a scientific quarterly

EBER

Entrepreneurial Business and Economics Review

ISSN 2353-883X eISSN 2353-8821 2021, Vol. 9, No. 3

CRACOW UNIVERSITY OF ECONOMICS
Department of International Trade
Centre for Strategic and International Entrepreneurship

a scientific open access quarterly

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ISSN 2353-883X eISSN 2353-8821 2021, Vol. 9, No. 3

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Publisher

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All articles are double-blinded peer-reviewed at least by two independent reviewers.
The detailed list of reviewers is published at our website once a year.

Original Version

The online journal is the primary and reference version.
Both printed and online versions or the journal are original and identical.

ISSN 2353-883X (printed version, in the years 2013-2019)
eISSN 2353-8821 (online version, since 2013)

Abstracting/Indexing

The journal, and all its articles, is abstracting and/or indexing
in international databases, including:

ESCI Web of Science [TM] Core Collection (USA)
Scopus by Elsevier (the Netherlands)
Clarivate Analytics (Beijing, China)
EconLit – American Economic Association (USA)
ABI/INFORM Global (USA)
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NSD Nordi – Norwegian Register for Scientific Journals, Series and Publishers (Norway)
Julkaisufoorumi – Finish Classification of Publications (Finland)
BazEkon (Poland)
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All articles published in EBER are tagged with an identification number
employing the Digital Object Identifier (DOI) System.
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submitted to the journal.

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2021, Vol. 9, No. 3

10.15678/EBER.2021.090301

Entrepreneurial behaviour: The effects of the fear and anxiety of Covid-19 and business opportunity recognition

Le Thi Loan, Doung Cong Doanh, Ha Ngoc Thang, Ngo Thi Viet Nga, Pham Thanh Van, Phan Thanh Hoa

ABSTRACT

Objective: The major objectives of the article were to explore the effects of the fear and anxiety of Covid-19 and business opportunity recognition on start-up self-efficacy, entrepreneurial intention, and behaviour, as well as to test entrepreneurial intention-behaviour association.

Research Design & Methods: The study was performed by means of an online survey questionnaire conducted on 405 students at a Vietnamese university. The survey questionnaire was developed based on prior research. Structural equation modelling (SEM) was utilised to test the research model and hypotheses.

Findings: The results illustrated that the fear and anxiety of Covid-19 have a negative impact on start-up self-efficacy and entrepreneurial intention, while business opportunity recognition is strongly and positively correlated with entrepreneurial self-efficacy, entrepreneurial intention, and behaviour. In addition, entrepreneurial intention is found to be the most important antecedent to predict actual start-up behaviour whereas entrepreneurial intention significantly mediates the association between entrepreneurial self-efficacy and entrepreneurial behaviour.

Implications & Recommendations: The study offers practical contributions for both universities and policymakers to foster youths' entrepreneurial activities and manage the negative outcome of Covid-19 on students' mental health.

Contribution & Value Added: This research contributes to the entrepreneurship literature by addressing the notable gap when testing the linkages between entrepreneurial intention and behaviour. Furthermore, the finding confirms that the fear and anxiety of Covid-19 can decrease entrepreneurial self-efficacy, intention, and behaviour, while business opportunity recognition fosters entrepreneurial activities.

Article type: research article

Keywords: fear and anxiety of Covid-19; business opportunity recognition; self-efficacy; entrepreneurial intention; entrepreneurial behaviour; pandemic

JEL codes: L26, M13

Received: 20 February 2021 Revised: 17 April 2021 Accepted: 20 April 2021

Suggested citation:

Loan, L.T., Doanh, D.C., Thang, H.N., Viet Nga, N.T., Van, P.T., & Hoa, P.T. (2021). Entrepreneurial behaviour: The effects of fear and anxiety of Covid-19 and business opportunity recognition. *Entrepreneurial Business and Economics Review,* 9(3), 7-23. https://doi.org/10.15678/EBER.2021.090301

INTRODUCTION

For many years, business venture has been generating increasing interest as a result of its crucial influence on the national and global economy. Entrepreneurship is identified as the global practice and phenomenon because it contributes to economic growth, the maintenance of social stability and the reduction of unemployment rate (Lingappa, 2020; Zamrudi & Yuliantu, 2020). Moreover, contemporary society continually undergoes a change. Entrepreneurship studies, accordingly, have experienced a body of changes. Almost all previous studies only focused on the antecedents of entrepreneurial intention (Krueger, Reilley, & Carsud, 2000; Wach & Bilan, 2021). However, the

linkage between entrepreneurial intention and actual behaviour has not been explored yet in recent studies (Gubik & Bartha, 2018; Mohammed, Zubairu, & Oni, 2021; Nowiński *et al*., 2020), while investigating this relationship was determined as novel in the research stream to contribute to better knowledge about the process of business venture creation (Gieure *et al*., 2020). Indeed, Neneh (2019) stresses that such research limits our current understanding of entrepreneurial behaviours as increasing evidence indicates that not all entrepreneurial intentions are transformed into actual start-up behaviours (Shirokova, Osiyevkyy, & Bogatyreva, 2016), especially in crisis conditions because of a disease outbreak (Giones *et al*., 2020; Ratten, 2020).

Recently, the spectre of the Covid-19 pandemic has been looming over the global economy (Lipkind & Kitrar, 2021; Żak & Garncarz, 2020). This pandemic not only results in serious impacts on the communities in the influenced regions, but it also leads to various levels of negative and profound mental health issues to both infected and uninfected people (Feng *et al*., 2020). Moreover, fear and anxiety are identified as unpleasant emotional experiences that result from a variety of antecedents, including the pandemic crisis (Mahmud *et al*., 2020). Since the current outbreak, some prior studies have illustrated fast growth of mental disorders such as fear and anxiety in uninfected healthy individuals as a result of the growing risk of the Covid-19 infection (Feng *et al*., 2020), strict quarantine measures, compulsory home isolation and other occurrences (Zhu *et al.*, 2020). Over the last two decades, scholars have growingly investigated the psychological factors of nascent entrepreneurs to have better understanding of mechanisms underlying the influence of these psychological problems on entrepreneurial activities (Gorgievski *et al.*, 2010). Nevertheless, almost all previous studies either examine the relationship between psychological disorders, such as psychiatric symptoms (Leung *et al.*, 2020) and Attention-Deficit Hyperactivity Disorder symptoms (Yu *et al*., 2019), and entrepreneurship, or focus on exploring psychological distress, such as stress and anxiety about financial problems (Gorgievski *et al.*, 2010), or general anxiety (Thompson *et al*., 2020) and business venture. However, there is a dearth of literature found to explore the fear and anxiety of Covid-19 on entrepreneurial activities (Hernández-Sánchez *et al.*, 2020), while this information is really important and necessary for both scholars and practitioners (Giones *et al.*, 2020). Kuckertz *et al.* (2020) also reported that the existence of many start-ups has been threatened by the lockdown measures to control the spread of the Covid-19 pandemic.

Business opportunity recognition consists of a person's capacity to realize, discover, and capture trends and new business concepts (Hassan, Saleem, Anwar, & Hussan, 2020). It is considered one of the cognitive states concerned in the process of making entrepreneurial decisions by individuals (Krueger *et al.,* 2000; Nowiński *et al.*, 2020; Wach & Bilan, 2021). Ratten (2020) states that entrepreneurial activities integrate a powerful mindset which can help our society rebound from a crisis, while the resilience is necessary to capture new business opportunities in times of the Covid-19 crisis (Kuckert *et al*., 2020). Several previous studies confirmed that opportunity recognition was found to have strong association with perceived behavioural control and entrepreneurial intention (e.g. Mahmood *et al*., 2019; Javis, 2016). Indeed, Hassan *et al.* (2020) reported that business opportunity recognition was positively correlated with university students' entrepreneurial intention, whereas Anwar, Thoudam, and Saleem (2021) argued that business opportunity recognition not only played the crucial role in sculpting entrepreneurial intention, but it affected indirectly through the self-efficacy mediator among 663 students. However, the correlations between business opportunity recognition and entrepreneurial behaviour were still not taken into consideration in prior studies.

The major objectives of the articles study are to explore the effects of the fear and anxiety of Covid-19 and business opportunity recognition on start-up self-efficacy, entrepreneurial intention, and behaviour, as well as to test entrepreneurial intention-behaviour association. Therefore, the present research has three detailed objectives: (i) to estimate the link between entrepreneurial intention and behaviour; (ii) to investigate the effects of the fear and anxiety of Covid-19 on entrepreneurial self-efficacy, entrepreneurial intention, and behaviour, and (iii) to examine the role of business opportunity recognition in shaping entrepreneurial self-efficacy, entrepreneurial intention, and behaviour among university students.

This article includes five parts: Introduction, literature review, material and method, results and discussions, and conclusion.

LITERATURE REVIEW

Entrepreneurship: The intention-behaviour gap

Establishing a new enterprise is identified as a process which starts when a person develops and is driven by the intentions to involve in entrepreneurial activities and finishes when that person creates and runs an actual business (Elnadi & Gheith, 2021). This behaviour might take numerous forms, such as self-employment or incorporating with established businesses as a partner. Briefly, entrepreneurial behaviours are related to the formation of a business venture which is opposed to being hired by others (Baharuddin & Rahman, 2021; Neneh, 2019; Nguyen, 2020).

It is noticed that there was a lack of common definition of entrepreneurial behaviour in the literature. In this study, the construct of entrepreneurial behaviour is defined as the capacity, skills and knowledge referred to constituent dimensions of an enterprise. Such understanding and abilities enable individuals to carry out entrepreneurial actions (Gieure *et al.*, 2020). Thus, it means that entrepreneurial behaviour is seen as the acquired capacity which can drive a nascent entrepreneur to the stage of creating a plan and endeavouring to run one's own business (Shirokova *et al.*, 2016). Discovering oneself capable of carrying out a particular business venture actions or even being interested in entrepreneurial actions refers to demonstrating the ability to retain intentions and involve in business venture activities. In other word, stronger intentions towards engaging in a business venture can lead to stronger likelihood of performing an entrepreneurial action (Ajzen, 1991). This insight has been supported in a body of domains when intentions have been found to have significant correlation with actual behaviour in various fields (Sheeran, 2002). Many scholars have contributed to indicating the significant linkage between intentions and actual behaviour, including business venturing (Neneh, 2019). For example, a cross-cultural study from 34 countries, conducted by Shirokova *et al.* (2016), showed that there is a significant and positive association between entrepreneurial intention and the behaviour of students. Van Gelderen *et al.* (2015) reported that stronger entrepreneurial intentions resulted in ahigh rate of entrepreneurial actions which individuals engage in. Shinnar *et al.* (2018) employed four-year longitudinal dataset which also confirmed that there was a strong correlation between business venture intention and actual behaviour. Indeed, previous studies suggested that there was a strong correlation between intention and actual behaviour, which accounted for 0.9 to 0.96 (Nystrand & Olsen, 2020). Nevertheless, for the entrepreneurship field, it is suggested that entrepreneurial intention can only explain around 18 to 27% of the variance of business venture behaviour (Fayolle & Liñán, 2014). Shinnar *et al*. (2018) suggested that although intentions are broadly acknowledged to be a vital predictor of actual behaviour, the linkage between entrepreneurial intentions and actual behaviour has not been adequately tested in entrepreneurship literature.

It is necessary for further research which estimates the association between intention and behaviour to create a business venture in various contexts (Neneh, 2019; Doanh, 2021a; Fauzi, Martin, & Ravesanga, 2021). Thus, the following hypothesis is proposed to examine the entrepreneurial intention-behaviour relationship in the context of Vietnam.

H1: Entrepreneurial intention is positively associated with entrepreneurial behaviour.

In addition, self-efficacy is determined to be a central construct in the social learning theory proposed by Bandura (1977). The fundamental proposition of the social learning theory concerns people's beliefs in their abilities to create desired effects with their own actions (Bandura, 1977). In entrepreneurship literature, there is increasing attention to the role of entrepreneurial self-efficacy in predicting entrepreneurial intention (Schmitt *et al*., 2018). Entrepreneurial self-efficacy is defined from various viewpoints (Tsai, Chang, & Peng, 2014). Some studies define entrepreneurial self-efficacy as entrepreneurs' self-confidence in carrying out specific actions (Shahab *et al*., 2019), while others depict it as people's confidence in their own abilities to perform and become successful in their entrepre-

neurship activities (Segal, Borgia, & Schoenfeld, 2005). Start-up self-efficacy is, therefore, a crucial precursor of intention and behaviour to engage in a business venture (Shahab *et al*., 2019). Indeed, prior studies confirmed that entrepreneurial self-efficacy is strongly correlated to the intention to engage in entrepreneurial activities (Elnadi & Gheith, 2021). For instance, individuals with higher entrepreneurial self-efficacy have a higher intention to become an entrepreneur (Liñán & Chen, 2009). Thus, the following hypothesis to estimate the entrepreneurial self-efficacy association in the context of Vietnam.

