face challenges which are made even greater by the fact that they usually do not have an appropriate management structure or professional managers (especially micro-enterprises). The ability to recognize the value of advisory information offered, as well as to assimilate, analyze, interpret and understand it, plays an important role in this respect (Navarro & Eldridge, 2016). These are particularly important and difficult to obtain capabilities in technologically advanced and innovative industries (Patterson & Ambrosini, 2015). The ability to transform business advice information means the capacity for changing and developing procedures that allow the integration of existing knowledge with advisory knowledge, expanding the knowledge base, modifying it, and achieving synergy. In turn, the ability to exploit this knowledge resource means the opportunity to improve existing management competences or create new ones (including competences for building development strategies or developing innovations).

RESEARCH METHODS

The study on selected determinants of the competitiveness of small innovative enterprises operating in international markets, taking into account business advice, was conducted under the direction of the author in 2016 as part of the National Science Centre project entitled “Shaping the Competitiveness of a Small Company – the Role of Business Advice” (no. UMO-2012/07/B/HS4/03019). The aim of the research was to determine the impact of business advice on building and maintaining the competitiveness of small, innovative Polish enterprises. The survey was conducted using the technique of computer-assisted direct telephone interviews (CATI), carried out by means of a questionnaire form, with the owners or co-owners of the enterprises surveyed or their general managers. In the research methodology, it was assumed that the sample would comprise 400 Polish enterprises from the small business sector (with up to 49 employees) from various industries, randomly selected using a random number generator out of a group of 9,703 companies from the REGON CSO database, operating throughout the country, meeting the innovation criterion and using external business advisory services in the last three years before the interview.

The original data obtained as a result of surveys were subjected to statistical analysis and statistical comparative analysis. A standard data analysis and description procedure in the framework of descriptive and mathematical statistics was used in the study. The selection of factors determining the impact of business advice on selected areas of operation and performance of small innovative companies was carried out taking into account the following criteria: substantive, formal and statistical.

Characteristics of the research sample

In the market structure of the 400 surveyed enterprises, the local and national market predominated (respectively: 37.5% and 45.5% of enterprises), while there were 67 (16.8% of the total sample) entities for which the international market was dominant. In the analyzed sample, 67 enterprises with a dominant share in the international market were mostly mature enterprises with a 4-10 year presence in the market (2/3 of the sample), while the average employment rate was 13 people, i.e., three times more compared to all the other surveyed enterprises. The industry structure of the sample was very diverse: services predominated (75.2% of enterprises), including enterprises from the IT sector (29.1%), followed by trade (13.4% of enterprises) and manufacturing (10.4% of enterprises).

All the surveyed enterprises were innovative, according to the criterion of novelties which the company introduced in 2013-2015, i.e., new or improved products/services, new or improved methods of production/service provision or changes in the organization of activities. Companies with a low level of innovativeness predominated, i.e., introducing changes that are only new to the market itself or to the local market (41.8% of the sample tested). Enterprises introducing changes that are new on a national scale constituted 35.8% of the sample, while those introducing changes that are new on the international scale accounted for 22.4% of the sample. Compared to the entire population of 333 enterprises with a dominating share in local or national markets, the sample of 67 enterprises is characterised by a higher level of innovativeness, as the percentage of entities introducing new changes on a national or international scale in the population of 333 enterprises was 25.8%, including 4.8% on the international scale, and was by 32.4 p.p. lower than in the group of 67 enterprises.

In the years 2014-2016, all the surveyed enterprises used business advisory services related to their business operations. The basic areas of services provided included sources of financing and accounting (39.3% of enterprises), followed by legal and tax services (18.5% of enterprises), manufacturing, logistics and IT (12.5% of enterprises), as well as strategic and development management (10.5% of enterprises) (Figure 1). Among the motives for using business advice, a gap in the business knowledge of managers, problems in company management and the development priorities of enterprises, were mentioned. As far as the scope of cooperation in the course of the advisory process is concerned, the examined sample is dominated by a lack of cooperation (32.8% of entities) and partial cooperation regarding the implementation phase of business advice (31.3% of companies). Partial cooperation (both in the phases of the initiative and implementation) concerns 46.2% of enterprises. Full cooperation of the company with the advisor (both during the initiative and implementation phase) was recorded by 20.9% of entities. Nearly 63% of enterprises using business advisory services stated that they obtained benefits as expected, and 34% of enterprises obtained benefits partly in line with expectations. Only 3% of entities claimed that the results of advisory services had not met their expectations.

RESULTS AND DISCUSSION

Determinants of competitiveness of enterprises excluding business advice

The study of the competitiveness of enterprises operating in international markets concerned the estimation of business advantages that the enterprises had over the main market competitors in terms of resources, product or production characteristics such as novelty or innovativeness of the offer, costs or prices, quality, service, promotion, logistics, customer service, etc. The measurement of competitiveness was carried out on a 1-5 point scale, where 1 point meant very poor competitiveness and 5 points very strong competitiveness. The average level of competitiveness in the sample of enterprises was quite high and amounted to 3.4 points, while the median amounted to 3.0 points. 14.9% of enterprises were characterized by very weak or weak competitiveness, and 43.3% of enterprises by high or very high competitiveness.

The results of the analysis of the relationship between competitiveness and selected factors of functioning of the surveyed enterprises, mainly in the field of management, excluding business consulting, are presented in Table 1.

Table 1. Comparison of the relationship between the improvement in the competitiveness of enterprises and selected characteristics of enterprises excluding business consulting

Characteristics	Coefficient	Significance level
Family relations among the board members	0.411a	0.034
Business development priorities	0.356a	0.138
Form of planning	0.349a	0.158
Strategic management	0.255b	0.037
Business knowledge of managers	0.249b	0.044
Educational profile of managers	0.401a	0.172
Number of people on the board	0.267a	0.526
Age of enterprises	0.201b	0.102
Professional experience of managers	0.191b	0.028
Operational management	0.183b	0.954
Business knowledge absorptive capacity	0.182b	0.163
Scale of enterprises	0.162b	0.189
Innovations	0.111b	0.373
Industry	0.102a	0.002

Note: a - measured by Pearson's C contingency coefficient; b - measured Spearman's rank correlation coefficient.

The above-presented overview of factors indicates a limited range of competitiveness determinants in the sample – only 5 out of the list of 14 factors had a statistically significant impact on their competitiveness (at the 0.05 level of significance). It seems that these are mainly pro-development factors, positively affecting the competitiveness of enterprises. The role of innovation is irrelevant as a determinant of improving the competitiveness of the surveyed enterprises, however, it should be noted that companies with a high or very high level of innovativeness prevail in the sample.

Determinants of competitiveness of enterprises including business advice

The paper is an attempt to assess the moderating influence of business advice on improving the competitiveness of enterprises. The measurement was carried out on a 1-5 point scale, where 1 meant a very weak impact and 5 a very strong impact. The average level of impact of business advice on the improvement of competitiveness in the sample was moderate and amounted to 2.6 points, while the median amounted to 3.0 points. The results of the analysis of competitiveness determinants are presented in Table 2.

The survey indicates that the use of business advice extends the range of competitiveness determinants in the sample – 11 out of the list of 14 factors (excluding business advice, i.e., advisory process, frequency of business advice, and business advice management) had a statistically significant impact on competitiveness (at the 0.05 level of significance). Only factors related to enterprises (industry, age and scale of enterprises) did not have a significant statistical impact on their competitiveness.

It is worth emphasising the great importance of the advisory process characteristics for assessing the impact of business advice on raising the level of enterprises' competitiveness. The greater the scope of advisory services, the higher the frequency of using business advice and the higher the level of management of advisory services, the higher the assessment of the importance of business advice in raising the level of competitiveness of enterprises.

The research also shows the positive impact of the current level of competitiveness of enterprises on the assessment of the importance of business advice for increasing the level of enterprises' competitiveness. This dependence is statistically significant, though moderate, and amounts to 0.250 with a significance level of 0.05 (measured by Spearman's rank correlation coefficient). It is fulfilled by a total of 2/3 of the surveyed enterprises.

This means that the increase in the level of competitiveness is accompanied to a slightly greater extent by a higher assessment of the impact of business advisory services on the competitiveness of the surveyed enterprises than the reverse.

Table 2. Comparison of the relationship between the improvement in the competitiveness of enterprises as a result of business advice and selected characteristics of enterprises

Characteristics	Coefficient	Significance level
Advisory process	0.645a	0.000
Educational profile of managers	0.565a	0.002
Frequency of business advice	0.544a	0.000
Business knowledge absorptive capacity	0.517b	0.000
Strategic management	0.510b	0.000
Operational management	0.488b	0.000
Business development priorities	0.469a	0.015
Family relations among the board members	0.465a	0.018
Form of planning	0.452a	0.028
Number of people on the board	0.434a	0.049
Professional experience of managers	0.419b	0.000
Business advice management	0.405b	0.108
Level of business knowledge of managers	0.372b	0.002
Innovations	0.262b	0.032
Industry	0.364a	0.598
Age of enterprises	0.069b	0.577
Scale of enterprises	0.067b	0.592

Note: a - measured by Pearson's C contingency coefficient; b - measured Spearman's rank correlation coefficient.

The low level of competitiveness is combined with a low assessment of the impact of business advice, as only 6.8% of enterprises in this group have increased their competitiveness thanks to advisory services. In the case of enterprises with a high level of competitiveness, the percentage was higher and amounted to 32.6%.

Nearly 88% of enterprises characterized by a high assessment of the impact of business advice have increased their competitiveness, the remaining 12% of enterprises have not noticed any improvement in competitiveness due to personnel or resource constraints. In the case of enterprises with a low assessment of the impact of business advice on improving their competitiveness, 43.5% of these enterprises have managed to improve their competitiveness, which means that most of them did not have the potential to improve their competitiveness with a low share of the use of advisory services.

It can be assumed that generally, the surveyed enterprises have improved their competitiveness, which is accompanied by a high assessment of advisory services. In cases where enterprises determined the impact of business advice

in improving their competitiveness as high, they were also the enterprises characterized by a high level of competitiveness. It seems, therefore, that a high level of competitiveness is conducive to the effectiveness of the use of business advice. Thus, if business advice can be considered as an effective factor in improving the competitiveness of enterprises, it concerns more highly competitive ones. Enterprises characterized by low competitiveness have improved their competitive position as a result of business advice to a significantly lesser degree.

Table 3. Basic differences in the characteristics of enterprises, including the impact of business advice on improving their competitiveness (%)

Characteristics	Enterprises with a low impact	Enterprises with a high impact
Management experience (over 10 years)	41.2%	87.5%
Level of business knowledge	Low (58.0%)	High (93.8%)
Competitiveness	Low (64.7%)	High (68.8%)
Business advice absorptive capacity	Low (54.6%)	High (81.3%)
Scope of advisory process	Implemented together with the advisor (17.6%)	Implemented together with the advisor (31.3%)
Level of business advice management	High (58.8%)	High (75%)

Data analysis confirms a large diversity of distinguished groups of enterprises in terms of the impact of business advice on the improvement of competitiveness which is dependent on: the professional experience of managers, the level of their business knowledge, the existing competitiveness of enterprises, their business advice absorptive capacity, the scope of the advisory process and the level of business advice management, i.e. obtaining greater benefits from business advice (Table 3).

Business knowledge absorptive capacity and the competitiveness of enterprises including business advice

In order to determine the impact of changes in business knowledge absorptive capacity, resulting from business advice, on the competitiveness of the surveyed enterprises, Spearman's rank correlation coefficient was applied. The analysis conducted shows that this relationship is statistically significant (Table 4). This applies to effects in all areas of absorption, with the exception of the ability to assimilate knowledge, for which such a relationship was turned out to be insignificant. As far as the individual areas of absorptive capacity are concerned, changes in absorptive capacity have the greatest

impact on the competitiveness of enterprises in the case of their ability to transform knowledge (the coefficient was medium and amounted to 0.530), in other areas the coefficients are also medium (above 0.400). Otherwise, i.e., without using advisory services, this impact is weak and limited only to the area of the ability to absorb knowledge (the coefficient was at a level of 0.294) and to acquire knowledge (the coefficient was at a level of 0.260).

Table 4. Dependencies

Areas of business knowledge absorptive capacity	Coefficient	Significance level
<i>Excluding business advice</i>		
Knowledge value recognition	0.226	0.082
Knowledge acquisition	0.260	0.045
Knowledge assimilation	0.294	0.022
Knowledge transformation	0.116	0.379
Knowledge exploitation	0.065	0.623
<i>Including business advice</i>		
Knowledge value recognition	0.426	0.001
Knowledge acquisition	0.470	0.000
Knowledge assimilation	0.105	0.424
Knowledge transformation	0.530	0.000
Knowledge exploitation	0.423	0.000

Note: measured by Spearman's rank correlation coefficient.

The above-presented results seem to indicate that in the analyzed sample, the improvement in business knowledge absorptive capacity, as a result of business advice, was accompanied by an improvement in the competitiveness of the surveyed enterprises. On the other hand, a lack of business advice affected to a much lesser extent the relationship between business knowledge absorptive capacity and the improvement in the competitiveness of the surveyed enterprises.

CONCLUSION

The conducted analysis of the research results confirms the hypothesis concerning the correlation between management-related factors and the competitiveness of small innovative Polish enterprises operating in international markets. Management-related factors affecting strongly or moderately the competitiveness of the surveyed enterprises include family relations among the board members of enterprises and pro-development

factors (business development priorities, form of planning, strategic management and the level of business knowledge of managers).

The survey indicates that the use of business advice extends the scope of determinants of the competitiveness of enterprises. The level of competitiveness is of crucial importance in assessing the role of business advice since advisory services can be considered as an effective factor in improving the competitiveness of enterprises characterized by high competitiveness, which means that a high level of competitiveness is conducive to the effectiveness of the use of advisory services. Enterprises characterized by low competitiveness have improved their competitive position as a result of business advice to a much lesser degree.

Among the characteristics that may affect the relationship between business advice and the competitiveness of enterprises are management-related factors. Relatively, the most favorable conditions for improving the competitiveness of enterprises as a result of the use of advisory services occurred in enterprises with more experienced managers characterized by greater professional experience; a higher level of business knowledge and a higher capacity for absorbing business knowledge; together with development orientation and a business plan; as well as a wider range of cooperation with advisors, and these are the enterprises that gained the greatest benefits from business advice. The results of the research confirm a large diversity of distinguished groups of enterprises in terms of the impact of business advice on the improvement of their competitiveness, which is dependent on: the professional experience of managers, the level of their business knowledge, the existing competitiveness of the enterprises, their business advice absorptive capacity, the scope of the advisory process and the level of business advice management, i.e. those that benefit to a greater extent from business advice.

In the sample of small, innovative enterprises, the improvement in their business knowledge absorptive capacity, as a result of business advice, was accompanied by an improvement in their competitiveness. To the highest degree, changes in absorptive capacity affected the competitiveness of the surveyed enterprises in the case of their ability to transform and acquire knowledge. On the other hand, a lack of business advice had an impact on the relationship between business knowledge absorptive capacity and the improvement in the competitiveness of the surveyed enterprises to a much lesser extent.

The paper has a number of limitations. It discusses specifically Polish conditions which are characterised by lower experience in the operation of small enterprises compared to the 'old countries' of the EU, mainly due to the relatively short period of development of the Polish SME sector (25-

30 years) and the unsatisfactory state of business advice development, especially its mismatch to the needs of micro and small enterprises, as well as a lack of a tradition of cooperation between enterprises and commercial consultants (Stawasz & Ropega 2014, pp. 99-113). The research is static and concerns results from one period. Moreover, only two-dimensional relations are considered. Estimation of the parameters of the econometric model could extend these analyses since the impact of a larger number of variables would be evaluated. This approach would result in obtaining a more complex framework for the analysis of the determinants of competitiveness. Future studies should be extended to include the economic performance of enterprises (revenues, costs). The role of entrepreneurship support policy may also require separate analysis as, in addition to the support for training, the support of the cooperation between small enterprises and advisors should also become an important element of this policy. Studies encompassing different periods, allowing for the comparison of changes in knowledge resources and interactions of managers with business advisors, would be interesting as well. Also of interest may be a comparative analysis of the role of business advice in managing small enterprises in countries with a different degree of development of this sector.

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Abstrakt

Celem prezentowanego artykułu jest identyfikacja znaczenia wybranych determinantów konkurencyjności małych przedsiębiorstw innowacyjnych działających na rynkach międzynarodowych, korzystających z doradztwa biznesowego. Osiągnięcie tego celu wymagało: określenia determinantów konkurencyjności małych przedsiębiorstw (charakterystyki zarządzających, charakterystyki przedsiębiorstw), omówienia motywów, obszarów oraz efektów korzystania z doradztwa biznesowego. Przedstawiono także zagadnienie zdolności absorpcji wiedzy biznesowej jako determinanty konkurencyjności małych przedsiębiorstw oraz warunku skuteczności korzystania z zewnętrznej wiedzy biznesowej. W drugiej części artykułu przedstawiono wyniki badań empirycznych przeprowadzonych w 2016 r. techniką CATI na próbie 67 małych polskich przedsiębiorstw innowacyjnych działających na rynkach międzynarodowych i równocześnie korzystających z doradztwa biznesowego. Przeprowadzone badania potwierdzają hipotezę o istotnym modyfikującym wpływie doradztwa biznesowego na układ determinant konkurencyjności przedsiębiorstw. Potwierdzona została także hipoteza o pozytywnym związku doradztwa biznesowego i zdolności absorpcji wiedzy biznesowej przedsiębiorstw, a pośrednio na ich konkurencyjność. Poprawa konkurencyjności przedsiębiorstw wymaga korzystania z doradztwa biznesowego i poprawy zdolności absorpcji wiedzy biznesowej.

Słowa kluczowe: mały biznes, determinanty konkurencyjności na rynkach międzynarodowych, doradztwo biznesowe, zdolność absorpcji wiedzy biznesowej.

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Social networking and the family business performance: A conceptual consideration

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Abstract

Researchers and practitioners are divided on the preferred measures of business performance, largely due to the quality of available financial data and the measurability of the non-financial indicators. However, owing to the embeddedness of social networking in families and in the business world, this study reviews the contribution of social networking to the financial and non-financial performance of family businesses. The study is based on a review of 55 peer-reviewed published journal articles. Consequently, the most frequently used social networking platforms, the measures of financial performance, the measures and proxies of non-financial performance and the differences between financial and non-financial performance were identified. The study proposes the use of both financial and non-financial measures in assessing the performance of family businesses due to their complementary roles.

Keywords: social networking, social network, family business, financial performance, non-financial performance, interplay, interdependence.

INTRODUCTION

Social networking is as old as man himself. Before the advent of the internet and social media, social networking was practiced traditionally or through physical contact with other businesses or their stakeholders in business association forums. Al-Mommani, Al-Afifi and Mahfuzi (2015) assert that the emergence of the internet revolutionized virtual communication and social networking. Social networking through the new media allows business owner-managers to acquire new business skills, knowledge, customers and suppliers faster. Additionally, the new media enables owner-managers to market their

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products/services, access business opportunities, relate with other business owner-managers and expand their businesses faster (Jagongo & Kinyua, 2013). The new media used for social networking includes Facebook, YouTube, Instagram, LinkedIn and Twitter (Harris & Rae, 2009; Icha & Agwu, 2015).

As at January 2018, Facebook had 2.2 billion monthly active users, while YouTube had 1.57 billion active monthly viewers. The monthly active users of Instagram, LinkedIn and Twitter, are respectively 800, 530 and 330 million (Statistics, 2018). This implies a large market size. Moreover, social networking is not the only factor that influences firms' financial and non-financial performance. However, firms are getting involved in it because of the large market size it offers. Icha and Agwu (2015) opine that these channels have gained more than one billion users worldwide in less than two decades of existence. This explains why customers follow their brands through social networking (Turkle, 2011; Technoratimedia, 2013). Family firms that are actively involved in social networks and advantageously positioned on social websites obtain resources and contacts that enhance business performance and promote the internationalization process more quickly (Coutinho & Moutinho, 2012). Owing to the effects of social media on family relationship, customer relationship management, product/service design and customer education, families and businesses are beginning to embed social media into the family and the business systems.

The performance of family businesses is enhanced by the enabling environment created by social media interactions. However, today's business environment is becoming more turbulent owing to the advances in the internet, information and communication technology. This has by extension rendered traditional social networking ineffective. Researchers (e.g., Surin & Wahab, 2013; Ogunnaike & Kehinde, 2013) have examined the relationship between networking and the performance (financial and non-financial) of family and non-family businesses in both developed and developing countries. The results of these studies show that performance is a multi-meaning concept and a cultural artifact (Colli, 2011). Aside, family businesses do not exist solely to achieve financial performance (Zellweger & Nason, 2008; Salvato & Moores, 2010). The culture-specific nature of a family business (Sharma, 1997) makes a family business embedded in the family system and the community of location.

However, the contributions of social networking to the embeddedness of the business in the family, the family reputation, family members' commitment and family social capital are not quantified and captured in the computation of the financial performance of the family business. This issue has given rise to a debate about whether financial measures are preferred to non-financial measures in the assessment of family business performance. Salvato and

Moore (2010) assert that other factors that lend support to this debate are: the poor quality of available financial data; and the difficulties in the application of financial ratios on the available data (Colli, 2011). Based on the foregoing, this study, therefore, seeks to review the contribution of social networking to both the financial and non-financial performance of family businesses.

RESEARCH METHODOLOGY

This study adopts a literature review research method. This is a systematic process of selecting and analyzing published journal articles that is similar to that employed by Pukall and Calabro (2014). This method is selected so as to facilitate the identification of the different measures of family business financial performance and the various measures and proxies of family business non-financial performance. The selection of the journal articles was done according to the steps below.

The review was restricted to journal articles published from January 2006 to December 2017. This was done to generate conceptual and empirical journal articles on current research that focus on social networking and family business performance. Additionally, the time frame was chosen to avoid a never-ending search.

Different journal databases (Google Scholar, EBSCO, and CrossRef) were searched for journal articles that focus on social networking and family business performance. This initial search gave journal articles that are too narrow in their scope of coverage. For instance, it was found from the 122 journal articles that were initially selected that there is a dearth of studies relating social networking to family business performance; particularly non-financial performance.

The titles, abstracts and keywords sections of the published journal articles on family business were searched for a combination of the following keywords: family firm, non-financial performance, financial performance, social network, social networking and social media applications. This broader search was done in the different databases based on the keywords so as to increase the number of journal articles generated for the study. However, only peer-reviewed academic journal articles were selected since they assure increased academic rigor. Conceptual journal articles were selected to develop the analysis of the non-financial performance measures and proxies, and the interplay and interdependence of social networking tools. On the other hand, empirical journal articles were selected to help in the analysis of financial performance measures. Consequently, 43 more journal articles that

focused on financial and non-financial performance were added. The final sample selected for review from a total of 165 journal articles was 55.

The selected journal articles were read to check for the following information points: discussions related to the contribution of social networking sites (e.g., Facebook, YouTube, Instagram, LinkedIn and Twitter) to family business financial and non-financial performance; the interplay and interdependence of social networking tools; benefits of social networking tools to family business; measures and proxies of non-financial performance; measures of financial performance; and the differences between financial and non-financial performance. Before commencing the reading of the selected journal articles, the titles, abstracts and keywords were manually screened to ensure they all match the objective of the study. However, journal articles in which the author(s) did not state that the businesses studied are family businesses were included. This was done for only studies that highlight the unique characteristics of a family business (i.e., family, ownership and management). All the selected journal articles were thoroughly read. During the reading, notes were made on the different information points of the study. At the end of the reading, the notes were linked together to review the relevant literature, state and discuss the findings, and state the conclusion.

LITERATURE REVIEW

Social networking and social network

The concept “social media” is made up of two words; social and media. The term “social” implies the interaction between individuals of common interest, a group, or even a community, while the term “media” implies the medium, channel or platform through which the individuals, group or community interact. Shabbier, Ghazi and Mehmood (2016) note that social media is also known as consumer-generated media, new media and citizen media. Prior to 1997, the known traditional media were television, radio and newspaper (Singh & Sinha, 2017). The new or social media started in 1997 with the launch of sixdegrees.com (Shabbir et al., 2016). Kaplan and Haenlein (2010) define social media as a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0 and allow the creation and exchange of user-generated content. Web 2.0 is the total of open-source, interactive and user-controlled online applications which expand experiences, knowledge and market power of users as participants in business and social processes.

However, the social interactions or networking activities which social media facilitates is viewed by Chi (2011) as a connection between brands and consumers that offer a personal channel and currency for user-centered networking. Through social networking, individuals (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system (Agwu & Murray, 2015). Kaplan and Haenlein (2010) argue that social media is different from social networking; social media is the environment in which social networking thrives. Before now, social media was used exclusively in the context of creating and maintaining relationships. However, today, it is now being incorporated into all business functions (Palanissamy, 2014).

Owing to the turbulence in today's business environment, owner-managers consider social networking as a process that facilitates access to important resources (Garcia & Carter, 2009). Many firms do this by cooperating with not just individuals but small and large organizations to exploit new technologies (Acquaah, Gyampah & Jawaram, 2011). Therefore, social networking is the forming and maintaining of a relationship involving actors in the business environment. The nodes in the network may be roles, individuals or organizations (Johannisson, Ramirez-Pasilas & Karlson, 2002). Social networking is used to search for information, knowledge, friendship, social support (Harris & Rae, 2009), and for marketing, creating and maintaining relationships with customers, collaboration, education and entertainment (Kaplan & Haenlein, 2010). Social networking is time-consuming, cost-effective, educative, and an enabler of customer-to-company and customer-to-customer conversations. Furthermore, negative post responses are hard to avoid in social networking (Al-Mommani et al., 2015).

Nevertheless, there is a growing belief that social networking facilitates business stakeholder engagement activities. This is evident in its increasing use by business owners (Palanissamy, 2014). Social networking is used by firms to improve their performance and to maintain their effectiveness in the market (Batiz-Lazo & Woldesenbet, 2006). Social networking channels like Facebook, YouTube, Instagram, LinkedIn, Twitter, Skype and WordPress (blog) are being employed by business owner-managers to build online groups around various firms, customers and other members of the public. All the social networking channels play different roles in the strategic plan of businesses (Ellison, Steinfield & Lampe, 2007; Ogunnaike & Kehinde, 2013). The interactions among the different stakeholders which these channels facilitate provide useful feedback that helps the businesses to improve their products and by extension meet the needs of their customers (Kotler & Armstrong, 2011; Jagongo & Kinyua, 2013).

Facebook is a popular free social networking website that allows registered users to create profiles, upload photos and video, send messages and keep in touch with friends, family and colleagues (Icha & Agwu, 2015; Singh & Sinha, 2017). It presents an opportunity to tie all of a firm's social network channels into one hub. Family business stakeholders rely on Facebook just as they rely on a firm's website for information. A branded firm's Facebook page provides an opportunity for the firm to showcase customers', investors' or corporate information in a multimedia format. Facebook serves as a means for a firm to improve its relationship with current and potential customers and investors (Palanissamy, 2014; Singh & Sinha, 2017). Firms spread messages about their free service via Facebook. Through Facebook, firms showcase who they are, what they say and what they have done to customers (Ellison et al., 2007; Ogunnaike & Kehinde, 2013). Facebook remains the most visited social network platform by entrepreneurs for business purposes (Ogunnaike & Kehinde, 2013). Businesses employ Facebook and Skype during discussions to share their views, encounters and knowledge. It helps businesses to advertise and communicate with customers speedily/cheaply. Social networking through Facebook and Skype helps the business to construct a database that can be used to generate business leads that can translate to increased sales and business growth. All these improve the creativity of the employees (Jagongo & Kinyua, 2013). A firm's blog is used by the firm to provide users with high-quality content (Ogunnaike & Kehinde, 2013).

YouTube is a free video-sharing site where users can upload, watch and share videos. It is used by businesses to display firms' brands and sales promotion videos with connotations to enhance customers' and investors' engagements (Icha & Agwu, 2015). Instagram formerly called "Burbn" was acquired by Facebook in 2012. It is a social networking site that is designed to be used with smartphones. It has fewer filters and, hence, can engage more users and equally reach them faster. LinkedIn is a social networking platform where professional firms post jobs and professionals seeking jobs post their curriculum vitae. It is used to organize contacts into downloadable databases, create a targeted customer or investor page, lead/participate in discussion groups on relevant topics and promote the services/products of a firm. A firm can use LinkedIn to improve its reputation and to position itself as an industry leader (Palanissamy, 2014; Singh & Sinha, 2017). **Twitter** is an online social networking and microblogging channel that enables users to send and read short text messages, called "tweets." Registered users can read and post tweets, but unregistered users can only read the messages (Icha & Agwu, 2015; Singh & Sinha, 2017). Twitter is used to monitor what people say about a firm and to promote the firm's campaigns (Ogunnaike & Kehinde, 2013). Twitter represents an opportunity for a firm to broadcast information,

slide share its brands and increase the public's conversation about the firm (Palanissamy, 2014). The distribution of social networking channels by date launched, monthly active users (as of January 2018) and benefits to family firms are presented in Table 1.

Table 1. Distribution of social networking channels by number of active monthly users and benefits to family businesses

Channel	Date launched	Active monthly users (Jan., 2018)	Benefit to family business
Facebook	Feb., 2004	2.2 Billion	Information from this channel can suggest to a family firm the best pricing strategy to adopt. Is a source of qualitative data to a family firm. Gives a family firm the opportunity to bring together all the firm's channels into one hub. Enhances the sharing of information about a family firm. Fosters relationships within a family firm. Helps in managing a family firm's relationships with customers and investors. Serves as a channel for engaging customers and investors in a poll and contest.
YouTube	Feb., 2005	1.57 Billion	It serves as a channel for sharing a firm's videos on adverts, instructions, conference call transcript and tutorials.
Instagram	Oct., 2010	800 Million	It is employed to reach customers and the public faster. Used to engage a larger number of customers and other stakeholders. Employed to enhance income because the engaged customers pay a higher order value. Employed for out-door businesses because all the contents can be viewed using smart phones.
LinkedIn	May, 2003	530 Million	It is employed as a channel for organizing contacts into downloadable databases. It is employed to promote a family firm's products and services. It serves as a channel for leading and participating in discussions with customers and investors. It is used by family firms to facilitate customer relationship management. It is a source of insightful ideas on how to improve family firms' products and services. It is a source of qualitative data to family firms.
Twitter	July, 2006	330 Million	Employed to slide share customer, investor and corporate presentations at real-time. Serves as a channel for broadcasting information to customers, investors, analysts and followers of a family firm. It is used as a conversation channel between a family firm and the community of customers and investors. It serves as a channel for monitoring customers' comments on a family firm's products and services. It is employed to promote a family firm's products, services and other social networking channels. It serves as a source of relevant, timely and innovative information to a family firm. It is used for recruitment.

A social network is the inter-relationship between entrepreneurs (ego) and their contacts [alter(s)] for business purposes (Fomburn, 1982). Alter(s) comprise family members, friends, relatives, business contacts, social associations and clubs (Chuaiuang, 2013). Coutinho and Moutinho (2012) note that a social network allows owner-managers that are positioned on the social web to be the first to obtain information on potential business opportunities. The owner-managers also obtain resources with which to successfully compete with large firms and to contribute to the growth of their businesses (Lechner, Dowling & Welpel, 2006). Burt (2000) asserts that the absence of a tie between two alters amount to a structural hole. A tie can be weak or strong. Weak ties are long-term relationships that focus on goal fulfillment for both parties (Smelser & Baltes, 2001). Weak ties exist among individuals with infrequent and generally non-affective contacts (Nelson, 1989). They serve as a channel for opportunity discovery and to access a wide variety of resources (Granovetter, 1983). Weak ties include relationships an entrepreneur has with suppliers, customers, new business friends, government agencies and chambers of commerce.

On the other hand, strong ties include relationships an entrepreneur has with family members, close relatives and good friends. They are based on frequent contacts and emotional closeness. Strong ties are relationships that an entrepreneur can “count on.” Strong ties enhance exchange and long-term relationships, and promote the development of trust and the transfer of information and tacit knowledge (Granovetter, 1983; Anderson, Jack & Dodd, 2005). They also exist among nascent entrepreneurs (Aldrich & Martinez, 2001). Chell and Baines (2000) found that weak and strong ties contribute to business development. Since the absence of a tie gives rise to structural holes (Burt, 1992, 2000) entrepreneurial networking can be made effective by blending strong and weak ties (Elfring & Hulsink, 2003).

Most importantly, weak ties bridge diverse networks better than strong ties (Kozan & Akdeniz, 2014). Granovetter (1973) states that weak ties make available information that may not be readily provided by strong ties and this is regarded as the “strength of weak ties.” Strong and weak ties complement each other in different roles, for a different purpose or in different populations. Hence, weak ties are used for recruitment, while strong ties promote mutual trust (Kozan & Akdeniz, 2014). The extent and ease with which the owner-managers connect and access these resources are influenced by the characteristics of the social network.

Interplay and interdependence of social networking tools

Researchers have alluded to the existence of three media types, that is, paid (e.g., advertising on cable TV and in newspapers), owned (e.g., company website and social media accounts), and earned (e.g., consumers' word-of-mouth). However, while the effects of media channels and the interrelationships of paid media have been widely reported, little is known about the interplay and interdependence across different types of media channels (Stephen & Galak, 2012; Office of the Chief Information Officer, 2014; Yu & Chen, 2015). Extant literature has shown that the interrelationship between paid media and earned media is inconclusive as some researchers report substitution, while others found it as complementary (Tucker & Zhang, 2011; Stephen & Galak, 2012; Yu & Chen, 2015). To marketers who report substitution, it is beneficial to them because they can potentially save money on traditional paid media after earned media has taken shape (Yu & Chen, 2015).

Recently, social networking platforms, especially Facebook, YouTube, Instagram, LinkedIn and Twitter have become popular alternative ways to engage potential consumers (Dorr, 2012; Office of the Chief Information Officer, 2014) and to allow them interplay (interact). Since these social networking platforms combine owned media and earned media, businesses create their official page, post a wealth of content, and orchestrate various activities to engage customers. Consumers then interplay when they consume the various kinds of information, create word-of-mouth, and spread product or service information through their own social networking platforms (Yu & Chen, 2015).