H2: Entrepreneurial self-efficacy is positively associated with entrepreneurial intention.

The effect of the fear and anxiety of Covid-19

The entrepreneurial process relates to all the activities, functions and certain actions correlated with the perceived business opportunities and the foundation of the firm to pursue these business opportunities (Keh *et al*., 2002). Thus, in order to understand what fosters or restrains business venture activities, it is necessary to understand these antecedents and how they influence individuals' perception, attitude and intention associated with the creation of a business organization (Krueger *et al*., 2000). Previous studies found that the entrepreneurial process is affected by risky, uncertain and crisis conditions (Keh *et al*., 2002), such as a macroeconomic crisis or a war (Amorós *et al*., 2019), and mental disorders (Gorgievski *et al.*, 2010; Thompson *et al*., 2020). However, what is less known are the impacts of the fear and anxiety of Covid-19 on the entrepreneurial process, while others have shown that the Covid-19 pandemic is determined as a major shock affecting entrepreneurship in general (e.g. Giones *et al.*, 2020; Liñán & Jaén, 2020; Ratten, 2020; Szostak & Sułkowski, 2021). Hernández-Sánchez *et al.* (2020) state that individuals' entrepreneurial intentions are affected by the Covid-19 pandemic via the subjective perception of a serious hazard. Also, the fear and anxiety of the Covid-19 infection can pose a threat to the minds of students who are preparing to engage the workforce (Mahmud *et al.*, 2020).

We argue that the fear and anxiety of Covid-19 can reduce entrepreneurial self-efficacy, entrepreneurial intention, and entrepreneurial behaviour due to three main reasons. First, some studies showed that self-efficacy is negatively affected by the anxiety of Covid-19 (e.g. Xiong, 2020). Also, general fear and anxiety are determined as a culprit of the self-efficacy reduction (Arora *et al*., 2021). Thus, in terms of entrepreneurial manner, the fear and anxiety of Covid-19 can decrease students' entrepreneurial self-efficacy. Second, general fear and anxiety are identified as negative factors, which lessen intentions to carry out a specific action in several types of behaviour, such as travelling (Lou & Lam, 2020), help-seeking (Calear *et al*., 2021), and turnover intentions (Modaresnezhad, 2020). Also, Hernández-Sánchez *et al.* (2020) confirmed that the perception of the Covid-19 pandemic is negatively associated with entrepreneurial intentions. Last, the entrepreneurial decision is a choice made by individuals out of the alternatives of various careers (Shepherd *et al*., 2015), thus, when facing the fear and anxiety of Covid-19, they can hesitate to set up their own business. Also, the identification and exploitation of business opportunities can be inhibited by negative emotions due to health problems (Shepherd *et al*., 2015). The following hypotheses, therefore, are formulated to test these associations.

H3: The fear and anxiety of Covid-19 is negatively associated with (a) entrepreneurial self-efficacy, (b) entrepreneurial intention, and (c) entrepreneurial behaviour.

The role of business opportunity recognition

Business opportunity recognition is a phase in which business ideas for probably profitable new ventures are realized by a person (Hassan *et al*., 2020). Many individuals consider the decision to engage in entrepreneurial activities when they recognize potential and feasible business opportunities (Krueger *et al*., 2000). Schmitt *et al.* (2018) also confirmed that business opportunities are primary to the establishment of a new venture, business performance, then the venture development, especially for the high level of environmental uncertainty changes. Also, recent results have confirmed that a higher degree of uncertainty has been sparked by the Covid-19 pandemic (Liñán & Jaén, 2020; Ratten, 2020). Notably, there are numerous sources of information that helps a nascent entrepreneur recognize business opportunities (Krueger *et al.*, 2000). Finding appropriate information, however, also plays the key role in identifying business opportunities before performing entrepreneurial activities (Mahmood *et al*., 2019).

Business opportunity recognition is determined as one of the most important process in creating a business venture because it comes in rescue whenever choosing a suitable idea before performing a business venture, adapting and working with all the acquired abilities and skills (Schmitt *et al*., 2018), thus increasing entrepreneurial self-efficacy and start-up intention and behaviour (Hassan *et al*., 2020). In other words, those who have a high level of potential business opportunity recognition are more likely to run their own business, as well as show greater confidence towards engaging in entrepreneurial activities. The following hypotheses, therefore, are formulated:

H4: Business opportunities recognition is negatively associated with (a) entrepreneurial self-efficacy, (b) entrepreneurial intention, and (c) entrepreneurial behaviour.

Thus, in light of previous studies and the research gap, the following conceptual framework is proposed to explain the impacts of the fear and anxiety of Covid-19 and business opportunity recognition on entrepreneurial self-efficacy, intention, and behaviour among Vietnamese university students (Figure 1).

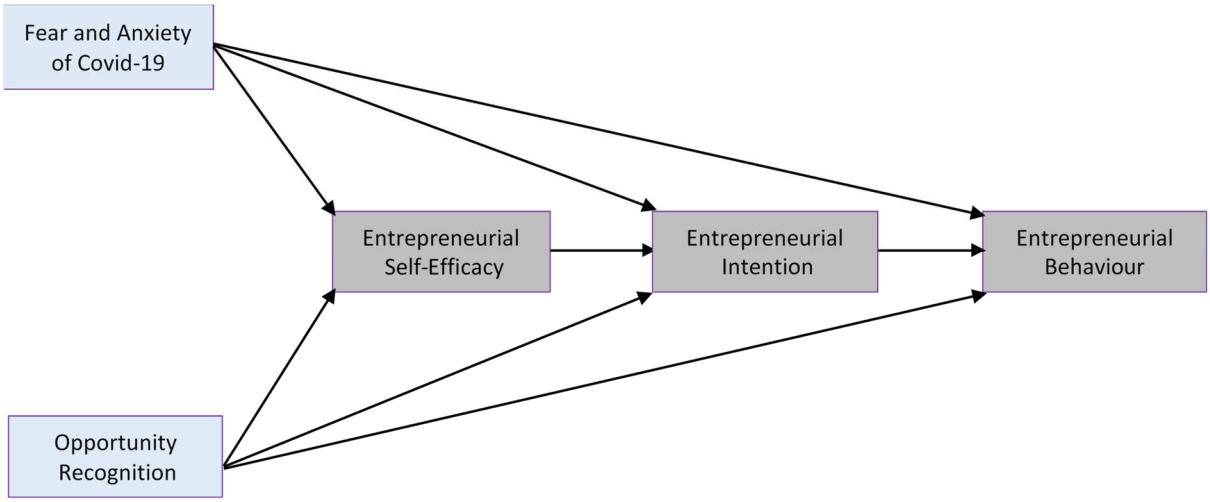

Figure 1. Conceptual Framework
Source: own elaboration.

RESEARCH METHODOLOGY

Research Design and Analytical Approach

The purpose of this study is to investigate the influence of the fear and anxiety of Covid-19, opportunity recognition, and entrepreneurial self-efficacy on entrepreneurial intention and behaviour among Vietnamese university students. Thus, the survey questionnaire is utilised to collect the dataset measuring demographic characteristics of respondents, the fear and anxiety of Covid-19, opportunity recognition, entrepreneurial self-efficacy, entrepreneurial intention and entrepreneurial behaviour. The scales (the survey items) were based on validated measurement from previous studies. The validity of scales, the conceptual framework, and the proposed hypotheses were tested using Cronbach's Alpha, Confirmatory Factor Analysis (CFA), and Structural Equation Modelling (SEM) supported by SPSS and AMOS 24.0 software.

Particularly, the Cronbach's alpha first and confirmatory factor analysis (CFA) were utilised to estimate the reliability and discriminatory value of each scales (Hair *et al*., 2020). Then, structure equation method (SEM) was conducted following two stages in this study and several proper analysis techniques were employed to validate the proposed model and to test the research hypotheses (Jackson, 2009; Byrne, 2010; Hair *et al*., 2020). Also, bootstrapping approach with the use of PROCESS version 3.5 via SPSS 24.0 was utilised to examine mediation correlations (Hayes, 2013).

Research instrument

To measure the main constructs of this study, the study adopted the existing measures which had been validated in prior research. Specifically, the five-item measures reflecting "fear and anxiety of Covid-19" was modified from Lee *et al.* (2020). The measures of "opportunity recognition" (five items) were adopted from Ozgen and Baron (2007). The "Entrepreneurial self-efficacy" scale with five items was adopted from Tsai, Chang, and Peng (2014). "Entrepreneurial intention" was measured by six items which were adopted from Liñán and Chen (2009). The scale of "entrepreneurial behaviour" was modified following Lortie and Castogiovanni (2015). A five-point Likert scale was employed in all items (observed variables) of the survey questionnaire, rating from 1 (strongly disagree) to 5 (strongly agree). All scales (and/or instruments) had been reliably and discriminatively validated by previous studies in various contexts, for example, the fear and anxiety of Covid-19 (Doanh, 2021b), opportunity recognition (Hassan *et al*., 2020), entrepreneurial self-efficacy (Shahab *et al*., 2019), entrepreneurial intention and behaviour (Gieure *et al.*, 2020). Before delivering the survey questionnaire, 20 students from National Economics University, Thuongmai University and Hanoi University of Science and Technology were invited to voluntarily participate in the survey. The initial survey helps us correct several errors and guarantees that respondents understand the questions correctly.

Sampling and data collection

The online-based cross-sectional survey questionnaire with the tool of Google docs was conducted from 20th September to 20th October 2020 at Vietnamese universities. Despite physical distancing measures were permitted to relax at that time in almost all cities in Vietnam, some other measures, including face masks, staying at least 2 metres away, closing unnecessary services (karaoke, games, bars…) were set by the authorities. The tool of online dataset collection, thus, was employed to be safer during the Covid-19 pandemic. All the students were clearly apprised that answering the survey questionnaire was not compulsory, it was completely voluntary to take part in it. The personal information of respondents was kept in strict confidence and only used for the research.

Initially, the study collected 429 responses. Nevertheless, 24 responses were eliminated because of being not completely fulfilled (missing values). Finally, the sample of 405 undergraduate students from different Vietnamese universities was utilised for analyses. The samples were randomly selected and described in Table 1. Holmes (1983) argued that at least 115 valid answers for the totality of the sample size are necessary to guarantee that this sample is effective for further analyses, especially for studies related to psychological variables. Thus, the sample of 405 responses is effective for further analysis.

Table 1. Personal characteristics of respondents

Variables	Characteristics	Frequency	%
Gender	Male	159	39.3
	Female	246	60.7
Age	From 18 to 20 years old	227	68.4
	From 21 to 23 years old	93	23.0
	Over 23 years old	35	8.6
Fields of study	Economics and Business Management	258	63.7
	Engineering and others	147	36.3
Years of study	1st year	75	18.5
	2nd year	135	33.3
	3rd year	132	32.6
	Final year	63	15.6

Source: own calculations (N = 405).

RESULTS AND DISCUSSION

The measurement model

Confirmatory factor analysis and Cronbach's alpha were used to test the reliabilities and validities of the scales. However, the fit indices of the initial measurement model were not within the recommended degree (Hair *et al*., 2020). Jackson (2009) suggested that all unsuitable items (low factor loading) should be extracted from the measurement model. Thus, three items, including FAC1 (**"**I felt dizzy, lightheaded, or faint when I read or listened to the news about the coronavirus", λ = 0.418), ESE2 ("I show great aptitude for leadership and problem-solving", λ = 0.491) and EB6 ("I can save money to invest in a business", λ = 0.489), were removed because their factor loadings were lower than 0.5. In addition, according to Jackson (2009), if the value of MI (Modification Indices) is higher than 15, it means that there are redundancies in the measurement model. Therefore, all these redundant items scales are connected to increase the model fit. Figure 2 depicts the final measurement model with recommended fit indexes. TLI and CFI were higher than 0.9, whereas NFI and GFI were over 0.8. Besides, Chi-Square/df < 3, while RMSEA is lower than 0.06 (Jackson, 2009).

Table 2 illustrates the final results of Cronbach's alpha values, average variance extracted (AVE), composite reliability (CR) of all the concepts, and factor loading (standardised regression weights) of each item after extracting inappropriate items. The results demonstrate that all the scales were found to reach satisfactory values with the smallest degree of 0.696 (α_{ESE} = 0.696), thus, the internal consistency reliabilities of all the variables were reached (Hair *et al*., 2020). Also, CR values for all the variables were found to be around or higher than 0.7, although AVE values of "fear and anxiety of Covid-19", "business opportunity recognition", "entrepreneurial self-efficacy" and "entrepreneurial intention" accounted only for 0.368, 0.334, 0.391 and 0.391 respectively, these values could be satisfactory if their CR values were higher than 0.6 (e.g. Ertz *et al.*, 2016; Lam, 2012). Thus, the scales showed the discriminant validity and construct reliability.

The structural model

The result of the structural equation analysis was depicted in Figure 3, while Table 3 summarised the outcome of testing hypotheses. The results showed that the proposed model fitted well. While GFI and NIF illustrated a value higher than 0.8, the TLI and CFI demonstrated a value of over 0.9. Chi-Square/df was lower than 0.3, whereas RMSEA was lower than 0.08 (Jackson, 2009). The variance explained (R^2) of ESE, EI and EB were 0.398, 0.663, and 0.700, respectively. These indicated the evidence that the model showed considerable insights regarding the antecedents of entrepreneurial intention and entrepreneurial behaviour, both direct and indirect effects.

The result of the proposed hypotheses was depicted in Table 3. The result of the structural path analysis provided supports for seven of the eight hypotheses. Specifically, the result confirmed that H1 proposed a significant association between entrepreneurial intention and entrepreneurial behaviour (β = 0.590; p < 0.001) and it was supported by the dataset. This result goes beyond all previous expectations (e.g. Fayolle & Liñán, 2014; Shirokova *et al*., 2016). Therefore, the present study provides contributions to broader entrepreneurship literature on the notable gap between entrepreneurial intention and actual behaviour in general, which was proposed in several prior studies (e.g. Fayolle & Liñán, 2014). Entrepreneurial self-efficacy was found to have strong effect on entrepreneurial intention (β = 0.501; p < 0.001). H2, therefore, was supported. This finding was consistent with previous studies (Tsai *et al*., 2014; Shahab *et al*., 2019).

Interestingly, the fear and anxiety of Covid-19 was negatively correlated with entrepreneurial self-efficacy (β = -0.184; p = 0.039 < 0.05) and entrepreneurial intention (β = -0.397; p < 0.01). However, the fear and anxiety of Covid-19 was not found to have a linkage with entrepreneurial behaviour (p > 0.05). Thus, H3a, H3b were supported, while H3c was not. The findings reveal that the fear and anxiety of Covid-19 decrease entrepreneurial self-efficacy and entrepreneurial intention. Indeed, individuals can hesitate to start a business venture at present because they are afraid

to be inflected by Covid-19 (Dubey *et al*., 2020). These relationships were proposed in some previous qualitative research (Giones *et al.*, 2020; Liñán & Jaén, 2020), but still has not been statistically examined. However, the correlation between the fear and anxiety of Covid-19 and entrepreneurial behaviour was not statistically proven in this study.

Besides, business opportunity recognition had significant impact on entrepreneurial self-efficacy (β = 0.685; $p < 0.001$), entrepreneurial intention (β = 0.599; $p < 0.001$), and entrepreneurial behaviour (β = 0.553; $p < 0.001$). H4a, H4b and H4c, therefore, were supported by the data. Several prior studies also confirmed the relationship between business opportunity recognition and entrepreneurial intention (e.g. Hassan *et al*., 2020), however, according to our best knowledge, the study is

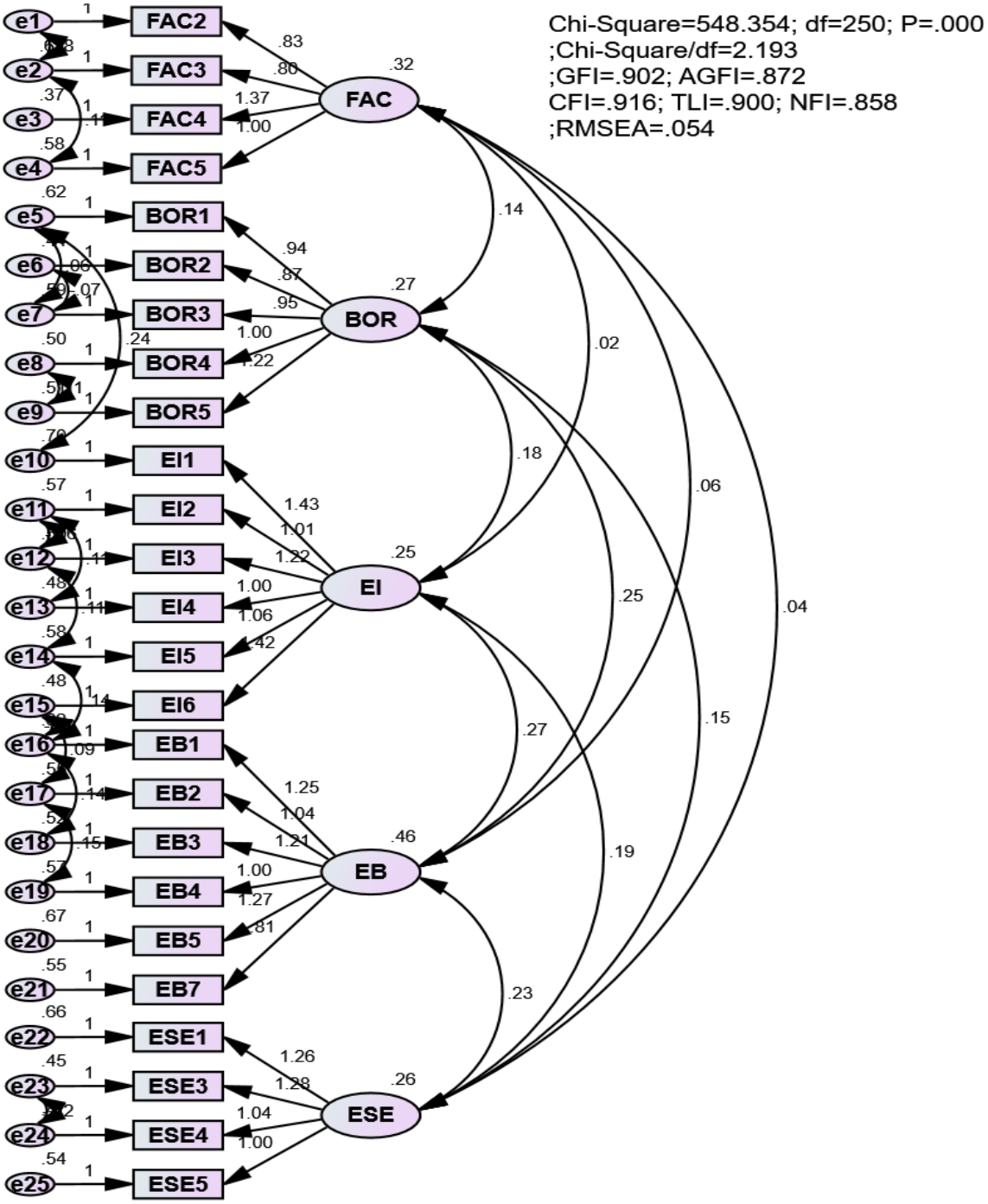

Figure 2. The measurement model

Source: own elaboration.

Table 2. Cronbach's alpha and Confirmatory Factor Analysis report summary

Code	Variables	λ	Cronbach's Alpha	CR	AVE
FAC	**Fear and anxiety of Covid-19 (Lee *et al.*, 2020)**		**0.740**	**0.691**	**0.368**
FAC2	I had trouble falling or staying asleep because I was thinking about the coronavirus	0.501	0.700		
FAC3	I felt paralysed or frozen when I thought about or was exposed to information about the coronavirus	0.503	0.661		
FAC4	I lost interest in eating when I thought about or was exposed to information about the coronavirus	0.788	0.685		
FAC5	I felt nauseous or had stomach problems when I thought about or was exposed to information about the coronavirus	0.600	0.677		
BOR	**Business opportunity recognition (Ozgen & Baron, 2007)**		**0.724**	**0.714**	**0.334**
BOR1	I see many opportunities to start and grow a business	0.526	0.693		
BOR2	Finding potential venture opportunities is easy for me	0.562	0.692		
BOR3	In general, there are many opportunities for new product innovation	0.541	0.694		
BOR4	I have a special sense of new venture ideas	0.590	0.653		
BOR5	During my routine day-to-day activities, I see potential new venture ideas	0.662	0.650		
ESE	**Entrepreneurial self-efficacy (Liñán, 2008; Tsai, Chang, & Peng, 2014)**		**0.696**	**0.718**	**0.391**
ESE1	I show great aptitude for creativity and innovation	0.618	0.606		
ESE3	I can develop and maintain favourable relationships with potential investors	0.696	0.615		
ESE4	I can see new market opportunities for new products and services	0.610	0.672		
ESE5	I can develop a working environment that encourages people to try out something new	0.569	0.627		
EI	**Entrepreneurial Intention (Liñán & Chen, 2009)**		**0.803**	**0.792**	**0.391**
EI1	I am ready to do anything to be an entrepreneur	0.651	0.778		
EI2	My professional goal is to become an entrepreneur	0.558	0.781		
EI3	I will make every effort to start and run my own firm	0.652	0.765		
EI4	I am determined to create a firm in the future	0.586	0.775		
EI5	I have a very seriously through of starting a firm	0.572	0.780		
EI6	I have the firm intention to start a firm some day	0.717	0.756		
EB	**Entrepreneurial Behaviour** (Gieure *et al.*, 2020)		**0.855**	**0.848**	**0.483**
EB1	I have experience in starting new projects or businesses	0.732	0.825		
EB2	I am capable of developing a business plan	0.689	0.829		
EB3	I know how to start a new business	0.751	0.819		
EB4	I know how to do market research	0.667	0.830		
EB5	I have invested in an informal manner in some business	0.725	0.826		
EB7	I belong to a social network that can promote my business	0.595	0.851		

Note: λ = factor loading (standardized regression weights).

Source: own calculations (N=405).

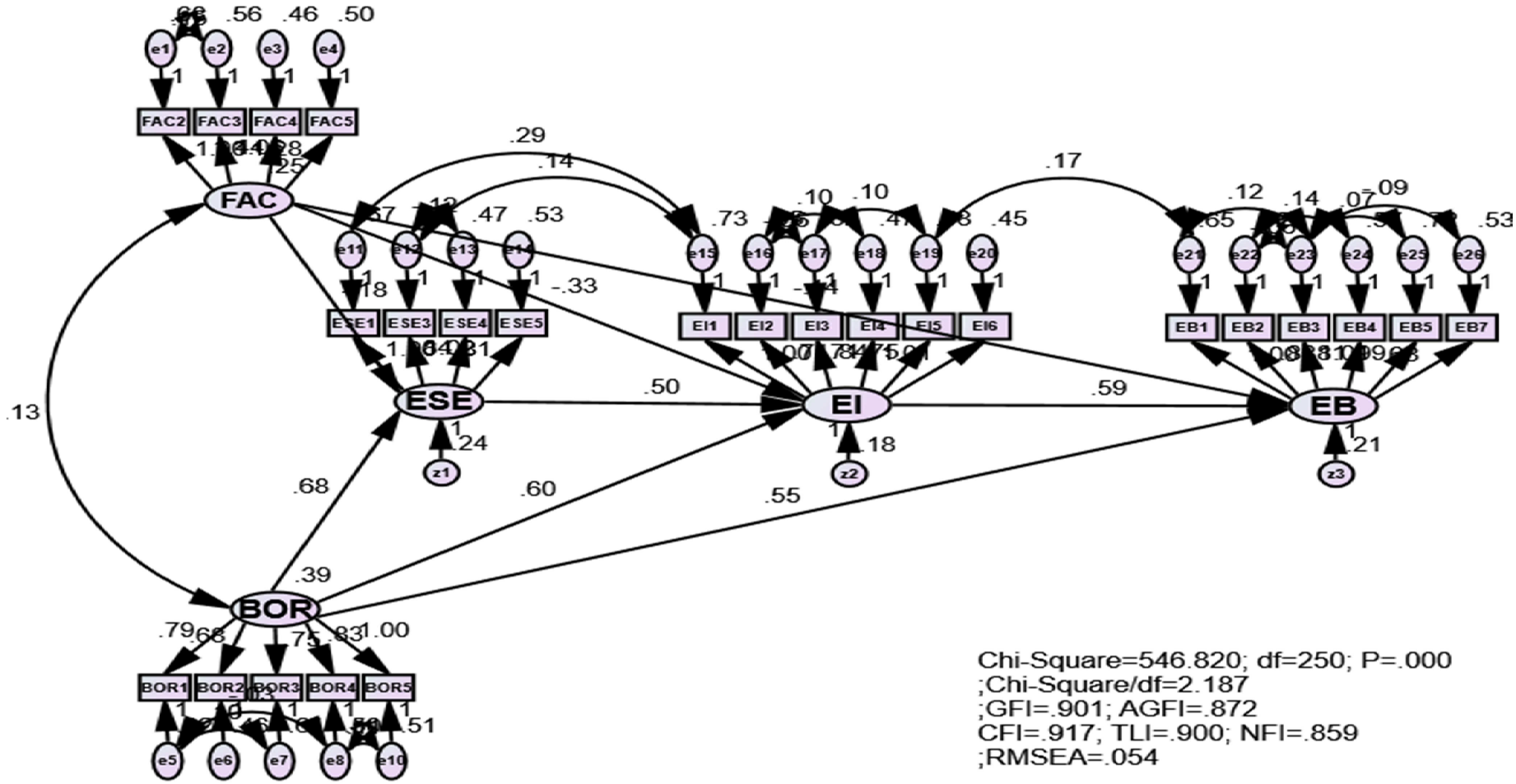

Figure 3. The structural model
Source: own elaboration.

the first to reveal that business opportunity recognition helps individuals increase their entrepreneurial self-efficacy and foster actual entrepreneurial behaviour. Indeed, while Hassan *et al.* (2020) only considered the impact of opportunity recognition on entrepreneurial intention, Mahmood *et al.* (2019) examined the role of opportunity recognition in shaping perceived control behaviour, then translated into intention and behaviour to engage in business venture among Asnaf Millennials.