Interdependence is the degree to which a person relies on or relates to others. It exists when the outcomes of such persons are affected by each other's actions (Johnson, Johnson & Stanne, 1989) and facilitates the group formation (Van der Vegt & Van der, 1998). Thus, interdependence is associated with the willingness and effort put in by these persons as they relate (Wagennan, 1995). For instance, any update on Myspace appears on Twitter. Similarly, in a bid to dominate social media, Facebook has incorporated Twitter perks in its platform. As the customers and the business relate through Facebook, they share photos, videos and information through links to blog items and websites. They can as well apply digital filters on pictures and videos, and use Instagram to share them on a variety of social networking platforms (e.g., Facebook, Twitter). LinkedIn ensures enhanced information sharing, collaboration and horizontal communication among multiple users through the LinkedIn page. Since Twitter allows microblogging, information from Twitter is made widely available to the general public through the Twitter feed. Through YouTube, videos are uploaded and shared by embedding in

blogs, web pages or other social networking platforms (Office of the Chief Information Officer, 2014).

Social networking platforms are all important because they serve different purposes. However, family business owner/managers should employ social networking platforms that help them achieve their goals. The social networking platform(s) used by a family business should be integrated with all social networking platforms. This should be done by ensuring that the website, blog and email newsletter of family businesses have social “share” buttons for people to share such content using different social networking platforms.

Family business

The term “family” refers to a group of people related to each other by blood or marriage. Businesses whose owners are members of a family are family-owned businesses (Belenzon, Pataconi & Zarutskie, 2015). Poza (2014) defines a family business as a unique synthesis of firstly, ownership control by two or more family members; secondly, managerial influence through active participation, advisory role, board membership or active shareholding; thirdly, concern for family relationships; and finally, the possibility of continuity. Belenzon et al. state that some authors define a family firm as those that are owned and controlled by a single individual or a family; while other authors define family firms as those that are both owned and managed by family members. Aldrich and Cliff (2003) opine that these family members could be from a nuclear family, a family of origin (i.e., a family into which the individual was born) or an extended family.

Consequently, in the categorization of family businesses, there are single (lone) owners and family owners businesses. Single owners can have families, but their families do not hold significant stakes in their firms. Single owners adopt strategies for growth. On the other hand, the family owners’ businesses have two or more family-related individuals who hold significant stakes in the same firm (Belenzon et al., 2015). Family owners may be reluctant to allow investors and/or take on debt, as these strategies may compromise family control and welfare. However, they always remain the major investors in the family business (Le Breton-Miller et al., 2011). Family businesses abound in all sectors and range from small to multinational organization (Villalonga & Amit, 2006). The management, involvement, and ownership in family businesses evolve from generation to generation. Hence, members from different generations coexist (Cappuyns, 2007).

Family businesses are known to resist economic crisis and to be more successful than non-family businesses. Despite the strengths of family businesses, Warnar (2012) asserts that family businesses have weaknesses

that are associated with financing, emotional issues and succession. However, the strengths of family businesses outweigh these weaknesses owing to certain features. These features have been described by Habbershon and Williams (1999) as familiness. Familiness refers to a number of unique resources that result from the interaction between the family and the business. The resources that constitute the familiness are human capital, social capital, survivability capital, patient capital and governance structure (Sirmon & Hitt, 2003). Aronoff, Astrachan and Ward (1996), and Warnar refer to these features as internal flexibility, commitment, reliability, knowledge, speed in decision-making, stability, family-based management, continuity of operations and long-term vision. These features have been further described by Motwani (2016) as potentials that enable family businesses to outperform other forms of business organizations.

Family business performance

Performance is the ability of an organization to achieve its goals and objectives through efficient and effective use of available resources (Ricardo & Wade, 2001). Performance is measured based on financial and non-financial (operational) indicators (Neely, Bourne & Kennerly, 2001). Researchers (e.g., Alam, 2009; Mehraliyev, 2014) have advocated a combination of financial and non-financial indicators in the measurement of performance. This is because financial performance measures the result of a firm's policies and operations in monetary terms (Ozer, 2012). Similarly, Monday, Akinola, Olegbenla and Aladeraji (2014) note that non-financial measures focus on issues pertaining to customer satisfaction and customer's referral rates, delivery time, waiting time and employee's turnover.

Panigyraakis et al., (2007, as cited in Esuh, 2012) define financial indicators of performance to include profit and growth. "Profitability is defined as the ratio of a company's profit before interests and taxes to net total assets. It measures how effective a company is in using capital resources without differentiating between debt and equity" (Zapata, Brito & Triay, 2014: 53). The measures of profitability are return on assets, return on investment and earnings per share (Monday et al., 2014). Growth, on the other hand, cannot bring about improvement and expansion in every aspect of business. Research has shown that business growth has been measured using a number of variables. These variables include: sales (e.g., Monday et al., 2014); employment (e.g., Altinay & Altinay, 2006); and business revenue (e.g., Kelley & Nakasteen, 2005). Other studies use a combination of different (multiple) measures (e.g., Barringer, Jones & Neubaum, 2005).

FINDINGS AND DISCUSSION

The literature review reveals that there are a plethora of recent studies on the contribution of social networking to financial performance of family businesses. This is however not so with the comparable non-financial measures. The review of the studies further reveals that researchers are divided; some advocate the use of financial measures, while others propose the adoption of non-financial measures. Specifically, social networking through new media is more effective and has wider coverage of the interactions involving all the stakeholders. Thus, it provides the business owner with qualitative or non-financial data. These data cannot be obtained from the transaction records of the businesses. Rather, the non-financial data which are needed for the assessment of non-financial performance are obtained from social networking platforms through monitoring. The findings and discussion are presented under the subheading; (1) contribution of social networking to the financial performance of family businesses, and (2) contribution of social networking to the non-financial performance of family businesses.

Contribution of social networking to the financial performance of family businesses

The traditional methods of calculating business performance are based on financial indicators (Kotane & Kuzmina-Merlino, 2011). Extant literature reveals that researchers have employed financial indicators such as growth and profitability as performance elements in both family and non-family firms (Ahmad, Nadeem, Ahmad & Hamad, 2014). The family system and the personal goals of the owner-manager are intertwined with the business system and business strategies. One of the most frequently employed strategies is a solid and enduring social connection between the family and the external environment. Such a social networking relationship is a source of business resources that contribute to business growth (Lin, 2011). Business growth models for small firms generally reveal early stage and late stage. Other researchers adopt prestart-up stage, start-up stage and maturity stage. At each stage, the firm can grow, plateau, die or enter a stage of expansion – transition from small to medium or large firm - before attaining maturity.

Additionally, maintaining contacts with well-connected people gives the business founders access to information that can solve business problems, and contribute to the survival and growth of the business. Since experts have valuable resources but are not easily accessible, socializing informally, therefore, helps to build social capital and by extension enhance business growth (Robinson & Stubberud, 2009). Although, the contributions of the

social media interactions are not factored into the financial report of the business, the subsequent expansion of the business occasioned by the interactions influences the owner-manager to increase its operation, hire additional employees, deploy professional management skills, increase the overall complexity of the firm's activities and enhance planning to support the new level of complexity (Mazzarol, 2005). Mazzarol further states that the expansion of the firm will by extension lead to changes in corporate governance, formalized accounting, the introduction of equity finance as new equity partners are admitted, a decline in the original owner-manager's control and a decentralized management structure.

Many managers are very concerned about growing their firms. Growth is associated with more prestige for some managers. Still, for some families, growth might be a result of more risk-taking (Magnussen & Sundelius, 2011). Growing firms attract more qualified employees due to better-expected career opportunities (Coad, 2009). Since politicians are influential and have considerable control over resources allocation in a country, family members network with them. Family members do so to acquire information, knowledge, facilities and authorities required for the growth and continuity of the business. This usually happens in countries with a high level of corruption (Fisman, 2001; Acquah, 2011).

In spite of the benefits of business growth, small business owner-managers dread growing their businesses. This is owing to the risks involved, fear of running into debt, and fear of loss of control and management. It is important to note that the challenges associated with business growth are not only daunting but applicable to both small and large firms. However, the difference is that most small firms lack the resources to pursue business growth (Shuman & Seeger, 1986). Also, transfer to relatives, reproduction of family ties and the creation of immaterial capital are respectively very delicate, most delicate and extremely delicate. This happens during the process of expansion and growth of the family business (Colli, 2011). This explains why growth is often more sustainable than profitability (Coad, 2009).

Another measure of financial performance is profitability. Several studies have analyzed the difference in profitability between family and non-family businesses (Zapata et al., 2014). Researchers (e.g., Cabrera-Suarez et al., 2001; Maury, 2006) have emphasized that to assess the survival of a company; profitability should be considered. However, more recent researches on the importance of profitability information in decision-making have proved otherwise (Zapata et al., 2014). Moreover, family businesses perform better than non-family businesses with respect to faster growth and higher profit. This better performance has been attributed to family networking strategy, ownership and control of the business (Allouche, Amann, Jaussaud &

Kurashima, 2008). Trostel and Nichols (1982) note that family businesses use financial information to minimize taxes, rather than for strategic decision-making and performance evaluation.

Business historians are not enthusiastic about the financial measures of performance. This is owing to the difficulties surrounding the application of ratio analysis and the quality of data available. Other reasons for this lack of interest are the absence of proper regulations and disclosure requirements, the flaws and uncertainties in financial information (Colli, 2011). Furthermore, financial performance is not the sole reason for the existence of family business. This is evident in the much higher non-financial performance outcomes displayed by family businesses (Zellweger & Nason, 2008; Salvato & Moores, 2010). Owing to the vagaries in today's business environment, measures that focus on financial performance alone are becoming less appropriate to completely assess performance. This is due to the fact that they focus only on the past and do not reflect the importance of the current decisions for future financial performance (Pont & Shaw, 2003). Kotane and Kuzmina-Merlino (2011) further explain that financial measures give incomplete performance because they only depict past performance thus failing to take into consideration the current (or present) and future performance of a firm which is only described by non-financial performance indicators. Hence, financial measures and metrics rarely provide much valuable information about performance like non-financial measures through social networking (Merrill, Latham, Santalesa & Navetta, 2011). The distribution of studies by financial performance measures is presented in Table 2. Table 2 further shows that the most frequently used financial measure is return on assets (ROA) followed by Tobin's q.

Contribution of social networking to the non-financial performance of family businesses

Family and non-family businesses differ to the extent to which they are affected by non-financial measures of performance (Gomez-Mejia, Haynes, Nunez-Nickel, Jacobson & Mayano-Fuentes, 2007). The non-financial measures are family social capital (Danes, Stafford, Haynes & Amarapurkar, 2009) and family/business culture (Aderonke, 2014). Other indicators of non-financial performance in family businesses are commitment (Cappuyns, 2007), survival, embeddedness, reputation and sustainability (Colli, 2011).

Table 2. Distribution of studies by financial performance measures

Measure	Study
ROA	Barontini & Caprio (2006), Maury (2006), Lopez-Gracia & Sanchez-Andujar (2007), Allouche et al. (2007), Bennedsen et al. (2007), Farooque et al. (2007), Blanco-Mazagatos et al. (2007), Sraer & Thesmar (2007), Martinez et al. (2007), Sciascia & Mazzola (2008), Cruz et al. (2008), Smith (2008), Allouche et al. (2008), Yuan et al. (2008), King & Santor (2008), Kowalewski et al. (2009), Bonilla et al. (2010), Chu (2009), Shyu (2011), Aguilo & Aguilo (2012), Cai et al. (2012), Cassia et al. (2012), Gonzales et al. (2012), Lappalainen (2012), Wellalage et al. (2012), Al-Dubai et al. (2014)
Tobin's q	Barontini & Caprio (2006), Villalonga & Amit (2006), Maury (2006), Martinez et al. (2007), King & Santor (2008), Miller et al. (2008), Saito (2008), Amran & Ahmad (2010), Shyu (2011), Lappalainen (2012), Lin & Chen (2012), San Martin-Reyna & Dura-Encalada (2012), Wellalage et al. (2012), Aguilo & Aguilo (2012), Cai et al. (2012)
Growth	Lee (2006), Lopez-Gracia & Sanchez-Andujar (2007), Oswald et al. (2007), Kim & Gao (2013)
Sales growth	Sciascia & Mazzola (2008), Brice (2013), Bhat & Shah (2013), Agyapang et al. (2017)
ROE	Martinez et al. (2007), Sciascia & Mazzola (2008), Kowalewski et al. (2009), Aguilo & Aguilo (2012)
Profitability	Lee (2006), Brice (2013)
Productivity	Allouche et al. (2007), Martikainen et al. (2009), Kim & Gao (2013)
Market share	Kim & Gao (2013), Bhat & Shah (2013), Brice (2013)
ROI	Brice (2013), Bhat & Shah (2013), Agyapang et al. (2017)
Multiple	Sacristan-Navarro et al. (2011), Ernst et al. (2012), Lam & Lee (2012)
ROS	Cassia et al. (2012), Agyapang et al. (2017)
Financial performance	Oswald et al. (2007), Uhlaner et al. (2007)
Revenue	Westhead & Howorth (2006), Rutherford et al. (2008)
Operating return on assets (OROA)	Perez-Gonzalez (2006), Molly et al. (2010)
ROC	Bhat & Shah (2013)
Market/book ratio	Yuan et al. (2008)
Income	Rettab et al. (2011)

Measure	Study
Customer retention	Brice (2013)
Firm size	Brice (2013)
Service quality	Bhat & Shah (2013)
Employee satisfaction	Bhat & Shah (2013)
Absenteeism	Bhat & Shah (2013)
Employee turnover	Bhat & Shah (2013)
Assets growth	Molly et al. (2010)
Gross return on assets	Molly et al. (2010)
Stock return	Jiang & Peng (2011)

Social capital

The term “family capital” refers to the resources within the family that can be made available to the business. A family has family capital if its family resources are in excess of its liabilities (Sorenson & Bierman, 2009). Family capital is a composite of social, human and financial resources (Danes et al., 2009). Out of the three, social capital best distinguishes family from non-family businesses. Family businesses can hire other types of capital but cannot hire social capital because it exists within the family relationship (Dyer & Dyer, 2009). Researchers focus on social capital when networking. This is because it serves as the main source for new business resources. Entrepreneurs of high performing firms engage in social networking more than entrepreneurs of low performing firms (Premaratne, 2002). Social capital is the entire resources a firm accrues through its durable network of relationships with other firms (Nahapiet & Ghoshal, 1998). Social capital is a network of relationship that has economic benefits. These benefits include opportunities, resources and goodwill (Arregle et al., 2007). Similarly, social capital depicts such results as entrepreneurial and financial benefits one receives from one’s relationships with others or relation (Alder & Kwon, 2002; Pitt, Merwe, Berthon, Salehi-Sangari & Barnes, 2006; Hanafizadeh, Ravasan, Nabavi & Mehrabioun, 2012). Family social capital is the supportive social network among the family, customers and the community (Sorenson, Goodpaster, Hedberg & Yu, 2009).

Building social capital requires investing time and other resources that create and sustain the acquired capital from the relationships (Agyapong, Agyapong & Poku, 2017). Family business owners improve their performance through social capital by developing a strong social, business and personal ties (Rooks, Szirmai & Sserwanga, 2009). Social capital improves the ability of businesses in gathering resources that can improve their performance (Leana & Pil, 2006; Ofori & Sackey, 2010). Social capital facilitates cooperation with

network partners and provides access to new business opportunities (Carney 2005; Fan, Wong & Zhang, 2012). Thus, it positions the family business in the social media to interact more closely with more customers or clients. Social capital is “capital” only if its effects persist (Grootaert, 1998) through the culture of the family (Sharma, 1997).

Culture

Culture is the accumulation of the shared meanings, rituals, norms and traditions among the members of the community. It is something that characterizes the human community, its individuals, social organizations, and also economic and political systems. It includes both abstract ideas such as values or ethics and material objects or services, such as cars, cloths, food, or art and sport, which are manufactured or valued in a group of people (society) (Bartosik-Purgat, 2011, as cited in Bartosik-Purgat & Hadryś-Nowak, 2014). Culture is the combination of man’s heritage, achievements or performance which is learned by individuals from generation to generation through tradition and communication in social relationships. As these individuals became members of a family, they learn business culture through social networking. Thus, making a family business culture-specific (Sharma, 1997; Ugboro, 2011). The culture identity of these members and the culture of the family business play a significant role in determining the performance of the business beyond the first generation. This also explains why the reins of a family business are handed to a member of the family (Ugboro, 2011; Aderonke, 2014).

The effects of culture on an individual, family business and by extension its social relationship have been explained in the literature. Family businesses are influenced by the culture of the family and the community where it is located. Thus, the family is an element of the business culture (Hofstede, 1983). Corbetta and Salvato (2004) assert that most family firms experience a trust-based business culture. Trust has been considered as a variable that has positive effects on work group process and performance, through higher levels of cooperation, joint efforts (Dirks, 1999) and altruism between family members. Altruism refers to decisions that are made to benefit others, rather than decisions made for selfish reasons (Lunati, 1997). Altruism within the family leads to superior employment contracts (Chami & Fullenkamp, 2002; Randoy & Nielsen, 2002).

Hence, family members can add to the performance of the family business through economic incentives and positive altruism toward other owners of the firm they interact with through any of the social networking platforms. These family businesses experience an increase in interactions with their customers and other stakeholders through the social networking platforms

when they showcase their products and/or services on social media. This also happens when the number of social networking platforms used by the family businesses is increased. Gallagher and Brown (2007) note that a company's culture influences everything such a company does and by extension its performance (Stewart, 2010; Bhat & Shah, 2013). The culture of a family, therefore, affects the culture of the family business, the commitment of the family members to the family business and the performance of the business.

Commitment

Commitment supposes something beyond mere passing loyalty to an organization. It involves active relationship with the organization such that individuals are willing to give up something in order to contribute to the organization's wellbeing (Mowday, Steers & Porter, 1979). The commitment of family members to a family business and the performance of the family business itself are enhanced by certain intangible factors. These factors are the freedom of behavior among the family members, and the trust and love among the members and with respect to the business (Cappuyns, 2007). In relation to a social networking platform, these factors help to increase the proximity of the family business to the members of the public who are connected to the social network. It follows that as a family business' social networking platforms and interactions widen, the patronage will also witness an upward trend. Carlock and Ward (2001) further state that commitment to an organization is based on at least three factors: a personal belief and support for the organization's goals and visions; a willingness to contribute to the organization; and a desire for a relationship with the organization. Cappuyns (2007) asserts that women's sense of intuition and sensibility help them foster commitment among family members. However, this is not the situation owing to the strong gender-specific role offered them by the family. Thus, women are only active behind the scenes in supporting the survival of family businesses.

Survival

A central aspect of a family firm's performance concerns survival across generations (Yu et al., 2012). Survival is the persistence of control by the same family over time, even when it implies downsizing and a reduction in the chances of expansion, growth and financial success (Salvato & Melin, 2008; Colli, 2011). The survival of a family business is the transformation in the family business and the selection of capable managers from within or outside the family. The survival of a family business can be considered a good measure

of performance when the competitiveness of the business can be linked to good performance and value creation. In a situation of the discontinuities in growth and expansion of the family business, survival becomes the best non-financial performance indicator (Colli, 2011).

A higher level of social capital in a family firm enhances the survival of such a firm (Gedajlovic & Carney, 2010). This is because survivability capital, like social capital, is part of the unique resources (i.e., familiness) of family firms (Simon & Hitt, 2003). The development of new weak ties, which are laden with risk, conflicts, altruism, downsides of social capital, lower level of risk-taking and R&D, reduces survival chances and negatively affects the performance of family firms (Schulze, Labatkin & Dino, 2003; Zahra, 2010). The survivability of a family business can be enhanced by creating strong ties with customers or clients via different social networking platforms. As the interactions with few customers are maintained, more customers are attracted thus the survivability of the business is improved. Moreover, Wilson, Wright and Scholes (2013) assert that the survival and performance of a family firm can be improved by putting in place a board that has “built-in diversity” in terms of age, gender and experience. Above all, survival promotes the embeddedness of the business in the family.

Embeddedness

Embeddedness is the capacity of a business to fit into the local community. Embeddedness also means “unity” or “cohesion” (Colli, 2011). Embeddedness is the contextualization of economic activity in ongoing patterns of social relations and captures the contingent of an economic actor’s activities by virtue of being embedded in a larger social structure (Powell, Koput & Smith, 1996; Choi & Kim, 2008). Embeddedness is important in the economic life of a family and a business because scarce business resources like capital and information are acquired through it (Zhou, 1998). Family embeddedness is the extent to which the individuals themselves fit into their families (Toumbeva, 2012). Family businesses are embedded within the local community more than non-family businesses (Colli, 2011). The three family embeddedness dimensions are: (1) family fit - family members perception of how well the family business fits the entrepreneur; (2) family link - the extent to which the family members are connected to the family business; and (3) family sacrifice - what the family would have to give up if they moved (Ramesh & Gelfand, 2010).

As social networking among the family members and between the family business and their external environment increases, the level of embeddedness also increases. The embeddedness of the family business can affect the business negatively or positively (Hansen, 1995; Choi & Kim, 2008).

However, the embeddedness in a social network context allows individuals to benefit from the social capital of that particular context. The stronger the cohesiveness of this social network context and the social network ties, the larger the effect on human behavior and on business performance (Rutten & Boekema, 2007). The increased level of embeddedness of the family business in the family and the local community increases the reputation of the family and the family business.

Reputation

One of the social capitals which entrepreneurs obtain through social networking is reputation. Dyer and Whetten (2006) opine that reputation is how outsiders perceive an organization. It is a valuable intangible resource that influences financial performance (Rindova, Williamson, Petkova & Sever, 2005; Rindova, Williamson & Petkova, 2010). Reputation is an immaterial capital that provides value to family business (Danes et al., 2009). The actions that contribute to family firms' reputation have positive effects on its performance (Levenburg, 2006; Fernando & Almeida, 2012). Family business reputation is created through value creation and family name. First, value creation is the ability of the family business to preserve the unity of the family members, family business and the local community. Thus, identification between the family and family business means that value creation for the family business coincides with value creation for the family, and vice versa (Colli, 2011). Second, a family name as a brand name counts as assurance to buyers and as a saleable asset (Landes, 2006). Family/business reputation serves as collateral to obtain credit from financial institution (Colli, 2011) and as a sustainability factor to family businesses (Larson & Starr, 1993).

Corporate naming is scarcely referred to in non-empirical texts. This is because empirical studies do not show the link between corporate naming and corporate non-financial performance in family businesses. Using the founders' family name to call a business creates and maintains reputation (Olivares-Delgado et al., 2016) due to the reciprocal and explicit association between the founders or their family and their firms (Miller, Le Breton-Miller & Scholnick, 2008; Niehm, Swinney & Miller, 2008). Faithful and self-satisfying family members who work in the family business contribute to the reputation and performance of the family business by representing the name and the values of the family in all their networking activities (Gluckler & Armbruster, 2003; Jack, 2005). This reputation can be damaged by financial and non-financial difficulties that stem from the overlapping interests of the family and the firm (Dyer & Whetten, 2006; Miller et al., 2008; Olivares-Delgado et al. 2016).

The reputation of a firm is determined by its size, financial success (or failure), social responsibility and media coverage (Fombrun & Shanley, 1990). The interdependence and repeated interactions between network members increase social capital and nurture the organization's reputation (Arregle et al., 2007). A firm's reputation facilitates its access to networks and increases its social ties. It also fosters its relationships with business partners and community leaders (Sieger, Zellweger, Nason & Clinton, 2011). Businesses with good reputations find networks (Sieger et al., 2011; Chandler, Haunschild, Rhee & Beckman, 2013) and financial resources (Yang, 2010) more easily accessible than businesses without good reputation (Sageder, Mitter & Feldbauer-Durstmu, 2018). Thus, family businesses that want to improve their reputation must strive to create and maintain a strong tie with all categories of customers through social networking platforms. This could imply using different social networking platforms. This is important because social networking facilitates the showcasing of their products and services, real-time interaction with the different categories of customers, increase in the number of customers from different parts of the world, and the reputation and sustainability of the business. Overall, an improved reputation will lead to an increased customer base and vice versa.

Sustainability

Sustainability is the process of managing economic, social and environmental demands so as to maintain a responsible, ethical and successful organization. Colli (2011) views sustainability as the capability to couple of family control with the growth and expansion of the family business. Ogundele, Idris and Ahmed-Ogundipe (2012) define sustainability as the extent to which an organization's life can be stretched while fulfilling its purpose. Furthermore, sustainability is the ability of an organization to achieve its mission and satisfy its stakeholders. Sustainability creates value and provides more funds (Carsrud & Brannback, 2010). To achieve sustainability, adaptive leadership, management and technical capacities are needed to monitor, make decision, employ resources and implement the programmes respectively (Carsrud & Brannback, 2010). Similarly, York (2012) asserts that sustainability is characterized by adaptability and capacity. The capacities are adaptive, leadership, management and technical. Adaptive capacity helps to monitor, assess and respond to the dynamic internal and external environment. Leadership capacity facilitates decision-making and organizational goal attainment. Management capacity enables efficient and effective use of resources. Technical capacity (i.e., skills, knowledge and experience) enables

the implementation of strategies (Carsrud & Brannback, 2010; York, 2012; Gundry et al., 2014).

The segmentation of customers and clients by the media, suggests that family businesses must employ a multi-faceted approach in their efforts to meet customers' demands. To achieve sustainability, family businesses must create strong ties with online customers, who today constitute the latest segment by reason of advances in internet and information and communication technology. Moreover, different social networking platforms should be employed to accommodate all the online customers who also differ from the social networking platform they use. This will ensure that as more social networking platforms are added, the customer base will increase and the sustainability will improve. The distribution of studies by non-financial performance measures and proxies is presented in Table 3. Table 3 shows that the most frequently used non-financial measure is culture followed by sustainability. Also, Table 4 depicts the differences between financial and non-financial performance.

RECOMMENDATIONS FOR FUTURE RESEARCH ---

Managerial implication: to obtain relevant and timely non-financial data that will help family businesses become high performing global players, the owner-managers should be more visible and active in creating and maintaining strong ties with their business stakeholders through social networking via the traditional and new media. All the stakeholders of a family business should be involved in an open and on-going social network for the purpose of establishing work standards and ensuring compliance. The stakeholders should also be involved in the gathering of non-financial data. These non-financial data can be gathered from the family business web pages, social media profiles and other platforms through monitoring. This can be done by observing online interactions involving the employees' of the family business and other stakeholders of the business. Before starting the monitoring properly, the family business should choose the area to focus on. This can be a geographical setting, an entity or a trending issue.

Monitoring also helps to ensure that the employees adhere to the rules associated with interacting with all the business stakeholders. Monitoring facilitates the acquisition of capability to rapidly adapt to the dynamic business environment, and enhance the ability of the business to identify, segment and better understand their customers' needs. The stakeholders should be involved in analyzing the gathered non-financial data.

Table 3. Distribution of studies by non-financial performance measures and proxies

Measure	Study	Proxy
Culture	Brice (2013)	Power distance, masculinity, femininity, spirituality, reward for application, fate control, social flexibility and social cynicism.
Culture	Bhat & Shah (2013)	Family values, support, pride, decision, effort, influence, commitment, loyalty and participation.
Culture	Aderonke (2014)	Extended family system, age, education, religion and inheritance law.
Culture	Bartosik-Purgat & Hadry's-Nowak (2014)	Universalism and particularism, status assigned and achieved, power distance, femininity and masculinity, pro-partnership and pro-transaction.
Sustainability	Colli (2011)	Growth, expansion and persistence of family control.
Sustainability	Gundry et al. (2014)	Level of satisfaction with sales level, sales growth, turnover, profitability, net profit, gross profit and ability to fund enterprises growth from profits.
Sustainability	Aderonke (2014)	Succession.
Commitment	Martinez et al. (2013)	Obligation, loyalty and motivation
Embeddedness	Colli (2011)	Employee loyalty, low rate of workforce turnover, low absenteeism, commitment, the presence of family members in local institutions.
Reputation	Colli (2011)	Ability to maintain the same business relations over time, the strength and endurance of business and social network, the reliability, efficiency, long-term orientation of family firms and their relationships with the workforce.
Survival	Colli (2011)	Inter-organizational transmission, presence of family and non-family members in management positions.
Social capital	Agyapang et al. (2017)	The three dimensions of social capital – structural, relational and cognitive.

Table 4. Difference between financial and non-financial performance

Criterion	Financial performance	Non-financial performance
Nature of data	Quantitative	Qualitative
Sources of data	Financial records	Traditional and electronic social media through monitoring.
Measures	ROA, Tobin's q, growth, sales growth, ROE, profitability, productivity, market share, ROI, multiple, ROS, financial performance, revenue, OROA, ROC, market/book ratio, income, customer retention, firm size, service quality, gross return on assets, stock return, employee turnover, assets growth, employee satisfaction, net profit growth, cash flow growth and/or absenteeism.	Culture, sustainability, commitment, embeddedness, reputation, survival
Results	Monetary terms	Non-monetary terms
Long-term prediction	Not better than non-financial performance in predicting long-term financial performance.	Better than financial performance in predicting long-term performance.
Focus	Past performance	Present (or current) and future performance.
Nature of resources	Tangible	Intangible
Completeness	Without the financial performance, the overall performance is incomplete.	Without the non-financial performance, the overall performance is incomplete.

This is to ensure that the generated and analyzed data are meaningful and related to the family/family business social capital, culture, commitment, survival, embeddedness, reputation and sustainability and contribute to the overall performance of the family business. This is important as it will not only make for reinvention of work standards and reorientation of stakeholders, particularly the workers, but will enhance the cohesiveness, continuity and performance of the family business.

Family business owner-managers should desist from using financial measures (growth and profit) alone in the computation of business performance. This is owing to the difficulties in the application of ratio analysis, poor quality of available financial data, absence of proper regulations and disclosure requirements, and the flaws and uncertainties in financial information. This suggests that financial measures only depict past performance and does not show current and future performance. Similarly, financial measures give incomplete performance. In comparison to financial performance, non-financial measures of family business contribute much more to the cohesiveness, continuity and reputation of family members and family businesses. Thus, family-owned small firms measured by non-financial indicators show better performance than large ones measured by growth and profitability. Based on the complementary roles of the financial and non-financial data in terms of the owner-manger's past and future performances respectively, management should ensure the integration of the two types of data to make for a complete business performance report.

Research implication: methodologically, the implication of combing financial and non-financial data in the measurement of family business performance suggests that further research is required. Therefore, researchers should examine the contributions of family business social capital, culture, commitment, survival, embeddedness, reputation and sustainability to family business non-financial performance. The result of the study of family business performance that is based on non-financial measures should be complemented with financial measures (growth and probability). Such studies can be conducted in developed and developing countries and most importantly on a comparative basis. This research will not only put an end to the speculation that non-financial indicators are unreliable and immeasurable but will further encourage the use of both financial and non-financial indicators in assessing family business performance by both owner-managers and researchers.

Limitations and future research direction: there is no research without limitations and this research is no exception. The study accounts for the effect of social networking on the financial and non-financial performance of family businesses. The study is conducted based on literature review design. In the course of the literature search, the selection of relevant literature was limited to peer-review journal articles. Furthermore, the study is limited to social networking as a factor that enhances family business financial and non-financial performance.

Consequently, the study gives several directions for future research. Future research can combine journal articles that are not peer reviewed with those that are peer reviewed. Moreover, future literature research could be

conducted using any other factor rather than social networking to determine its contribution to family business financial and non-financial performance. More research should be carried out to identify more widely accepted proxies of both the financial and non-financial measures of family business performance.

CONCLUSION

Social networking is not the only factor that influences firms' financial and non-financial performance. However, firms are getting involved in it because of the strong ties it helps family businesses to create and maintain with their stakeholders and the growing market size it offers. Social networking platforms such as Facebook, YouTube, Instagram, LinkedIn and Twitter affect both the financial and non-financial measures of family business performance. Owing to the complementary roles of financial and non-financial data in measuring business performance, this research establishes the need for family businesses to employ both types of data in measuring business performance. This is further premised on the: embeddedness of family business in the owning family and the community of location; poor quality of available financial data; difficulties in the application of financial ratios on the available data; advances in information and communication technology, and social media; and the fact that non-financial measures – family/family business social capital, culture, commitment, survival, embeddedness, reputation and sustainability – contribute much more than financial measures to the cohesiveness, continuity and sustained performance of family members and businesses.

The most frequently used non-financial measures are culture and sustainability. These non-financial data are operational information which is not stated in monetary terms, but which give more information than financial indicators. Non-financial data can be gathered from the social network platforms through monitoring. This entails observing the company's web pages, social media profiles, and other platforms used by the employees for data on the non-financial measures. As non-financial performance indicators, they increase customer loyalty, attraction of new customers, improvement of perceived company image and reputation on a long-term basis.

Moreover, the most frequently used financial measures are growth and profitability. Growth connotes increase in the number of qualified employees; while the most frequently used financial measures are Return on Assets (ROA) and Tobin's q. However, financial performance reports only focus on the past efforts of the business without reflecting the effect of the current efforts on future financial performance. Conversely, non-financial performance measures picture future financial performance better than the financial measures

through its ability to recognize the attraction of new customers, increase in customer loyalty, and improvement in a firm's image and reputation on a long-term basis. Financial and non-financial performance differ on the basis of the nature of data, sources of data, measures, results, long-term prediction, focus, nature of resources and completeness. The findings show that a family business is a totally different type of business whose performance should be assessed differently. Therefore, this research contributes to the family business literature by highlighting the importance of combining financial and non-financial measures in assessing family business performance.

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Abstrakt

Badacze i praktycy są podzieleni ze względu na preferowane miary wyników biznesowych, w dużej mierze ze względu na jakość dostępnych danych finansowych i mierzalność wskaźników niefinansowych. Jednak ze względu na sieci społecznościowe w rodzinach i świecie biznesu, niniejsze badanie sprawdza wkład sieci społecznościowych w finansowe i niefinansowe wyniki firm rodzinnych. Badanie jest oparte na przeglądzie 55 recenzowanych artykułów z czasopism. W związku z tym zidentyfikowano najczęściej używane platformy społecznościowe, mierniki wyników finansowych, środki i proksy wyników niefinansowych oraz różnice między wynikami finansowymi i niefinansowymi. W badaniu zaproponowano wykorzystanie zarówno finansowych, jak i niefinansowych środków do oceny wyników firm rodzinnych ze względu na ich uzupełniające się role.

Słowa kluczowe: sieci społecznościowe, sieć społeczna, firma rodzinna, wyniki finansowe, wyniki niefinansowe, wzajemne zależności, współzależności.