Table 3. The result of testing hypotheses

Hypotheses				Estimate	S.E.	C.R.	P-value	Result
H1	EI	→	EB	0.590	0.116	5.099	***	Supported
H2	ESE	→	EI	0.501	0.101	4.985	***	Supported
H3a	FAC	→	ESE	-0.184	0.097	-1.890	0.039	Supported
H3b	FAC	→	EI	-0.327	0.101	-3.239	0.001	Supported
H3c	FAC	→	EB	-0.141	0.114	-1.231	0.218	Not supported
H4a	BOR	→	ESE	0.685	0.102	6.686	***	Supported
H4b	BOR	→	EI	0.599	0.123	4.872	***	Supported
H4c	BOR	→	EB	0.553	0.156	3.541	***	Supported

Note: *** $p < 0.001$
Source: own calculations (N=405).

Moreover, the bootstrapping method (5000 bootstrapping sample and 95% confidence interval) was employed in our study to estimate mediation associations (Cheung & Lau, 2008). The result showed that the fear and anxiety of Covid-19 was not found to have indirect effects on entrepreneurial intention and entrepreneurial behaviour through entrepreneurial self-efficacy and entrepreneurial intention ($p > 0.05$), respectively, while business opportunity recognition had indirect impact on entrepreneurial intention via entrepreneurial self-efficacy ($\beta = 0.2232$; $p < 0.05$) and entrepreneurial behaviour via entrepreneurial intention ($\beta = 0.3255$; $p < 0.05$). The correlation between entrepreneurial self-efficacy and entrepreneurial behaviour was also mediated by entrepreneurial intention ($\beta = 0.3427$; $p < 0.05$).

Table 4. The result of mediation associations

Mediation paths					Indirect effects	SE	95% confidence interval	
							LLCI	ULCI
FAC	→	ESE	→	EI	0.0443	0.0307	-0.0148	0.1068
FAC	→	EI	→	EB	0.0133	0.0355	-0.0559	0.0821
BOR	→	ESE	→	EI	0.2232*	0.0314	0.1653	0.2881
BOR	→	EI	→	EB	0.3255*	0.0367	0.2546	0.4006
ESE	→	EI	→	EB	0.3427*	0.0428	0.2621	0.4292

Note: * $p < 0.05$
LLCI: Lower level of confidence interval. ULCI: Upper level of confidence interval. SE: Standard errors.
Source: own calculations.

CONCLUSIONS

The aim of this study was to estimate the influence of the fear and anxiety of Covid-19 and business opportunity recognition on entrepreneurial self-efficacy, intention, and behaviour among Vietnamese students, as well as to fulfil the research gap in exploring the entrepreneurial intention-behaviour association.

The study provides several theoretical contributions to entrepreneurship literature. Firstly, this study filled the intention-behaviour gap in entrepreneurship. Secondly, the research showed that entrepreneurial self-efficacy directly affects entrepreneurial intention, then transferred into entrepreneurial behaviour through entrepreneurial intention. Thirdly, the study revealed that the fear and anxiety of Covid-19 have decreased entrepreneurial self-efficacy and intention to start one's own business. Finally, business opportunity recognition was found to have significant impact on entrepreneurial self-efficacy, intention, and behaviour.

The research offers practical applications for both universities and policymakers. First, in order to promote entrepreneurial activity, the Vietnamese government should have the appropriate policies to increase entrepreneurial self-efficacy of the youth and help them recognize business opportunity through educational programmes and institutional solutions. Simultaneously, entrepreneurship should be included in the curriculum design with the activity-based teaching method at universities to help students enhance entrepreneurial knowledge, skills, capacity, and self-efficacy. This can increase students' intention and actual behaviour of engaging in entrepreneurial career (Tsai *et al*., 2014). Second, for controlling the negative influence of the Covid-19 pandemic on entrepreneurial activities, although the coronavirus outbreak has been well-managed in Vietnam, the government and universities should take into account students' mental health problems which are derived from the lockdown, physical distancing, school closure measures. Particularly, universities can reduce students' pressure and stress related to exams during the Covid-19 pandemic. The reduction of difficulty level of final exams or using E-exams should be employed during the Covid-19 pandemic (Elsalem *et al.*, 2020).

However, we also acknowledge that this research can have several limitations that can help further studies. First, this study only focuses on the effects of the fear and anxiety of Covid-19, business opportunity recognition on entrepreneurial self-efficacy, entrepreneurial intention and behaviour, future research should expand the conceptual model by considering the impacts of personal and context factors (Wach & Głodowska, 2021). Second, the present study indicates that the fear and anxiety of Covid-19 are not associated with entrepreneurial behaviour, later studies should test this linkage further in a different context. Lastly, this study only tests the direct effect of the fear and anxiety of Covid-19 on entrepreneurship, while the coronavirus affects almost all perspectives of our life, further research into the influence of the Covid-19 pandemic should be conducted in order to control this disease better.

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Acknowledgements and Financial Disclosure

The article came into being within the project no. 339/QD-DHKTQD, financed by National Economics University, 2020.

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Entrepreneurial Business and Economics Review

2021, Vol. 9, No. 3

10.15678/EBER.2021.090302

Does entrepreneurial self-efficacy moderate effects of cognitive flexibility and entrepreneurial alertness on entrepreneurial intentions?

Shabeeb Ahmad Gill, Nelly Bencheva, Selcuk Karayel, Muhammad Usman

ABSTRACT

Objective: The objective of this article is to empirically investigate whether entrepreneurial self-efficacy moderates the effects of cognitive flexibility, entrepreneurial alertness on entrepreneurial intentions. It is based on social cognitive theory and person-environment fit theory; the present study aimed to identify the impact of cognitive flexibility, entrepreneurial alertness on entrepreneurial intention.

Research Design & Methods: The sample of this study comprised 486 respondents from the public sector business schools of Pakistan. Data were gathered using a self-report administered questionnaire, and hypotheses were tested with structural equation modelling.

Findings: The results supported the structured hypotheses of the study where cognitive flexibility positively predicts the conditional direct relationship between entrepreneurial alertness and entrepreneurial intentions.

Implications & Recommendations: Our study has some practical implications for the researcher, educationist, and policymakers who are directly and indirectly involved in enhancing the growth of entrepreneurship.

Contribution & Value Added: A unique technique adopted to run a second-order moderated mediation model through AMOS v.26 in one-shot. This study contributes to the emerging research of cognitive psychology and entrepreneurship fields and concludes that individuals with a high level of cognitive flexibility, alertness, and self-efficacy are more inclined to pursue a career in entrepreneurship.

Article type: research article

Keywords: entrepreneurial self-efficacy; entrepreneurial alertness; entrepreneurial intentions; second-order moderated mediation; model 15; user-defined estimand; robust one-shot model; new venture creation

JEL codes: L26, M13

Received: 1 January 2021 Revised: 12 April 2021 Accepted: 2 May 2021

Suggested citation:

Gill, S.A., Bencheva, N., Karayel, S., & Usman, M. (2021). Does entrepreneurial self-efficacy moderate effects of cognitive flexibility and entrepreneurial alertness on entrepreneurial intentions?. *Entrepreneurial Business and Economics Review,* 9(3), 25-41. https://doi.org/10.15678/EBER.2021.090302

INTRODUCTION

Entrepreneurship is an essential driver of societal health, wealth and a formidable engine of economic growth. The debate is ongoing on the vocational studies for new business start-ups that why some individual wants to pursue a career in entrepreneurship rather than others (Obschonka & Hahn, 2018; Dheer & Lenartowicz, 2019). As suggested by several authors, intentions are assured the best predictor for measuring entrepreneurial behaviour (Yi, 2020; Neneh, 2019a). Prior researchers found that individuals with a high level of entrepreneurial intentions positively and significantly influence entrepreneurial behaviour (Shirokova *et al.*, 2016; Kautonen *et al.*, 2015).

Existing studies investigated the role of personality factors such as positive (Mahmood *et al.*, 2019) and negative traits (Wu *et al.*, 2019) to predict the entrepreneurial intention of individuals and examine the importance of cognitions perspective of humans in developing their entrepreneurial behaviour to

start a new business (Brännback & Carsrud, 2018; Treffers *et al.*, 2017). Cognitive flexibility refers to "a person's awareness that in any situation there are many options alternatives available, a willingness to be flexible and adapt to the situation and self-efficacy in being flexible (Dheer & Lenartowicz, 2019; Dajani & Uddin, 2015; Arán Filippetti & Krumm, 2020)."

The compact evidence related to the substance of cognitions is that in exploring entrepreneurial intentions. It needs to expand the literature of prior researchers and contribute to cognitive flexibility abilities that impact individuals perceived fit to become an entrepreneur (Dheer & Lenartowicz, 2019; Obschonka & Hahn, 2018; Shepherd & Patzelt, 2018). This study contributes to the literature on the mediating role of entrepreneurial alertness on entrepreneurial intentions. Previous studies have explored entrepreneurial alertness as a predictor and outcome variable to examine entrepreneurial intention (Hu & Ye, 2017; Obschonka *et al.*, 2017; Bueckmann-Diegoli & Gutiérrez, 2020). The mediation role of alertness on intention is relatively obscure in the existing literature (Hu *et al.*, 2018; Campos, 2017).

The lens of social cognitive theory to understand the mechanism of cognitive flexibility and entrepreneurial self-efficacy on entrepreneurial intention. This theory developed mutual association among personal factors, behavioural factors, and environmental factors (Dheer & Lenartowicz, 2019). Finally, the relationship between cognitive flexibility, entrepreneurial alertness, entrepreneurial self-efficacy, and entrepreneurial intention is under-explored; limited studies have examined the direct and indirect effect of cognitive flexibility or entrepreneurial alertness and entrepreneurial self-efficacy on entrepreneurial intention covered Western culture (Obschonka *et al.*, 2017).

We have used two famous theories of entrepreneurship to strengthen our hypotheses relationship. First, social cognitive theory (SCT) was proposed by Bandura (1997). It is associated with the motivational, learning, and behavioural processes that could be achieved through three bidirectional and reciprocal elements of personal factors; environmental inputs and behavioural results (Wang *et al.*, 2019).

Second, the person-environment fit proposed by Dheer and Lenartowicz (2019). The importance of this theory is underlying in different perspectives. It suggests that every individual's needs, desires, wishes, actions, skills, and abilities are different. It also states that individuals incline toward the environment where they would evaluate their skills and abilities according to the environmental situation (Tepper *et al.*, 2018).

LITERATURE REVIEW

Cognitive flexibility and entrepreneurial intention

Prior studies suggest that individuals with cognitive minds are more active in perceiving, identifying, recognising, and exploiting opportunities to start new ventures (Dheer & Lenartowicz, 2019; Obschonka & Hahn, 2018). Moreover, some scholars state that cognitive abilities and skills facilitate an individual to perceive opportunities and apply knowledge to pursue a career in entrepreneurship (Treffers *et al.*, 2017; Krueger, 2017). Cognitive flexibility influences individuals to engage in entrepreneurial activities and create cognitive abilities in individuals to become an entrepreneur (Baron, 2000).

Roberts *et al.* (2017) have stated that in the process of cognitive flexibility, a theory of cognitive flexibility highlights the individual's necessary beliefs and information play a significant part in developing their entrepreneurial intention and exploring the cognitive abilities and recognition of new opportunities to solve social and environmental hurdles in shaping the new ventures (Spiro *et al.*, 2003). Thus, we hypothesised that:

H1: Cognitive flexibility positively related to entrepreneurial intention.