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Does socioemotional wealth matter for competitive advantage? A case of Polish family businesses

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Abstract

A growing body of research is concerned with how family businesses achieve competitive advantage, yet unique qualities that distinguish family firms and non-family firms are sometimes overlooked. In our study, we argue that socioemotional wealth (SEW) may trigger or limit family firms' strategic initiatives that ultimately shape their competitive advantage. Therefore, in our study of 193 Polish family firms, we investigate how (SEW) and a firm's competitive advantage are associated with a family firm context. Our research results reveal that, indeed, (SEW) and competitive advantage are partially associated and SEW can be regarded as an important strategic antecedent to firm performance.

Keywords: family business, (SEW), competitive advantage.

INTRODUCTION

In recent years, a growing interest in family entrepreneurship can be observed. The popularity of family businesses is a consequence of the significant role they play in the economy, but also the fact that they have

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coped relatively well with the effects of the economic crisis. The reasons for that are associated with the specific culture of family entrepreneurship, expressed in the sphere of values, and reflected in the relationship within teams and the ways of managing these entities. Therefore, efforts made by both management theoreticians and practitioners, aimed at identifying the determinants of family firms' competitiveness and understanding the determinants of their functioning, are not surprising. Nowadays, researchers still face theoretical and empirical challenges stemming from the intensive interpersonal relations between different stakeholders and those pursuing non-financial goals, which are not typically found in non-family businesses (Evert, Martin, McLeod, & Payne, 2015; Reilly & Jones III, 2017). The nuanced insights into the complexity of the dynamics, due to the blurred boundaries between family and business, are relatively underdeveloped. Indeed, we need both family business specific theories, as well as valid measurement instruments relevant to family business research.

This study aims at complementing and extending existing research on family firm competitive advantage by taking a SEW perspective. It is based on the idea that family firms can be competitive while still maintaining a strong family character (Chrisman & Patel, 2012). Based on these premises, this study attempts to extend current theory on family firms in two major respects. First, the study complements prior empirical studies on how family firms achieve competitive advantage. In particular, this study aims at extending and refining existing theory as to how family firms can best accommodate and leverage their attributes SEW, in particular in order to achieve competitive advantage. Secondly, our study attempts to extend current theory on SEW as a construct that is linked to competitive advantage in family business settings. This is important because of wired-in family forces for SEW maintenance.

LITERATURE BACKGROUND

SEW and competitive advantage

This study is drawn up in the convention of strategic management, which focuses on the organization (in particular on the enterprise) as the basic level of analysis and recognizes the diversity of the organization in terms of efficiency, that is in the area of creating and capturing values (Durand, Grant, & Madsen, 2017). From among a variety of possible approaches, a resource-based approach was chosen that puts emphasis on the strategically valuable resources and abilities of the enterprise being a source of competitive

advantage. Research attention was focused on the SEW, which is an important strategic resource.

Family businesses are defined as those in which many members of the same family are involved as owners or managers, either now and in time (Miller, Le Breton-Miller, Lester, & Cannella, 2007). The family is a specific social group related to marriage, biology or adoption, including people also connected with affection, commitment, dependence and cooperation (Rothausen, 1999).

Unlike the non-family firms, family businesses have some unique qualities that can lead to competitive advantage. We argue that the SEW theory is suited to examining deeply the kind of strategic consequences of specific features of family firms. In our paper, we define that SEW (hereafter, SEW) refers to an “all-encompassing approach that captures the affective endowment of family owners” (Berrone, Cruz, & Gomez-Mejia, 2012). In other words, SEW is concerned with attributes of the firm that bear the family’s affective endowments (Gomez-Mejia, Hynes, Nunez-Nickel, & Moyano-Fuentes, 2007).

Research has shown that the SEW perspective offers a conceptual framework to view the complex and dynamic interplay of economic and non-economic factors (Chrisman, Chua, De Massis, Frattini & Wright, 2015; Miller & Le Breton-Miller, 2014). From SEW considerations, which emphasize that they take precedence over the assessment of economic benefits and costs (Gomez-Mejia et al., 2007), changes in behavioral decision-making processes might result in declining power to pursue the family agenda (Leitterstorf & Rau, 2014). Similar dynamics have been documented in other settings such as avoiding acquisitions that threaten the preservation of existing stock of SEW (Miller, Le Breton-Miller, & Lester, 2010). Furthermore, the introduction of new ways of working and, probably, human resource, is perceived as a potential threat to family stability, specifically to affinity-related dimensions, namely family identity, social bonds, and emotional attachment (Gomez-Mejia, Makri, & Lazzara-Kitana, 2010). Meanwhile, in SEW case, developments with regards to new, discontinuous technology adoption are inhibited as a potential dilution of family control (Konig, Kammerlander, & Enders, 2013). Using similar, family-ownership logic, Souder, Zaheer, Sapienza, and Ranucci (2017) theorize and demonstrate a tendency to perceive new technology as potential erosion of SEW, mainly from identity and family influence aspects. Drawing on this perspective, we argue that SEW may trigger or limit family firms’ strategic initiatives that ultimately shape their competitive advantage. In general, findings indicate that the boundaries between business and family are blurred, ultimately affecting how family firms perform their strategic activity (Duran, Kammerlander, van Essen & Zellweger, 2016).

The consideration of SEW is important because forming SEW appears critical to firm performance – but it is not always so (Bettinelli, Sciascia, Randerson, & Fayolle, 2017). Berrone et al. (2012) significantly contribute to the SEW literature by showing that SEW, as a latent explanatory construct, has five dimensions, namely: (1) family control and influence, (2) identification of family members with the firm, (3) binding social ties, (4) emotional attachment of family members, and (5) renewal of family bonds to the firm through dynastic succession. According to such a conceptualization of SEW, the first dimension refers to exercising current family control, which depends on family members' power to control key strategic decisions both formally (e.g., a family member being the CEO or owner) and informally influencing decision-making processes. The second dimension connotes a close linkage between the reputation of family and firm, which provides a sense of identity that is also visible in a broader social context. The next dimension relates to the social relationships of the family firm, its family members, its internal as well as external stakeholders, which create social capital as a potential for gaining access to desirable resources and experiences. The fourth dimension is associated with shared emotions, heritage, jointly experienced events, and responsibility for the long-term viability of family firms that become a source of affective needs satisfaction (e.g., belonging, security). The fifth dimension, in turn, characterizes a tendency to keep the family under the family's control over multiple generations, and therefore protect the family's wealth and value. These scholars have also labeled the operationalization of this set of dimensions as the FIBER scale, which is intended to measure socioemotional endowment across family firms. Additionally, they demonstrate how the tendency to preserve SEW as a decision criterion, strengthens strategic choices that carry a significant financial risk. Lastly, they explain why the studies with regards to effecting firm performance have been inconclusive and ambiguous.

The desire to preserve SEW potentially leads to specific strategic orientations (De Massis, Kotlar, Chua, & Chrisman, 2014). Duran et al. (2016) in their meta-analysis recognize that family firms engage in innovation less than their non-family counterparts. Other scholars have also examined SEW within entrepreneurship literature, recognizing that corporate entrepreneurship allows the firm to considerably improve its competitive advantage (Corbett, Covin, O'Connor, & Tucci, 2013). Similarly, innovations enhance their competitive advantage (Hayton & Kelley, 2006).

In terms of family control and influence, earlier findings focus on the indirect effects of this dimension on competitive advantage. In particular, a high proportion of family members in top management lead to a negative relationship between innovation orientation and new product portfolio performance (Kraiczy, Hack, & Kellermanns, 2014). Chrisman and Patel

(2012) demonstrate that family ownership is negatively related to research and development spending. This is because family owners perceive such investments as risky and might threaten their influence in the firm. In contrast to these findings, Hauck and Prugl (2015) show that the effects of family involvement on a willingness to innovate are ambiguous and even conflicting. There is also evidence that family involvement in the board of directors influences entrepreneurial orientation according to an inverted U-shaped relationship (Bauweraerts & Colot, 2017). Lee and Chu (2017) have also documented that entrepreneurial orientation magnifies family firm performance when family control is very active.

Scholars have also highlighted how the second dimension of SEW influences organizational outcomes. Stevens, Kidwell and Sprague (2015) draw on the basic idea that family owners' identity is strictly connected with the firm. In consequence, the boundaries between the reputation of family and firm fade (Leitterstorf & Rau, 2014). Shepherd and Haynie (2009) uncovered that an appropriate level of family business identity fit strengthens the tendency to entrepreneurial activities. Therefore, family member's identification with the firm leads to conservative orientation and innovation aversion (Gomez-Mejia et al., 2007). Some family business scholars demonstrated how strong identification limits firm growth (Anderson & Reeb, 2003; Jones, Makri, & Gomez-Mejia, 2008).

Research has also shown how the binding-ties dimension is related to family firm innovation, and in consequence to competitive advantage (De Massis, Kotlar, Frattinin, Chrisman & Nordqvist, 2016). Moreover, strong social relationships between the family firm, family members, and internal and external stakeholders create social capital and knowledge networks (Uhlener, 2006), which, in turn, contribute to a greater access to resource and experiences (Miller, Le Breton-Miller, & Scholnick, 2008). This opens up the potential for information sharing (Gomez-Mejia et al., 2007) and ultimately results in the ability to innovate (Spriggs, Yu, Deeds, & Sorenson, 2013). As Mohr and Puck (2013) also show that good relationships with different stakeholders enhance competitive advantage. In general, family firms' social capital positively impacts performance in a variety of settings (Sorenson, Goodpaster, Hedberg, & Yu, 2009).

Emotional attachment to the actual organization, to which Fan and Zietsma (2017) refer, can encourage specific action as a driver of competitive advantage. Some works identify the competitive advantage effects of emotional attachment. Welsh, Memili, Rosplock, Roure and Segurado (2013) noted that family emotional attachment strengthens family office entrepreneurial orientation. In this vein, the existence of a positive association of affective commitment and family engagement with entrepreneurial

behaviors is observed (Salvato, Chirico, & Sharma, 2010). In fact, strong emotional attachment supports a sense of responsibility for the viability of a family firm (Miller et al., 2008; Lumpkin, Brigham, & Moss, 2010).

Last, regarding the renewal of family bonds to the firm through dynastic succession, Lumpkin et al. (2010) theoretically explain the positive impact of the long-term orientation of family firms on proactiveness, innovativeness and autonomy, while it negatively influences risk-taking and competitive aggressiveness. The focus on transgenerational succession results in long-term decisions (Levenburg, Schawrz, & Almallah, 2002) and a willingness to invest in a firm's growth (Classen, Carree, Van Gils, & Peters, 2014). Eddleston, Kellermans and Zellweger (2012) confirm the positive influence of long-term orientation on corporate entrepreneurship. Gomez-Mejia, Campbell, Marin, Makri, Sirmon, and Hoskinsson's (2014) findings contradict the literature - in which the advantages of SEW are emphasized - and reveal that family firms are oriented on high financial wealth rather than on a long-term perspective and an agreement on a later pay-off. The long-term orientation of top management can, however, act as an innovation driver by raising the tendency to experimentation and extending the time for creativity (Kammerlander & Ganter, 2015). Their results also shed light on how socioemotional goals can reinforce the achievement of economic goals. Other studies report that a family firm's predisposition to carry the firm onto the next generation (Mahto, Ahluwalia, & Khanin, 2014) is associated with more risk aversion (Craig, Pohjola, Kraus, & Jensen, 2014). Contrary to what we would have believed from the socioemotional negative-effect literature, some scholars find positive consequences of unique family heritage that intensify the innovation process (Classen et al., 2014). In other words, to preserve a firm's wealth for the next generation, family firms need to be innovative (Cassia, De Massis, & Pizzurno, 2011).

In sum, innovation is a key driver of family firm continuity (Filser, Brem, Gast, Kraus, & Calabrò, 2016). By combining the abovementioned arguments, we have shown that SEW may both enable and constrain family firm performance, as a result of simultaneously providing long-term orientation, as well as setting in motion risk aversion. As Songini and Gnan (2015) already noted, family firm dynamics is based on the contradiction between protecting the family goals and long-term viability.

The relationships between family business attributes and firm performance are by no means easy to understand. The abovementioned five general points form a strong base on which to posit that SEW influences family firm competitive advantage. They enter into competitive advantage through individual SEW dimensions which activate entrepreneurship and innovation in particular, and so lead to a competitive advantage for the family firm. Although

previous studies have highlighted and vividly discussed the impacts of SEW on firm performance, it should be remembered that the results are inconclusive (Debicki, Van de Graaff, Randolph, & Sobczak, 2017). To take an example, the risk of losing the value of SEW leads to specific strategic action that augments its “dark side” by reducing financial performance (O’Boyle, Pollack, & Rutherford, 2012). In contrast, another possibility is that family firms outperform non-family counterparts (Wagner, Block, Miller, Schwens, & Xi, 2015). Theoretical and empirical ambiguities noted by several scholars have a common strategic perspective (Strike, Berrone, Sapp, & Congiu, 2015). Indeed, in recent years, appreciation of SEW as an important strategic antecedent to firm performance has increased substantially (Sharma & Sharma, 2011).

To sum up our literature review, current studies emphasize links between SEW dimensions and competitive advantage. Although previous research is inconclusive, showing different effects of SEW dimensions on competitive advantage (both negative and positive), we posit that there is a clear rationale to link, theoretically, the two constructs. Thus, consistent with our discussion earlier, we elaborated the following hypothesis:

Hypothesis 1. In a family firm context, SEW and a firm’s competitive advantage are associated.

RESEARCH METHODS

Sample

To test the research hypothesis and verify the created research model, we carried out empirical research on family firms from southern Poland – the Silesian voivodeship. The data were gathered between June and August 2017. The survey was constructed in English, and then we translated the items of original scales into Polish and then translated them back into English. Minor adjustments were made in the process to ensure content similarity of the versions. In the following step, a market research company telephoned 974 randomly-selected small and medium-sized family companies. Respondents were asked three screening questions: (1) Are you an owner of the company and are you willing to participate in a study? (2) Do you consider your company to be a family firm? And (3) Do you or your family own more than 50% of the company? If the respondent’s answers to all the questions were positive a face-to-face interview, based on a questionnaire, was arranged. Next, the dataset was reviewed for incomplete responses, outliers, and uniform responses across all scale items. From the original telephone research sample

of 974 firms contacted we gathered 211 completed questionnaires, of which 193 were included in the research. These procedures yielded an effective response rate of 19.8%, which is slightly below similar research carried out in a Polish context (see Debicki et al., 2017).

Dependent variables

Competitiveness of a family business. To measure the competitiveness of a family business, we used a modified, 5-item 7-point Likert scale developed by Antoncic and Hisrich (2001) (alfa Cronbach = 0.835), composed of growth in employment, net sales, volume and market share, and net profit over the past three years in relation to main competitors. Exploratory factor analysis (Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.796; Bartlett's Test of Sphericity – Approx. Chi-Square = 368.308 with 10 degrees of freedom, significance: $p=0.000$), using principal component analysis with Varimax rotation, revealed that a single component – factor explains 60.76% of the variance and, considering the eigenvalue criteria, we found no support for identifying other factors. All five items loaded to this single factor, with factor loadings varying from 0.714 to 0.825. Thus, in the following analyses, we considered competitiveness as the unidimensional, latent construct.

Independent variables

SEW. Congruent with recent calls for distinguishing between dimensions of SEW (Gomez-Mejia, Cruz, Berrone, & De Castro, 2011), we identify three formative dimensions, which have different antecedents as well as consequences (George, 2011; Sullivan & Ford, 2010). As a consequence of the results of the exploratory factor analysis (Kaiser-Meyer-Olkin sample adequacy equal to 0.937, significant Bartlett's test of sphericity at a level below 0.05, percentage of variance explained equal to 61.7 for four factors), and following Hinkin's (1998) criteria (presented earlier), we eliminated 10 items from the original scale.

The remaining 17 items were subjected to confirmatory factor analysis in Mplus. This analysis confirmed that there are three dimensions, and the model was fitted slightly above the cut-off level for RMSEA (0.062, with the cut-off line as 0.06), and with satisfactory CFI and Tucker-Levis Index (TLI) level reaching 0.957 and 0.946, respectively. Thus, finally for calculations we used three dimensions: family control and identification with the firm (11 items, Cronbach's alpha = 0.947), binding social ties (3 items, Cronbach's alpha = 0.675, that is slightly above the accepted 0.6 level (Drasgow, 1984)), and long

term emotional attachment (emotional attachment of family members and renewal of family bonds) (3 items, Cronbach's alpha = 0.721). Recent empirical results strongly suggest that the family influence and control dimension yields high levels of family firm noncompliance with corporate governance codes (Kabbach de Castro, Aguilera, & Crespi-Cladera, 2017). In addition, and by contrast, the identification dimension (image and reputation, in their words) weakens the aforementioned relationship. Drawing on this logic, our core argument is that these two SEW dimensions are closely related and influence family firm strategic behavior. Turning to the interpretation of our results, we propose to name the first factor "family control and identification with a firm." Rotated loadings and questionnaire items are presented in Table 1.

Table 1. Rotated component matrix for SEW

Items	Component		
	Family control and identification with a firm	Binding social ties	Emotional attachment of family members
7. Family members have a strong sense of belonging to my family business	.807	.106	
8. Family members feel that the family business's success is their own success	.802		
11. Family members are proud to tell others that we are part of the family business	.785		
9. My family business has a great deal of personal meaning for family members	.770		.162
3. In my family business, most executive positions are occupied by family members	.768	.187	.114
6. Preservation of family control and independence are important goals for my family business	.748		.149
5. The board of directors is mainly composed of family members	.733	.168	
2. In my family business, family members exert control over the company's strategic decisions	.730	.219	.111
10. Being a member of the family business helps define who we are	.724		
1. The majority of the shares in my family business are owned by family members	.708	.234	
4. In my family business, non-family managers and directors are named by family members	.690	.214	
14. In my family business, non-family employees are treated as part of the family		.808	
15. In my family business, contractual relationships are mainly based on trust and norms of reciprocity	.202	.805	
16. Building strong relationships with other institutions (i.e., other companies, professional associations, government agents, etc.) is important for my family business	.236	.500	
25. Family owners are less likely to evaluate their investment on a short-term basis	.107	0.210	.777

Items		Component	
21. In my family business, affective considerations are often as important as economic considerations	.175	.138	.759
19. Protecting the welfare of family members is critical to us, apart from personal contributions to the business	.246	-.199	.567

Source: own calculations based on the survey data.

The first dimension, labeled family control and identification with the firm is composed of two aspects, that is family control and identification with the firm (11 items). Interestingly, Gast, Filser, Coen Richtering, Harms, Kraus, and Chang (in press) observed five causal configurations of the SEW dimensions and identified the presence of family control and identification with the firm in three of these causal paths. The second dimension, labeled binding social ties contains three items, i.e., building strong relationships with institutions, contractual relationships based on trust and norms of reciprocity, and treating non-family employees as the part of the family. And finally, the third dimension called emotional attachment of family members is composed of three items, namely: the likelihood to evaluate family owners' investments on a short-term basis, treating affective considerations as important economic considerations, and protecting the welfare of family members as crucial to owners, apart from personal contributions to the business.

Control variables

In order to preserve the analysis from the impact of exogenous factors, we used two control variables. Following previous studies (Chu, 2011) we assessed firm size using the total number of employees in the firm, and it was measured on a three-point scale – (1) the company is employing less than 9 employees; (2) the company is employing more than 10 but less than 49 employees, and (3) the company is employing more than 50 employees. Thus, the respondents were asked to categorize their business into one of three categories. Secondly, the firm's age was assessed, and in this regard respondents were asked an open-ended question about the number of years the company had operated in the market. The rationale for such a question relies on the assumption that more established companies have a higher reputation, are more experienced at sustaining in difficult market conditions, and have more opportunities to fulfill family obligations, related for example to family ownership.

RESULTS

Table 2 shows the means, standard deviations, and correlations for the variables studied in the research project. It demonstrates there are small correlations between the studied constructs. In particular, competitive advantage is poorly correlated with the dimensions of SEW (family control and identification with a firm, binding social ties, and emotional attachment). However, all dimensions of SEW are mutually correlated. Firm age correlates positively with firm size and competitive advantage, as well as with binding social ties and emotional attachment. Firm size, in turn, correlates negatively with family control and identification with a firm, and with binding social ties.

Table 2. Means, standard deviations and correlations between dimensions of studied constructs and descriptive statistics (n=193)

Variables	1	2	3	4	5	6
1 Age	-					
2 Size	.254**	-				
3 Competitive advantage	.130	.051	1			
4 Family control and identification with a firm	.072	-.142*	-.018	1		
5 Binding social ties	.161*	-.152*	.023	.369**	1	
6 Emotional attachment	.148*	-.101	.088	.488**	.157*	1
Mean	17.26	1.6	4.14	5.72	4.92	4.97
SD	14.96	0.659	0.93	1.24	1.12	1.05

Note: n=193, *p<0,05, ** p<0,01

Source: own calculations based on the survey data.

To further test the relationships between SEW and competitive advantage, we used structural equation modeling in the MPlus 8.0 statistical package using a general type of the analysis stating that competitive advantage is a dependent variable related to SEW. In Table 3 we present the influence of SEW dimensions and control variables on competitive advantage of the family company.

In Table 3, Model 1 shows the effects of the control variables on the dependent variable – namely: competitive advantage. The subsequent Model 2 shows the effects of SEW dimensions and control variables on competitive advantage. Both models are well fitted with a root mean square error of approximation below the 0.08 cut-off line, and CFI and TLI indexes above the 0.900 cut-off level.

Table 3. Relationships between SEW and competitive advantage

	Model 1 (SE)	Model 2 (SE)
Constant	0.615 (0.139)***	0.558 (0.135)***
Size	0.058 (0.097)	0.128 (0.115)
Age	0.007 (0.004)	0.002 (0.006)
Family control and identification with a firm	-	-0.280 (0.156)*
Binding social ties	-	0.150 (0.214)
Emotional attachment	-	0.495 (0.314)
Root Mean Square Error of Approximation (RMSEA) (the lower the better)	0.045	0.059
Compound Fit Index (CFI) (the higher the better)	0.987	0.935
Tucker-Lewis Index (TLI) (the higher the better)	0.979	0.922

Note: values in brackets represent standard errors of estimated model parameters, *p<0,05, ***p<0,001
 Source: own calculations based on the survey data.

Analyses bring support for hypothesis 1, while the family control and identification with a firm dimension of SEW explain competitive advantage, although the relationship is negative (Model 2: B = -0.280, p<0.1). Contrary to most previous studies that have underlined the advantages of a family business in attenuating the agency problems due to reducing agency cost by the unclear separation between ownership and management (Lee and Chu, 2017, Zhou, Tam, and Yu, 2013), our results are analogous to the earlier concerns on the negative effect of family involvement in ownership, management and control (Naldi, Nordqvist, Sjolberg, & Wiklund, 2007), especially the observation that family involvement is a barrier to attaining family business effectiveness (Hillier & McColgan, 2009). Our findings, related to the other two SEW dimensions (binding social ties and emotional attachment), are counter to our theoretical presumption – these findings show similarity to the literature, in which relationships between family business features and firm effectiveness are not significant (Carney, Van Essen, Gedajlovic, & Heugens, 2015). Therefore, as Carney et al. (2015) suggest, to fully understand the relationship between SEW and family business success or failure, key mediators should be taken into account. One of them could, for example, be familiness (Minichilli, Corbetta, & MacMillan, 2010). In sum, SEW and competitive advantage are partially associated.

DISCUSSION AND CONCLUSION

The results of the considerations have two important theoretical implications. First and foremost, they contribute to strategic management by providing new results of empirical research that emphasizes the importance of SEW as a strategic resource. Such wealth is a significant source of competitive advantage for the company. Building this resource is extremely complicated and, therefore, difficult to follow, which emphasizes its strategic value.

Secondly, it transpired that SEW is an important predictor of competitive advantage. Family businesses rely on more complex social dynamics than the dynamics of a pure market, where the informal sphere is critical to the realization of creative values. In addition to economic aspects, they include non-measurable and emotional aspects. In particular, the full effects of strategic actions launched around SEW are more nuanced and beyond direct effects. Focusing on the SEW components, we contribute to the list of determinants of competitive advantage, and in particular, how it is attained in family business settings. This will provide an enhanced understanding of the complex, strategic dynamics across different types of family firms triggered by SEW and competitive advantage. Our results clarify how family control and identification with a firm hinders the competitive advantage of family businesses. This highlights an area of possible interest in family business management professionalization.

Our research results also lead to recommendations for practitioners. In particular, the relationship between SEW and competitive advantage of a company is complex. In order to make better-informed, embedded, strategic choices, the activities of management should focus on three main areas: family control and identification with a firm, bonding social ties, and the emotional attachment of family members. Moreover, while the influence of family control and identification with a firm on competitive advantage is negative, we refer to the concept of family business professionalization (Lien & Li, 2014). In particular, we argue that family business owners should entrust the management of the family firm to professional managers. Consequently, family members should focus more on the ownership aspects and formal control over the actions performed by professionals.

While the theory enriched in our study does not rely on idiosyncratic environment characteristics, future studies in other empirical settings could deepen the understanding of the generalizability of the results and also merit further discussion. Although our research results are not contingent upon firm size, we cannot be certain that the findings generalize towards large family businesses. In particular, we propose that a deeper understanding of

the given relationships might be obtained by using Latent Profile Analysis, reflecting family business characteristics as latent classes.

In design terms, we encourage researchers to study processes and events with more dependent variables. Our argument is in line with Miller, Washburn and Glick's (2013) research, underlying that firm performance is a complex notion which contains multiple formative dimensions. Future research should examine the effects of SEW on family firm performance in terms of objective and subjective measures related to different constructs such as growth, value creation and capture, social effectiveness, high performance, wellbeing, etc. Additionally, we encourage scholars to test the predicting validity of the scales using different firm performance indicators (Frank, Kessler, Rusch, Suess-Reyes, & Weismair-Sommer, 2016).

To the best of our knowledge, only a few previous studies have addressed the SEW dimensions and their measurement. Gast et al. (2018) identified five dimensions congruent with the FIBER scale. Contrary to the aforementioned results, our empirical data show support for a three factor solution combined by family control and identification with the firm, binding social ties, and renewal of family bonds and emotional attachment of family members. Hauck, Suess-Reyes, Back, Prugl and Frank (2016) demonstrated the value of taking into account the shortened version of the FIBER scale (named REI scale) which contains only three dimensions of core affective endowments: renewal of family bonds, emotional attachment of family members, and identification of family members with the firm. Two dimensions of the FIBER scale, namely family control and influence and binding social ties are excluded because they do not pass the validation criteria and do not clearly capture the affective values a family derives from its ownership and control. Debicki, Kellermanns, Chrisman, Pearson, and Spencer (2016), in order to capture the firm performance effects of SEW, used the importance of the potential benefits of three dimensions – family prominence, family continuity, and family enrichment. In light of this evident confusion, we see a clear need for further empirical work aimed at refining the validity of socioemotional measurement. Future research may pursue the question about the multidimensionality of SEW.

Our theory is limited by not distinguishing the different types of family firms. James, Jennings and Breithereuz (2012) call for more research that investigates the heterogeneity with regards to different family structures, values, and interaction patterns. Randerson, Dossena, and Fayolle (2016) underline the importance of differences among families across cultures, legal systems and religions. Importantly, Souder, Zaheer, Sapienza and Ranucci (2017) note a contrast between two types of family firms, minority family ownership and majority family ownership, in the context of new technology

adoption. Randolph, Li, and Daspit (2017) have blended family intention to pursue transgenerational succession and family ability to acquire external knowledge, and suggest four types of family firms labeled “constrained,” “competency-enhancing,” “diversified family dominant,” and “dynastic.” We, therefore, encourage the examination of SEW in different family business types as a fruitful avenue for future research.

The multidimensionality of SEW provides interesting nuances to this construct – on the one hand. However, on the other hand, configurations of socioemotional factors also highlight that they likely result in complex strategic decision-making processes (Deephouse & Jaskiewicz, 2013). It is noteworthy that SEW dimensions may have a negative valence (Schultze & Kellermanns, 2015) and may be in conflict with each other (Vardaman & Gondo, 2014). Consistent with these arguments, Kellermanns et al. (2012) highlight the fact that SEW dimensions can have a negative or positive impact on firm performance. In this respect, Debicki et al. (2017) conclude their recent empirical findings that family prominence (reputation and social support within the community) and family continuity (the maintenance of family in the business) positively influence firm performance, but simultaneously found the negative impact of family enrichment (fulfilling a set of obligations towards the family at large).

Provided that interdependencies are depicted by discontinuity and equifinality, there is a fruitful avenue for future research on the basis of qualitative comparative analysis (Misangyi & Acharya, 2014), thereby extending our ability to understand SEW more deeply. The configurational design has accommodated the complexity of firm performance (MacDougall, Bauer, Novicevic, & Buckley, 2014) and equifinality (Fiss, 2011). For example, Gast et al. (2018) argue that individual SEW dimensions are not inherently negative or positive. They suggest five causal configurations of SEW dimensions, showing how their combined effects influence family firm innovativeness. Although it makes sense to theorize SEW dimensions as different variables since it has extensive theoretical and empirical support, it is particularly appropriate to understand SEW complexity, and future research should examine the appropriate configurations. The other noteworthy variation on qualitative comparative analysis is using a configural design in conjunction with meta-analysis (Joshi, Son, & Roh, 2015).

The research results come with a number of limitations that stem mainly from the known shortcomings of quantitative research conducted with a survey method. The assessments of all the variables examined are based on the respondents’ subjective opinions. This might cause a bias due to the respondents’ tendency to reply positively to questions related to performance. The inclusion of objective measures could reinforce the

conclusions of this study. Limitations are also connected with the fact that, in each respondent firm, only one manager evaluated enterprise performance. In order to decrease the risk of bias during the design and administration of our research, we assured respondent confidentiality. This is aimed at reducing common method bias by making respondents less likely to modify their answers due to social desirability or how they think others may expect them to answer.

Obviously, in future research, it is crucial to increase the number of respondents. Moreover, we can assume that the use of longitudinal analysis would be required to investigate the entire complexity of the relationships between SEW and competitive advantage. Future studies could also aim to determine how industry classification or industry size might bias the results. In further studies, it would be worthwhile to use other mediating variables, such as familiness, innovativeness, or moderating variables, such as task environment or organizational climate. It also seems reasonable to focus on the implications of SEW in the long run – especially using qualitative research. Future research in other countries should be undertaken in order to evaluate whether our results might be country-specific.

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Abstrakt

Obecnie badacze coraz częściej skupiają się na zrozumieniu w jaki sposób firmy rodzinne osiągają przewagę nad konkurencją, choć w tych dociekaniach czasem pomijane są wyjątkowe cechy odróżniające od siebie firmy rodzinne i nierodzinne. W niniejszym artykule zakładamy, iż bogactwo społeczno-emocjonalne może uruchamiać albo wręcz ograniczać inicjatywy strategiczne w firmach rodzinnych, które to inicjatywy ostatecznie kształtują ich przewagę konkurencyjną. Dlatego też w prezentowanych badaniach przeprowadzonych w 193 polskich firmach dociekamy, w jaki sposób bogactwo społeczno-emocjonalne i przewaga konkurencyjna firmy są powiązane w kontekście firm rodzinnych. Jak wskazują wyniki naszych badań, bogactwo społeczno-emocjonalne i przewaga konkurencyjna są częściowo powiązane, a samo bogactwo społeczno-emocjonalne może być uznane za ważną determinantę wyników uzyskiwanych przez organizacje.

Słowa kluczowe: przedsiębiorczość rodzinna, bogactwo społeczno-emocjonalne, przewaga konkurencyjna.

Biographical notes

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How entrepreneur personality affects agrirural entrepreneurial alertness

Chaoyun Liang¹ 

Abstract

Academic research on agrirural entrepreneurship and opportunity recognition is scant. Because of this research gap, a series of three studies were conducted to develop a measure of entrepreneurial alertness (EA) in agrirural environments that is empirically valid and easy to administer and to analyze how the personality traits of agrirural entrepreneurs affect their EA. The results indicated that both extroversion and openness affected all of the dimensions of EA, whereas conscientiousness only affected scanning and searching and agreeableness only affected evaluation and judgment. The results also demonstrated interactive relationships between extroversion and openness for all of the dimensions of EA. Our results provide a new understanding of how agrirural EA can be assessed more practically and how personality traits can predict various dimensions of agrirural EA.

Keywords: *agrirural entrepreneurs, entrepreneurial alertness, personality traits, scale development.*

INTRODUCTION

Responding to various agricultural development problems (e.g., climate change, natural resource limitations, crop instability, and insufficient distribution channels), governments worldwide, including the government of Taiwan, have formulated relevant policies to aid in restructuring and upscaling the agricultural industry (Bachnik & Szumniak-Samolej, 2018; Chen, Yueh, & Liang, 2016). Based on this trend, Estahbanaty (2013) suggested that guidance must be provided for agrirural entrepreneurship. Agrirural entrepreneurship has become critical for ensuring increased job security, profitability, food productivity, environmental sustainability, and ecological diversity (Liang, Peng, Yao, & Liang, 2015; Niemelä, 2015). However, entrepreneurship is

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not a quality that agrirural workers widely possess (Khan, Khan, Ahmed, & Ali, 2012). Among the various skills required of a successful entrepreneur, accurately identifying and selecting potential opportunities have been identified to be essential; explaining the discovery and development of market opportunities is a critical part of entrepreneurship research (Luna-Reyes, Durán-Encalada, & Bandala, 2013; Omri & Boujelbene, 2015). Particularly at the initial stage of entrepreneurship (which exhibits the highest failure rate), Shane (2005) verified that entrepreneurs are challenged with chaotic market conditions and may encounter impediments at any time, leading to failure. This concept of entrepreneurial alertness (EA) was first introduced by Kirzner (1997) who defined alertness as the 'ability to identify opportunities which are overlooked by others'.

Improving agrirural entrepreneurship has become a worldwide agenda because of discussions involving government support and promotion, sociocultural trends, and the injection of economic capital (Chia & Liang, 2016; Niemelä, 2015). Recent meta-analytic studies have reported a significant relationship between personality traits and entrepreneurship, indicating that entrepreneurs are more extroverted, open, and conscientious while being less neurotic and agreeable (e.g., Brandstätter, 2011; Zhao & Seibert, 2006). However, academic research focusing on the influence of entrepreneur personality traits on EA is limited (Shane, Nicolaou, Cherkas, & Spector, 2010), particularly regarding their effect on agrirural EA. Because EA is the core of entrepreneurial development, it is crucial to examine how the personality traits of agrirural entrepreneurs affect their EA.

Because of this research gap, a series of three studies were conducted to develop a measure of EA in agrirural environments that is empirically valid and easy to administer and to analyze how the personality traits of agrirural entrepreneurs affect their EA. The first study was conducted to develop a self-report scale for assessing the EA of agrirural entrepreneurs based on Tang, Kacmar, and Busenitz (2012). The second study was conducted to confirm the factor structure of this scale and test the degree of measurement invariance in the scale across genders. The third study was conducted to test how entrepreneurs' personality traits interact to affect their EA.

LITERATURE REVIEW

Agirural entrepreneurship

Changes produced by global warming in physical and biological systems worldwide have become the focus of human society during the past two

decades. Scholars have advocated that human society must consider the ecological, ethical, and social dimensions of future agricultural practices and the use of rural landscapes (Wilson & Morren, 1990), with agrirural entrepreneurship being a central concern. Responding to the shifting agrirural economy, numerous U.S. rural communities have become more entrepreneurship-oriented, thus exhibiting a healthy acceptance of controversy in allowing risk-taking and a community willingness to tax itself to maintain infrastructures (Flora & Flora, 1990). Recently, the Taiwan government introduced various policies for diversifying agriculture (Chen et al., 2016). These nonconventional operations require an appropriately developed entrepreneurial capacity for recognizing market opportunities and optimizing rural resources.

Rural development is increasingly linked to entrepreneurship. Saxena (2012) indicated that entrepreneurial combinations of rural resources include tourism, sport and recreation facilities, professional and technical training, retailing and wholesaling, industrial applications (engineering, crafts), servicing (consultancy), value-added products (from sources such as meat, milk, and wood), and the possibility of off-farm work. New uses of land enable reducing the intensity of agricultural production (e.g., organic production) (Chia & Liang, 2016; Luna-Reyes et al., 2013). In other words, agrirural entrepreneurs can benefit from opportunities to use local knowledge and experience in exploring rural innovations, evaluating the latest economic developments, and creating new value in rural areas (Sareban, 2012). These entrepreneurs can also benefit from creative problem-solving approaches such as employing high technologies or engaging in global distribution and multinational operations for converting rural risks and environmental constraints into market opportunities (Estahbanaty, 2013).

Entrepreneurial alertness

In recent years, institutions and individuals promoting rural development have come to consider entrepreneurship a strategic development intervention that can accelerate the rural development process (Niemiälä, 2015; Saxena, 2012). Vigorous entrepreneurial activities offer rural economies many benefits; however, they are also extremely risky, ambiguous, and prone to failure. How entrepreneurs identify opportunities in fast-changing environments and how they engage in entrepreneurial efforts have inevitably become crucial challenges (Luna-Reyes et al., 2013; Omri & Boujelbene, 2015). EA concepts can be used to explain why successful entrepreneurs exhibit an increased sensitivity to and recognize market opportunities that have not yet been exploited by others (Gaglio & Katz, 2001). Such recognition is an ability

that agrirural entrepreneurs should develop, which can aid them in forming and actuating future prospects to be used in exploiting the recognized opportunities. Building on McMullen and Shepherd (2006), Tang et al. (2012) determined EA to comprise three dimensions: 'scanning and searching,' 'association and connection,' and 'evaluation and judgment.' This suggestion was applied in the current study.

When entrepreneurs encounter a tangible problem that cannot be resolved using existing organizational systems, they engage in a scanning and searching process, attempting to identify possible solutions. Shepherd and DeTienne (2005) indicated that 'scanning and searching' enables entrepreneurs to think logically and unconventionally, aiding them in establishing personal information databases and expanding their base of personal knowledge. The knowledge acquired through scanning and searching can be translated into an entrepreneur's ability to adapt to new situations. This ability undergirds people's absorption and digestion of external information, thus becoming accumulated experiences. McMullen and Shepherd (2006) suggested that these experiences represent the knowledge stored by an entrepreneur, which can be encapsulated within a specific field and used to benefit from lucrative business opportunities.

Entrepreneurs typically realize the potential of their observations by eliminating interference and concentrating on information details (Lumpkin & Lichtenstein, 2005). If the information is incomplete or biased because of incorrect information or a partial omission, associating enables entrepreneurs to adjust their current thinking and adapt to the mismatched information sources before formulating options and making unique connections (Gaglio & Katz, 2001). Entrepreneurs may spontaneously associate irrelevant information with each other by decomposing properties and forming new connections discovered through scanning and searching. Lumpkin and Lichtenstein (2005) explained that entrepreneurs rescanned and researched relevant information within the environment to verify the feasibility of these newly emerging connections.

After the aforementioned processes, entrepreneurs evaluate and judge the gained information pairs to ensure that the formulated ideas match their cognitive framework (Baron, 2006). The extent of evaluation and judgment allows entrepreneurs to discard uncritical messages and enhance their situational awareness. Entrepreneurs may also be required to evaluate, adjust, or reconsider relevant substitutes because additional information can aid them in formulating accurate evaluations and judgments that may lead to new business insights. Dutta and Crossan (2005) suggested that information reappearing most frequently may be more useful in evaluating and judging a framework that adequately explains and matches the new concept, thus

uncovering a business opportunity. In other words, 'evaluation and judgment' assists entrepreneurs in assessing their willingness to bear the risk and uncertainty of exploiting a particular opportunity (McMullen & Shepherd, 2006). In summary, for there to be an entrepreneurial opportunity, action must evolve from cues, gathered information, and evaluations (Tang et al., 2012).

Personality traits and entrepreneurial alertness

The five-factor model (FFM) is a widely accepted personality model (Ariani, 2013; Liu, Ip, & Liang, 2018), originated by Goldberg (1992). Thompson (2008) then developed the International English Big-Five Mini-Markers (IEBFMM) and confirmed the invariance of the FFM structure across different cultures. The FFM structure comprises the five dimensions of extroversion, openness, neuroticism, conscientiousness, and agreeableness.

Extroversion is associated with sociable, talkative, and self-assured behavior (McCrae & Costa, 1991). People exhibiting high degrees of extroversion typically enjoy interacting with people and sharing their ideas with others, thereby enabling a cross-fertilization of ideas. However, they can suppress impulses that are socially inappropriate (Wolff & Kim, 2012). By contrast, people who exhibit introversion are typically reserved, consistent, and prefer to process information internally (Van Der Molen, Schmidt, & Kruisman, 2007).

Openness is associated with preferring variety, exhibiting intellectual curiosity, and being attentive to broad-minded, reflective, flexible, and unconventional trends (Ariani, 2013; Janowski, 2018). People having high openness scores have an ability to absorb and combine new information, typically seeking a variety of experiences and exploring novel ideas (Baer, Oldham, Jacobsohn, & Hollingshad, 2008). By contrast, a person with a low degree of openness may behave in a conventional and unanalytical manner (Ariani, 2013).

Neuroticism is a tendency to experience negative emotional states, such as anxiety, depression, fear, sadness, and anger. People exhibiting high levels of neuroticism are prone to thinking irrationally, behaving impulsively, and applying poor coping strategies in stressful situations (McCrae & Costa, 1991). By contrast, people with low neuroticism scores are typically self-confident, calm, relaxed, and able to face stressful situations without becoming upset (Zhao & Seibert, 2006).

Conscientiousness refers to a person's degree of organization, self-control, hard work, active planning, and motivation in accomplishing goals (Barrick, Mount, & Judge, 2001). Highly conscientious people are responsible, reliable, ambitious, purposeful, and achievement-oriented. However, they may focus excessively on task accomplishment, causing them to adhere rigidly to

established thoughts and behaviors (LePine, 2003). People with low conscientiousness scores are less exacting in applying moral principles (Ariani, 2013).

Agreeableness is associated with being considerate, friendly, compassionate, warm, and willing to cooperate in conflict situations, in addition to preferring positive interpersonal relationships (Janowski, 2018). Although people with high agreeableness scores are unlikely to be preoccupied with avoiding confrontations and conflicts, they can be excessively self-effacing (Bernardin, Cooke, & Villanova, 2000) and might not claim credit for their contributions (Ilies, Johnson, Judge, & Keeney, 2011). By contrast, a person exhibiting low levels of agreeableness can be described as self-centered, ruthless, egocentric, and skeptical of other people's intentions (McCrae & Costa, 1991).

Several meta-analytic studies have determined strong associations between personality traits and entrepreneurship, indicating that entrepreneurs typically have high extroversion, openness, and conscientiousness scores and comparatively low neuroticism and agreeableness scores (e.g., Brandstätter, 2011; Zhao & Seibert, 2006). Shane et al. (2010) suggested that the trait of openness and the ability to recognize opportunities have the same genetic source. Furthermore, Lim, Lee, and Ramasamy (2015) determined that extroversion, openness, and conscientiousness are strongly associated with EA. In addition, previous studies have shown that the five FFM traits interact with each other, affecting perceived ability or behavior (Pease & Lewis, 2010; Swickert, Hittner, & Foster, 2010). Based on the aforementioned studies, the following three hypotheses were proposed:

H1: Extroversion, openness, and conscientiousness positively affect agrirural EA.

H2: Neuroticism and agreeableness negatively affect agrirural EA.

H3: Extroversion, openness, neuroticism, conscientiousness, and agreeableness interact with each other to affect agrirural EA.

Study 1: Exploratory factor analysis

Method

The participants in this study were agrirural entrepreneurs in Taiwan, serving as the calibration sample for testing the number of factors by using an exploratory factor analysis (EFA). The most appropriate structure of the EA scale was determined by this analysis results. Of the 341 participants, the majority (53.08%) was male; 22.87% did not have bachelor's degrees, 35.48%

had bachelor's degrees, and 41.65% had master's (and above) degrees; 16.13% ranged in age from 20 to 30 years, 25.81% ranged from 31 to 40 years, 34.31% ranged from 41 to 50 years, and 23.75% ranged from 51 and above.

Based on Tang et al. (2012), a 21-item EA assessment was developed by the researchers, which was scored by the research participants to determine the level of agreement with each EA item using a 6-point Likert-type scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Regarding the face validity of the assessment, three experts in the agrirural entrepreneurship field were invited to provide feedback. This scale was then completed by approximately 35 agrirural entrepreneurs to test its readability and flow.

The paper-and-pencil survey was administered at three conferences on agrirural entrepreneurship held in Taiwan during December 2014. Identical procedures were followed during each assessment and conducted by the researchers directly; hence, any problems faced by the participants when answering the questions could be resolved. Participation was voluntary, confidential, and anonymous to reduce the possibility of social desirability bias. The questions in this study did not include sensitive items that may have caused the participants to represent themselves dishonestly because of a desire for social acceptability. The participants had the right to review the results of their responses.

Results

Data were analyzed using SPSS Version 17.0. The measured items were organized by item analysis on the mean range of EA (3.66 to 5.12), standard deviation (0.770 to 1.191), skewness (-0.810 to -0.013), and kurtosis (-1.054 to 0.531) of the data acquired during the formal survey. To calculate the item discrimination, the means of the participants involved in the 27% bottom-top groups were compared through an independent samples *t*-test, indicating the significance level achieved. An item-total correlation test was then performed to check if any item in the scale was inconsistent with the averaged behavior, also indicating the significance level achieved. Cronbach's alpha reliability coefficient was then analyzed ($\alpha > .6$) to determine the reliability of the scale. The results of the aforementioned analyses showed that the measured items were appropriate.

In this study, the Kaiser–Meyer–Olkin measure was 0.947. Bartlett's test of sphericity was significant ($\chi^2 = 5826.038$, $df = 210$, $p = .000$). Both analyses showed that the sampling was sufficient to proceed to the factor analysis. A Principal Axis Factoring (PAF) analysis with Promax rotation was conducted to determine the dimensionality of the scale. The result showed that three-factor solutions (eigenvalues greater than 1) with explained variables of

65.239% provided the optimal factor structure. Accordingly, Factor 1 was labelled *scanning and searching* (Cronbach's $\alpha = .8486$); Factor 2 was labelled *association and connection* (Cronbach's $\alpha = .9128$); and Factor 3 was labelled *evaluation and judgment* (Cronbach's $\alpha = .9517$). The M, SD, and PAF results are listed in Table 1. The correlation coefficients between the three different factors ranged from 0.539 to 0.773.

Table 1. The M, SD, and PAF of the EA scale ($n = 341$)

Factor/item	M	SD	PAF
Scanning and searching	4.87		
I have frequent interactions with others to acquire new information.	5.06	.770	.502
I always keep an eye out for new business ideas when looking for information.	5.12	.798	.506
I read newspapers, magazines, or trade publications regularly to acquire new information.	4.78	.997	.520
I browse the Internet every day.	4.96	.948	.799
I am an avid information seeker.	4.59	1.082	.836
I am always actively looking for new information.	4.71	.935	.795
Association and connection	4.31		
I often make trips to government agencies to inquire about new business opportunities.	3.66	1.191	.751
I often make novel connections and perceive new or emergent relationships between various pieces of information.	4.38	.953	.614
I am more skilled than others at predicting how things will unfold.	4.46	.902	.500
I often think of new solutions after observing the problems of clients.	4.35	.929	.504
I always think outside the box.	4.67	.858	.716
I see links between seemingly unrelated pieces of information.	4.30	.970	.887
I am good at 'connecting dots'.	4.38	.930	.885
I often see connections between previously unconnected domains of information.	4.32	.970	.731
Evaluation and judgment	4.18		
Uncovering potential opportunities comes naturally to me.	4.37	.935	.637
I am particularly attentive to profitable opportunities.	4.29	1.114	.726
I experience a 'gut feeling' regarding potential opportunities.	4.27	1.091	.706
I can distinguish between profitable opportunities and not-so-profitable opportunities.	4.20	1.060	.965
I have an extraordinary ability to 'smell' profitable opportunities.	4.27	.999	.946
I have a knack for discerning high-value opportunities from low-value opportunities.	3.95	1.069	.793
When facing multiple opportunities, I am able to select the good ones.	3.90	1.075	.869

Discussion

Accordingly, the scale developed in the present study can be used for assessing the EA of agrirural entrepreneurs in Taiwan, based on three dimensions: 'scanning and searching,' 'association and connection,' and 'evaluation and judgment.' 'Scanning and searching' refers to the ability of scanning the environment and searching for new information overlooked by others. 'Association and connection' refers to the ability of pulling together disparate information for building coherent alternatives. Finally, 'evaluation and judgment' refers to the ability of making evaluations and judgments regarding the existence of profitable business opportunities.

Study 2: Confirmatory factor analysis and measurement invariance

Method

The same EA scale was administered in Study 2 during three conferences on agrirural entrepreneurship held in Taiwan in March 2015. Identical procedures were followed as Study 1. In Study 2, the participants were also agrirural entrepreneurs in Taiwan, serving as the validation sample for verifying the established structure of the EA scale, using a confirmatory factor analysis (CFA). Of the 411 participants, the majority (53.29%) was male; 23.84% did not have bachelor's degrees, 34.79% had bachelor's degrees, and 41.37% had master's (and above) degrees; 14.84% ranged in age from 20 to 30 years, 27.01% ranged from 31 to 40 years, 33.33% ranged from 41 to 50 years, and 24.82% ranged from 51 and above. Participation was also voluntary, confidential, and anonymous.

Results

Confirmatory factor analysis (CFA) with a maximum likelihood estimator was performed using LISREL 8.80 to test the factorial validity of the EA scale. The three-factor solution yielded an acceptable fit ($\chi^2 = 927.34$, $df = 186$, $p < .005$, $RMSEA = .085$, $SRMR = .060$, $CFI = .98$, $NFI = .97$, $TLI = .97$). The results of the CFA are illustrated in Table 2. The tests of reliability and validity are reported in Table 3.

Table 2. The confirmatory factor analysis of the EA scale ($n = 411$)

Item/Factor	Scanning and searching	Association and Connection	Evaluation and Judgment
1	0.53	0.50	0.81
2	0.61	0.75	0.85
3	0.64	0.79	0.90
4	0.65	0.76	0.85
5	0.76	0.84	0.88
6	0.85	0.88	0.86
7		0.89	0.82
8		0.86	

Table 3. The reliability and validity of the EA scale ($n = 411$)

Factors	Composite reliability	Measurement errors	Convergent validity (factor loadings)	Discriminant validity (confidence intervals)
1. Scanning and searching	.8449	.33 ~ .69	.56 ~ .82	$\phi_{1,2}$: .6016 ~ .7584;
2. Association and Connection	.9265	.18 ~ .87	.50 ~ .90	$\phi_{1,3}$: .4520 ~ .6480;
3. Evaluation and Judgment	.9496	.20 ~ .35	.80 ~ .89	$\phi_{2,3}$: .8008 ~ .8792

The analysis of the composite reliability estimates demonstrated that the EA scale had a strong internal consistency. In Study 2, the construct validity was examined in terms of convergent validity and discriminant validity. The convergent validity of each factor was tested by examining the standardized factor loadings. Factor loadings should be .50 or higher for the convergent validity to be achieved. The discriminant validity in this study was tested using confidence interval tests. If the confidence intervals did not include a value of one, discriminant validity was demonstrated. The results reported in Table 3 suggested that convergent validity and discriminant validity were assured.

The degree of measurement invariance of the EA scale across genders was further tested by the researchers. As shown in Table 4, configural invariance was supported. Whether different degrees of measurement were invariant across genders was then examined by the researchers, including factor loadings (metric invariance), response tendency (scalar invariance), factor covariance, factor variance, and error variance. Except for χ^2 and $\Delta\chi^2$, which are sensitive to large samples, other goodness-of-fit indices, including ΔCFI , which was proposed to test the measurement invariance, indicated that all models assuming different degrees of invariance were acceptable. The EA scale attained a high degree of measurement invariance across genders. The relationships of covariates with the three EA factors were also found to be invariant (structural invariance).

Table 4. The measurement invariance tests of the EA scale ($n = 411$)

Problem	χ^2	$\Delta\chi^2$	df	$RMSEA$	TLI	CFI	ΔCFI
Configural Invariance	1307.5072		372	0.1194	0.9479	0.9539	
Metric Invariance	1337.4434	29.9362	390	0.1178	0.9497	0.9533	-0.0006
Scalar Invariance	1370.0177	32.5743	408	0.1162	0.9512	0.9526	-0.0009
Factor Covariance Invariance	1384.5744	14.5567	411	0.1158	0.9509	0.9520	-0.0006
Factor Variance Invariance	1391.3298	6.7554	414	0.1156	0.9511	0.9518	-0.0002
Error Variance Invariance	1433.5986	42.2688	435	0.1142	0.9525	0.9508	-0.0010
Structural Invariance	1455.3056	21.707	438	0.1151	0.9519	0.9498	-0.0010

Discussion

In Study 2, a confirmatory factor analysis was conducted to verify the established factor structure of the previous study. The CFA results confirmed the three-factor solution of the EA scale across genders in Taiwanese agrirural entrepreneurs to ensure the quality of the assessment. A comparison of the scale used in Study 1 and Study 2 with that in Tang et al. (2012) indicates that four additional items were added to ‘association and connection,’ such as consulting with government sectors, predicting happenings, and observing client problems, indicating specific characteristics of agrirural work. Two additional items were added to ‘evaluation and judgment’ (natural born ability and attention to profits), also showing specific intrinsic and extrinsic attributes of entrepreneurship.

Study 3: Hypothesis testing and model building

Method

In Study 3, a web-based EA scale was developed and administered by the researchers during March 2015. The Survey Monkey tool was chosen to host this study because the program was easy to use and economical. The survey web address was sent by email which provided a convenient and immediate means of response for the participants. A list of 715 agrirural entrepreneurs was obtained from the Ministry of Agriculture in Taiwan. Phone numbers and email addresses of the researchers were provided on the scale. Therefore, problems encountered by participants when answering the scale could be resolved directly. The participants were asked to express their agreement levels regarding their EA. The results were delivered in aggregate and

anonymous form and the data remained private but could be shared with others if the researchers consented.

No particular incentives were offered for participation, accounting for the low participation rate ($336/715 = 46.99\%$). Of the returned emails, 331 were valid. The majority (54.68%) was male; 23.26% did not have bachelor's degrees, 33.54% had bachelor's degrees, and 43.20% had master's (and above) degrees; 13.90% ranged in age from 20 to 30 years, 28.40% ranged from 31 to 40 years, 33.23% ranged from 41 to 50 years, and 24.47% ranged from 51 and above.

Study 3 adopted the 40-item IEBFMM (Thompson, 2008), which were measured using a 6-point Likert-type scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). The IEBFMM items consisted of short phrases that were used to assess the traits associated with each of the FFM dimensions: extroversion (e.g., talkative, energetic, outgoing), openness (e.g., creative, intellectual, artistic), neuroticism (e.g., envious, anxious, jealous), conscientiousness (e.g., efficient, systematic, organized), and agreeableness (e.g., kind, cooperative, warm).

Results

Prior research has shown the five traits of FFM would interact with each other to affect perceived ability or behavior. Therefore, Hypothesis 3 was tested using LISREL 8.80. Simple slopes and regression lines for each level of the moderator were calculated to examine further the form of interaction for interpreting the interactive effects (Hayes & Matthes, 2009). The results revealed that only extroversion and openness interacted with each other to affect EA; hence, Hypothesis 3 was partially supported.

Accordingly, high levels of extroversion (high-EX) entrepreneurs perceived their EA in scanning and searching higher than low levels of extroversion (low-EX) entrepreneurs did, no matter under the conditions of high or low levels of openness. The low-EX slope was much steeper than the high-EX slope; showing that the difference between the effects of high-EX and low-EX on the scanning and searching decreased in response to increased levels of openness. When the level of openness was high, the interactive effect of the three levels of EX that influenced EA in scanning and searching approximated each other (Figure 1). The numbers on the axes of Figures 1–3 correspond to points on the Likert-type scales used in the current study. This means that the interactive effect of *openness by extroversion* for low-EX entrepreneurs was stronger than for high-EX entrepreneurs.

Regarding the interactive effect on association and connection, a similar pattern to that on scanning and searching was shown (Figure 2). Furthermore,

the interactive effect on evaluation and judgment also had a similar pattern except for the effect under high levels of openness. The data indicated that high-EX entrepreneurs perceived their EA in evaluation and judgment higher than low-EX entrepreneurs did at low levels of openness. However, at high levels of openness, the high-EX entrepreneurs perceived their EA in evaluation and judgment lower than low-EX entrepreneurs did (Figure 3). This indicates that the EA in evaluation and judgment of introverted entrepreneurs increases more quickly in response to their openness than that of extroverted entrepreneurs.

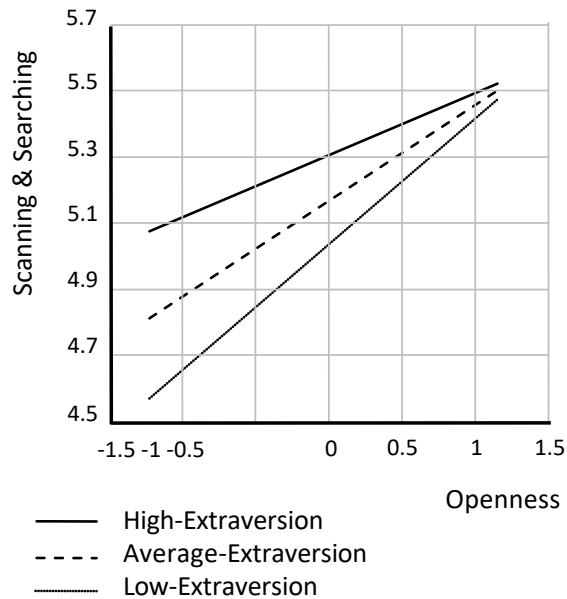


Figure 1. Plots of the *interactive effects* of openness and extraversion on EA in scanning and searching ($n = 331$)

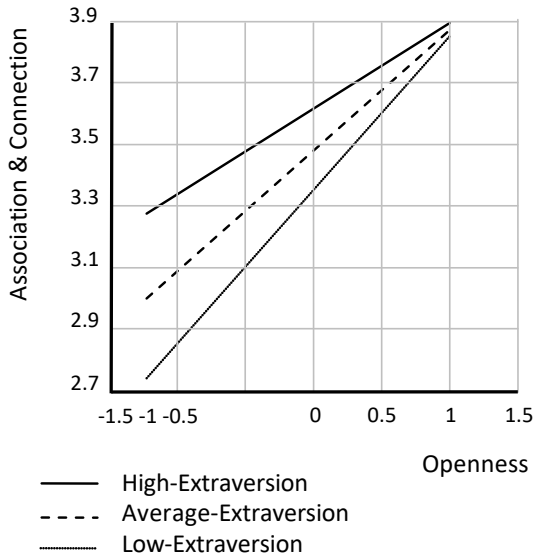


Figure 2. Plots of the *interactive effects* of openness and extroversion on EA in association and connection ($n = 331$)

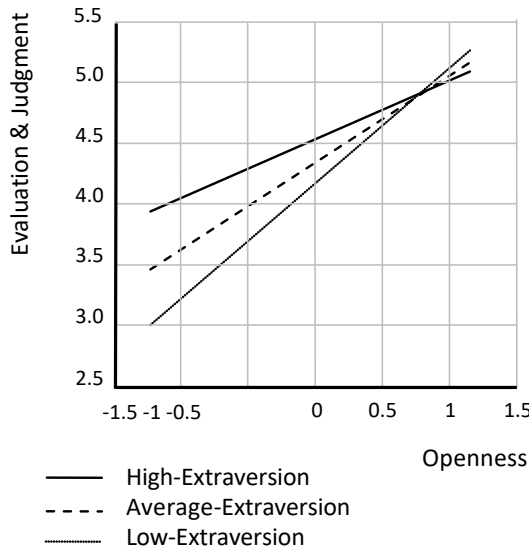


Figure 3. Plots of the *interactive effects* of openness and extroversion on EA in evaluation and judgment ($n = 331$)

Structural equation modeling (SEM) combined with maximum likelihood estimation was performed using LISREL 8.80 to test the hypotheses and build the structural model. The structural models were initially supported, but not all the variables were significantly associated with the three dimensions of EA. The researchers removed paths that were nonsignificant and subsequently revised the structural model (Figure 4). The revised model produced a model fit comparable to that of the initial model ($\chi^2 = 2121.14$, $df = 798$, $p < .005$, RMSEA = .078, SRMR = .071, CFI = .95, NFI = .92, TLI = .94).

The negative coefficients of ‘Openness X Extraversion’ mean that the effects of extroversion on the three dependent variables decreased in response to an increase of openness. In addition, the statistics suggested that extroversion and openness affected all the three dimensions of EA, whereas conscientiousness only affected the dimension of scanning and searching; thus, Hypothesis 1 was partially supported. Neuroticism did not have significant effects on any dimension of EA, whereas agreeableness only had a minor positive effect on the dimension of evaluation and judgment, indicating that Hypothesis 2 was not supported. The results of SEM explained a substantial level of variance for the dimensions of scanning and searching ($R^2 = .22$), association and connection ($R^2 = .30$), and evaluation and judgment ($R^2 = .35$).

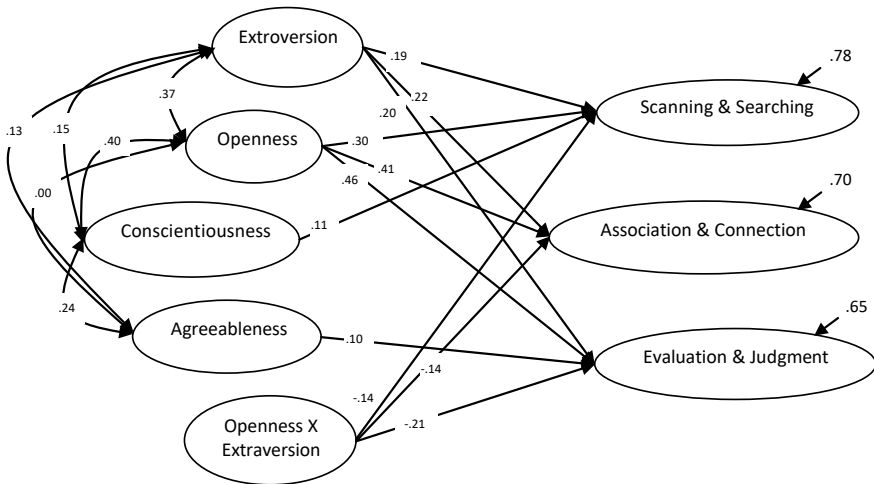


Figure 4. The structural model of personality traits on the EA of agrirural entrepreneurs ($n = 331$)

Discussion

People possessing openness are generally described as intellectually curious, broad-minded, and reflective, in addition to having active imaginations, a preference for variety, and an enhanced ability to absorb and combine new information. Their seeking of experiences and cognitive exploration explain why this trait strongly influences all of the EA dimensions. Extrovert people typically enjoy sharing their ideas with others, thereby enabling the cross-fertilization of ideas. They are competent in developing networks and seeking stimulation, explaining why this trait can also reliably predict all of the EA dimensions. Conscientious people tend to be responsible, purposeful, persistent, and achievement-oriented, which explains why conscientiousness positively influences the dimension of scanning and searching instead of the other two. The results lend additional support to the literature on entrepreneurship.

Agreeable people are described as being considerate, caring, and willing to cooperate in conflict situations, thus exhibiting a strong influence on the dimension of evaluation and judgment in the current study. Although this result somewhat contradicts prior research (being a robust predictor of team-based performance), this trait may serve as a facilitator for decision making in evaluation and judgment. In addition, although previous studies have concluded that this trait is unbeneficial to entrepreneurship, it was found to show a nonsignificant effect on every EA dimension, which may result from the factors affecting alertness differing from entrepreneurship or from measurement errors in the current study. Neurotic people tend to provide others with candid feedback regarding their actions. By logical inference, this trait can result in a positive impact on evaluation and judgment. The lack of significant associations in this study warrants further investigation.

Regarding interactive effects, the statistics revealed that extroversion and openness interacted to affect all of the EA dimensions. The data also indicated that lower levels of 'evaluation and judgment' were perceived in entrepreneurs with high EX and high openness than in entrepreneurs with low EX and high openness. The trait of openness has been a strong predictor of human creativity, which may lead to illegal or immoral decisions that harm entrepreneurial innovation and firm performance (Cropley, 2010; Del-Corte-Lora, Vallet-Bellmunt, & Molina-Morales, 2015). Extroverted people enjoy interacting with people and may compromise their judgment when excessive openness to others is involved.

GENERAL DISCUSSION

As discussed, improving agrirural entrepreneurship has currently become a worldwide agenda. Accurately recognizing and selecting market opportunities are considered critical abilities in an effective entrepreneur. However, EA is not a quality that agrirural workers widely possess. Because of this research gap, this paper presents a series of three studies that developed and validated an agrirural EA scale, in addition to testing the effects of entrepreneur personality on their EA levels. According to the results, EA can be assessed using three dimensions: 'scanning and searching,' 'association and connection,' and 'evaluation and judgment.'

'Scanning and searching' refer to the ability of constantly scanning the environment and deliberately searching for new information, changes, and shifts overlooked by others. 'Association and connection' refers to the ability of pulling together previously disparate information and building them into coherent alternatives, denoting how entrepreneurs respond cognitively to and process new information clues. Finally, 'evaluation and judgment' refers to the ability of making evaluations and judgments about the new changes, shifts, or information and deciding whether they reflect a business opportunity with profit potential.

The extent to which each dimension may be applied warrants further investigation. For example, because of its definition, EA has been treated as an entrepreneurial ability; however, does perceiving it as an entrepreneurial behavior change the investigation? By using measures of behavior observation or an action test, research may provide deeper insights into entrepreneurial performance than the current study did. Additional explorations may include an analysis of EA differences and dimensions in various domains (e.g., high technology, social welfare, health care, finance and banking), the practical implications of these differentiations, the factors influencing them, and how these factors may function differently at individual, team, organizational, societal, and global levels. Answering these questions may yield valuable insights for developing and operating agrirural enterprises.

Regarding traits that directly affected scanning and searching, openness was found to be the most influential trait, followed by extroversion and conscientiousness. In addition, openness and extroversion were identified to be traits that affected association and connection. Regarding evaluation and judgment, the traits of openness and extroversion remained dominant influences, followed by agreeableness. Although possible explanations and inferences were discussed, several uncertainties (e.g., neuroticism's lack of influence on agrirural EA, the positive effect of agreeableness on agrirural EA,

and the minor impact of conscientiousness and agreeableness on agrirural EA) warrant further investigation.

In addition, the results demonstrated interactive relationships between extroversion and openness on all of the EA dimensions. Information and evidence regarding the traits and their interactions can determine the EA dimensions that are crucial for the optimal deployment of human resources within an agrirural enterprise, which could maximize the contributions of the enterprise. In addition, many open questions require clarification, particularly regarding the contribution of intrinsic characteristics and contextual variables to the shaping of EA. For example, how do intrinsic characteristics, such as motivation, emotions, or self-efficacy, influence agrirural EA? How can these characteristics enhance entrepreneurial performance? What are the contextual variables, such as leadership, incentive system, team climate, and organizational culture, that affect agrirural EA? How do these intrinsic characteristics and contextual variables interact to influence agrirural EA? The answers to these questions can provide insights into employee recruitment, development strategies, and retention policies, in addition to elucidating organizational design, development, and management in agrirural enterprises.

This study contributes to entrepreneurship literature by theorizing and testing how the interaction of personality traits can benefit the EA of agrirural entrepreneurs. Although this study elucidates topics pertaining to entrepreneurial research, several study limitations should be mentioned. First, the self-reported scale, which was used to ensure the empirical validity and to simplify the survey administration process, may have caused common method bias. However, the study questionnaire contained no sensitive questions, and its consistency with previous studies supports the measures. This study adopted simple measures, selected the instruments carefully, and offered necessary feedback after the survey to reduce such bias and minimize this limitation. Second, only agrirural entrepreneurs who attended the conferences in Taiwan from December 2014 to March 2015 were included. The limited subject scope and investigation period may cause inevitable bias. Additional subjects and an extended survey period should be considered in future studies to expand the generalisability of the findings. Third, the perspectives of external organizations, such as farmers' associations and cross-industrial coordination companies, were not investigated in this study. Future studies should consider the different effects of internal and external perceptions regarding agrirural EA.

CLOSING REMARKS

Despite the global economic recession, agriculture remains the basis of socioeconomic development. Governments worldwide are actively formulating relevant policies to aid in the restructuring and upscaling of their agricultural industries. Providing essential guidance in agricultural entrepreneurship for diversifying rural regions should be the central concern. Recognizing and interpreting opportunities are the most crucial abilities that should be fostered and empowered in developing agrirural entrepreneurship, with the needs of related research being supported. Therefore, despite the aforementioned limitations, the results of the current study provide a new understanding of how agrirural EA can be assessed more practically and how the personality traits of entrepreneurs can predict various dimensions of agrirural EA.