Cognitive flexibility and entrepreneurial alertness

Entrepreneurs may differ from each other as they are from the rest of the population (Puhakka, 2011). In precursor, it found that entrepreneurs who do not take risks to start a new business compared to

non-entrepreneurs are more likely to have cognitive abilities and control in uncertain situations positively (Obschonka & Hahn 2018; Tang *et al.*, 2012; Roundy *et al.*, 2018). Some researchers argued that the entrepreneur's traits are different from non-entrepreneurs and think differently to pursue a career in entrepreneurship (Gozukara & Colakoglu, 2016).

Tang *et al.* (2012) individuals who are more alert have extra knowledge of the market, internal and external abilities, and a greater intelligence level, which encourages them to start new ventures (Roundy *et al.*, 2018). Therefore, it is possible to discuss that entrepreneurs who have cognitive traits can see business opportunities better than non-entrepreneurs who do not have cognitive abilities (Shepherd, 2015; Obschonka *et al.*, 2017). Hence, we have assumed this hypothesis:

H2: Cognitive flexibility is positively related to entrepreneurial alertness.

Entrepreneurial alertness and entrepreneurial intention

The connection between entrepreneurial alertness and entrepreneurial intention has well established by the antiquities (Neneh, 2019a; Campos, 2017; Tang *et al.*, 2012; Hu & Ye, 2017; Obschonka *et al.*, 2017; Hu *et al.*, 2018; Gozukara & Colakoglu, 2016). It associated with the self-acknowledged belief by an individual that they aim to start a new business and intentionally plan to do so in the future (Tsai *et al.*, 2016).

Entrepreneurial intention helps individuals shape their entrepreneurial behaviours to start a new business (Neneh, 2019b). Tang *et al.* (2012) found that entrepreneurial alertness measure through three dimensions; 1) scanning and searching; systematically and non-systematically scan the internal and external environment and gather information, 2) association and information; associate together scanned and searched unconnected information, 3) judgment and evaluation; make judgment and evaluation according to the commercialise ability of the idea to pursue new business. Accordingly, we have predicted the following hypothesis:

H3: Entrepreneurial alertness is positively related to entrepreneurial intention.

Second-order moderated-mediation of entrepreneurial self-efficacy and entrepreneurial alertness on the relationship between cognitive flexibility and entrepreneurial intention

Many researchers have been highlighted the importance of entrepreneurial self-efficacy in the area of entrepreneurship because of its direct and mediator role to explore the individual entrepreneurial intentions, opportunity recognition, and organisation performance (McGee *et al.*, 2009; Barbosa *et al.*, 2007; Zhao *et al.* 2005; Fuller *et al.*, 2018; Nowiński *et al.*, 2019; Nowiński *et al.*, 2020; McGee & Peterson, 2019; Wach & Bilan, 2021). According to Bandura (1997), entrepreneurial self-efficacy states to "a cognitively created motivation." A few researchers in the past have studied the literature on self-efficacy and cognitive flexibility.

The social cognitive theory's role facilitates the individual's beliefs and develops a high level of self-efficacy toward engaging in new business formation actions (Boyd & Vozikis, 1994; Odoardi *et al.*, 2019; Dheer & Lenartowicz, 2019). This study aims to explore and extend the previous literature using entrepreneurial self-efficacy as a moderator in the relationship between cognitive flexibility and entrepreneurial intention. Therefore, we assumed the following hypotheses:

H4: Entrepreneurial self-efficacy moderates the strength of the direct relationship between cognitive flexibility and entrepreneurial intentions. The relationship will be stronger for the higher entrepreneurial self-efficacy individuals than those who are lower in entrepreneurial self-efficacy.

H5: Entrepreneurial self-efficacy moderates the mediated relationship between cognitive flexibility and entrepreneurial intentions by entrepreneurial alertness in the way that the mediated relationship will be stronger for those who are higher in entrepreneurial self-efficacy.

In the continuity of the hypotheses constructed above, in the literature review chapter and has a solid theoretical foundation. Figure 1 demonstrates the research model of the study.

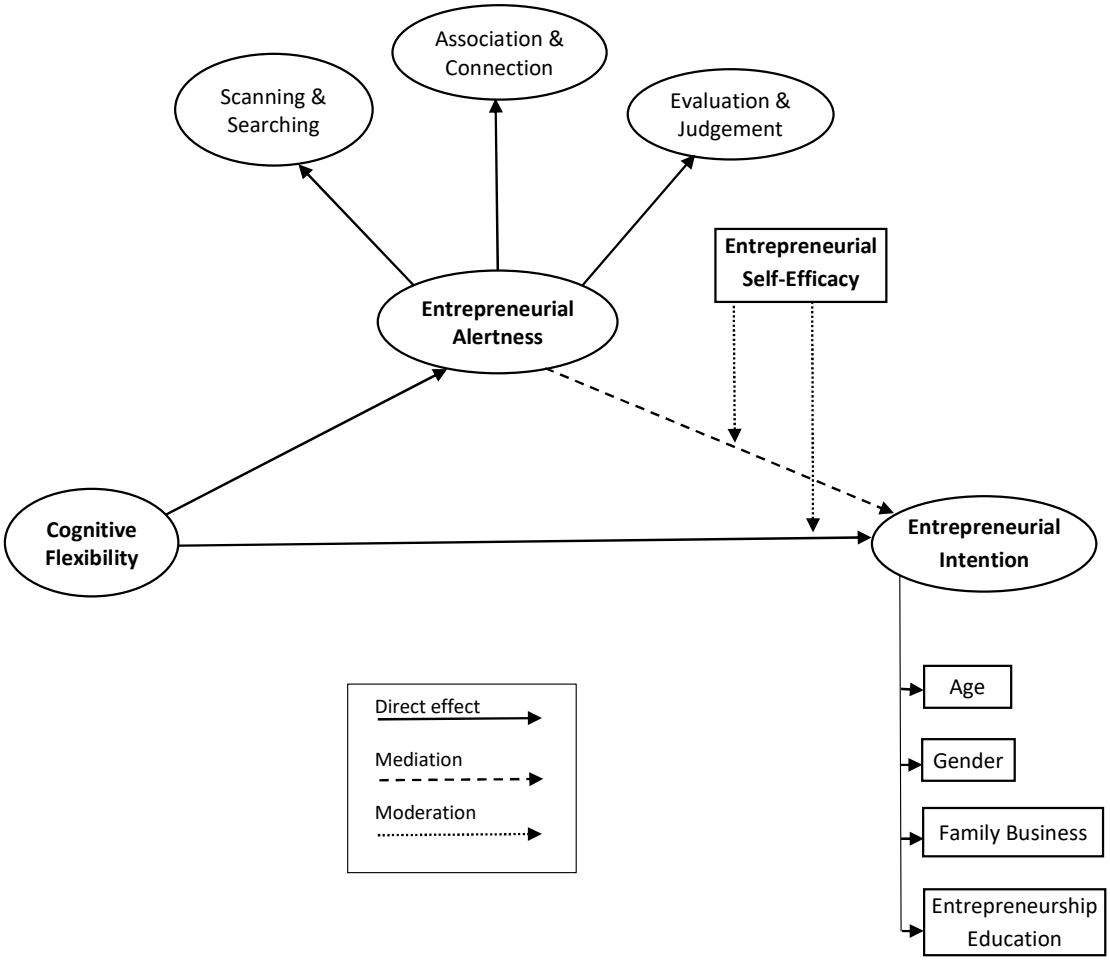

Figure 1. Research Model
Source: own elaboration.

RESEARCH METHODOLOGY

Study Design and Sampling

The study is an empirical analysis using cross-sectional data based on the primary survey. The data came from ten public sector universities working under the umbrella of the higher education department in Punjab, Pakistan. It focused on final year undergraduate and post-graduate students enrolled and studying at business management schools in respective universities (Fuller *et al.*, 2018; Neneh, 2019a; Newman *et al.*, 2019; Shirokova *et al.*, 2016).

According to previous researchers, a sample fall between 400 to 1000 participants significantly contribute to the proposed study (Rouquette & Falissard, 2011; Kyriazos 2018). We randomly distributed the 600 paper-and-pencil questionnaires among the students during their free time using a time lag of three weeks after getting approval from the university administration. Contemplate the Podsakoff *et al.* (2003) approach to reduce the possibility of common method bias. The students' participation was voluntary, and confidentially of their responses was assured. The students returned a total of 530 questionnaires. The overall participation rate was 91.6%. Some of the questionnaires around 44 were discarded due to incomplete forms of filling. Thus, the final sample size was 486 participants and further used for analysis. The participants were 56.7% male and 43.4% female. Also, 77.4% had completed an entrepreneurship education course and most of the participants were between the ages of 18-25 57.4% years. Moreover, 43% of participates came from entrepreneurial family backgrounds.

Instruments

Martin and Rubin (1995) assessed cognitive flexibility with twelve items from previous research on a new cognitive flexibility measure using a five-point Likert scale. To measure entrepreneurial alertness, we used thirteen items scale validated by (Tang *et al.*, 2012) using a five-point Likert scale (Hu *et al.*, 2018; Obschonka & Hahn, 2018). We validate these dimensions using second-order CFA analysis to identify the total variance of these factors. We found 72% variance with each of the three dimensions accounting for 21%, 25%, and 26%. We applied six items based on prior studies to assess entrepreneurial intention, using a five-point Likert scale (Liñán & Chen, 2009). This scale is widely used and acceptable to identify entrepreneurial intention (Neneh, 2019a; Mahmood *et al.*, 2019). To measure entrepreneurial self-efficacy, we used four measurement items on a five-point Likert scale (Zhao *et al.*, 2005).

RESULTS AND DISCUSSION

Model Measurement and Exploratory Factor Analysis

To run this complex model, we used SPSS v.26 and AMOS v.26 for analysis. Three steps approach performed from exploratory factor analysis to confirmatory factor analysis, and then we tested the complex structural model through a single operation.

We conducted principal component analysis (PCA) to reduce and articulate our data. The value of Kaiser-Meyer-Olkin (KMO) is 0.93, which is excellent to attain sample adequacy. After fixing the rotation to six factors study received 75% of the explained variation that is excellent. All the extracted values of commonalities are above the threshold limit (Table 1).

Confirmatory Factor Analysis

We have used confirmatory factor analysis (CFA) using AMOS v.26 software to predict the measurement model, and findings are presented in Table 1 and Figure 2. For the goodness-of-fit the results were stated as follows: X2=1604.354, df=545, X2/df=2.944<5, CFI=0.932, TLI=0.926, IFI=0.932, RFI=0.892, NFI=0.901, GFI=0.835, AGFI=0.809, RMR=0.033, SRMR=0.043 and RMSEA= 0.60. Thus, all the constructs meet the criteria for the measurement model (Hu & Bentler, 1995).

Reliability and Validity Analysis

Cronbach's α of each of the four measurement constructs, such as cognitive flexibility, entrepreneurial alertness, entrepreneurial self-efficacy, and entrepreneurial intention, exceeded the cut-off value of 0.80 showing acceptable reliabilities suggested by (Bagozzi & Yi, 1989). The composite reliability and validity were assessed with the values ranged from 0.916 to 0.960 exceeded the proposed benchmark of 0.70 (Lance *et al.*, 2006). To find out Convergent validity Table 1 shows that the average variance extracted (AVE) values ranged from 0.603 to 0.803, which are acceptable (Fornell & Larcker, 1981).

Discriminant Validity, Descriptive Statistics, and Correlations

Discriminant validity was assessed following criteria (Fornell & Larcker, 1981). Table 2 indicates that values with diagonals are the AVE's square root is discriminant validity, and values under diagonals are correlations between variables. We found a positive and significant correlation between cognitive flexibility and entrepreneurial intention (r=0.408, p=0.01). Moreover, it was positive and significant correlations of scanning and searching (r=0.364, p=0.01), association and connection (r=0.426, p=0.01), evaluation and judgment (r=0.416, p=0.01) and entrepreneurial self-efficacy (r=0.442, p=0.01) with entrepreneurial intention.

Common Method Bias

Harman's single factor test is outdated and not used due to its limitations (Kumar & Shukla, 2019). This study used the common latent factor (CLF) test was recommended by Podsakoff *et al.* (2003). However, the difference between the two situations (standardised regression weights after inclusion and exclusion of CLF) was below the threshold value of (delta>0.2) so, it rejected the possibility of common method variance (CMV) bias.