During the research process of this series of studies, the researchers noted that an increasing number of younger people had devoted themselves to agrirural entrepreneurship in Taiwan. The younger agrirural entrepreneurs have exhibited increased EA, highlighting their entrepreneurial potential. Although developing agrirural enterprises in Taiwan remains at an early stage, people who have been working in this field can initiate a larger movement, thereby educating and inspiring Taiwanese society. The researchers believe that Taiwan will follow in the footsteps of successful agrirural enterprises in the West and enable innovators to have a socioenvironmental impact across Asia, contributing as a whole to a globally sustainable society.

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Abstrakt

Badania akademickie w zakresie przedsiębiorczości agrarnej i rozpoznawania szans są niewielkie. Z powodu tej luki badawczej przeprowadzono serię trzech badań, aby rozwinąć miarę czujności przedsiębiorczej (EA) w środowiskach agroturystycznych, która jest empirycznie ważna i łatwa w administrowaniu oraz analizuje, w jaki sposób cechy osobowości przedsiębiorców rolnych wpływają na ich EA. Wyniki pokazały, że zarówno ekstrawersja, jak i otwartość wpłynęły na wszystkie wymiary EA, podczas gdy sumienność wpłynęła tylko na skanowanie i wyszukiwanie, a ugodowość wpłynęła tylko na ocenę i osąd. Wyniki pokazały również interaktywne zależności między ekstrawersją a otwartością dla wszystkich wymiarów EA. Nasze wyniki zapewniają nowe zrozumienie, w jaki sposób EA można ocenić bardziej praktycznie i jak cechy osobowości mogą przewidywać różne wymiary EA agriruralnego.

Słowa kluczowe: przedsiębiorcy agriruralni, czujność przedsiębiorcza, cechy osobowości, rozwój skali.

Biographical note

Chaoyun Liang is a Professor in the Department of Bio-Industry Communication and Development, National Taiwan University, Taipei, Taiwan. He gained his Ph.D. degree in the Instructional Systems Technology program at Indiana University, USA. His research interests focus on: imagination & creativity, entrepreneurship & social enterprise, and agrirural communication & marketing. Professor Liang can be reached via cliang@ntu.edu.tw.

A methodical approach to the assessment of human resources` interactions

Anna Pereverzieva¹ 

Abstract

To our knowledge, there is a need to develop a methodological approach to the assessment of united communities` human resources` level of interactions, as a large group, and of separate structural unit`s – a small group. This allows us to determine the dependence of the level of interactions on the number of people who interact within a particular structure and the nature of the activity they carry out – intellectual or manual labor. The purpose of our research is to develop a methodological approach to the assessment of the level of human resources` interactions, which allows us to identify key areas and policy measures. Expert assessments and analytical dependencies are used as research tools in the article. These tools allow us to quantitatively determine the level of human resources` interactions for an individual entity. Empirical implementation of the proposed approach, using the example of two entities varying in size and nature of labor, allowed us to make a comparative analysis and to distinguish the characteristic features that are the basis for making managerial decisions. A manager acts as an expert who assesses the presence or absence of a particular event in the subordinate unit. The indicator, which characterizes the presence or absence of certain activities and the level of participation in them, is defined on the basis of managerial assessment. The next stage is to determine the interaction rate by means of certain mathematical dependencies and results` analysis. As a result of the research, we got the assessment of the level of human resources` interactions between two entities – a united community and a structural unit. The assessment revealed a dependence on the level of interactions on the entity`s size (small and large groups) and the nature of labor. The results showed that a structural unit, focused on intellectual labor and presented by a small group, has a greater level of interactions than a united community, which has a bigger size and a predominance of manual labor.

Keywords: *assessment, human resources, interactions, labor, synergistic effect.*

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INTRODUCTION

At the present stage of society's development, there is a dynamic increase in the significance of human resources for the economy as a whole, and for individual business entities in particular. This happens due to the impact of the level of knowledge and individual qualities aimed at obtaining a high level of performance. These are people who are perceived as the "element" that can create value, and only they can force the equipment to operate at the expense of their intellectual potential. Each person is characterized by certain abilities that give the possibility to perform the imposed functions and to participate in certain activities. The peculiarity in the process of maximal realization of human potential is that the individual abilities of a person can only be detected in the process of interactions with others – latent abilities. Only under these conditions will the available knowledge and abilities bring the expected result concerning individual development and business entity's success. This is also important for a manager since an efficient and united team envisages not only the automatic distribution of roles and labor functions but also the availability of interaction, collaboration, support and assistance on the way to the common goal. Knowledge accumulation is also the result of interactions, which manifests itself in the ability to benefit from the knowledge of other team members. However, one should not forget that team interactions might have a mixed impact on the activities' results, and can both increase and reduce them, for example, because of a conflict situation. Therefore, an important task for a manager is to ensure a high level of teamwork, as well as its support and development in the future.

The functioning of a particular team or group should be regarded as a certain system, all the elements of which are interrelated, and can either strengthen or weaken each other. According to a systemic approach, the issue of co-existence and interactions between people within a particular system becomes of particular importance, because the quality of these interactions depends on the success of the system's functioning and its future development. Any system has a certain set of elements that interact with each other. The result of these interactions is achieved on the basis of aggregate potential use, rather than the potential capabilities of its elements. On this basis, it can be stated that the whole is greater than simply the sum of its constituent elements. At the same time, the category "whole" refers to the system in general (an enterprise, a united territorial community), and "parts" are individuals and human resources. These words certify the fact that it is impossible to provide a high level of an enterprise's operation efficiency and to create a productive united territorial community without achieving a high level of interactions between human resources who act as a driving force.

Achievement of a certain synergetic effect is the consequence of interactions between system parts. It shows the nature and strength of interactions between a system's parts, for example, between human resources within united territorial communities. The synergetic effect is reflected in both positive and negative results, i.e., it characterizes the direction of interactions. The strength of interactions directly influences the system's development; that is, the stronger its elements are connected through the possibilities of co-existence; the greater the probability of successful development is.

In this study, united territorial communities and a structural unit (university department) are considered as systems. In this case, a community is an example of a large group with a predominance of manual labor, and a structural unit is an example of a small group with domination of intellectual labor. Let us substantiate the need to take into account the level of human resources' interactions for communities.

The formation of united territorial communities means the implementation of a national decentralization policy aimed at increasing the efficiency of a national economy's functioning and raising the living standard of the population by redistributing powers and financial resources and involving citizens in management. Herewith, the issue is the formation of efficient territorial communities whose functioning depends to a large extent on resource provision, among which the key role belongs to human resources: not only to determine the real possibilities of a territorial community which can meet its own needs but also to form potential opportunities for future development. Any territorial community at the beginning of its formation faces a significant number of obstacles, directly related to human resources. The most important are the deficit of human resources with relevant qualifications, low levels of motivation, a lack of substantial participation in a community's life, and other issues that require optimal solutions. These problems cause the necessity to study and evaluate the level of interactions between a community's human and labor resources.

A positive synergetic effect should be achieved inside united territorial communities, as it affects the community's ability to accomplish common goals. After all, as economic facts show, communities are formed on the basis of certain criteria defined by law, that is, there is a significant level of conventionality regarding their formation. Therefore, for the united territorial communities, it is important to achieve only a positive synergistic effect that will allow them to evolve in the future. If a negative impact of synergy is detected, it is necessary to provide the tools to increase the impact of human resources' interactions within the community. Tools' development, aimed at enhancing the interactions between human resources, is an integral

part of the process of a socio-economic system's management, i.e. a united territorial community.

The analysis of the level of a structural unit's (university department) human resources' interactions is of a small group with a domination of intellectual labor. This lets us determine whether there is a correlation between the level of human resources' interactions and the group size and its type – either direct or inverse, as well as a correlation between the levels of interactions in teams engaged in manual or intellectual labor, that is, differences caused by the nature of labor. Teams characterized by intellectual labor have considerable intellectual potential and, as a rule, it is difficult for them to find a common point of view because of the unwillingness of some team members to meet halfway, or to walk a thin line, to take consensus. However, if there is a high level of interactions, the process of finding a common point in the team of “intellectuals” is successful. This directly affects the activities' outcomes both of a separate unit (element of system), and an organization in general (system).

The level of interactions affects activity outcomes and supposes the application of measures for their future adjustment based on the human resources management policy by increasing the level of interactions between them. The development of measures to enhance human resources' interactions is an integral part of the process of socio-economic systems' management, namely a united territorial community and a structural unit. The methodical approach proposed in the study allows us not only to quantify the level of interactions on the basis of the coefficient's calculation, but to identify the “weaknesses” that reduce the strength of interactions and “strong points”, which are the background for the successful co-existence of a community's and structural unit's human resources.

The aim of this study is to determine the methodological approach to the assessment of human resources' interactions. This approach is universal, as it can be used for various economic actors both at macro- and micro-levels – enterprises, united territorial communities and others. The peculiarity of using this approach with united territorial communities is to achieve a high level of interactions not by the number of community members, but by the intensification level of their participation in joint activities and projects. That is, a high level of interactions can be achieved in big groups too. It depends on the effectiveness of human resources management methods in the community and the level of self-organization. Comparative analysis with the level of human resources' interactions within a structural unit allows us to state the fact of its dependence on the team size – a small group or a large one. Besides, the nature of labor – intellectual or manual was considered as

the determinant affecting the level of interactions. To carry out the research and justify the obtained results, we will consider several hypotheses.

We propose the following hypotheses for testing:

H1: There is a relationship between the level of human resources interactions and the group size (co-workers, association of people), the nature of which may be determined by the ability to self-organization and management system`s features.

H2: The level of team interactions based on intellectual nature of labor, which is determined by the more active participation of human resources in group`s activities, than in associations with the predominance of manual labor.

H3: the level of interactions affects the results of the entity`s business due to the positive effects of synergy

LITERATURE REVIEW

Amid increasing instability of economic development, raising the level of economic entities` efficiency is a matter of current interest as their functioning depends to a large extent on resource provision, among which the key role belongs to human resources, which not only determine the real possibilities of functioning but also form potential opportunities for their future development. In particular, the true capabilities of a business entity can be determined by quantitative indicators, but potential can be determined by a human resources` interactions` rate, which is one of the priorities of an entity`s effective development and operation. "Interactions" are considered from a theoretical point of view within the framework of interdisciplinary analysis by scientific literature (Figure 1). Practical elements of interactions are investigated by scholars in terms of their impact on the business entity`s performance (productivity, creation and implementation of innovations). Besides, on the basis of factors analysis they affect the strength of interactions between people (presence of a certain team leader, the psychological need of a person to be "included" in a certain group, the involvement of temporary workers, the appearance of "stars" in a team, staff turnover, doing "standard" tasks, etc.).

Study of the theoretical aspects of the “interactions” category

The concept of “interactions” arises and causes considerable interest among scholars within the framework of a modern paradigm – Synergetics, which examines complex systems that consist of a large number of components or subsystems, in other words, details interacting with each other in complex ways. The word “synergetics” means “joint action,” emphasizing the coherence of the parts` functioning, which is reflected in the behavior of the system as a whole (Melnikov, 2014).

In the functioning of business entities, scientists single out the following types of synergies: structural, functional and administrative:

- structural synergy originates from the organization’s structure, and depends on the available information flows, the intergroup relationships and their positioning relative to each other. The main condition for structural synergy development is the presence of a culture in which group behavior rules take into account the individual needs of team members, systematic conflict situations prevention is implemented, there is an openness to group work, and there is a clear understanding of the value of teamwork to achieve the overall final result;
- functional synergy is balanced interactions of team human resources based on common goals, consonance of interests, and the introduction of innovations;
- administrative synergy determines the external impact on a group or team.

The concept of “interactions” is the object of research within the framework of interdisciplinary analysis. Each of the fields of science provides its own definition of this category (Figure 1).

The definitions` analysis in the context of separate fields of knowledge shows that the common understanding for all interpretations is the explanation of “interactions” through the way of mutual influence, liaise and unity, which makes it possible to achieve results with fewer resources than the efforts required to attain a goal individually. We analyze the definition of “interactions” according to the approach to categories structure proposed by Starostina (2011). This approach implies that the constituent elements in a category`s construction should be “essence,” “ structure “ and “result.” The element “essence” answers the question “what?”, “structure” - “how? whence?”, and “result” - “for which reason?”. Table 1 represents the construction of the category “interactions” in terms of the proposed approach.

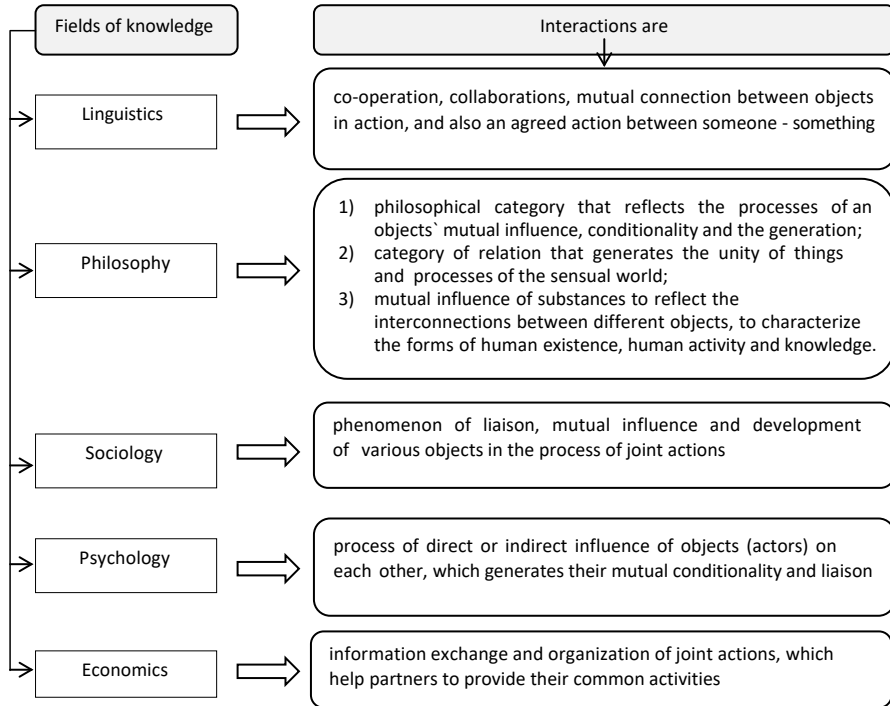


Figure 1. Definition of the category “interactions”

Source: adopted from Gonchar (2008), Morozov (2015) and Gornostai (2015).

Most of “interactions” definitions are incomplete, as they contain two of the three necessary elements regarding the approach to categories construction. When studying the essence of the “interactions” category, it should be noted that from the Linguistics point of view, this category is defined as a mutual connection, while Philosophy defines it as the impact of one object on another. The definition of “interactions” from the Sociology and Psychology points of view combines both relations and influence simultaneously. Economics defines interactions as a process of organizing joint actions that allow us to reach a certain result. While there is considerable interest in such a concept as “interactions” within various disciplines, it indicates the existence of this phenomenon and its importance in various spheres of human activity. Because a person is a part of a particular environment, the question of interactions with others to maximize self-realization and achieve a collective success arises.

Table 1. Construction of the category «interactions»

Field of knowledge	«essence»	«structure»	«result»
Column 1	Column 2	Column 3	Column 4
Linguistics	co-operation collaboration	mutual connections between objects in action, and also an agreed action between someone - something	-
Philosophy	philosophical category	reflects the processes of objects` mutual influence, conditionality and the generation that generates the unity of things and processes of the sensual world	-
	category of relation		-
	mutual influence of substances	-	to reflect the interconnections between different objects, to characterize the forms of human existence, human activity and knowledge
Sociology	phenomenon of liaison, mutual influence and development of various objects	in the process of joint actions	-
Psychology	the process of direct or indirect influence of objects (actors) on each other	which generates their mutual conditionality and liaison	-
Economics	information exchange and joint activities arrangement		helps partners to implement some joint activity

Source: adopted from Gonchar (2008), Morozov (2015) and Gornostai (2015).

Contemporary empirical studies of human resources` interactions

In addition to the definition of theoretical foundations of interpersonal interactions, an important role is played by modern empirical research. In scholars` studies, the concept of “interactions” is considered from the point of view of the determinants that influence the formation of a human-coexistence environment, their relationships with each other and the outcomes. One of

the most important determinants` influencing human resources` interactions within a certain system (enterprise, its structural unit, etc.) is the existence of a leader in a particular group. Studies reveal the impact of a leader`s personal psychological qualities on a team`s functioning and development (Liborius, 2017) and his/her role in ensuring conducive working conditions (Brimhall et al., 2017). Qualities also include age, education, and other individual leader`s characteristics (Kearney & Gebert, 2009). Scientists emphasize that the creativity of a leader can be channeled on team characteristics (Gibson, Cooper, & Conger, 2009; Tse, To, & Chiu, 2018). At the same time, the role of the leader in increasing the level of interactions can be both positive and negative. Studies by Lopez (2018) show a negative leadership influence on employees` interactions. This is explained by its advantage in managing time distribution, determining improvement trends, and not taking into account the opinion of others. Three types of leadership are distinguished: moral, benevolent and authoritarian (Lin & Sun, 2018). Studies showed that moral leadership has the greatest impact on interactions, and authoritarian has the least. In our opinion, this confirms the change in an individual`s role, his/her values and social attitudes. This causes the necessity to formulate the concept of human resources management based on the increased level and strength of interactions. In this regard, the question of an individual`s increasing significance arises, giving him/her the “voice,” which facilitates the intensification of information exchange and, accordingly, inter-person and inter-leader interactions (Cumberland, Alagaraja, Shuck, & Kerrick, 2018). Besides, scholars note that it is necessary to differentiate situations that require “voice” or “silence,” as well as to understand the possible consequences (Morrison, 2011).

Hirst and van Dick (2009) proved the serious influence a leader`s motivation has on teamwork, creativity and creative work. The researchers also identified a direct dependence between a leader`s motivation and team creativity based on his/her trustworthiness among others. An important role is played by inter-group leadership, which promotes not only interactions and productivity within a group of people but also within other teams (Hogg & van Knippenberg, 2012).

Social psychology considers interactions between people as a need for “inclusion” in a particular group and differentiation in it (Leonardelli, Pickett, & Brewer, 2010). The sense of belonging to a particular team increases work efficiency (Mitchell, Parker, & Giles, 2011). It reduces the level of antagonism and increases the chances of conflict solving (Somech, Desivilya, & Lidogoster, 2009). Interactions can also be affected by the so-called “psychological contract” in a team, that is, clearly defined principles of establishing team relationships (Bingham, Oldroyd, Thompson, Bednar, & Bunderson, 2014).

Studying interactions between executives (managers) and employees, scientists have proved that the greater the quality of interactions between executives and employees, the higher the quality and work productivity of the latter (Zanozovska, 2017). There are interesting research studies on the impact of executives' managerial humor on teamwork (Wijewardena, Härtel, & Samaratunge, 2017). Humour is an event run by managers in order to provoke a positive emotional reaction from employees and create an appropriately favorable working environment. It was confirmed that a noticeable level of interactions with a manager engenders a positive staff response to humor, and vice versa. In addition, a manager's behavior and support that helps form the staff's attitude to work also play a substantial role (Teoh, Coyne, Devonish, Leather, & Zarola, 2017). In turn, this contributes to greater team interactions and increases the level of job satisfaction. Russell et al. (2018) also considered the key role of a manager in the regulation of inter-person relationships. Within the dynamic management theory, the influence of managerial abilities on human interactions and the ability to regulate it, taking into account the dynamism of the environment and the need to respond promptly to changes, is considered (Martin, 2011; Helfat & Martin, 2015; Helfat & Peteraf, 2015).

Examining the role of inter-person interactions, scholars determine that the higher the level of interactions in a team, the less the impact is on human behavior and the results of stress caused by work overload and interpersonal conflict (Pooja, De Clercq, & Belausteguigoitia, 2016). Positive influence also manifests itself in the level of employees' complementarity (Ethiraj & Garg, 2012). In such cases, three aspects determine the level of complementarity: the nature of interactions, the dominance of team members and its structure. Scholars proved that the higher the level of inter-person interactions, the more team members focused on teamwork, the higher the level of complementarity is. If certain team members are on the front foot, this leads to a decrease in the level of complementarity. This is ensured by the dynamism of the team, in which members can easily move within and outside their group (Dibble & Gibson, 2018; Faraj & Yan, 2009).

Labor motivation is important for human resources management (Glaz & Rusetskaya, 2017; Keizer, 2017; Bridoux, Coeurderoy, & Durand, 2017). Scholars, investigating the influence of internal and external motives, concluded that interactions as the internal motive promote the intensification of innovation activity by high rates of progress. Adequate remuneration, which also contributes to the creation of innovations through the mitigation of the negative impact of labor intensity, is figured to be among the external motives (Delmas & Pekovic, 2018). Analyzing the impact of employees' interactions, which is manifested in knowledge sharing and job satisfaction, a group of

researchers demonstrated an increase in the level of innovativeness in the service sector (Okoe & Boateng, 2018).

To implement the innovation activity, a team should create an idea and implement it. Research shows that the levels of interactions at these two stages are different: the creation of an idea is characterized by the lower level of interactions due to traditional methods, and implementation is characterized by high interactions of people, as it involves the application of new creative approaches (Huang, Gibson, Kirkman, & Shapiro, 2017). Somech and Khalaili (2014) studied a group's ability to innovate activity based on its structure and reflexivity (Schippers, West, & Dawson, 2015). Salvato and Vassolo (2018) emphasized the leading role of human resources in the organization's activities and interactions between them in their scientific works. Scientists confirmed that the ability to use interactions makes it possible to build high-quality organizational relationships. This greatly enhances its innovative potential in a dynamic environment and improves operational efficiency. This gives priority to the need for interactions not only within one group of people but cooperation between groups – intergroup interactions (Litchfield et al., 2018). Based on empirical research, Hülshager, Anderson and Salgado (2009) found a direct correlation between team creativity and innovation activity. The obtained results showed that the level of team creativity is higher than individual creativity; thus a team's ability to create and introduce innovations increases. Kostopoulos et al. (2009) explain the benefits of interactions and teamwork based on the fact that the effectiveness of team learning and its impact on efficiency is higher than in the case of individual training. Also, it was found that teamwork and reciprocity have a positive impact on productivity (Mortensen, 2014). The results of Huckman, Staats and Upton (2009) demonstrated that the intensity of human interactions, for example, the execution of joint projects, has a much greater effect on performance than other determinants such as existing work experience.

Scholars specify hiring temporary workers to teamwork as one of the methods of increasing the level of interactions and its strength (Tempest, 2009; Wilkin, de Jong, & Rubino, 2018). At the same time, the impact analysis of this type of worker on the main team structure proves the lack of fundamental changes in the efficiency of group as a whole (Banerjee, Tolbert, & DiCiccio, 2012). The impact of “standardized” tasks on the level of intergroup interactions was determined as scientifically valid and empirically proved (Rousseau & Aubé, 2010; Cohen, Levinthal, & Warglien, 2014). The more standard the task, the higher are the viability of a team and its effectiveness. In our opinion, this pattern depends on a team's peculiarities, because, as a rule, the very “non-standard” creative tasks contribute to the efficiency of teamwork and increase the strength of interactions. Scholars admit when

determining the impact of teamwork on a company's performance that it is necessary to take into account its industry specificity and the nature of the labor (Gaisina et al., 2017), as well as a team's heterogeneity or similarity, i.e. the group's structure (Drach-Zahavy & Somech, 2010; Bell, Villado, Lukasik, Belau, & Briggs, 2011). Faraj and Yan (2009) studied, from the point of view of psychological interactions, the possibility of coexistence within a team, whilst others found that changes in group structure affect the level of interactions between its members, and their performance in general (Fang, Lee, & Schilling, 2010).

Analyzing the peculiarities of a human resources management policy that form a particular team, scholars point out that effective management is determined by the ability to work in a team and interact with each other. This allows them to obtain new opportunities for both team development and the enterprise as a whole (Edmondson & Nembhard, 2009; Gibson & Dibble, 2013). The important attribute is the sustainability of team members' interactions. In addition, it should be taken into consideration that accepting a "freshman" into a team may have an ambivalent impact on interactions. Therefore, the problem of team and individual adaptation arises (Rink, Kane, & Ellemers, 2013). Considering the features of team interactions, scholars highlight such essential attributes as conscientiousness, emotional stability and the acceptability of relationships, and that these attributes of interactions are related to a company's financial performance (Schneider & Bartram, 2017).

The real obstacle to effective interactions between employees is the so-called team "star" (Chen & Garg, 2018). The "Star" is an employee who differs from others by a significant level of success over a long period of time (Call & Nyberg, 2015). In this case, the organization of teamwork and interactions is rather complicated. Scholars consider that the temporary suspension of a "star" from work for a certain time could be the solution to this issue. Studies showed that the absence of a "star" allows a team to reduce dependence on this employee and improve teamwork performance through interactions. Improvement in teamwork contributes to increased productivity, even if the "star" returns. In our opinion, "stars" as team members cause negative consequences in terms of interactions between people and may lead to the formation of separate groups, which ultimately reduces an enterprise's performance. On the other hand, the "star's" success may become a powerful motive to intensify the efforts of others. Grigoriou and Rothaermel (2014) distinguish two kinds of "stars": those that are able to unite people - "connectors" and, conversely, those who weaken interactions - "disconnectors". "Connectors" have a positive influence due to their ability to improve productivity around themselves. Another factor

that negatively affects the level of team interactions is staff turnover (van der Vegt, Bunderson, & Kuipers, 2010).

Analysis of the “interactions” theoretical and empirical aspects proves the necessity of taking this phenomenon into account in the activity of any business entity, as it is directly related to the relationships between people. Being aware of the level of human resources interactions allows us not only to state the presence or absence of coordination and essential connections but also to define the “portfolio” of management tools and measures that increase the strength of these interactions and obtain expected results in the future.

RESEARCH METHODS

It is difficult enough to assess quantitatively qualitative aspects related to human activity, which involves interactions between people. This is due to the peculiarities of each business entity’s activity, which requires an individual approach to assessing the level of human resources’ interactions. Therefore, in this manuscript, we propose the methodological approach to assessing the level of human resources’ interactions for a community as a large group with manual labor domination and a structural unit (university department) as a small group with intellectual labor domination. Certainly, this approach can be used by other business entities and allows one to reveal the features of human resources’ interactions, taking into account certain characteristics (size of a business entity, number of human resources, activity type, nature of labor, etc.). The assessment of a human resources’ interactions level will be made using the example of a community and a structural unit. Let us consider consistently the determination of the interactions’ level for each business entity. The main tool of the study is the method of expert assessment and application of certain mathematical dependencies to determine the coefficient of interactions, which involves the implementation of the system of actions:

- definition of activities, which exist in the community. Determined by an expert as a head;
- evaluation of human and labor resources’ participation in certain events according to the introduced scale;
- calculation of the coefficient of a community’s human and labor resources interactions using mathematical dependencies;
- calculation of the adjusted interaction coefficient taking into account the number of participants in a particular activity on the basis of the proposed analytical toolkit.

Let us consider in more detail the sequence of estimation of the level of human and labor resources’ interactions of united territorial communities. We consider in detail the steps of the algorithm to assess the level of interactions

between human and labor resources of united territorial communities. To quantify the level of human resources interactions within a united territorial community, it is possible to use the coefficient of interactions (k_j), which has a synergetic effect for the functioning and development of a territorial community. The coefficient (k_j) takes into account the level of community members' interactions and simultaneously acts as a multiplier. The strength or quality of these interactions leads to a synergistic effect. That is, the total human potential of the entire territorial community is not just the sum of each community members' potential, but may either be increased (strengthened) through collaboration, or reduced (weakened), for example, by conflict situations.

The assessment of the coefficient could be made for human resources in general, that is people who are community members, and for a specific group of employees. We distinguish these two groups for a community, as employees tend to have limited time resources and are not inclined to participate in activities that unite people within a particular institute and facilitate their interactions. We offer a methodical approach to estimation of the coefficient of interactions, which takes into account the extent of community members' participation in its activities.

A list of N activities in which community members may take part is determined ($k_j = \overline{1, M}$), where M – number of entities studied according to the coefficient of human resources' interactions. It characterizes the quality of community members' interactions. Participation in each activity will be evaluated using a scale:

The total coefficient of interactions is determined by the formula:

$$k_j = 1 + \frac{\sum_{i=1}^N d_i}{N}, \quad (1)$$

where $d_i = \begin{cases} 1, & \text{there is a community activity in which community members} \\ & \text{participate;} \\ 0, & \text{do not participate;} \\ -1, & \text{there are no activities in the community} \end{cases}$

The head of a community acts as an expert who assesses coefficient d_i . Information about community members' participation in a particular event is recorded during its arrangement. This can be done by providing some attributes for the participants. To do this, you need to calculate the difference between the maximum number of required attributes and the amount of attributes provided to the participants. This allows one to determine the participants of the event. Besides, one can apply polling. It should be noted that attributes also contribute to the participant's self-identification

as a united team member and the awareness of his/her importance in its functioning and development.

When determining the coefficient of interactions within united territorial communities, it is advisable to take into account the number of participants of a particular activity. As was mentioned above, what should also be taken into account is the participation of human resources in general and employees as well, considering their limited time and their passive participation in the activities.

The adjusted coefficient of interactions which includes the number of participants:

$$k_j = 1 + \overline{Q_{HR_l}} \times \frac{\sum_{i=1}^N d_i}{N}, \quad (2)$$

where $\overline{Q_{HR}}$ – the geometric mean value of a united territorial community's human resources' share, who participated in the activities

$$\overline{Q_{HR_l}} = \sqrt[N]{\prod_{i=1}^N \frac{HR_i}{HR}}, \quad (3)$$

where HR – total number of community members, persons;
 HR_i – number of community members, who participated in the activities, persons;
 N – number of activities, for which $d_i = 1$.

Consider the calculation of the adjusted coefficient of interactions for labor resources. The adjusted coefficient of interactions considers the number of participants

$$k_j = 1 + \overline{Q_{LR_l}} \times \frac{\sum_{i=1}^N d_i}{N}, \quad (4)$$

where $\overline{Q_{LR}}$ – the geometric mean value of a united territorial community's working population share, who participated in the activities

$$\overline{Q_{LR_l}} = \sqrt[N]{\prod_{i=1}^N \frac{LR_i}{HR}}, \quad (5)$$

where HR – total number of community members, persons;
 LR_i – number of a community's working population, who participated in the activities, persons;
 N – number of activities, for which $d_i = 1$.

To calculate mean values $\overline{Q_{HRi}}$ and $\overline{Q_{LRi}}$ we do not use an arithmetic mean, but a geometric mean formula. The geometric mean allows considering both high and low values of the indexes, whereas the arithmetic mean allows compensating low values by high ones. The last does not provide a fair assessment.

Taking into account geometric mean values $\overline{Q_{HRi}}$ and $\overline{Q_{LRi}}$ allow us to determine the number of people who took part in certain activities. We can assume that the more the number of participants in a particular event, the higher is the probability of interactions between them. It can happen through mutual communications during direct participation in the event or in the process of future communications – when meeting and recollecting participation in a particular event. This contributes not only to greater the level of interactions, but also increases the group members' openness rate through mutual communications and maintaining contacts.

Increasing frequency of communication deepens the level of group members' awareness and raises the level of openness to each other. It should also be noted that if a person is open to a certain group, then the probability of increasing the level of openness to each member of this group is higher, due to the sense of belonging to a certain group. On the contrary, if a person is "closed" relative to a group, the probability of openness to a group member decreases. If a person is a potential participant of a particular group, then on the basis of openness to the group it can be stated whether he/she can become a full team member and develop successfully in it, or, on the contrary, there is an increase in the distance between a person and a team, the level of "closeness" increases, even if there is a significant level of openness with at least one member of this team. That is, it is the group's openness and interactions that determine its ability to attract new members and to succeed through the harmonious coexistence of human resources within a particular environment. Features of the work environment are determined by the dominance of human resources that are close to certain psychological characteristics, the similarity of characters, the type of temperament or socio-psychological orientations that manifest themselves in attitudes to work and money, the focus on activities or processes, altruism or selfishness, submissiveness or freedom. The level of human resources' interactions within a certain group with a significant degree of similarity of these characteristics is much higher.

ANALYSIS AND RESULTS

To conduct comparative analysis and distinguish the features of interactions, we applied the proposed approach to two entities: a united territorial community as a large group, whose members are mainly involved in manual labor and a structural unit (university department), whose labor resources form a small group and do intellectual work. This makes it possible to distinguish two criteria for comparing the level of interactions: the group size and the nature of labor. The practical application of the proposed approach involves a procedure, that is, a certain action plan (Figure 2).

STAGE 1	Information classification concerning the activity list and the number of participants	
STAGE 2	Determination of coefficient d_i based on expert assessment (the communities or department heads act as the experts)	
STAGE 3	Determination of the coefficient of interactions k_j for the community members (large group with a manual nature of labor) and department unit's team (small group with an intellectual nature of labor)	
STAGE 4	Determination of the type of correlation between the levels of interactions based on certain criteria: the group size and the nature of labor based on a comparative analysis of the obtained results	

Figure 2. Stages of regional economic structure development according to the evolutionary approach

The presented procedure for estimating the level of human resources' interactions consists of three stages (Figure 2). During the first stage, classification of information concerning activities and the number of participants is implemented in order to provide it to the expert as the head of the community or the unit. The second stage involves determining the coefficient d_i . During the third step, the coefficient of interactions k_j for the communities members (large groups with a manual nature of labor) and the structural unit's team (small groups with intellectual labor) is calculated. The last stage of the procedure means conducting a comparative analysis of the obtained results in order to determine the nature of the level's dependence on the group size and the nature of labor. The importance of analyzing the level of interactions is determined by its meaning, both for the community with a large amount of human resources and for a small team.

Interactions play a key role in the functioning and development of united territorial communities, because:

- the interactions result in achievements that are unattainable for one person because the potential of the team is much bigger than the sum of potentialities of each of its members;
- the sustainability of interactions during the time a territorial community exists. Thus, it becomes possible to have a joint influence on each other, which leads to the setting of common goals and interests, real awareness of this community and the integrity of factual actions.

Interactions of communities' human resources' contribute to the emergence of a synergetic effect. It is explained by obtaining an additional result from the close co-ordinated interactions of individual parts of a system.

The study focuses on interactions between human and labor resources because the proposed methodical approach considers time expenditures for participation in certain activities. As a rule, labor resources, due to a lack of time, do not actively participate in joint activities. Therefore, there is a scientific interest to calculate the coefficient of interactions for human and labor resources separately. The coefficient of interactions for communities and structural units are calculated in turn: first for communities, and then for structural units. Then, comparative analysis according to the distinguished criteria: the group size (large, small) and the nature of labor (manual, intellectual) are conducted. We consider the example of calculation of the coefficient of interactions for an ordinary united territorial communities. Data about community members' participation in its activities are shown in Table 2.

Analysis of the coefficient of interactions calculated for three communities proves that the community with the least amount of human resources - 1130 people – has the highest value. The coefficient of interactions for this community is 1.28 for active participation of human resources in general and 1.12 for labor resources. That is, the interactions between human resources are determined by their total number and level of involvement in teamwork. It is commonly believed that the association of people with a small number of human resources has a higher level of interactions than large groups. Such a result is achieved by self-organization. The largest territorial community has the lowest coefficient of interactions in terms of human and labor resources – 1.07 and 1.05, respectively, which can be explained by difficulties of large groups' organization, structuring and management.

Table 2. Data of an «ordinary communities» to calculate the coefficient of interactions

Activities	d_i	Number of community residents (HR), persons	Amount of human resources, participated in the event (HR _i), persons	Number of employees who participated in the event (), persons		
Ordinary community 1						
Column 1	Column 2	Column 3	Column 4 persons	share	Column 5 persons	share
1. Community day	1	1250	560	0.448	410	0.328
2. Contest «The best community»	-1	-	-	-	-	-
3. Sport competitions	0	-	-	-	-	-
4. Joint projects	1	1250	480	0.384	300	0.24
5. Purity day	1	1250	460	0.368	320	0.256
Geometric mean value	0.4			0.399		0.272
Ordinary community 2						
Column 1	Column 2	Column 3	Column 4 persons	share	Column 5 persons	share
1. Community day	1	1420	670	0.472	530	0.373
2. Contest «The best community»	0	-	-	-	-	-
3. Sport competitions	1	1420	380	0.268	254	0.179
4. Joint projects	-1	-	-	-	-	-
5. Purity day	0	-	-	-	-	-
Geometric mean value	0.2			0.356		0.258
Ordinary community 3						
Column 1	Column 2	Column 3	Column 4 persons	share	Column 5 persons	share
1. Community day	1	1130	620	0.549	312	0.276
2. Contest «The best community»	0	-	-	-	-	-
3. Sport competitions	1	1130	540	0.478	180	0.159
4. Joint projects	0	-	-	-	-	-
5. Purity day	1	1130	420	0.372	220	0.195
Geometric mean value	0.6			0.460		0.205

Calculation of the coefficient of interactions is shown in Table 3.

Table 3. Calculation of the coefficient of interactions by different methods

Methods		Calculated meaning			
Column 1		Column 2	Column 3	Column 4	
		Ordinary community 1	Ordinary community 2	Ordinary community 3	
Adjusted k_j	Human resources	1.16	1.07	1.28	
	Working population	1.11	1.05	1.12	

Within the framework of the proposed methodology, one can identify the “ideal” community in terms of interactions and provide comparative analysis of an ordinary community with the ideal one. The ideal is the community which applies all kinds of activities, and its members take part in all of them, so for all activities =1. To calculate the coefficient of interactions for the “ideal” community we use the following formulas:

$$k_{j \text{ ideal}HR} = 1 + \overline{Q_{HR_i}} \quad (6)$$

$$k_{j \text{ ideal}LR} = 1 + \overline{Q_{LR_i}} \quad (7)$$

We calculate the coefficient of interactions using our example

- | | |
|-------------------------|--|
| 1) Ordinary community 1 | $k_{j \text{ ideal}HR} = 1 + \overline{Q_{HR_i}} = 1 + 0.399 = 1,399 \approx 1.40$
$k_{j \text{ ideal}LR} = 1 + \overline{Q_{LR_i}} = 1 + 0.272 = 1,272 \approx 1.27$ |
| 2) Ordinary community 2 | $k_{j \text{ ideal}HR} = 1 + \overline{Q_{HR_i}} = 1 + 0.356 = 1,356 \approx 1.36$
$k_{j \text{ ideal}LR} = 1 + \overline{Q_{LR_i}} = 1 + 0.258 = 1,258 \approx 1.26$ |
| 3) Ordinary community 3 | $k_{j \text{ ideal}HR} = 1 + \overline{Q_{HR_i}} = 1 + 0.460 = 1,460 \approx 1.46$
$k_{j \text{ ideal}LR} = 1 + \overline{Q_{LR_i}} = 1 + 0.272 = 1,205 \approx 1.21$ |

According to the calculations of deviations from the ideal state presented in Table 4, the second community is the most distant one from the “ideal” characterized by the coefficient of human and labor resources' interactions – 0.29 and 0.21, respectively. The best results for team cohesion are demonstrated by the third team, which, as we noted above, has an insignificant number of human resources. In general the calculations of the coefficient of interactions presented in Table 4 clearly demonstrate that the level of human resources' cohesion is less than the interactions amongst employed community members, as the deviation between the coefficient of interactions when comparing the “ideal” and “ordinary community 1” for human resources is 0.18, and for employed members – 0.09.

The reasons can be explained by the determinant of limited time resources. As a rule, people who are employed make decisions about participating in a particular event, selecting between the alternatives in favor of attending a certain event or vice versa. Mostly other alternatives are selected. The determined coefficient makes it possible to determine a set of measures that would contribute to the participation of community members in joint activities and the achievement of a common goal.

The calculation results are shown in Table 4.

Table 4. Calculation of the coefficient of interactions according to different methodical approaches for an “ideal” and “ordinary” communities

Coefficient of interactions	Values		
	Ordinary community 1	Ordinary community 2	Ordinary community 3
$k_j HR$	1.16	1.07	1.28
$k_j LR$	1.11	1.05	1.12
$k_{j \text{ ideal}} HR$	1.40	1.36	1.46
$k_{j \text{ ideal}} LR$	1.27	1.26	1.21
$k_{j \text{ ideal}} HR - k_j HR$	0.24	0.29	0.18
$k_{j \text{ ideal}} LR - LR$	0.16	0.21	0.09

Let us consider empirical implementation of the proposed approach using the example of a structural unit (university department), as a small group with an intellectual nature of labor. As we study labor resources, we calculate the coefficient of interactions using analytical dependencies for labor resources (formula 4-5). The head of the unit acts as an expert, who estimates the coefficient. Data on the participation of team members in the activities are presented in Table 5.

We determine the coefficient of interactions for a structural unit's team – ordinary and ideal meaning:

1) Unit 1:

$$k_{j \text{ ideal}} HR = 1 + \overline{Q_{HR_i}} = 1 + 0.786 = 1.786 \approx 1.79$$

$$k_{j \text{ ideal}} LR = 1 + \overline{Q_{LR_i}} = 1 + 0.554 = 1.554 \approx 1.55$$

2) Unit 2:

$$k_{j \text{ ideal}} HR = 1 + \overline{Q_{HR_i}} = 1 + 0.658 = 1.658 \approx 1.66$$

$$k_{j \text{ ideal}} LR = 1 + \overline{Q_{LR_i}} = 1 + 0.530 = 1.530 = 1.53$$

3) Unit 3:

$$k_{j \text{ ideal}} HR = 1 + \overline{Q_{HR_i}} = 1 + 0.617 = 1.617 \approx 1.62$$

$$k_{j \text{ ideal}} LR = 1 + \overline{Q_{LR_i}} = 1 + 0.541 = 1.541 \approx 1.54$$

Table 5. Data on structural unit's team used to determine the coefficient of interactions

Activities	d_i	Number of structural unit's team members (), persons	Amount of human resources, participated in the event (), persons	Number of members who participated in the event (), persons
Unit 1				
Column 1	Column 2	Column 3	Column 4 persons share	Column 5 persons share
1. Participation in scientific projects	1	12	10 0.833	7 0.583
2. Participation in conferences	1	12	11 0.917	8 0.667
3. Sport competitions	-1	-	-	-
4. Joint projects	1	12	8 0.667	5 0.417
5. Joint events: holidays, concerts, picnics	1	12	9 0.75	7 0.583
Geometric mean value	0.6	-	0.786	0.554
Unit 2				
Column 1	Column 2	Column 3	Column 4 persons share	Column 5 persons share
1. Participation in scientific projects	1	14	10 0.714	8 0.571
2. Participation in conferences	1	14	9 0.643	6 0.429
3. Sport competitions	1	14	8 0.571	7 0.500
4. Joint projects	0	-	-	-
5. Joint events: holidays, concerts, picnics	1	14	10 0.714	9 0.643
Geometric mean value	0.8	-	0.658	0.530
Unit 3				
Column 1	Column 2	Column 3	Column 4 persons share	Column 5 persons share
1. Participation in scientific projects	1	16	10 0.625	9 0.563
2. Participation in conferences	1	16	12 0.750	8 0.500
3. Sport competitions	-1	-	-	-
4. Joint projects	-1	-	-	-
5. Joint events: holidays, concerts, picnics	1	16	8 0.500	9 0.563
Geometric mean value	0.2	-	0.617	0.541

To conduct a comparative analysis, we use the determined criteria: the group size and the nature of labor and put the obtained results of calculations concerning community and structural units in Table 6.

The comparisons of calculations of coefficient of interactions in communities and structural units obtained in Table 6 show that in the latter, this coefficient is higher. This can be attained by active participation in joint activities and the achievement of common goals. It should be noted that in spite of different nature of activities considered as a type of activity for attracting human resources determined by various fields of activity – intellectual and predominantly manual labor, there is a relationship between the number of group members (small or large) and the nature of labor (intellectual or manual).

Table 6. Comparative analysis of community's and structural unit's coefficient of interactions

Value	Communities			Structural units		
	Column 2			Column 3		
	Community 1	Community 2	Community 3	Unit 1	Unit 2	Unit 3
$k_j HR$	1.16	1.07	1.28	1.47	1.53	1.12
$k_{j\ ideal} HR$	1.40	1.36	1.46	1.79	1.66	1.62
$k_j LR$	1.11	1.05	1.12	1.33	1.42	1.11
$k_{j\ ideal} LR$	1.27	1.26	1.21	1.55	1.53	1.54
$k_{j\ ideal} HR - k_j HR$	0.24	0.29	0.18	0.32	0.13	0.50
$k_{j\ ideal} LR - LR$	0.16	0.21	0.09	0.22	0.11	0.43

It should also be emphasized that if the group is large, the level of interactions is lower than for a small group. The inverse dependence exists. A team with intellectual labor dominance has a greater level of interactions than that characterized by the domination of manual labor. This confirms the hypothesis H1 and H2. It should be noted that each team seeks to achieve the ideal state. It cannot be determined by the imitation of similar economic entities' functioning and development peculiarities, but is created on the basis of abilities, talents and moral qualities of human resources, and depends on the possibilities of coexistence within a certain environment, that is, the level of interactions as well.

A high level of human resources' interactions also affects performance. The indicator for a community and a structural unit is their ranking position compared to others. Thus, the higher the level of interactions, the greater the ranking position of an entity is. Of course, this also manifests itself in higher levels of income, profit, self-sufficiency – as material indicators; and recognition, self-realization – as intangible elements. That is, the level of human resources' interactions affects the activity performance (hypothesis H3).

DISCUSSION

The goal of the study was to propose a methodical approach to the assessment of human resources interactions. This approach is universal and can be used by different economic actors. We have used the approach for united territorial communities and structural unit.

Application of this approach allows us to state that human resources' interactions depend on certain determinants. We considered two of them – the group size and the nature of labor. The research showed that small groups

with intellectual labor have a higher level of interactions than large groups with a predominance of manual labor. Nevertheless, the pattern is not typical for all business entities. It depends on a number of characteristics: activity type, age and gender structure of the human resources, and psychological characteristics. Therefore, the level of interactions in small groups is not always higher than in large ones, as is generally accepted.

The additional value of this study is represented by the following idea's justification: the level of interactions depends on the group size and the nature of labor. As commonly believed, a small group has a higher level of interactions and it is easier to manage. To a large extent, it also depends on other determinants and the ability of people to unite in order to achieve a common goal, and coexist in one environment. Implementation of the named approach allows us to state the fact that it is not a common pattern that small groups always have a relatively higher level of interactions. The level of interactions increases as the number of joint activities expands, so it depends on the community members' socially active lifestyle.

The main contribution of this study is the determination of the level of interactions between human resources which belong to different economic actors, e.g., to enterprises, of enterprises' units and united communities. Based on the obtained results, it is possible to work out specific measures that will increase the level of interactions and thereby create a positive synergetic effect. An additional advantage of this study is the substantiation of the conditional dependence of the interactions' level on the group size. It may seem that a small group of people has a higher level of interactions and it is easier to manage. However, to a large extent, this does not depend on the total number of group members, but on their active participation in joint activities and their ability to cooperate in order to achieve a common goal, to co-exist in one socio-economic system.

The importance of this research is also determined by the fact that it allows us to quantify the co-existence of people in one socio-economic environment, who are united not only by objective characteristics, but who also take into account subjective factors. Moreover, conforming to results, an economic entity (an enterprise, united communities) can redistribute financial expenditures and direct them to increase the level of cohesion and interactions of human resources in order to obtain a positive synergetic effect. In addition, measuring the "ideal" value of the coefficient of interactions, which is different for business entities, allows us to determine the level to be achieved. The fact that the "ideal" condition for different entities is unequal indicates the peculiarity and uniqueness of each business entity. That is, the "ideal" condition determines the existing potential, and the "ordinary" reveals the extent of its fulfillment. The greater the gap of the ordinary level

of interactions from the “ideal” value, the less the level of the available human potential fulfillment is. Therefore, it makes sense not only to conduct a comparative analysis of the level of different entities` human resources` interactions but also to determine the gap level of the real value from the ideal one, which allows us to conclude about the existing potential capabilities` fulfillment. This can be the basis for the formation of the “portfolio” tools and measures of human resources management. After all, people are the most complex “element” of the system in terms of management, as well as the most valuable, taking into account their importance for business effectiveness and obtaining the expected results from it. Assessment of the level of interactions allows us to come to the conclusion that the “energy potential” of the community is formed by the cumulative energy of each participant and combining it into a whole.

CONCLUSION

In our article, we proposed the methodical approach to assessing the level of human resources` interactions using the example of a united community and a structural unit. This made it possible to determine the dependence of the level of interactions on the group size (large or small) and the nature of labor (manual or intellectual). We found the impact of these criteria on the level of human resources` interactions: for a community, which is a large group with the predominance of manual labor, the level of interactions is lower than for a structural unit, which is a small group with the domination of intellectual labor. A group is identified as large or small depending on the number of its members, comparing the number of people in a community and a structural unit. The nature of labor is determined by the peculiarities of community and unit activities. This is confirmed by our study, which includes calculations of the coefficient of a community`s and a unit`s human resources` interactions. Based on the obtained results we make the conclusion that the level of interactions depends on the group size and the nature of labor.

To determine a clear procedure for assessing the level of human resources` interactions process, we proposed an action plan that consists of four stages:

Stage 1 – classification of information concerning the activities list and the number of participants;

Stage 2 – determination of the coefficient based on expert assessment (community or department head act as the expert);

Stage 3 – calculation of the coefficient of interactions for a community's team (large group with a manual nature of labor) and a structural unit's team (small group with an intellectual nature of labor);

Stage 4 – determination of the nature of the relationship between the level of interactions based on the criteria: the group size and the nature of labor on the basis of the comparative analysis results.

For empirical implementation of the proposed approach, particular analytical tools were used: expert assessment and analytical dependencies that allow one to calculate quantitatively the level of human resources' interactions for a community and a structural unit. A manager is assigned as an expert whose assessment is used to determine the coefficient that characterizes the presence or absence of certain activities and the activity participation. To determine the coefficient of interactions, certain mathematical dependencies are used. Comparative analysis of the level of human resources' interactions using the example of two entities, which are different in size and nature of labor, allowed us to distinguish their characteristic features, which are the basis for managerial decision-making.

The proposed methodical approach to the assessment of interactions of human resources allows us to make conclusions that are particularly important for economic actors' functioning at all levels of the economy: from micro- to macro-level.

The calculated coefficient of interactions of the united territorial communities' human and labor resources allows us to state that its meaning to a large extent depends not only on the physical participation in certain activities but also on the number of participants, that is, on the activity of community members. Strictly speaking, the more human resources are involved in community life, the greater the power of interactions between them and the community "strength."

The proposed approach is universal, as it can be used not only for communities but also for other business entities or their structural subdivisions.

It is important to determine the level of interactions, as it leads to the emergence of positive synergetic effect, which sets off a chain reaction and promotes the economic actors' efficient functioning, and creates prospects for their further development. For the united territorial communities, it means an increase in their economic capacity, and growth of their own revenues' share in the community budget, and the achievement of absolute self-sufficiency in the future. For enterprises, it indicates improved performance and higher profits, and in the future access to new markets through the interactions of constituent elements.

Making an “ideal” model to calculate the coefficient of interactions is a crucial advantage of the proposed approach. This allows scholars to assess development opportunities and the potential level of community growth. You can also determine the period needed to achieve the “ideal” state and manage these processes in real time: to accelerate or slow down movement to the “ideal” level according to the development level, influencing through the mechanisms of governance the level of human resources` interactions. The definition of an “ideal” value shows that the coefficient of interactions for the communities is less than the corresponding value of the “ideal” condition for structural units. That is, even though a structural unit has a greater coefficient of interactions, it is far behind the defined “ideal” condition in comparison with community.

For convenience, we summarize the results for the hypotheses below:

H1: The relationship between the level of human resources` interactions and the group size (co-workers, association of people), the nature of which may be determined by the ability to self-organization and management system`s features, is adopted;

H2: The level of team interactions based on intellectual nature of labor, which is determined by the more active participation of human resources in group`s activities, than in associations with the predominance of manual labor, is adopted;

H3: The level of interactions, which affects the results of the entity`s business due to the positive effects of synergy, is adopted.

Our work is not without limitations. We offer only one approach that allows us to quantify the level of human resources` interactions. The calculation of the coefficient of interactions is shown using the example of a community and a structural unit, using two criteria: the group size and the nature of labor. The level of interactions can be influenced by other determinants specified by the activity type, individuals` distribution and age structure, gender, different psychological characteristics. The proposed approach has to be enhanced and improved when considering them. From a socio-psychological point of view, social and psychological orientations can play an important role in interactions, which allow one to identify certain group`s human resources` characteristics, determine its members` stereotypes, as well as predict their behavior in the future. Socio-psychological trends reflect the system, which directs the group and its members to certain norms of behavior: moral,

social, economic and other. For example, within the socio-psychological trend called "process-result" one can conclude that the group members have a propensity to creative work and the process of its implementation, if the group predominantly focuses on the "process", and vice versa, if the focus is on the "result", it is mainly determined by the material parts. The socio-psychological trend "labor-money" is the indicator that determines the tangible or intangible part's domination in work motivation. It is interesting to determine the level of group interactions depending on the dominance of a particular motivation type. According to these features, groups may vary in terms of interactions. Definitely our task for further research is to find an effective approach for the precise, quantitative assessment of the level of human resources' interactions taking into account as many determinants as possible: material, social, psychological, as well as the development of a methodological approach that allows one to measure quantitatively the impact of the coefficient of interactions on an entity's performance. This will allow us to identify key aspects of human resources management policy. It is also useful for making managerial decisions. After all, there is a correlation between the performance (of enterprise, community, structural unit) and human resources' interactions. The quantitative assessment of this correlation will allow us to develop an effective mechanism of human resources management aimed at their preservation and development in the future. Due to a chain reaction, this will contribute to the achievement of high efficiency and performance effectiveness. Future work will grapple with some of these issues.

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Abstrakt

Zgodnie z naszą wiedzą istnieje potrzeba opracowania metodologicznego podejścia do oceny poziomu interakcji między społecznościami w ramach zasobów ludzkich, jako dużej grupy, a także oddzielnej jednostki strukturalnej - małej grupy. To pozwala nam określić zależność poziomu interakcji od liczby osób, które wchodzi w interakcje w ramach danej struktury i charakteru wykonywanej przez nich działalności - pracy intelektualnej lub fizycznej. Celem naszych badań jest wypracowanie podejścia metodologicznego do oceny poziomu interakcji zasobów ludzkich, co pozwala nam zidentyfikować kluczowe obszary i środki polityki. Ekspertyzy i zależności analityczne są używane jako narzędzia badawcze w artykule. Narzędzia te pozwalają nam ilościowo określić poziom interakcji zasobów ludzkich dla pojedynczej jednostki. Empiryczna implementacja proponowanego podejścia, na przykładzie dwóch podmiotów o różnym rozmiarze i charakterze pracy, pozwoliła nam dokonać analizy porównawczej i wyróżnić cechy charakterystyczne, które są podstawą do podejmowania decyzji zarządczych. Menedżer działa jako ekspert, który ocenia obecność lub nieobecność określonego zdarzenia w podległej jednostce. Wskaźnik, który charakteryzuje obecność lub brak określonych działań i poziom uczestnictwa w nich, określa się na podstawie oceny menedżerskiej. Kolejnym etapem jest określenie współczynnika interakcji za pomocą pewnych zależności matematycznych i analizy wyników. W wyniku przeprowadzonych badań uzyskaliśmy ocenę poziomu interakcji zasobów ludzkich między dwoma podmiotami - zjednoczoną społecznością i jednostką strukturalną. Ocena wykazała zależność od poziomu interakcji i wielkości podmiotu (małe i duże grupy) oraz charakteru pracy. Wyniki pokazały, że jednostka strukturalna, skoncentrowana na pracy intelektualnej i prezentowana przez małą grupę, ma wyższy poziom interakcji niż zjednoczona społeczność, która ma większy rozmiar i przewagę pracy fizycznej. **Słowa kluczowe:** ocena, zasoby ludzkie, interakcje, praca, efekt synergiczny.

Biographical note

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Seasonality: Is it a problem or challenge facing future tourism employment? Implications for management

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Abstract

Many countries have recently seen rapid growth in tourism which is perceived as an engine for economic growth and social development. On the other hand, many countries have been faced with problems of attracting and retaining well-qualified employees, as many graduates do not enter the tourism industry on graduation. This study aims to determine the attitudes of Tourism and Hospitality (T&H) students towards the problem of seasonality in tourism employment and how it relates to students' employment aspirations. The research was conducted among students of higher educational institutions (HEI) located in Northern Poland (Southern Baltic Sea Region). A survey instrument was applied and 171 usable questionnaires were retrieved and analyzed in this study. Students' perceptions of tourism seasonality seem to be more positive than negative and it may relate to their working intentions on graduation. Additionally, students who declared their seasonal working experience referred to tourism seasonality more positively. This study makes useful contributions to the existing knowledge and management literature by showing that the ability to identify negative aspects of future career development, such as tourism seasonality, and the ability to manage it effectively, may have a positive impact on employment perception in the view of a future workforce.

Keywords: Southern Baltic Sea Region, tourism, seasonality, employment aspirations, students.

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INTRODUCTION

The influence of travel and tourism (T&T) on economic and social development is indisputable as it opens up countries to business, trade and capital investment opportunities leading to new jobs and entrepreneurialism for the workforce (World Travel & Tourism Council, 2015b). During recent years T&T has been growing at a faster rate than both the general economy and other significant sectors including automotive, financial services or health care (World Travel & Tourism Council, 2015b). In 2016 T&T's contribution to world GDP generated US\$7.6 trillion (10.2% of global GDP) and supported 292 million jobs (1 in 10 jobs) (World Travel & Tourism Council, 2017b). T&T's expansion is forecast to continue (World Travel & Tourism Council, 2015b) and the total T&T GDP is forecast to constitute 11.4% of global GDP by 2027 (World Travel & Tourism Council, 2017b).

Taking a direct perspective, T&T's direct contribution to GDP grew by 3.1% in 2016 (generating US\$2.3 trillion), i.e. faster than the global economy as a whole (growth at 2.5%), and is predicted to increase at an average of 3.9% per year over the next ten years. When it comes to T&T's direct contribution to employment, it rose by 1.8% in 2016 (supporting 109 million jobs globally), which means that almost 2 million net additional jobs were generated by T&T directly. However, it is expected that by 2027 T&T will support more than 380 million jobs worldwide, which means 1 in 9 of all jobs in the world, and the sector is expected to contribute circa 23% of total global net new jobs over the next ten years (World Travel & Tourism Council, 2017b).

Based on the above, it can be argued that as one of the world's largest economic sectors, tourism can be perceived as a major source of employment (Lu & Adler, 2009). However, although it creates new jobs, drives exports, and generates prosperity across the whole world (World Travel & Tourism Council, 2017a), the T&T sector also experiences talent gaps and deficiencies as indicated in the World Travel & Tourism Council's report prepared by Oxford Economics (World Travel & Tourism Council, 2015a). The overwhelming number of countries analyzed in the report were forecast to have deficit talent trends over the next decade (talent demand grows faster than talent supply).

Similarly, in the case of Poland, although T&T directly supported 305,000 jobs in this country in 2016 (1.9% of total employment) and is forecast to increase to 405,000 jobs (2.5% of total employment) in 2027 (World Travel & Tourism Council, 2017a), Poland is among the countries that are projected to have the most acute deficit T&T talent trends that can touch the college/university level in particular (World Travel & Tourism Council, 2015a). Additionally, poor transfer of tourism graduates to the industry is observed, as over half of the graduates (54.7%), as indicated in a report commissioned

by the Ministry of Sport and Tourism of the Republic of Poland (ACTIVE Group, 2014), were not working in consistence with their study profile, which makes the issue of tourism graduates employment a critical topic for both business and educators.

It is underlined that T&T has some unique characteristics that make it a challenging sector to recruit and retain talent and skills, and among many of these characteristics the seasonal nature of work is emphasized (World Travel & Tourism Council, 2015a). Employment demands in tourism (particularly in hospitality) often reflect the customers' seasonal and leisure demands (see Kamari, 2004), which means that it is often difficult to offer full-time employment as in other sectors (World Travel & Tourism Council, 2015a). Thus, unsurprisingly, the workforce here often involves temporary, seasonal, part-time or shift workers (Kamari, 2004; Kusluvan, 2003). These employment features, including seasonal jobs and their instability, may have a negative influence on students' vocational attitudes (see Grobelna & Marciszewska, 2016a; Jiang & Tribe, 2009).

On the other hand, peaks in demand create a real opportunity for seasonal employment of young people, particularly T&H students. It is underlined that seasonal fluctuations in many businesses in the tourism industry seem to promote student employment opportunities at times suitable for both employers and employees (Martin & McCabe, 2007). Students should be particularly welcomed by the service industry in view of high labor costs and huge fluctuations in demand (Barron, 2007; Barron & Anastasiadou, 2009). Industry practitioners should appreciate the flexibility and other benefits that young, multitasking, cheap and intelligent seasonally working students (Barron, 2007; Barron & Anastasiadou, 2009) may bring to their organizations. In a study by Lucas and Ralston (1996), answering the question "Why do you employ student employees?" employers indicated, among other answers: "to meet increased demand at a particular time" or "to cover for regular staff shortfalls during vacations." Thus, understandably, students as temporary employees seem to be particularly important for the industry (Shin & Lee, 2011). Their seasonal working experience, perceived as an introduction to the real world of work, may influence students' perception of tourism seasonality and employment aspiration in the industry. This seems to be of great importance, especially that, although tourism industry development can create new employment opportunities (Roney & Öztin, 2007), attracting and recruiting graduates seems to be a critical issue for the future success of an industry that experiences a shortage of skilled and well-qualified employees (Băltescu, 2016; Tan et al., 2016).

Thus, research on T&H students' employment aspirations and their critical antecedents is particularly advisable. Given the low status of industry employment,

due to seasonality and instability of many tourism jobs, the perception of tourism seasonality and its consequences for employment, and particularly in view of the industry's future workforce, this calls for empirical attention.

Based on the above, the objective of this study is to present T&H students' attitudes towards the problem of seasonality in tourism employment. The aim of the research is to answer the following research questions:

Q1: May students' perception of seasonality in tourism employment relate to their own employment aspirations in tourism after graduation?

Q2: may students' seasonal working experience have an influence on their attitudes towards seasonality in tourism employment?

The following hypotheses are proposed:

H1: That a negative perception of seasonality in tourism employment decreases T&H students' employment aspirations in tourism.

H2: That a positive perception of seasonality in tourism employment increases T&H students' employment aspirations in tourism.

H3: That there is a relationship between students' seasonal working experience in tourism and their perception of seasonality in tourism employment.

The research value of this study may result from the fact that although there are many previous studies that have examined students' perception of the T&H industry, empirical research focusing specifically on the issue of perceived seasonality in relation to students' employment aspiration is limited, especially within the context of the Southern Baltic Region. Thus this study provides a new perspective on students' perceptions of employment in the T&H industry taking the case of Central-East Europe. The results of this study aim to be of great importance to the industry which suffers from a low employment status and experiences chronic shortage of skilled and well-qualified employees.

LITERATURE REVIEW

The concept of tourism seasonality

The concept of seasonality is defined differently, depending on the science that deals with the essence of seasonality. In economic terms, seasonality is associated with revenue that has not been achieved because business activity is reduced or ceased altogether in certain periods. BarOn's work (1975),

which identifies the basic components of seasonality and the importance of cyclicity in the creation of demand for tourism services, is the foundation for the study of the nature of seasonality in tourism.

There is no universally accepted definition of seasonality. Although the essence of this phenomenon is that, with a certain regularity, greater or lesser interest in a given tourist region or tourist attraction occurs, many researchers of this issue propose definitions which focus on different aspects. These definitions can be sorted using classifications based on the essence criterion referred to by the authors of the definition. In general, definitions can be grouped into three areas: (i) seasonality symptoms, (ii) seasonal outcomes, and (iii) the preferences of tourists determining their demand for broadly-defined tourism services (Figure 1).

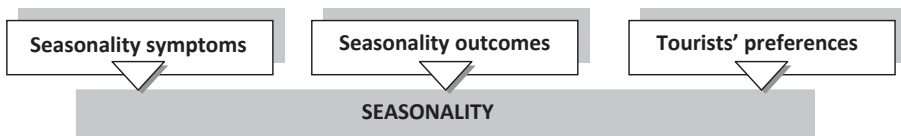


Figure 1. Approach to seasonality definitions – three perspectives

In Butler's definition (1994; 2014), the emphasis is on seasonality, which is a "temporal imbalance in the phenomenon of tourism, which may be expressed in terms of dimensions of such elements as numbers of visitors, expenditure of visitors, traffic on high-ways and other forms of transportation, employment and admissions to attractions". Similarly, Bender, Schumacher and Stein (2005) argue that seasonality is the year-to-year variation associated with specific periods, and Biedermann (2008) describes seasonality as "a prevalent characteristic in travel and tourism marked by sharp variations in demand depending on the time of the year." More specifically, the seasonality characteristics were mentioned by Wall and Mathieson (2006), who in their definition pointed out the recurring yearly cycle: "the peak season and the off season that are separated by two shoulder seasons." Some authors point out cycles shorter than yearly, with varying intensity of visits: month, week, or even a single day (Holloway, 1994; Lundberg, Krishamoorthy, & Stavenga, 1995). With reference to the definitions regarding the effects of seasonality, Hylleberg should be quoted (1992), who argues that seasonality is not necessarily a regular, repetitive change over the year that directly and indirectly affects business. The third group refers to a particular seasonality – the tourists and their preferences. Thus seasonality is defined as a phenomenon caused by the periodic movement of people

(Chung, 2009). Tourism demand expresses regular fluctuations associated with seasons (Cooper, Wanhill, Fletcher, Gilbert, & Fyall, 2008). Although the cited definitions concerned different collections depending on the essence of seasonality raised by the authors, it is difficult to unequivocally and categorically classify the definitions, due to the relationship between the tourists' preferences, seasonality and its effects.

Antecedents and consequences of seasonality – the critical impact on tourism employment

In literature, two sources of natural and institutional seasonality are most often identified (Butler, 2001; Commons & Page, 2001; Goulding, Baum, & Morrison, 2004; Hartmann, 1986). Natural factors are due to the geographic location of both the destination and the origin of the tourists. Not all natural phenomena are the source of seasonality. According to Witt and Moutinho (1995), unpredictable incidents (droughts, floods, volcano eruptions, earthquakes, etc.) are unlikely to occur in the orderly and repetitive seasonal pattern. The most elementary natural factors determining the seasonality include temperature, sunshine, occurrence or absence of precipitation: rain/snow. There is no one well-established standpoint on the stability of these factors. Koenig-Lewis and Bischoff (2005) believe that they are predictable and permanent because of their small-scale changes. The opposite approach (Baum & Lundtorp, 2001) states that natural occurrence is less obvious and less predictable in the face of climate change (Baum & Lundtorp, 2001; Butler, 2000; Butler & Mao, 1997). Natural factors play a particularly important role in coastal tourism and those types of tourism that are linked to outdoor activity. Institutional factors are those derived from law, politics or traditions, the social preferences created e.g. by social pressure, fashion. These include: (i) time off work and holiday/holidays (Commons & Page, 2001; Goulding et al., 2004; Hylleberg, 1992), (ii) travel habits and motivations for travel (social pressure, fashion, tradition, inertia, changing tastes) (Commons & Page, 2001; Goulding et al., 2004), (iii) events (cultural, religious, sports, etc.) (Baum & Lundtorp, 2001).

The effects of seasonality are extensive, and hence full identification requires a proper classification. The first, most obvious criterion is the nature of the effect, including positive (Draktos, 1987; Hartmann, 1986; Witt & Moutinho, 1995). There are definitely many more negative effects (e.g., Baum, 1998; Bender, Schumacher, & Stein, 2007; Butler & Mao, 1997; Cellini & Rizzo, 2012; Goulding et al., 2004; Higham & Hinch, 2002). Another division of effects goes between supply and demand. In this article, due to its subject and purpose, the effects of seasonality on the supply side will be presented.

Generally, there are three groups of effects caused by seasonality: economic, ecological and socio-cultural. The bigger the volume of tourist activity, the greater the meaning of its effects (Yan & Wall, 2003).

Among the ecological impacts, the most significant are: seasonal congestion, greater noise and environmental pollution associated with the handling of more people and the tourists' behavior (Butler, 2001) as well as excessive consumption/depletion of local natural resources (Bender et al., 2007). Socio-cultural impacts include increased congestion, increased risk of adverse events (thefts, robberies, acts of terrorism), increased risk of traffic accidents, mass accidents, etc. An increased number of people staying in a given location for a short time may negatively affect the residents' way of life (Jang, 2004). The imbalance in earning income during the year may motivate the emigration of a local population (especially young people), resulting in a deficit of social capital, lower quality of life, especially in the peripheral communities to industrial centers, where tourism plays the most important role.