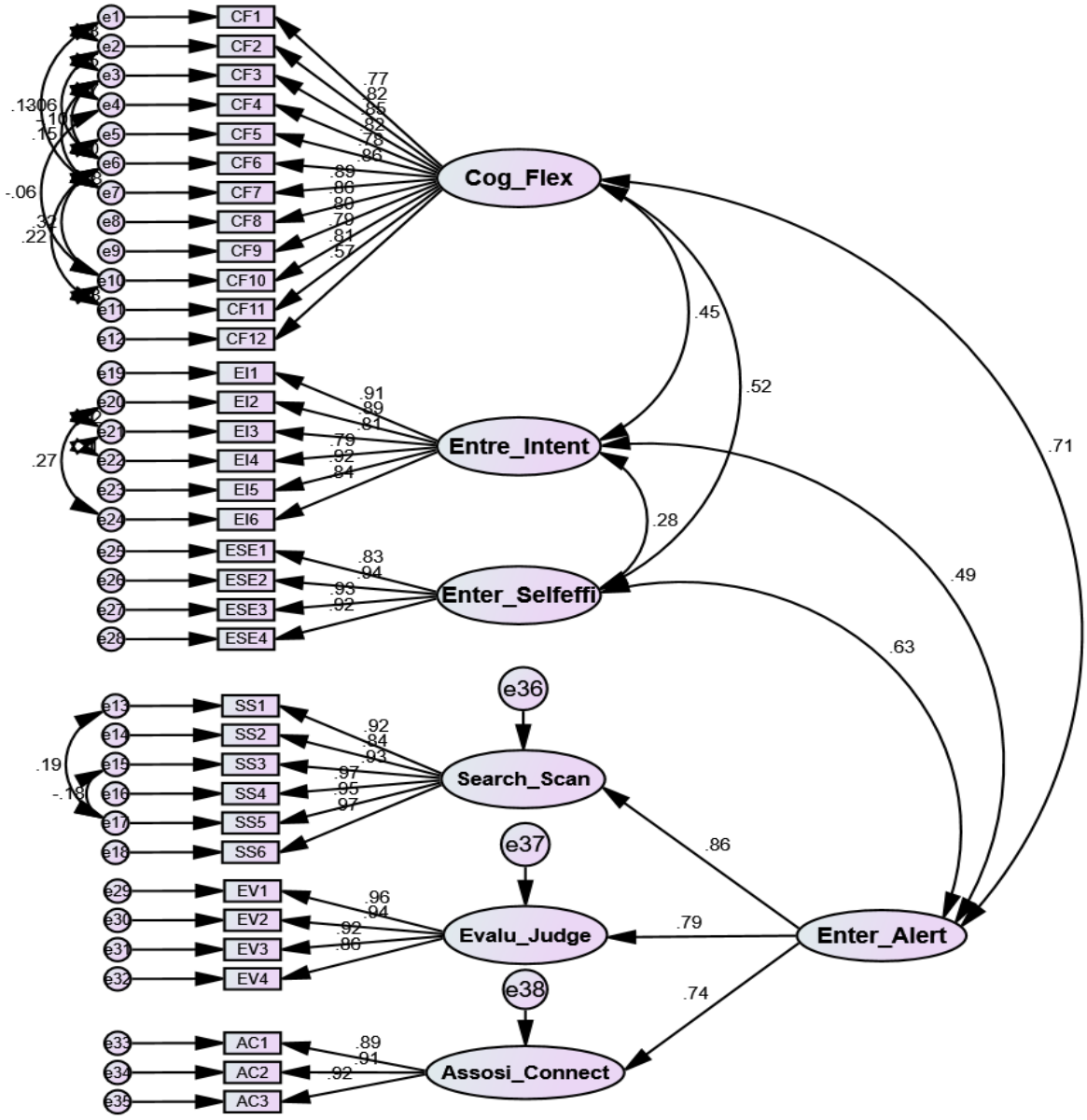

Figure 2. Second-order CFA analysis
Source: own elaboration.

Table 1. Confirmatory factor analysis for the measurement model

Second-order Factors	First-order Factors	Items	1	2	3	4	5	6	CR	AVE	Communalities
Entrepreneurial Alertness	Searching and Scanning	SS1	0.797						0.948	73.1%	0.724
		SS2	0.758								0.647
		SS3	0.817								0.769
		SS4	0.875								0.873
		SS5	0.872								0.845
		SS6	0.888								0.878
	Association and Connection	AC1		0.790					0.916	78.3%	0.821
		AC2		0.862							0.859
		AC3		0.861							0.872
	Evaluation and Judgment	EV1			0.850				0.946	78.9%	0.893
		EV2			0.852						0.877
		EV3			0.837						0.845
		EV4			0.837						0.797
Entrepreneurial Intention		EI1				0.893			0.960	74.9%	0.830
		EI2				0.867					0.817
		EI3				0.809					0.720
		EI4				0.793					0.699
		EI5				0.898					0.846
		EI6				0.846					0.774
Entrepreneurial Self-Efficacy		ESE1					0.805		0.952	80.3%	0.752
		ESE2					0.890				0.882
		ESE3					0.876				0.866
		ESE4					0.891				0.864
Cognitive Flexibility		CF1						0.739	0.953	60.3%	0.603
		CF2						0.788			0.689
		CF3						0.791			0.708
		CF4						0.758			0.655
		CF5						0.727			0.607
		CF6						0.777			0.753
		CF7						0.837			0.769
		CF8						0.816			0.720
		CF9						0.745			0.620
		CF10						0.758			0.635
		CF11						0.792			0.674
		CF12						0.533			0.377
Eigenvalue			3.81	1.44	2.23	3.61	2.51	12.9			

Note: All the values engage in exploratory factor analysis based on first order & second order.
Source: own study.

Table 2. Discriminant validity and correlations

Variable	M	S.D	CF	EI	SS	EV	ESE	AC
CF	3.76	0.711	0.777					
EI	3.77	0.747	0.408***	0.865				
SS	3.94	0.774	0.364***	0.353***	0.855			
EV	3.51	0.804	0.416***	0.354***	0.177***	0.888		
ESE	3.75	0.889	0.442***	0.426***	0.222***	0.443***	0.896	
AC	3.71	0.872	0.426***	0.412***	0.226***	0.296***	0.540***	0.885

Note: CF= Cognitive flexibility, SS=Scanning and Search, AC= Association and connection, EV= Evaluation and judgment, ESE=Entrepreneurial self-efficacy, EI=Entrepreneurial Intention are predictors.
Source: own study.

Data Analysis Method

Before analysing the structural model, we have checked multicollinearity by examining the variance inflation factor (VIF). The findings show that for cognitive flexibility, VIF was 1.482, for entrepreneurial alertness, VIF was 1.622, and for entrepreneurial self-efficacy, VIF was 1.395. All the values of VIF were below the threshold value of 10 recommended by Aiken *et al.* (1994). Moreover, we also applied skewness and kurtosis tests and found no issue with the data. All the values are between -2 to +2 (George, 2011).

Some studies (Campos, 2017; Kumar & Shukla, 2019) used (Baron & Kenny, 1986) approach. Preacher *et al.* (2007) criticised this approach. They suggested that this test did not provide robust statistical power and cannot provide the combined test of direct and indirect effects and accurate estimation of the predictor's indirect effect on the criterion variable (Fritz & MacKinnon, 2007). Several studies recommended that structural equation modelling is the best tool for more robust results than traditional data analysis methods (Yi, 2020; Obschonka & Hahn, 2018; Neneh, 2019b).

Structural Equation Modelling (SEM)

One of this model's novelties is that it is a second-order structural model, and all the items are estimating the complete model in a single run through AMOS v.26. Hence, we tested our second-order structural model in a one-shot, which has no evidence in past studies we explored but to justify our theoretical framework, we distributed it in a single table. We elaborated all the study hypotheses from 1 to 5 that supported the study framework, which was statistically more similar to model no.15 presented in process macro (Hayes, 2013). The AMOS has not the built-in capacity to run model no.15 in one-shot. However, through a well-constructed user-defined estimate (i.e., machine language called syntax), AMOS can run this model in one shot.

The following equations have been used in AMOS syntax to run the direct and indirect paths for second-order moderated mediation:

1. Indirect path = A*(B1+(B2*V));
2. Direct path = C1+(C3*V).

To follow this study's theoretical framework, we estimated entrepreneurial self-efficacy at high, medium, and low levels for conditional direct and indirect effects defined in the model (Figure 2). To fulfil the user-defined estimate's assumptions to run a statistically robust model, we analysed it using 5000 bootstrapped and at a 95% confidence interval (CI). The possible understanding of user-defined estimate in syntax for AMOS shows in Figure 2. To test the conditional direct and indirect moderated mediation of entrepreneurial self-efficacy, more specifically, was estimated on high (+1sd), medium, and below (-1sd).

To assess structural model R^2, we have found that the structural model explained a 40% variance in entrepreneurial alertness and a 19% variance in entrepreneurial intention. As suggested by Chin (1998), a desired R^2 value should be greater than 0.1 or zero. It is not surprising as most of the entrepreneurial intention and behaviour-based studies have explained a 20% to 40% variance in their prior studies (Fuller *et al.*, 2018; Shirokova *et al.*, 2016; Neneh, 2019a).

Hypothesis Testing from User-defined estimates

The findings of the hypotheses were expressed with standardised estimates, critical ratios, and p values. Table 3 and Figure 3 show the results of the hypotheses. As hypothesised in the model, cognitive flexibility is positively related to entrepreneurial intention. The findings indicate that cognitive flexibility has a direct positive and significant impact on entrepreneurial intention (β=0.299, t=3.44, p<0.000). Thus, H1 supported by the results and accepted. The relationship stated that individuals with a greater cognitive flexibility level have more awareness and decision-making power to pursue a career in entrepreneurship. We predicted H2 cognitive flexibility positively related to entrepreneurial alertness.

The structural model results show that cognitive flexibility has a direct positive and significant influence on entrepreneurial alertness (β=0.573, t=9.64, p<0.000). The H2 was supported and accepted.

Hence, individuals who have cognitive flexibility abilities are more inclined and alert to identify and recognise the opportunities for starting a new venture. The results illustrate that entrepreneurial alertness has a direct positive and significant effect on entrepreneurial intention (β=0.294, t=2.9, p<0.004). Consequently, H3 was also e supported and accepted. The association indicated that individuals with a higher level of alertness through scanning and search, association and connection, evaluation, and judgment actively recognise and exploit new opportunities to become entrepreneurs.

The hypothesis H4 of this study stated that the relationship is stronger for the higher entrepreneurial self-efficacy individuals than those who are lower in entrepreneurial self-efficacy. Table 3 shows that (β=0.92, t=2.51, p<0.012) entrepreneurial self-efficacy significantly moderates the direct relationship between cognitive flexibility and entrepreneurial intentions. The mediated relationship is more robust for those who are higher in entrepreneurial self-efficacy. Table 3, which indicated (β=-0.76, t=-2.3, p<0.002) that entrepreneurial alertness and entrepreneurial self-efficacy negatively but significantly moderated mediation effect on entrepreneurial intention. Hence, H5 confirmed partial moderated mediation and accepted. The study has four control variables to test either they influence the dependent variable or not. Unfortunately, all the control variables (i.e., entrepreneurial education, family business, gender, and age) are insignificant and have no relationship.