Major economic effects include: irregular annual income, low return on capital, high investment risk, difficulties with annual fixed costs, shortages in supply during the peak season, unused capacity off season (BarOn, 1975; Baum, 1998; Bender et al., 2007; Butler, 1994; Butler & Mao, 1997; Cellini & Rizzo, 2012; Goulding et al., 2004; Higham & Hinch, 2002; Kizielewicz & Luković, 2015). Among the economic factors, human factors are worth discussing separately. They are critical for the hotel industry, which is the largest part of the tourism industry. Due to the relatively rigid supply of accommodation, the effects of seasonality are felt in this industry particularly strongly. Not surprisingly, one of the reasons for employees' leaving is seasonality and the part-time nature of employment in this industry (Kusluvan, 2003). High turnover rates (Ko, 2012; Sims, 2003) may be particularly costly for organizations (Tesone, 2010) leading to many negative consequences, such as increases in stress, heavy workload, low employees' morale, poor standards, low productivity and others (see Kusluvan, 2003; Sims, 2003), and finally negatively affecting the organization's competitive advantage (Özbağ, Ceyhun, & Çekmecelioğlu, 2014).

However, particularly worrying is the fact that the nature of the tourism industry, including its seasonality, determines students' perception of the industry's attractiveness (see Grobelna & Marciszewska, 2016a; Jiang & Tribe, 2009). For example, Jiang and Tribe's study results (2009) revealed that the nature of tourism jobs does not encourage students in China to consider the industry as a long-term career. According to the study participants, seasonality was perceived as a factor that may have an important influence on employees' lifestyle, income, etc. (see Jiang & Tribe, 2009). Similarly, in the case of Polish

students, one of the identified obstacles to working in tourism after graduation was the perceived seasonality of tourism jobs (Gobelna & Marciszewska, 2016a). Therefore, “if today’s students are to become tomorrow’s effective tourism practitioners” (Huang, 2013), the nature of tourism jobs, particularly the issue of seasonality, needs further investigation not only to increase revenues from tourism through extending the high season, but also to increase the inflow of well-educated and trained employees.

Polish coast of the Baltic Sea – its climate and seasonality

The Polish coast of the Baltic belongs to three voivodships – in the nomenclature of European statistics, to three units at the NUTS2 level. These are Zachodniopomorskie (West Pomeranian) (PL42), Pomorskie (Pomeranian) (PL63) and Warmińsko-Mazurskie (Warmia and Mazury) Voivodships (PL62).

The Warmia and Mazury Voivodship has the least marine character – only 4 municipalities (NUTS5) out of 109, i.e. less than 4%, lie directly on the Baltic Sea. It should be noted that in this voivodship tourism is important, but it is more connected with the lakes in the central part of the voivodship than with coastal tourism (Studzieniecki, 2016).

In the Pomeranian Voivodship, about 22% of *gminas* (25 out of 114 NUTS5 units) are communes directly adjacent to the Baltic Sea (the open sea or the Bay of Gdansk). Yearly almost twice as many tourists per 1 inhabitant visit this area. The proportions in the West Pomeranian Voivodship are similar – 22 out of 106 NUTS5, i.e. almost 21%, are communes on the Baltic coast (the open sea or the shallow Pomeranian Bay). There are more than 2.5 tourists per 1 inhabitant per year (GUS Szczecin, 2016).

The Polish climate is not conducive to maintaining high demand for tourist services in the coastal strip throughout the year. Poland is located in a temperate warm zone with a transitional climate, which depends on the direction of the incoming air masses thus acquiring the characteristics of the sea or the continental climate. The location in the temperate zone (between 49° and 55°) of the northern latitude has a strong influence on the variation in length of the day and the degree of insolation per year (Mizerski & Żukowski, 2014). This results in 6 thermal seasons, which differ in average temperatures and the degree of insolation (Kožuchowski, 2014).

The parallels of geographic regions and the predominance of lowland areas are conducive to the free exchange of air masses from the Atlantic (humid air masses) and from the land areas of Eastern Europe and Asia (dry air masses). The coast of Poland remains under the influence of the Baltic Sea (Kondracki, 2014). The consequence of the free exchange of air masses is the high frequency of variations in weather patterns and precipitation. The

consequence of the above air temperature and precipitation distributions is the uneven distribution of tourists choosing the Polish Baltic Sea coast as a resting place (Figure 2).

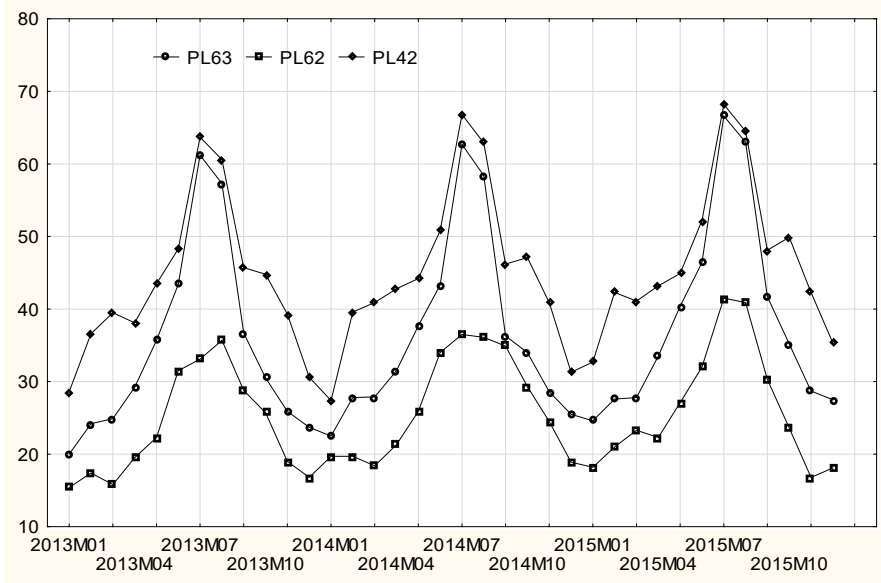


Figure 2. Occupancy rate of bed places in tourist accommodation establishments in coastal areas (PL42, PL62, PL63) by month, in 2015 [%]

Source: (GUS Szczecin, 2016)

By analyzing the changes in occupancy rates, it is clear that in the case of the Pomeranian and West Pomeranian Voivodships, variability is a perfect fit in (Wall & Mathieson, 2006). It is easy to highlight the clear peak season (July–August) and off-season (December–February) separated by shoulder seasons: March–June and September–November. Research on the causes of this phenomenon reveals that the strongest determinants are natural factors, especially climatic ones, with which the rhythms of tourists' arrival coincide.

RESEARCH METHODS

Procedure

In order to obtain the most adequate assessment of seasonality as a factor determining the decision to start a job in tourism, the study was conducted on a sample selected in purposive sampling. In Tricity, studies in the field of

tourism and recreation are conducted at five higher education institutions (GUS Gdańsk, 2017). The empirical research was conducted among students of three higher educational institutions (HEI) between May and June of 2017. These three HEI were identified as the target group for this study due to their availability. They were chosen due to mutual cooperation and/or familiarity between the researchers and these HEI.

On the basis of data from the statistical yearbook *Education in Pomeranian Voivodship in the 2016/2017 school year*, the number of graduates in the field of “tourism and recreation” graduating from university (1st and 2nd degree studies) was estimated in 2017 for all universities altogether (GUS Gdańsk, 2017). The number of graduates amounted to 703 people. At 95% confidence interval, the sample size should be around 250 people (exactly 248). The authors decided to distribute more questionnaires than the required number (+ 10%). A total of 275 questionnaires were distributed adequately, to three participating HEIs. In this study, the auditorium survey technique has been applied to gather the data. Respondents were requested to fill in the questionnaires during their teaching time agreed with lecturers. Students were informed that their participation was voluntary and that anonymity was protected. The survey was conducted after an explanation of its objectives. A total of 171 usable questionnaires were finally retrieved, yielding a response rate of 62.18 %.

All HEI were located in the Tricity metropolis as a part of the Pomeranian Voivodship, which is perceived as a tourist (coastal) destination of Northern Poland and a big academic center. The strength of Tricity is due to the potential of the three cities that make up the metropolis of Gdansk, Gdynia and Sopot. Analysis of the level of economic development of the coast indicates that the Tricity region is the most developed part of the Polish coast. Statistics of national accounts (NUTS3 level) show that while regions with a coastline have lower ratios compared to the national average (NUTS0) and even to the voivodship average (NUTS2), the Tricity area has 30–40 percentage points better results than the national average and 40–50 p.p. better than the voivodship average (*Bank Danych Lokalnych*, 2017).

These characteristics justify the choice of Tricity as a research location area. On the one hand, tourist attractiveness of Tricity may contribute to creating many new working places, specifically during the summer season. On the other hand, perceived as a big academic center, it may represent educational programs typical of T&H (Grobelna & Marciszewska, 2016b).

Measure

In developing the research instrument to evaluate students' perception of seasonality in tourism employment, 14 items were finally employed. They derived from the tourism and hospitality employment characteristics illustrated in the literature review and were developed during consultations with academicians and industry practitioners. Additionally, both authors' professional knowledge and expertise related to the T&H industry and observed trends in the T&H labor market also contributed to the shape of the items.

Finally, the list of 14 items was divided into two convenience categories that relate positively (7 items) and negatively (7 items) to the issue of seasonality in tourism employment; they were defined accordingly as Positive Perception of Seasonality (P_PS) and Negative Perception of Seasonality (N_PS) in tourism employment.

Students' employment aspirations (EMP_ASP) were measured via four (4) items from (Teng, 2008), who has used them successfully to measure hospitality employment aspirations among post-internship undergraduate hospitality seniors in Taiwan. However, because in this study the employment aspiration variable referred to the students' commitment to the tourism industry in general, the items were reworded accordingly. Additionally, to ensure the translation quality of the items, the back-translation method was applied. Respondents were asked to rate each item according to the extent to which they agree with it, from (1) strongly disagree to (5) strongly agree. Demographic data were also collected.

The reliability alpha used to check the internal consistency of the items within the study constructs were as follows: 0.80 for EMP_ASP; 0.63 for N_SP; and 0.60 for P_SP. Although both N_SP and P_SP had alpha below the recommended value of 0.7 (Nunnally, 1978), they were retained as even lower values of alpha are still considered to be sufficient in the early stages of an exploratory study (Kwok, Adams, & Feng, 2012; Tepeci & Bartlett, 2002).

The results were analyzed statistically. To verify the relationship between the study's constructs, Pearson's correlation was applied. To test for significant differences between the study's responses, an *independent-samples t-test* was used.

RESULTS

Respondents' characteristics

Female respondents accounted for the majority (81.3%) of all the surveyed students. 52% of the respondents were in the age range of 22–25 years, whereas 39.8% were between 18–21 years old, the remaining subjects (8.2%) were older than 25 years. Study respondents mostly came from Poland (89.5%); a small percentage of students came from Ukraine (5.8%) and Norway (1.2%), the remaining ones were from Russia, Belarus and Ireland. More specifically, most of the study respondents (80.7%) came from coastal provinces or lake districts where tourism, particularly the seasonal one, is well developed, giving them the unique possibility to observe actively this kind of tourism and its consequences for regional development and the regional labor market. Unsurprisingly, many of the study participants (69.6%) also declared they had seasonal working experience in tourism. Students were seasonally working in a variety of tourism branches such as food and beverage services (48.8%), hospitality services (34.9%), and travel agencies (5.8%). Study participants also declared working as a tour guide (2.9%) and in transport services (2.9%), and others. Moreover, 81.9% of study respondents agreed that work in tourism is connected with uneven distribution of the workload throughout the year.

The above data show that the investigated group, having rich observation and/or experience of the seasonality in tourism employment, may provide adequate feedback on the seasonality problems in tourism employment under investigation in this study.

Seasonality perception and its outcomes for students' employment aspirations

Analyzing the students' perception of the seasonality impact on tourism employment, the results showed that, generally, more students agree that seasonality contributes positively rather than negatively to tourism employment. Descriptive statistics for the study variables are provided in Table 1 and Table 2.

Among the detailed positive items (Table 1), students agree the most that the seasonal nature of tourism employment generally has many positive aspects, allows getting a job easily during study time, holidays, the summer season, etc., and may be perceived as a source of employees' creativity

and many innovative solutions as its consequences that reduce the scale of seasonal employment's negative effects on the tourism business.

Table 1. Perception of seasonality in tourism employment – positive aspects. Variable means and standard deviations

	P_PS	1	2	3	4	5	6	7
Mean	3.32	4.10	3.22	3.13	3.70	3.65	2.48	2.99
St. dev.	0.51	0.88	0.99	1.02	0.91	0.75	1.00	1.01

N=171

Note: P_PS (Positive Perception of Seasonality); seasonality of tourism employment:

1. allows getting a job easily during study time, holidays, the summer season, etc.
2. does not negatively affect the continuity of employment of people with a university diploma
3. does not negatively influence job perception in the tourism industry
4. has many positive aspects including increased interest in tourism employment
5. is a source of employees' creativity and many innovative solutions as its consequences which reduce the scale of seasonal employment's negative effects on the tourism business
6. does not threaten work-life balance
7. does not make it difficult to find a stable job.

Analysis of negative aspects of seasonality in tourism employment revealed that respondents achieved the highest agreement on the statement that it reduces interest in working in tourism industry, decreases attractiveness of employment in tourism and has a negative impact on all job positions in tourism enterprises regardless of the management level (Table 2).

Table 2. Perception of seasonality in tourism employment – negative aspects. Variable means and standard deviations

	N_PS	1	2	3	4	5	6	7
Mean	2.68	3.20	2.62	2.84	2.79	2.21	2.70	2.39
St. dev.	0.53	1.12	0.99	0.99	1.01	0.87	0.95	0.80

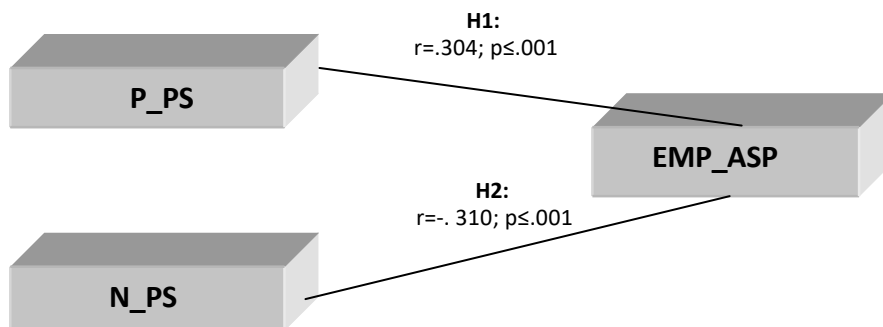
N=171

Note: N_PS (Negative Perception of Seasonality); seasonality of tourism employment:

1. makes tourism perceived as a temporary profession rather than a place for pursuing a long-term career
2. reduces interest in working in the tourism industry
3. decreases the attractiveness of employment in the tourism industry
4. negatively affects all job positions regardless of the level of management
5. is a source of only negative phenomena
6. hampers employees' innovative initiatives
7. negatively influences all operators in the industry, regardless of the quality of service.

As depicted in Figure 3, correlations among the study constructs were significant and in the predicted directions. More specifically, the results of this study demonstrated that there is both a significant and positive correlation between P_PS and EMP_ASP and a significant negative correlation between

N_PS and EMP_ASP. In other words, the more students believe that seasonality in tourism positively contributes to tourism employment, the stronger their intentions to enter the tourism industry. This provides support for Hypothesis 1. By contrast, the more negatively students perceive seasonality in tourism employment, the lower their commitment to the industry. Thus, Hypothesis 2 was also supported by empirical findings.



N=171; Note: N_PS (Negative Perception of Seasonality); P_PS (Positive Perception of Seasonality); EMP_ASP (Employment Aspirations)

Figure 3. Perception of seasonality in tourism employment and its relation to students' employment aspirations in tourism industry upon graduation

Given the detailed level of correlation analyses, it should be noted that the presented relationships, similarly as above, are statistically significant but rather weak. However, it is worth noticing that the strongest positive correlation was observed between EMP_ASP and the perception of seasonality as not making it difficult to find a stable job (item 7; $r=.252; p\leq.001$). It means that the more students believe that seasonality does not create obstacles to finding a stable job, the more they feel likely to take a tourism job after graduation (Table 3). Similarly, students who believe that seasonality does not negatively affect the continuity of employment of people with a university diploma (item 2), has many positive aspects including increased interest in tourism employment (item 4) being also a source of employees' creativity and innovative solutions (item 5), are more likely to take tourism jobs after graduation.

Table 3. Correlations between perception of seasonality in tourism employment – *positive aspects* – and students’ employment aspirations – detailed analyses^a

		2	4	5	7
EMP_ASP	Pearson correlation	.217**	.185*	.156*	.252**
	Sig. (2-tailed)	.004	.016	.042	.001
	N	171	171	171	171

* Correlation is significant at the 0.05 level (2-tailed);

**Correlation is significant at the 0.01 level (2-tailed)

Note: EMP_ASP (Employment Aspirations); 2,4,5,7: the same description as in footnotes of Table 1; a only significant correlations are presented in the table above

By contrast, when analyzing the negative aspects of seasonality in tourism employment, the strongest negative correlation is observed among students’ EMP_ASP and their perception that seasonality decreases interests in tourism employment (item 2; $r=-.367$; $p\leq.001$) (Table 4). Additionally, it is also worth noting that respondents who believe that seasonality leads to tourism being perceived as a temporary profession (item 1), decreases the attractiveness of employment in tourism (item 3) and is a source of only negative phenomena (item 5), also displayed less commitment to the tourism industry as a place of future employment.

Table 4. Correlations between perception of seasonality in tourism employment – *negative aspects*, and students’ employment aspirations – detailed analyses^a

		1	2	3	5
EMP_ASP	Pearson correlation	-.159*	-.367**	-.198**	-.203**
	Sig. (2-tailed)	.038	.000	.010	.008
	N	171	171	171	171

* Correlation is significant at the 0.05 level (2-tailed);

**Correlation is significant at the 0.01 level (2-tailed)

Note: EMP_ASP (Employment Aspirations); 1-3; 5: the same description as in footnotes of Table 2; a only significant correlations are presented in the table above

Thus going further, it was decided to investigate whether students’ seasonal working experience in tourism may have an impact on their perception of tourism seasonality, particularly whether seasonality of tourism employment may reduce significantly the interest in working in the tourism industry. As a result, a statistically significant difference was observed between the analyzed variables ($t=-1.983$; $p=0.049$). Those students who did not have seasonal working experience in tourism significantly more often believed that seasonality in tourism decreases peoples’ interests in working

in the industry, whereas those with working experience in tourism did not have such a determined attitude toward this aspect. Thus, Hypothesis 3 gains support from the empirical data. Probably, having seasonal working experience, students' might gain a real perception of the industry and its work specifics. This, indeed, may lead students to have a more favorable view on tourism employment, particularly given its seasonal nature.

DISCUSSION AND CONCLUSION

This study was designed to investigate T&H students' attitudes towards seasonality in tourism employment and its impact on students' tourism employment aspirations. The decision to apply results to the whole population is based on the specificity of the region. In the seaside region, the mass tourism model is still a 3S model (sea, sun, sand); therefore, seasonality plays a decisive role in creating demand for tourism industry services. The above statement is based on the results of research on the preferences of both Europeans and Poles. 46% of Europeans indicate "sunlight and life on the beach" as the preferred way of spending time (EC Press Release Database, 2014). As the most desirable way of spending free time, Poles indicate sunbathing and relaxing in the bosom of nature (45% and 41% respectively) (Borodako, 2016). Perhaps this is one of the reasons for treating the Pomeranian Voivodship as the most desirable destination (in 2014, 2015, 2016) (CBOS, 2017).

The way of spending free time and the preferred destination explains why seasonality is a phenomenon that strongly affects the functioning of the hotel industry in the Pomeranian Voivodship. An additional factor that will probably soon be reinforced by this phenomenon is climate change, because "it's expected that in the future tourists may rely more on last-minute bookings, once they are more certain that the weather in their preferred destination is appealing" (Pang, McKercher, & Prideaux, 2013).

The study findings revealed that students' perception of seasonality in tourism employment may relate to their employment aspiration after graduation. Thus, students who had more positive attitudes toward the issue of seasonality in tourism employment were more likely to work in tourism upon graduation. By contrast, the more they believed that seasonality in tourism is a source of negative aspects in employment, the less commitment to the industry they displayed. Additionally, over the half of the investigated students declared their seasonal working experience in tourism. Those with such experience referred to seasonality in tourism employment more positively than others, as they were less convinced that seasonality in tourism

may decrease interest in tourism employment. This proves that students' early seasonal working experience makes them more aware of the reality of tourism jobs and has an influence on their attitudes towards the future careers in the industry.

Taken above, it can be concluded that seasonality in tourism may be perceived in a more favorable light, as a challenge rather than a problem facing tourism employment in the opinions of its future workforce.

The results may be influenced by the fact that Tricity and its immediate surroundings, despite experiencing seasonality in tourism, do not experience such adverse effects as peripheral areas. Due to the nature of individual cities forming a metropolis, Tricity, besides mass tourism services, offers business tourism, medical tourism and wellness & spa services. Therefore, for young respondents, students of Tricity's HEI, the issue of seasonality, despite its existence, is not a problem that affects their view of future employment and career development in tourism. Moreover, given the statement that the higher level of education may guarantee better job opportunities in the future (Waśniewska & Olszewska, 2016), students may not perceive job seasonality as a serious threat to their future career development in tourism.

In accordance with the study recommendations, it must be noted that although employees and their competences – especially knowledge – are the main determinant of the development of each organization and its innovativeness (Szelągowska-Rudzka, 2014), one of the industry's concerns is the fact that the tourism and hospitality industry fails to retain significant numbers of well-qualified graduates (Băltescu, 2016; Lam & Ching, 2007). It is emphasized that youth are particularly poorly committed to the organization in the long run (see, e.g. Choi, Kwon, & Kim, 2013). Also, previous study results show that it is difficult to say that tourism and hospitality students are committed to a career in the industry (e.g., Richardson, 2008). Thus, in order to attract and retain young people to start their career in the industry, practitioners should realize that students' first working experience, usually gained seasonally, may play an important role in forming and bridging their expectations, playing an important role as a means of learning about the real world situations. Accordingly, it is crucial to realize what young people expect from their work and provide them exactly with what they seek to encourage them to stay in the industry upon graduation and transfer their valuable skills there.

It is pointed out that for young people fast promotion (advancement), development of new skills and work–life balance are of great importance (Ng, Schweitzer, & Lyons, 2010). They seek creative challenges and they want to have an immediate impact and responsibility. Particularly, those studying tourism and/or hospitality emphasize that self-achievement, congruence

of work with personal values and open communication are important (e.g., Lewis, 2015). They rank an enjoyable, interesting job, colleagues that they can get along with or pleasant working environment particularly highly (Richardson & Butler, 2012; Richardson & Thomas, 2012; Sibson, 2011). Therefore, it is important to design working conditions in such a way so as to provide working students with positive experiences (Richardson, 2008). Students who work seasonally in the industry while studying should have a real chance to deal with meaningful tasks and train in various departments or business sectors in tourism (see Richardson, 2008). They should experience interesting and challenging work that provides them with an opportunity for their own growth and development. Otherwise, when graduates are given menial and boring tasks rather than exciting and worthwhile ones, they may not benefit from the experience; as a result, they are not likely to be interested in developing their careers in the industry at all (Richardson, 2008).

There is no doubt that most students are interested in getting an interesting job during their studies (Suwa, 2014). Although, as indicated in previous research, some students may perceive that the seasonality of tourism work can make it difficult to find a stable job (Aksu & Koksal, 2005; Kusluvan & Kusluvan, 2000; Richardson, 2008; Richardson & Thomas, 2012), seasonality may indeed bring, as indicated by these study results, numerous advantages in students' perception. Especially, it allows getting a job easily during study time, holidays, summer season, etc. Seasonal work may provide a genuine possibility to gain real, beneficial working experience by students during their study time. It is especially important, as students' working experience may have a great impact on their attitudes towards working in industry after graduation (Chen & Shen, 2012; Kusluvan & Kusluvan, 2003) and significantly shape their image of a career in tourism (Roney & Öztin, 2007). Thus, if the industry would not like to miss its chance to attract a young qualified workforce, the most important thing is to perceive seasonal working students as future valuable employees who are worth investing in today in an effort to make them keen to stay in the field for longer. By contrast, if seasonal working students are perceived as only part-time, temporary workers who are not encouraged to gain skills which they can successfully use in their future careers in tourism, they will work today and be gone tomorrow pursuing other avenues for their future employment than tourism.

Therefore, both educators and industry practitioners should tightly cooperate with each other to shape students' realistic expectations towards their work and to assure the high quality of their seasonal work experience; as such experience may strongly influence young people's employment perceptions. Due to the nature of the study, the results cannot be generalized. Additionally, fairly low values of the correlation coefficients

require interpreting the study results with some caution. However, keeping above, these study results may serve as a basis for discussion and direction for future research with both a larger sample size and more HEI, from different regions, involved in the research project to overcome these limitations and validate the study results.

It may also support researchers in their further efforts to discover more general factors which may affect the perception of the seasonality and in understanding how they may differ, if at all, between different regions of Poland. It would also be useful to extend this study and determine the perceptions of both educators and industry professionals on the problem of seasonality in tourism employment and how they assess its potential influence on young people's career perception of the industry. The potential gaps between the perspectives of academia, business, and students may provide useful insights into the issue of seasonality in tourism employment and persuade all parties to closer cooperation on this issue.

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Abstrakt

W ostatnich latach wiele krajów odnotowało szybki rozwój turystyki, który jest postrzegany, jako swoisty „motor” wzrostu gospodarczego i rozwoju społecznego. Z drugiej strony, mimo, iż turystyka generuje wiele nowych miejsc pracy, wciąż wiele krajów boryka się z problemami związanymi z pozyskaniem i zatrzymaniem wykwalifikowanych kadr. Problem ten potęguje fakt, że wielu absolwentów, nie podejmuje zatrudnienia w turystyce po ukończeniu studiów, wskazując na specyficzny charakter

tej pracy, w tym jej sezonowość. Stąd biorąc pod uwagę powyższe, celem niniejszych badań było rozpoznanie postaw studentów specjalności związanych z turystyką i/lub hotelarstwem (T&H), wobec problemu sezonowości zatrudnienia w turystyce oraz zbadanie czy istnieje zależność pomiędzy postrzeganiem sezonowości a aspiracjami studentów wobec zatrudnienia w branży turystycznej po zakończeniu studiów. Badanie przeprowadzono wśród studentów wyższych uczelni zlokalizowanych w północnej Polsce (Region Południowego Bałtyku), która w sposób szczególny doświadcza problemu sezonowości w turystyce. W rezultacie przeprowadzonych badań ankietowych uzyskano 171 poprawnie wypełnionych kwestionariuszy. Rezultaty badań ukazały, że sezonowość zatrudnienia w branży turystycznej jest raczej pozytywnie postrzegana przez badanych. Istnieje także statystycznie istotna zależność pomiędzy percepcją sezonowości a aspiracjami zawodowymi studentów. W szczególności, respondenci, którzy postrzegali zjawisko sezonowości pozytywnie, również chętniej deklarowali swoją intencję zatrudnienia w branży turystycznej po zakończeniu studiów, w przeciwieństwie do badanych, którzy zjawisko to postrzegali negatywnie. Interesującym jest również, iż studenci, którzy pracowali już sezonowo w turystyce, postrzegali problem sezonowości w bardziej pozytywny sposób, co ukazuje istotną rolę doświadczenia pracy w kształtowaniu pozytywnych postaw przyszłych kadr sektora turystycznego wobec pracy w branży.

Słowa kluczowe: Region Południowego Bałtyku, turystyka, sezonowość, aspiracje zawodowe, studenci.

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Socio-economic requirements as a fundament of innovation in food packaging

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Abstract

The food packaging industry trends reflect the identified needs and requirements of consumers because entrepreneurs should satisfy changing consumer requirements to achieve and maintain a competitive advantage due to innovation. In the group of socio-economic needs, the most important ones are lifestyle changes, improving the quality of life through the added value offered to consumers through packaged products, profitable companies in the sector, packaged product safety and environmental protection. The main aim of the study was exploring the validity of food packaging requirements concerning the satisfaction of consumer needs. The resulting hierarchy of important needs and requirements represents the foundation for solutions and strategies to improve the quality of a consumer's life. Analysis of the results clearly shows that among all socio-economic needs and requirements posed to food packaging, safety is the most critical need for consumers. Other packaging properties such as convenience and legal requirements fulfillment are important. Proposed model packaging, which will stratify consumers' needs and requirements and will help to improve their quality of life, should be characterized by health, simplicity, identity, aesthetics, and meaning. The packaging industry is a branch considered to have high potential in the field of applying innovative solutions. This is mainly related to the desire of introducing solutions in the areas of improving safety, functionality, communication and environmental protection. Identification and understanding of consumer needs is a valuable source of information useful

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when developing improvements. Proposed components of model packaging follow the motto of the World Packaging Organization, which says: "Better quality of life through better packaging."

Keywords: *food packaging, socio-economics needs, guidelines of innovation in food packaging.*

INTRODUCTION

Innovation is an important element for both the development and the competitive advantage of packaging systems, especially for those utilized in the food supply chain. Innovations are conditioned by many factors of a very diverse nature that stimulate or limit them. Innovations depend to a large extent on the quantitative and qualitative transformations taking place in consumer behavior - the largest and most important group of clients in the trade. Those innovations are determined by many factors. By reviewing the current specialized techno-scientific literature, and analyzing the international industrial association elaborations, those factors can be grouped into the following main categories: business dynamics, distribution, regulation and consumption (The Future...2013). In particular, the business dynamics factors influence the packaging industry and, in turn, lead to increasing the requirements for brand enhancement/differentiation, in a progressively more competitive context that also includes the development of new innovative packaging materials. In the field of product distribution, and so among the related factors, important roles are played by: the consolidation and globalization rates of the retailers involved; the technological quality and innovation of the supply chains; and e-commerce. Moreover, very important drivers for industrial development are the current legal regulations that concern:

- the protection of consumer interests in terms of safety, protection of consumer economic interests; and
- the adoption of new regulatory requirements related to the recycling of packages, as well as the reduction in carbon footprint associated with their life cycles and, as a result, the impact on global climate change (Position Paper - Market Trends and Developments, 2008). In this regard, it should be observed that a huge number of researchers have assessed the environmental issues related to the food packaging field such as, just to name a few, Ingrao et al. (2015 a,b), Siracusa et al. (2014), and Gironi and Piemonte (2010). Those authors investigated different food packaging products (i.e. films, trays, bottles and clamshells) to assess the potential environmental improvements resulting from innovative solutions like the reduction of the input virgin polymer utilized, as well as the usage of recycled and/or natural polymers.

Results from the analysis of the aforementioned factors contributed to formulating the statement that nowadays packaging is supposed to perform well according to the following three dimensions: profit (economy aspect); planet (environmental aspect); and people (social aspects) (Yam, 2009). Social aspects should also be accounted for in the planning of marketing strategies for product and packaging.

However, it should be underscored that the socio-economic needs and expectations of consumers are acknowledged as mostly stimulating industrial development. In this context, the major consumption trends are depicted in Figure 1.

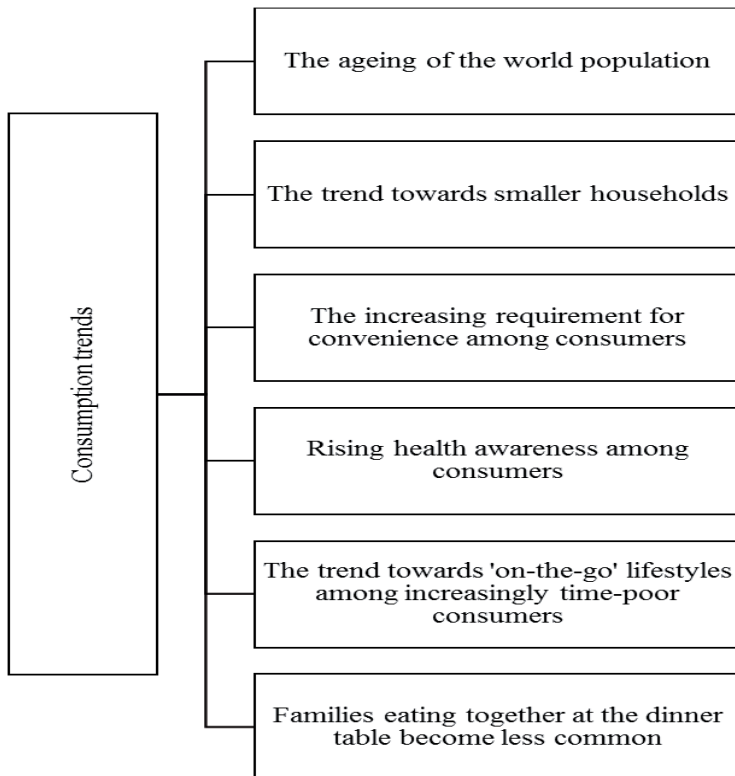


Figure 1. Consumption trends in the food market

Source: self-elaboration based on Position Paper - Market Trends and Developments (2008).

Social trends have a significant impact on the consumer goods market, and thus on the goods offered in it. Among the directions significantly affecting the changes taking place in the packaging market, we should mention first of all the following (Emblem & Emblem, 2011):

- the aging of society;
- the change in the structure of households;
- the changes in lifestyle;
- the increase in the requirements for the convenience of use of products;
- the rising health awareness.

The aging of society is a phenomenon that has been much more intense in recent decades. Especially in more developed countries, the dynamics of its growth accompanied by a drop in the birth rate has caused the percentage of older people in society to grow rapidly. Thus, the aging process has not only a demographic dimension but also an economic and social dimension.

Population aging is an occurrence which during the past several decades has expressively expanded. It has been easy to see the growing proportion of old people in society. It results from the greater longevity of people, the progress of civilization and a higher quality of life. More factors, such as a family model being promoted, the level of wealth of society, the level of social health care, the number of women who are active in the labour market, the educational level of the population and a social policy adopted by a state, exert a direct impact on the phenomenon of population ageing, (Irvine, 2008).