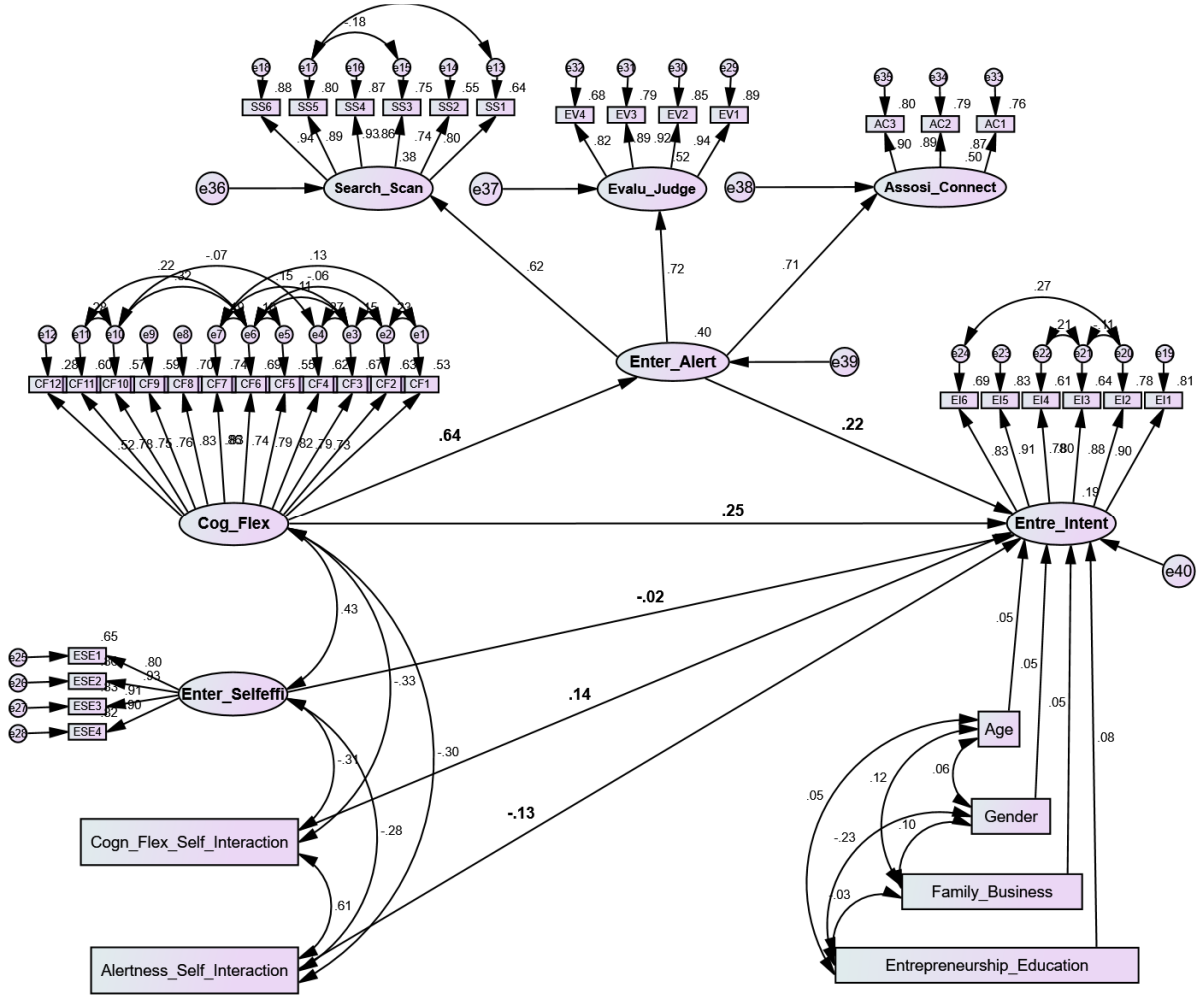

Figure 3. Structural Model

Note: CF= Cognitive flexibility, EA= Entrepreneurial alertness, ESE=Entrepreneurial self-efficacy, EI=Entrepreneurial Intention

Source: own elaboration.

Table 3. Direct, Indirect & Conditional Effects (One-shot Model)

Hypothesis & Paths			β	t-Value	P	Bias-corrected Percentile 95% CI				Label
						Estimate	Lower	Upper	P	
CF	→	EI	0.299	30.443	***	0.247	0.097	0.407	0.003	C1
CF	→	EA	0.573	90.646	***	0.636	0.555	0.711	0.000	A
EA	→	EI	0.294	20.909	0.004	0.219	0.033	0.411	0.018	B1
CF x ESE	→	EI	0.092	20.515	0.012	0.140	0.009	0.271	0.037	C3
EA x ESE	→	EI	-0.076	-20.330	0.020	-0.127	-0.272	0.019	0.084	B2
Controls										
Entrepreneurial Education	→	EI	0.146	10.809	0.070	0.080	-0.013	0.169	0.106	–
Family Business	→	EI	0.072	10.075	0.282	0.046	-0.040	0.132	0.299	
Gender	→	EI	0.072	10.046	0.295	0.046	-0.040	0.133	0.317	
Age	→	EI	0.041	10.135	0.257	0.049	-0.039	0.131	0.266	

Note: CF= Cognitive flexibility; EA= Entrepreneurial alertness; ESE=Entrepreneurial self-efficacy; EI=Entrepreneurial Intention; β=Standardized Coefficient Estimates; SE= Standard Error; p= level of significance; Label= Syntax; Bootstrapping=5000; CI=confidence of interval 95%.
Source: own study.

Testing the Conditional Direct and Indirect Effects (Hypotheses 4 And 5)

Hayes (2013) suggested that four conditions without attaining this moderated mediation do not exist. These suggestions are the following, a) the relationship between exogenous and endogenous should significant; b) the interaction of moderator and mediator on endogenous should significant; c) the relationship between the mediator and the endogenous variable should be significant; d) the degree of conditional indirect effect must be different at low, medium, and high levels for moderator.

Table 4. Conditional direct and indirect effect of cognitive flexibility on entrepreneurial intention through entrepreneurial self-efficacy

Conditional Direct & Indirect Effect	β	Percentile 95% CI		P
		Lower Bound	Upper Bound	
The conditional indirect effect at high, medium, and low entrepreneurial self-efficacy				
Low (-1sd) entrepreneurial self-efficacy	0.206	0.054	0.382	***
Medium (0) entrepreneurial self-efficacy	0.169	0.024	0.340	***
High (+1sd) entrepreneurial self-efficacy	0.131	-0.016	0.315	Insig.
The conditional direct effect at high, medium, and low entrepreneurial self-efficacy				
Low (-1sd) entrepreneurial self-efficacy	0.219	0.009	0.435	***
Medium (0) entrepreneurial self-efficacy	0.299	0.115	0.500	***
High (+1sd) entrepreneurial self-efficacy	0.379	0.187	0.586	***

Note: Bootstrapping sample size=5000; β=Standardized estimate.
Source: own study.

To test the conditional direct effect through H4 we analyse Table 3 shows (β=0.299, t=3.44, p<0.000) the significant relationship between cognitive flexibility and entrepreneurial intention. The interaction effect (β=0.92, t=2.51, p<0.012) between cognitive flexibility and entrepreneurial self-efficacy is also significant that confirms a moderating effect. It is observed in Table 4 and Figure 5, which shows a moderating effect of entrepreneurial self-efficacy on the relationship between cognitive flexibility and entrepreneurial intention. The results (β = 0.37, p<0.000) indicates high levels of entrepreneurial self-efficacy (+1sd) for individuals and (β = 0.21, p<0.000) for low levels of entrepreneurial self-efficacy (-1sd), thus, hypothesis 4 of this study supported by the results.

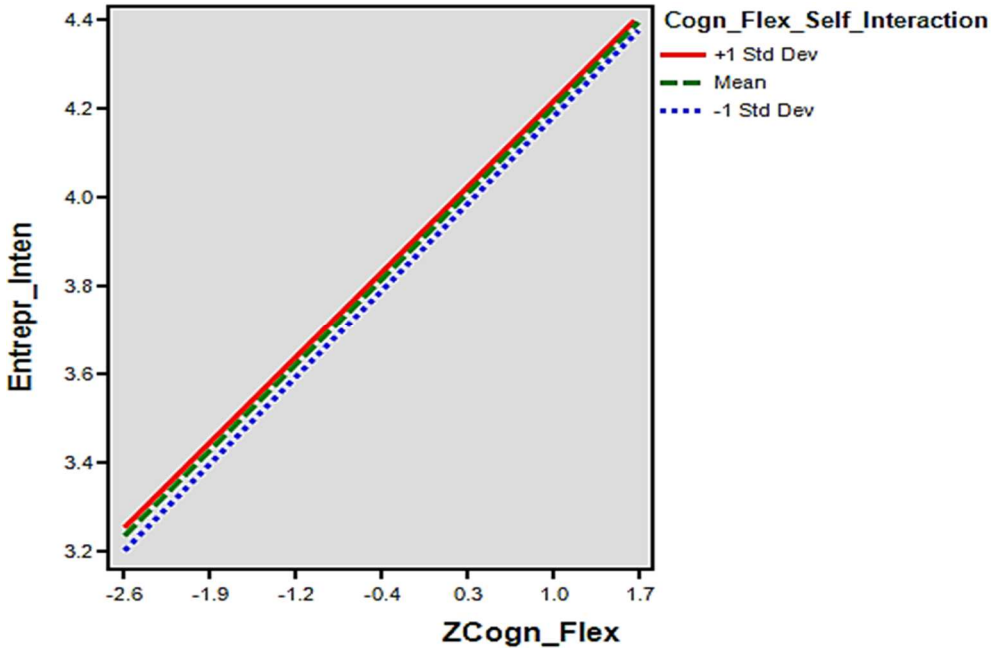

Figure 5. Interaction of ESE×CF and EI
Source: own elaboration.

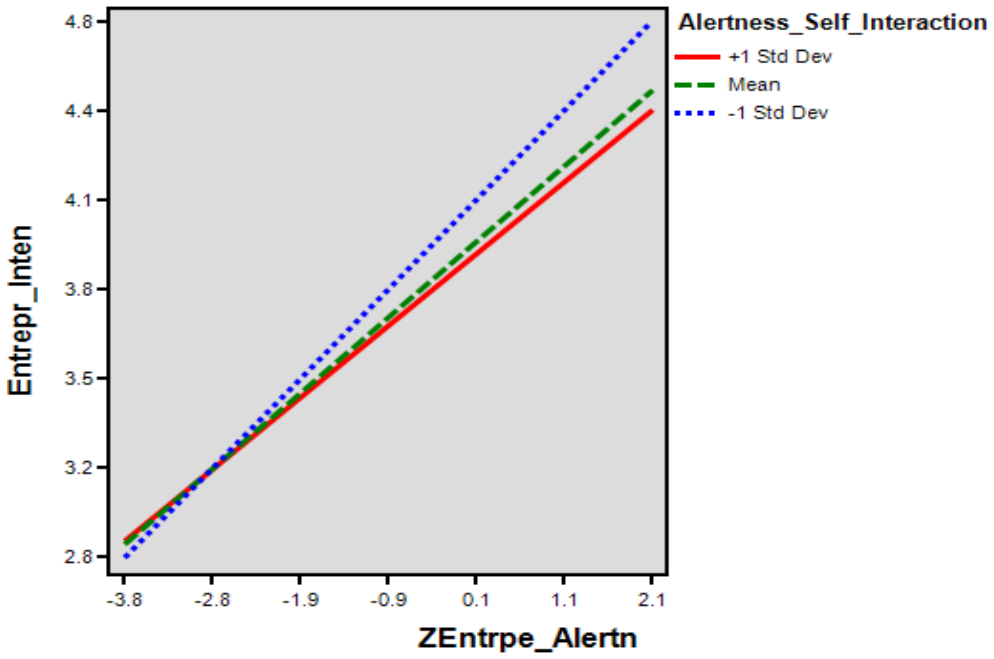

Figure 6. Interaction of ESE×EA and EI
Source: own elaboration.

To test the conditional indirect effect through H5 we analyse that Table 3 shows that (β=0.299, t=3.44, *p*<0.000) the significant relationship between cognitive flexibility and entrepreneurial intention here we meet condition (a). The interaction effect (β=-0.76, t=-2.3, *p*<0.002) between entrepreneurial alertness and entrepreneurial self-efficacy is also significant that meets the condition (b). Table 3 shows that entrepreneurial alertness has a direct positive and significant effect on entrepreneurial intention (β=0.294, t=2.9, *p*<0.004) that meets the condition (c). Table 4 and Figure 6 shows the conditional indirect effect of cognitive flexibility on entrepreneurial intention through entrepreneurial

self-efficacy (β = 0.13, *p*|-.016;.315) that is positive but not significant for high levels of entrepreneurial self-efficacy (+1sd) for individuals and conversely (β = 0.206, *p*|-.054;.382) is positively significant for low levels (-1sd) of individuals. Thus, hypothesis 5 of this study is not consistent.

CONCLUSIONS

This article highlights the substance of cognitive flexibility on entrepreneurial intention through the mediation role of entrepreneurial alertness and the moderating effect of entrepreneurial self-efficacy. We have added contributions in cognitive psychology literature to enhance the understanding that one is with a greater level of cognitive flexibility abilities are more inclined to start a new venture.

Concerning H1, we found that cognitive flexibility has a positive and significant impact on entrepreneurial intention; the results align with the previous researchers (Dheer & Lenartowicz, 2019; Fernández-Pérez *et al.*, 2019). Some studies indicated that entrepreneurship identifies the importance of individuals' intentions to start a new business (Asimakopoulos *et al.*, 2019). Besides, our results are similar to Puhakka (2011) stated that individuals' cognitive capabilities are essential for recognising opportunities, which also persuading perceptions that individuals can pursue the role and chores of entrepreneurs.

Regarding H2, our results indicate that cognitive flexibility positively influenced entrepreneurial alertness, and the hypothesis was supported (Mayer, 1992). Cognitive flexibility may also help individuals who have sufficient experience and knowledge to become an entrepreneur. According to Shepherd and Patzelt (2018), cognitive flexibility positively influences individual cognitive abilities to identify and recognise business opportunities. Concerning H3, our findings suggest that entrepreneurial alertness positively impacts entrepreneurial intention, supporting our hypothesis's acceptance. Entrepreneurial alertness enhances the individual level of searching and scanning, collecting appropriate information and judgment of opportunity identification, forming the entrepreneurial intention and entrepreneurial behaviour.