In Poland, the process of society aging has been seen since the 1990s. In 1990, people aged 60 and over accounted for 12.8% of the whole population, whilst in 2013 it was 21.5%. It is projected that this share of people 60 years and older will be 29% in 2030 and 40.4% in 2050 (according to information given by *GUS* – the Central Statistical Office of Poland in 2016). At the same time, it is predicted that the population will grow by 5.4 million by 2050. A significant increase in the number of older people is already signaled in the first years of the forecast because the population of older people will be fed by very large numbers of births from the 50s and 60s of the last century. The course of changes in the number of subpopulations at the age of 60 years and more coincides with the occurrence of highs and births in the second half of the last century (Raport na temat wpływu..., 2016).

An expression of this are changes in the consumption structure and an increased demand for products (including packaging) adapted to the needs of older consumers. Therefore, this situation forces the producers of products and their packaging to adapt activities to the changing environmental conditions. Especially important solutions are easy opening packaging in smaller sizes with an appropriate typeface and font size to ensure the visibility of the text (Emblem & Emblem 2011).

Another change affecting the transformation of the packaging industry is the change in the structure of households. When assigning the attribute of an economic operator to a household, it should be noted that its activity is

focused primarily on satisfying individual and common consumption needs. This essential household goal is the basis for decisions related to the selection of products that are able to meet their needs and requirements. The scope and structure of needs met in households is shaped both by external factors (e.g., prices and supply of goods) as well as internal ones resulting from the socio-demographic and economic structure of households and their members. In addition to the above-described factors of an objective nature affecting consumer consumption decisions, also subjective determinants should be added (so-called sociological and psychological factors) (Zalega, 2007).

What is more, the structure of households is changing as there is a systematic decrease in the number of household members. In 2002 the average number of people in the home-based economy was 2.84, while in 2011 this number was 2.82, and in 2014 it declined further to 2.73. The forecast for 2030 predicts a drop to 2.40 people in the household. According to the forecasted results for the population in the years 2014-2050, the structure of people by age will undergo dynamic changes, being a consequence of the demographic "wave." Taking into account the decreasing number of births and the rapid aging of Polish society, this situation will be reflected in the forecast of the structure of households (Prognoza gospodarstw domowych..., 2016).

Another important trend affecting the food market is the so-called "convenience foods." This trend refers to food products that, thanks to the use of appropriate technologies and raw materials in the production, show the desired durability but also allow quick preparation, either by themselves or in combination with other ingredients of ready-to-eat meals. This category includes products such as: ready for processing, pre-prepared for culinary works, ready for thermal processing, heating, consumption and table serving. Hence the popularity of ready soups, meats, frozen foods, salads and, finally, fruit and vegetable cocktails and other beverages. Consumers expect fast and easily prepared products without the need to unpack them (Tarczyńska, 2013). Thus, the role of packaging containing portions of meals adapted to individual needs, in which there is the possibility of heating a meal or self-heating packaging, significantly increases. Another need for the modern consumer is the convenience and functionality of using the packaged product. The improvement of convenience and functionality is possible by designing innovative packaging construction solutions. The convenience of use can be analyzed bi-directionally. On the one hand, it is related to the ergonomics of packaging, taking into account the shape of the packaging that facilitates the grip and use of the product, the method of opening, portioning, closing and dispensing the product. On the other hand, the convenience of use is related to the marketing of convenient packaging, for example for heating

in microwave ovens or packaging in which a simple exothermic reaction is followed by heating the product packed in it (Sykut et al. 2013).

An important stimulus for the development of the packaging industry is also a trend associated with a change in lifestyle, which influences the increase in demand for packaging that facilitates the use. This caused, among other things, an increase in the demand for products packed in convenient packaging. In addition, consumers desire packaging with innovative solutions in the field of improvements regarding the method of opening, closing, dispensing and handling the packed product and protection against unwanted opening (Lisińska & Kuśnierz, 2011).

In addition to demographic changes, consumer needs resulting from demographic change have a significant impact on innovation development. As a result, the packaging optimization trend is marked. Instead of the recently popular packaging with large capacities, packaging is becoming more and more dominant with a size suited to the needs of small families, people aging or running a household independently. The packaging should be user-friendly, enabling multiple opening and closing, easy transport from the place of purchase and convenient storage at home. Currently, consumers often expect personalized packaging, printed "on demand" by digital printing. Personalization introduces an element of interaction between a consumer and a given brand. The development of interaction is also augmented reality. The consumer can, using a smartphone, connect the actual image of the product with an artificially generated animation, offering additional information about the product, e.g. language versions, preparation proposals or a multimedia game. Consumer awareness will be transferred from the product to the service.

Social trends affecting consumption are closely related to the cycle of purchasing behaviors defined as a set of actions and activities aimed at satisfying the consumer's own needs. In this cycle, the consumer's action begins to feel the need (understood as a state of feeling of absence), while having preferences regarding the object that can satisfy these needs. In order to satisfy them, the consumer undertakes actions, consisting, among others, in searching for an object that is able to satisfy the need, often looking for information about objects and evaluating available solutions by making a choice and making a purchase. The consumption process also carries out the analysis of the choice made, the assessment of the degree of satisfaction of the need according to the preferences. It is assessed by the level of customer satisfaction and the likelihood of resuming the purchase of a consumed product or alternative objects (Rudnicki, 2012).

The food market, both in Poland and in the world, is one of the most innovative segments, although moderate consumer interest in new food

products does not lead to particular activity in this area. At the same time, there is an increase in consumer awareness of the relationship between food, diet and health, which for many food companies may be a prerequisite for the marketing of products with specific pro-health, functional or enhanced nutritional properties. Such trends, in relation to the domestic food market, may also be justified by the fact that health is the dominant value for the vast majority of Poles (Dąbrowska et al. 2013), and consumers are asked what is particularly important for them in food, most of them they answer “not to contain ingredients that harm me” and “to affect good health” (95% and 94% respectively think that these are important and very important attributes of food). This image only distorts the fact that the research cited shows that consumers value the taste of food more than health attributes. This situation is confirmed by global trends. In recent years, both in Poland and in the world, there are many new trends in consumer behavior towards food, which among others relate to health understood as perceiving food in terms of a positive impact on health (Gutkowska et al., 2014).

In conclusion, consumers are undoubtedly an important source of innovation in the retail trade. Their ideas can inspire entrepreneurs to seek new solutions, introduce radical changes. Sometimes, however, paying too much attention to the expectations and proposals of customers may contribute to the inhibition of the innovation process. The reason may be the reluctance of clients to change (especially new solutions), a misunderstanding of technical novelties, or the inability of clients to imagine what these new solutions may be and what their benefits may be. For the development of innovations, it is particularly important to observe consumer behavior, which is affected by changes constantly occurring in the environment of consumers. Changes in the environment contribute to the emergence of new trends in consumer behavior and thus create new conditions for making decisions and actions in the area of purchase (10 Trends..., 2011).

The study discussed in this paper was aimed at exploring the validity of food packaging requirements with a view to the satisfaction of consumer needs. Furthermore, the importance of giving hierarchy to those requirements can represent the foundation for the implementation of technological solutions and strategies enabling global improvement and innovation in the food packaging sector. As a result, there would be enhancement of the quality of people’s lives and, in turn, of entire societies worldwide.

Finally, the authors believe that the results obtained might contribute to enriching the international knowledge in the food packaging field, and support stakeholders to find, develop and promote those solutions and strategies.

LITERATURE BACKGROUND

Market trends reflect the identified needs and requirements of consumers: this is because entrepreneurs should satisfy continuously changing market requirements to achieve and maintain a competitive advantage. In the group of socio-economic needs, the most important ones are: lifestyle changes oriented to improving the quality of life through the added value offered to consumers through packaged products; enhancement of the income for the companies operating in the sector; and packaged product safety and environmental protection (Capitano, Coppola, & Pascucci, 2009; Loizou, Michailidis, & Chatzitheodoridis, 2013).

The rapid development of the food packaging industry and the forecasts for increased demand for modern and innovative packaging solutions have made it important to analyze both needs and demands of consumers for food packaging. Packaging systems are highly important for the protection of food quality and shelf life, as they are designed to allow consumers to obtain foods that correspond to their quality and safety expectations, also after traveling for long distances (Ingrao et al., 2015a). Therefore, it can be asserted that the package is an important element that shapes the quality of life and, therefore, due attention should be paid to the satisfaction of those needs. This can be done through the dynamic development of the packaging industry and through enhanced variety and sophistication of packages launched on the market (Lisińska-Kuśnierz & Ucherek, 2011, Ahmadi, Bahrami, & Ahani, 2013).

The problem of consumer expectations related to the packaging of selected product groups available in the market has previously been addressed by several author teams in their research studies. Perception of food quality through the prism of packaging was undertaken by several author teams such as, for instance, Chaya and Hort (2013), Labbe et al. (2013), Carrillo et al. (2014), Fiszman et al. (2015). In their studies, they identified features and properties of a packaging's visual layer that influence consumer perception of the overall quality of the product. The influence of packaging elements on a purchasing decision was investigated by authors like Butkevičienė, et al. (2008), Estiri et al. (2010), and Mueller and Szolnoki (2010), while the issues of consumer behaviors in relation to packaging were studied by Solomon et al. (2010), and Kawecka (2015), Lisińska-Kuśnierz and Kabaja (2018). Other research concerning the analysis of consumers' opinions, needs and requirements on several product groups was developed by Lisińska-Kuśnierz and Ucherek (2011), Rebollar et al. (2012), Lisińską-Kuśnierz (2014), Svanes et al. (2014), and Cholewa-Wójcik (2014, 2015).

It should be observed that results from the research mentioned above refer to selected packaging features related to the social aspect of packaging

like visual aspects, communication and functionality. As a matter of fact, those studies were focused upon investigating the ways consumers make decisions on what type of food to buy, based upon the appeal and the information reported in the package. In this context, the in-depth analysis of those studies formed the basis for investigating the specialized literature related to the role of packaging in consumer behavior. Moreover, it highlighted a lack of research and full analyses with regard to the merits of consumer expectations towards food packaging in the realization of their needs and requirements.

Among the trends influencing the development of the food packaging industry, consumption can be considered as the most important one. According to *The Future of Global Packaging to 2018* consumption of food products, as the main factor of industrial development is closely related to social needs (The Future..., 2013). These needs are expressed as both requirements and expectations of consumers for food products packaging. Social needs are connected with (Food and Beverage Packaging Technology, 2011):

- packaging quality properly chosen for the product;
- communication with consumers;
- convenience and functionality;
- extension of shelf-life by innovative systems of packing and storage without chemical preservative;
- safety;
- environmental-friendliness.

When the overall quality of a package is adjusted to the food content, it becomes an important element for protection and preservation of the quality of that food. Furthermore, hygiene is also important to be considered in the design of a package, as it is strictly linked to the social need for safety.

Communication with consumers through packaging is related to the presence of proper information and graphic signs (pictograms) that should be placed in a readable, legible way and is easily found by the consumer.

Convenience is connected with special equipment or elements improving utilization of a package. Improvements can be made in the ability to repeatedly open and close the package; in shaping the package to be ergonomic, so as to ease its grip and manipulation. The latter can be improved also by giving proper dimensions and mass not to the package but also to the food content, so to facilitate manipulation of the packed food in its whole. Functionality represents one of the added values for packaging systems, because it facilitates and improves their usage, above all for special groups of consumers (i.e., children, seniors and persons with physical disabilities), and increases their ergonomic-related issues.

Extension of shelf-life by means of innovative systems of food packing and storage without chemical preservative is also connected with lifestyle:

it is important because of changes in shopping patterns. Shopping is made rarely, and food must be kept unchanged for a longer time. On the other hand, using chemical preservatives is not well seen by social groups promoting the awareness and purchase of healthy and safe foods.

Moreover, environmental awareness worldwide is increasingly leading people to demand food packaging solutions whose production has involved consumption of: less non-renewable fuels and energy; less raw materials; and/or, when possible, more recycled materials. Moreover, packages are more and more developed and produced so that they can be easily re-used and recycled into new materials for other industrial applications, so reducing the impacts in their life cycles (Lisińska-Kuśnierz & Ucherek 2011). For this reason, they are manufactured by assembling different materials, like paper and plastics, in ways that they can be easily separated and recycled.

Referring to the concept proposed by Bix et al. (2009), packaging functions (protection, utility and communication) are realized in three surroundings such as physical, environment and humans. Detailed analyses of packaging functions allow the development of a matrix in which every component is associated with packaging properties and specific elements as referred to consumers' needs. Taking into consideration that social needs are closely correlated with consumer requirements regarding packaging, a summary of those needs/requirements related to human lifestyles is presented in Table 1.

Table 1. Requirements to food product packaging from a consumer point of view

Requirements groups	Specific consumers' requirements concerning food packaging
Lifestyle	Protection of both quantity and quality of the contents of the various conditions of use
	Variety of packaging materials
	Variety of packaging shapes and construction forms
	Convenience
	Packaging/labels informativity
	Aesthetics
	Packaging resistance on exposures
	Price

Requirements groups	Specific consumers' requirements concerning food packaging
Added value	Additional security guarantees in packaging Variety of shapes and the volume of packaging Packaging weight Use of draining indicators Variety of forms of joined manual Type of packaging surface structure Packaging transparency Packaging design Information positioning manufacturer and product on the market Indicators Advertisement
Safety	Maintaining the amount and quality of content Presence of first opening protection Presence of security against unauthorized opening Safety in use (no defects like sharp edges) Safety when handling (e.g., when moving, stacking) No interactions between components of the packaging material and the product Presence information affecting the safety of the user (i.e., the date of minimum durability, warning about the presence of allergens)
Legal regulations	Information concerning the protection of consumer interests in terms of safety, protection of consumer economic interests and environmental protection Meeting the requirements of legislation, e.g., the integrity of the product guarantee warranty usefulness for different age groups of consumers Information for adherence to laws related to packaging
Environment protection	Type of packaging material from the point of load on the environment Homogeneity of the packaging material used in the manufacture of the packaging Use of recycled materials Use of biodegradable materials Minimized weight of packaging Ease of recycling post-consumer packaging Information on how to deal with the packaging after the utility

RESEARCH METHODS

A survey was conducted by this author team, to identify the needs and social requirements of consumers on food packaging. This also included planning a set of research tasks, as in the following list, to explore the validity of food packaging requirements concerning consumer needs:

- identifying the characteristics of packaging materials from the point of view of consumer expectations in relation to food packaging;
- determining the validity of the features and elements of food packaging systems from the point of view of consumers' needs and requirements;
- sociological determination of rank requirements in the field of food packaging.

The first step of this study was to determine in empirical ways, the expectations of consumers with regard to the requirements related to various aspects of the socio-economic needs. In the questionnaire, respondents gave answers on a verbal scale which, for analysis, was converted into a 6-point number scale. A 6-point grade scale was used (0 – no expiration, 1 – very little validity, 2 – little validity, 4 – average validity, 5 – high validity, 6 – very high validity) for the assessment of the importance of various characteristics of food packaging. Subsequently, from the converted respondents' answers, arithmetic average indications were calculated.

The survey was conducted from September to December in 2014 administering questionnaires (in traditional paper form) containing single, multiple choice and ordering questions. The survey was completed by 200 consumers of both genders and of varying ages and education levels, which was considered as a representative sample for the reliability of the survey itself and related results. The sample selection was randomly taken among clients of shopping malls in a city of over half million inhabitants in Poland's Malopolska region. The questionnaire was administered in a paper version and was filled in by a trained interviewer based on the answers given by the respondents. The form of an interview with questionnaire had been chosen because the interviews were conducted in shopping malls, for better group diversity (in comparison to internet surveys). A paper questionnaire without an interviewer was not possible in those conditions. That also helped respondents have a better understanding of each question and kept their interest. Also, there was no reason to reject any surveys due to a lack of answers. The socio-demographic profile realized, based upon the population sample interviewed, is presented in Table 2.

Table 2. Socio-demographic profile of studied population

Socio-demographic criterion		Share [%]
Gender	Woman	58
	Man	42
Age	to 25	43
	26-35	19
	36-45	16
	46-55	13
	56-65	8
	over 65	4
Dwelling place	Countryside	22
	Town to 50 thous.	9
	50-100 thous.	11
	100-250 thous.	5
	250-500 thous.	7
	above 500 thous.	46
Education	Vocational	12
	Secondary	38
	Higher	50

Data surveyed were used to create the socio-demographic profile shown in Table 2 and then were elaborated and analyzed: the results obtained were discussed in the next sections. A rank-criteria-based analysis was carried out on the needs and requirements of consumers in the field of food packaging. Then, corrected sums of importance were calculated (element of ABCD Suzuki method) and the averaged rank indicator for each group of needs/requirements was determined accordingly. In order to eliminate answers to questions about the importance of particular concepts, and then to calculate a significant sum. Corrected sums of importance are sums of products of the number valid importance and the rank of cause.

Finally, the groups of analyzed socio-economic needs/requirements for food packaging were ordered based upon the designated indicator rank previously calculated.

ANALYSIS AND RESULTS

Results of the validity of food packaging features, calculated considering consumer requirements associated with separated groups of social needs as average scores, are presented in Table 3.

Table 3. The validity of the features of food packaging regarding social needs

Packaging features		Features validity (pts.)	
Consumers' life-style	Protection of the quantity and quality of the contents in various conditions of use	4.2	
	Convenience	4.1	
	Packaging/labels informativity	3.9	
	Aesthetics	3.7	
	The variety of packaging shapes and construction forms	3.6	
	Packaging resistance on exposures	3.5	
	Price	3.3	
	The variety of packaging materials	3.2	
	Added value	Additional security guarantees in packaging	3.8
		The variety of shapes and volume of packaging	3.8
Packaging weight		3.7	
Packaging design		3.7	
Indicators		3.7	
Type of packaging surface structure		3.7	
The use of draining indicators		3.6	
Packaging transparency		3.6	
Advertisement		2.9	
The variety of form of joined manual		2.7	
Information positioning manufacturer and product on the market	2.6		
Safety	No interactions between components of the packaging material and the product	4.8	
	Maintaining the quantity and quality of content	4.6	
	Safety in use (no defects like sharp edges)	4.6	
	The presence of security against unauthorized opening	4.4	
	Presence of information affecting the safety of the user (i.e., the date of minimum durability, warning about allergens)	4.4	
	The presence of first opening protection	4.2	
Safety while handling (e.g., when moving, stacking)	4.0		
Legal regulations	Meeting the requirements of legislation, e.g., guarantee of the product integrity	4.1	
	Information of adherence to regulations related to packaging and packaged product	4.1	
	Information concerning the protection of consumer interests in terms of safety, protection of consumer economic interests and protection of environment	3.7	
	Warranty usefulness for different age groups of consumers	3.5	

Packaging features		Features validity (pts.)
Environmental protection	The use of biodegradable materials	3.6
	Minimized weight of packaging	3.6
	Information on how to deal with the packaging after the utility	3.5
	Ease of recycling packaging	3.3
	The use of recycled materials	3.3
	Homogeneity of the packaging material used in the manufacture of the packaging	3.25
	Type of packaging material from the point of load on the environment	3.2

Analysis of the research results on the hierarchy of the packaging features showed that among the needs and demands of consumers concerning lifestyles, the most important characteristics of food packaging is protection of the quantity and quality of content under different conditions of use and convenience of use. Indeed, these features have obtained the highest average rate of the important factor, leveling out at between 4.1-4.2 points. In the group of average validity, the following features were indicated: packaging/labels informatively, aesthetics, the variety of packaging shape and form, packaging resistance on exposures, price and variety of packaging materials (for example plastics, paper, steel, etc.). The related validity scores were found to be ranging from 3.2 to 3.9 pts.

In the group of features that increase added value for consumers, indicated as important characteristics were: additional security guarantees in packaging, the variety of shapes and volume of packaging (3.8 pts.) and its weight and design (3.7 pts). As an additional packaging characteristic, the respondents also pointed out the use of packing draining indicators and the material transparency (3.6 pts.). The lowest validity in this group of needs was attributed to product information positioning and advertising. Evaluated characteristics obtained results of the validity in the range of 2.6 to 2.9 pts.

Results were reported in Table 3, their analysis showed that, between all food packaging safety characteristics, the most important feature for consumers was the absence of chemical interaction between packaging material and the product (4.8 pts). High scores (4.6 pts.) were also obtained by quality of content and safety in use. Other important features were found in: the clearness through which important information is given to consumers with regard to the food contained and package used; and the presence of securities against unauthorized opening were given due attention. In the

group of high validity features, consumers indicated the presence of first-opening protection (4.2 pts.) and safety during handling (4.0 pts.).

Analysis of the results obtained on the validity of the characteristics of food products packaging, that consider consumer demands related to legal regulations, showed that the most important feature for the respondents was legal data requirements to packaging materials and packaged food product, as meeting the legislation requirements concerning the product integrity (4.1 pts.). Other packaging features received the validity at an average level (3.5-3.7 pts.).

Research analysis revealed that the most important consumer point of view regarding the environmental aspects was the biodegradability of packaging material, minimizing the weight and volume of packaging, (3.6 pts). The less important characteristics were the type of packaging materials and its environmental performance (3.2 pts.) and homogeneity of the material used for production of packaging (3.25 pts.). Obtained results show that respondents (consumers) do not fully understand the environmental aspects of packaging materials. They have some knowledge about biodegradability or recycling but are not aware that it has an impact on the general environmental performance of packaging.

DISCUSSION

Among the analyzed characteristics of the food packaging, taking into account the requirements of consumer-related to lifestyle, safety, added value, legal requirements and environmental protection, those resulting to be significant (with value 4 and higher). They are basic guidelines for improving food packaging taking into account the requirements and needs of consumers:

- no interactions between components of the packaging material and the product;
- maintaining the quantity and quality of content;
- safety in use;
- the presence of security against unauthorized opening;
- presence of information affecting the safety of the user;
- the presence of first opening protection;
- protection of the quantity and quality of the contents in various conditions of use;
- convenience;
- meeting the requirements of legislation;
- information of adherence to regulations related to packaging and packaged product;
- safety while handling.

The results of the survey provided the basis for a detailed analysis of needs and requirements of consumers, in the field of food packaging. The subsequent hierarchy of importance indicates the importance of the characteristics of the packaging from the point of view of the needs of users. Summary of the results obtained in the analysis is presented in Figure 2.

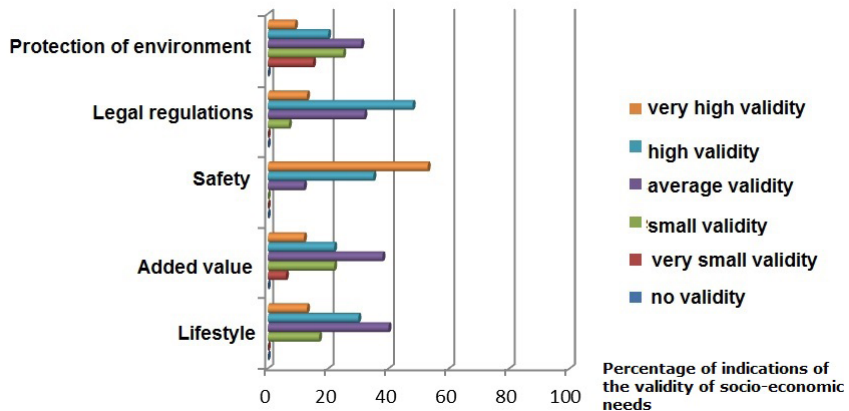


Figure 2. Importance of socio-economic consumers' needs

Analysis of the results clearly showed that among all socio-economic needs and requirements posed to food packaging, safety is the most important one for consumers. Declarations about the importance of social needs were made 200 respondents. Most of the survey participants (88%) agree that fulfillment of requirements relating to the safety of food packaging is very important (53%) and significant (35%). In the group of consumers, special attention to the characteristics of packaging associated with the safety aspect was considered. Particularly, consumers with ages ranging from 26-35 years and 36-45 years indicated this property as important. This group is dominated by women, living in cities of 250-500 thousand residents and cities of over 500 thousand residents. Results are in agreement with Jevšnik et al. (2008) because women are more aware consumers and more sensitive to food safety.

The analysis also showed that second in the hierarchy of needs/requirements indicated by consumers was requirement associated with legal regulations. This group of needs was indicated as *very important* and *important* by 61% of all respondents. The third in order of importance for consumers was pointed to be the requirement related to lifestyle: 43% of the respondents indicated *very high* and *high importance* of this group of needs. Next in the hierarchy of needs/requirements indicated by the consumer was

the requirement related to added value. This group of needs was indicated as *very important* and *important* by 34% of respondents. The lowest validity of the received group of needs was related to environmental protection, with a score of 29% of indications as *very high* and *high validity*, so underscoring the need for more education and information in this sense. This would allow consumers to understand that by improving the environmental quality of a package, its overall quality and functionality is improved.

Results are depicted in the graph of Figure 3.

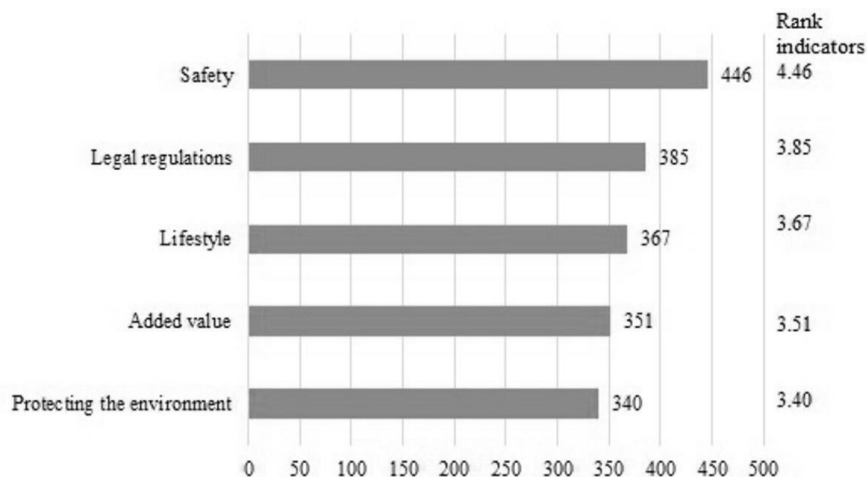


Figure 3. The hierarchy of socio-economic consumer needs

Analysis of the results indicated the order of priority of the needs from the most important ensuring safety (rank 1), meeting legal regulations (rank 2), needs related to lifestyle (rank 3), improving consumers' life quality through added value (rank 4), and importance of environmental protection (rank 5).

The study confirmed that both production and design of food packaging systems should be developed considering not only the technical requirements (such as barrier properties, physio-mechanic properties and chemical properties) but, also, the socio-economic and the environmental ones. In this paper, the authors proposed attributes and functions to be taken into account for improvement of food packages. Moreover, it would be desirable to consider the social needs in accordance with the hierarchy-related findings of the study. Previous studies on the topic of consumers' requirements regarding packaging were selective and concerned only lifestyle aspects. It was covered in studies by Estiri, Hasangholi, Yazdani, Nejad, and Rayer (2010), Mueller and Szolnoki

(2010), Venter et al. (2011), van der Merwe et al. (2013), Carrillo, Fiszman, Lähteenmäki, and Varela (2014), Cholewa-Wójcik (2015); Fiszman, Carrillo, and Varela (2015), Gomez, Martín-Consuegra & Molina (2015), added value aspects are presented in studies by Butkeviciene, Stavinskiene, Rutelione, 2008; Ares & Deliza, 2010; Ahmadi, Bahrami, Ahani (2013). The meaning of safety aspects of packaging was proven by (Wilcock, Pun, Khanona, Aung, 2004; Kawecka, 2014b; Baiardi, Puglisi, Scabrosetti, 2016). Environmental aspects importance was highlighted in the studies by Gironi & Piemonte (2010); Svansen et al. (2010); Siracusa et al. (2014); Ingraio et al. (2015a).

Finally, it goes without saying that the fulfillment of legal requirements is mandatory because, without them, packaging would not be available on the market. Consumers are aware of this fact: this was proven by findings from this study. In the literature review, all the presented studies are fragmentary and concern only one of the aspect. This study represents a holistic approach to the topic of consumer needs and requirements.

CONCLUSION

Food packaging belongs to a group of products with a high potential for innovation. This is mainly due to the multiple, interconnected effects of functionality, ergonomics, economic and environmental advantages of the offer but, also, by changes in visual layer. Currently, to some extent, packaging responds to consumer trends related to the aging of society, change in the structure of households, change of lifestyle, increase in requirements for the convenience of products, and rising health awareness. It is reflected in differential size, the popularity of convenient packaging for convenient food, in some countries product dedicated to older people, changes of packaging materials and packaging construction dictated by the ecological consciousness of consumers. These changes have variable dynamics, and they do not always find understanding and support in the market because they are not compatible with the needs of consumers. The identification and understanding of consumer needs is a valuable source of information, which is desirable to develop guidelines for better ways to design food packaging systems. In this context, the present study was carried out to analyze the requirements for food packaging to answer consumers' needs.

Results from the analysis made it possible to determine the significance of the groups of needs/demands by consumers related to the packages. The study helped to shed light upon the social needs that predict the importance of those packaging factors. Also, the obtained results were used as the basis to investigate consumers ranking needs and requirements, in relation to food

packaging. Assigning ranking indicators to groups of needs and requirements allowed the authors not only to create their hierarchy scale from the consumer's validity viewpoint but also to provide a database for the design of food packaging.

A further study is expected to be carried out to continue investigating consumers' needs and correlate those needs to socio-demographic consumer features. This kind of approach may lead to better adjusting design solutions in packaging for specific consumers groups, such as children, seniors and others.

The model packaging, which will stratify consumers' needs and requirements and will help to improve their life quality, should be characterized by health (safety), simplicity (reduction, convenience), identity (belonging), aesthetics (design), meaning (sustainability, intelligence). Packaging belongs to the group of products characterized by high potential in the field of implementing innovative solutions. This is mainly related to the desire to introduce solutions such as in the area of improving safety, functionality, communication and environmental protection. Identification and understanding of consumer needs is a valuable source of information necessary to develop the assumptions of packaging improvement. The components of model packaging proposed above fit into the motto of the World Packaging Organization, which says: "Better quality of life through better packaging".

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Abstrakt

Trendy w branży opakowań żywności odzwierciedlają zidentyfikowane potrzeby i wymagania konsumentów, które przedsiębiorcy powinni spełniać aby zaspokoić zmieniające się wymagania konsumentów, a także aby osiągnąć i utrzymać przewagę konkurencyjną dzięki innowacjom. W grupie potrzeb społeczno-ekonomicznych najistotniejsze z nich to: zmiany stylu życia, poprawa jakości życia poprzez wartość dodaną oferowaną konsumentom za pośrednictwem zapakowanych produktów, bezpieczeństwo produktów opakowanych i ochronę środowiska. Głównym celem przeprowadzonych badań była ocena ważności wymagań dotyczących pakowania żywności pod kątem zaspokojenia potrzeb konsumentów. Głównym wkładem pracy jest opracowanie hierarchii ważności potrzeb i wymagań, która stanowi podstawę dla rozwiązań i strategii mających na celu poprawę jakości życia konsumenta. Analiza wyników wykazała, że wśród wszystkich społeczno-ekonomicznych potrzeb i wymagań związanych z pakowaniem żywności bezpieczeństwo jest najbardziej krytyczną potrzebą konsumentów. Istotne są także inne właściwości i cechy opakowania, takie jak wygoda i spełnienie wymagań prawnych. Proponowane opakowanie modelowe, które zaspokoje potrzeby i wymagania konsumentów i przyczyni się do poprawy ich jakości życia, powinno charakteryzować się: bezpieczeństwem zdrowotnym, prostotą, tożsamością i estetyką. Branża opakowaniowa to branża uważana za mającą duży potencjał w zakresie stosowania innowacyjnych rozwiązań. Jest to związane głównie z chęcią wprowadzania rozwiązań w obszarach poprawy bezpieczeństwa, funkcjonalności, komunikacji i ochrony środowiska. Identyfikacja i zrozumienie potrzeb konsumentów jest cennym źródłem informacji przydatnych przy opracowywaniu ulepszeń. Proponowane komponenty opakowań modelowych są zgodne z mottem Światowej Organizacji Opakowań, która brzmi: "Lepsza jakość życia dzięki lepszemu opakowaniu".

Słowa kluczowe: opakowania do żywności, socjoekonomiczne potrzeby, wytyczne, innowacje opakowań do żywności.

Biographical notes

Agnieszka Cholewa-Wójcik - doctor of economic sciences in the field of Commodity Science. Research interests include kinetics of changes in the quality of packaging materials, durability of packed food products and innovativeness in unit packaging. She is a member of the Polish Commodity Science Society and a member of the Polish Logistic Technology Platform and an expert in the field of packaging and storage of goods. Agnieszka Cholewa-Wójcik is also the author of expert opinions and opinions for enterprises and for State Bodies. She works with national and international companies and is a member of the software and technical board of the packaging industry.

Agnieszka Kawecka - an employee of the Faculty of Commodity Science and Product Management since 2006, Ph.D. in economics in the field of commodity science. Research interests concentrating in particular on the subject of packaging safety, safety systems in the production and marketing of packaging and packed products, food products logistics and industrial and environmental aspects related to packaging and the functioning of supply chains. Appraisal of the Polish Commodity Science Society in the field of packaging and storage of goods. Cooperates as an expert with Chamber of Industry and Commerce in Krakow, the Polish Agency for Enterprise Development.

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Siracusa Valentina received her degree in Industrial Chemistry at the University of Catania (Italy). She completed her Ph.D. and post-PhD study working on the synthesis and characterization of innovative polyesters, used in the engineering field. After a period as lectures for “Chemistry and Materials” for Engineering, since 2006 she has been Associate Professor on Chemistry for Engineering at Catania University. She collaborates on several research projects, both for academic and industrial interest, on topics such as recycling, ambient, food packaging, graphene. She collaborates with national and international research groups on biopolymers used in the field of food packaging, for modified atmosphere packaging of fresh foods, with also Life Cycle Assessment study (with SimaPro8 software). She is the author of more than 70 papers in high impact factor scientific journals, she is the author of several book chapters for Wiley, Springer, Elsevier, she is the author of articles for a special Module of Elsevier Encyclopedia and she is guest editor of International Journals. Her research interests include synthesis and full characterization of biodegradable and bio-based polymers; gas barrier behavior; Life Cycle Assessment (LCA) study of polymers for food packaging applications; thermal and photo degradation behavior of packaging materials analyzed during food shelf-life study.