Related to H4, we found that entrepreneurial self-efficacy moderates and strengthens the direct relationship between cognitive flexibility and entrepreneurial intentions. Hence, our findings are in line with previous researchers who found that entrepreneurial self-efficacy as a mediator and moderator influence an individual's beliefs to become entrepreneurs (Urban, 2019; Wu *et al.*, 2019). Concerning H5 we found that entrepreneurial self-efficacy moderates the mediated relationship between cognitive flexibility and entrepreneurial intentions by entrepreneurial alertness. The mediated relationship is not more substantial for higher entrepreneurial self-efficacy, but it is reciprocal. Antiquities suggested that individuals with short efficacy are not motivated to achieve any desired goal than those with a greater efficacy level (McGee *et al.*, 2009; McGee & Peterson, 2019).

The practical implications of this study refer to the researcher, educationist, and policymakers who are directly and indirectly involved in enhancing entrepreneurship growth. The educator should pay more attention to the student's cognitive abilities and encourage them to pursue a career in entrepreneurship. They must offer some business start-up training programs for individuals and develop their entrepreneurial attitude and skills to start a new business. The educators must focus on students who have the cognitive abilities to become entrepreneurs and emerging those cognitive skills that can facilitate them to see entrepreneurship as the right path to utilise their minds.

They should make some assessment tools that help them identify the cognitively flexible individuals with the confidence that they would see more extraordinary fit toward new business development and display greater attention and determination toward getting the effective and efficient skills and abilities that facilitate them toward entrepreneurship. Finally, educators encourage and promote entrepreneurship's drive among the students and arrange some industry interaction to learn practical knowledge through interactive meetings with new young and passionate entrepreneurs.

A future researcher can take the actual behaviour of individuals with risk-taking as a predictor to add more contribution to cognitive psychology and entrepreneurship. The nature of our study was cross-sectional using a self-report questionnaire. Therefore, a future study conducted with longitudinal data using other cognitive psychology techniques such as EEG, neurology imaging, and individuals'

brain scanning to predict better cognitive abilities and their entrepreneurial intentions. Our study focused on public sector university students of Pakistan using a small sample size. Future researchers may also employ these constructs on different samples, e.g., SME's sector entrepreneurs, to enhance their firm performance with cognitive flexibility.

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Appendix: Instrument of the study

Second-order Factors	First-order Factors	Code	Items
Entrepreneurial Alertness	Searching and Scanning	SS1	I have frequent interactions with others to acquire new information.
		SS2	I always keep an eye out for new business ideas when looking for information.
		SS3	I read news, magazines, or trade publications regularly to acquire new information.
		SS4	I browse the Internet every day.
		SS5	While going about day-to-day activities, I try to look for new business ideas.
		SS6	I am an avid information seeker.
	Association and Connection	AC1	I often see new combinations of people, materials, or products.
		AC2	I often make novel connections and perceive new or emergent relationships between various pieces of information.
		AC3	often find differences between the way I see certain situations and the way other people see them.
	Evaluation and Judgment	EV1	"Seeing" potential new business opportunities comes very naturally to me.
		EV2	I have a special alertness or sensitivity toward profitable opportunities.
		EV3	I have a gut feeling for potential opportunities.
		EV4	I can distinguish between profitable opportunities and not-so-profitable opportunities.
Entrepreneurial Intention		EI1	I'm ready to make anything to be an entrepreneur.
		EI2	My professional goal is becoming an entrepreneur.
		EI3	I will make every effort to start and run my own firm.
		EI4	I'm determined to create a firm in the future.
		EI5	have very seriously thought in starting a firm.
		EI6	I've got the firm intention to start a firm someday.
Entrepreneurial Self-Efficacy		ESE1	Apply a fresh approach to problems.
		ESE2	I find it easy to balance different ideas within a team.
		ESE3	Understand the language of new venture creation.
		ESE4	Motivate others to work long hours and to meet a deadline.
Cognitive Flexibility		CF1	I can communicate an idea in many different ways.
		CF2	I avoid new and unusual situations.
		CF3	I feel like I never get to make decisions.
		CF4	I can find workable solutions to seemingly unsolvable problems.
		CF5	I seldom have choices when deciding how to behave.
		CF6	I am willing to work at creative solutions to problems.
		CF7	In any given situation, I am able to act appropriately.
		CF8	My behavior is a result of conscious decisions that I make.
		CF9	I have many possible ways of behaving in any given situation.
		CF10	I have difficulty using my knowledge on a given topic in real life situations.
		CF11	I am willing to listen and consider alternatives for handling a problem.
		CF12	I have the self-confidence necessary to try different ways of behaving.

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Shabeeb Ahmad Gill's share is 60%, Nelly Bencheva's share is 20%, while Selcuk Karayel's share is 10%, and Muhammad Usman's share us is 10%.

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Acknowledgements and Financial Disclosure

This paper and the research behind it would not have been possible without the exceptional support of my PhD teacher Dr. Masood Nawaz Kalyar. His enthusiasm, knowledge, and exacting attention to detail have inspired me and kept my work on track. From my first encounter with the entrepreneurial work to the final draft of this paper, my friend from China, Dr. Majid Murad, provided immense support.

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Entrepreneurial Business and Economics Review

2021, Vol. 9, No. 3

10.15678/EBER.2021.090303

Entrepreneurial career: Factors influencing the decision of Hungarian students

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ABSTRACT

Objective: The objective of the article is to examine the career plans and their key shaping factors among Hungarian students, with a special focus on entrepreneurial ambitions.

Research Design & Methods: The study is based on the analysis of the Hungarian database of the GUESSS (Global University Entrepreneurial Spirit Students 'Survey), with 9 677 valid answers.

Findings: After graduation, a significant proportion of students would like to work as an employee. The proportion of those planning an entrepreneurial career is low. Our research suggests that positive entrepreneurial attitudes and better knowledge about the entrepreneurial processes increase the chance of an entrepreneurial career. The entrepreneurial university environment may also have a positive effect on entrepreneurial aspirations. Finally, experiences from a family entrepreneurial background leave a very strong imprint on students 'career plans.

Implications & Recommendations: Understanding student opinions in the context of entrepreneurship, and in particular the key drivers behind them, makes it possible to develop policies and university practices that can increase students' entrepreneurial intention and thus entrepreneurial activity.

Contribution & Value Added: The study provides a literature overview of the factors which influence entrepreneurial career choices, introduces the main characteristics of students' career aspirations in 2018 in Hungary and contributes to understanding the factors shaping the decision.

Article type: research article

Keywords: entrepreneurship; entrepreneurial intentions; entrepreneurial spirit; entrepreneurial career; career plans; higher education; GUESSS research

JEL codes: L26, A20, I23

Received: 7 December 2020 Revised: 25 March 2021 Accepted: 17 April 2021

Suggested citation:

Gubik, A.S (2021). Entrepreneurial career: Factors influencing the decision of Hungarian students. *Entrepreneurial Business and Economics Review,* 9(3), 43-58. https://doi.org/10.15678/EBER.2021.090303

INTRODUCTION

Entrepreneurship is not a new concept, Richard Cantillon (1755) was the first to use this expression in the 17th century. Subsequently, more and more approaches came to light (entrepreneurship as the source of innovation and technological change (Schumpeter, 1934), entrepreneurship as opportunity recognition (Kirzner, 1973) and new aspects became known to professionals (Gancarczyk & Ujwary-Gil, 2021). Both entrepreneurship and innovation play a crucial role in the contemporary economies in the local, regional, but also in global context (Bigos & Wach, 2021).

In recent decades, the role of entrepreneurship in economic growth has become increasingly accepted (Carree & Thurik, 2010; Hope, 2016; Meyer & Krüger, 2021), but its cross-cutting analysis has also brought to the fore the framework conditions that can guarantee a positive correlation (Van Stel *et al.,* 2004; Ács *et al*., 2008). As a result, a considerable number of new approaches have emerged that capture this complexity, such as ecosystem models (Isenberg, 2011; World Economic Forum, 2013; Stam & Spigel, 2016; Ács *et al.,* 2018) and the institutional approach (Wennekers & Thurik, 1999; GEM, 2019; Ács *et al.*, 2008; Zygmunt, 2018; 2020).

Today's changes, such as digitalisation and the consequent drastic transformation of economy, which entails changes in the labour market (Leone & Cascio, 2020), also further increase the role of entrepreneurship. Personality traits and skills that are significant in business also prove to be beneficial within large corporations. The concept of intrapreneurship (Wennekers & Thurik, 1999) or corporate entrepreneurship (Bouchard & Fayolle, 2018) refers to the aspiration of large companies to achieve higher performance by increasing their entrepreneurial spirit (Gubik, 2020).

Within the promotion of entrepreneurship, special attention is paid to youth's and especially university students' entrepreneurial activity (Meyer & Krüger, 2021; Wach & Bilan, 2021; Loan *et al.*, 2021) and their competencies (Solesvik, 2019). This is partly due to the conclusions of the research that education positively affects the probability of trying to be an entrepreneur (Nikolova *et al.*, 2012), and these companies outperform the average in terms of their growth orientation (Autio, 2005; Schrör, 2006) and innovation (Richert & Schiller, 1994, cited by Lüthje & Franke, 2002). Another reason is the fact that higher education can influence the entrepreneurial ideas of these young people under the right conditions.

Recognizing the role of young people in entrepreneurship, a broad range of reports have been published that make recommendations for modernising education (methodology and content) and for the services provided to increase entrepreneurial intention and activity (EC, 2013; Eurofound, 2015; EYE, 2015). This article also focuses on young people, examining students in higher education.

The objective of this article is to investigate career choices of the Hungarian youth and to highlight some important driving forces of students' entrepreneurial career plans. In the literature, we often come across works that look for a correlation between certain factors and entrepreneurial intention, or a model that shows the combined effect of some factors in the evolution of entrepreneurial intention. The present work also aims to contribute to this area of research. What is new about our approach is that instead of the entrepreneurial intention used in the literature, we examine student career plans because we estimate that this variable (which career path do you intend to pursue) is more valid for future student plans. A further advantage of our work is that the questionnaire revealed not only the career ideas right after studies, but also highlights what longer-term plans the students have. Thus, we can also map the development of entrepreneurial ideas over time. In our work, we rely on the GUESSS (Global University Entrepreneurial Spirit Students' Survey) project database which is major international research on entrepreneurship, involving about 50 countries. Descriptive statistics, hypothesis testing and binary logistic regression are used to get to know the topic.

In this article, we attempt to create a complex model that shows the combined effects of individual characteristics, family entrepreneurial background, higher education, and the social environment on career plans. On the one hand, the idea fits into the complex approach of entrepreneurship, and on the other hand, it also provides an opportunity to be convinced of the partial impact of each factor.

The structure of the article is as follows: after reviewing the literature background and presenting our hypotheses, we clarify some methodological issues of the research. This is followed by a presentation of the research results and a discussion. Finally, we summarize the key lessons of the work.

LITERATURE REVIEW

Individual characteristics

The individual level addresses demographic factors (gender, age), as well as the role of skills and abilities in entrepreneurial issues. Entrepreneurial personality traits also emerge in the literature as critical individual characteristics (Wach & Głodowska, 2021). The ability to take risks (Meager *et al.*, 2003; Reissová *et al.*, 2020; Shamsudin *et al.*, 2017; Ključnikov *et al.,* 2019; Dankiewicz *et al.,* 2020) and the desire to become independent (Meager *et al.*, 2003) are especially crucial entrepreneurial characteristics (Mensah *et al.*, 2021). Bigos and Michalik (2020) found a statistically significant correlation between self-awareness and self-motivation and the students' entrepreneurial intentions using the binomial logistic regression model.

Other studies suggest that in addition to examining individual characteristics, the issue of entrepreneurial mindset should also be addressed. Because while the former is not, or is difficult to modify,

the latter can be shaped and demonstrate what behaviours and attitudes can be expected from individuals during an entrepreneurial process (Gauthier *et al*., 2018).

Krueger *et al*. (2000) emphasize that the individual variables alone are poor predictors and intention models offer opportunities to improve the explanatory power. Such models are known in the entrepreneurship literature, for example, the Social Cognitive Theory (Bandura, 1977; 1989), the Entrepreneurial Event (Shapero & Sokol, 1982), and the Theory of Planned Behaviour (Ajzen, 1991). These models consider the individual's values, attitudes and impressions important, at the same time, they also emphasize that signs from an individual's environment greatly shape these individual characteristics and the entrepreneurial ideas themselves.

The above highlights that skills and abilities alone are not enough, emotional charge must be present, a positive attitude and a sense of confidence in achieving goals are necessary conditions for intentions and then action. Besides, attitudes influence the transfer of knowledge and skills, thus, the relationship between these factors is reciprocal (OECD, 2019).

Almost all research examining the role of attitudes in entrepreneurship found a positive relationship between the two variables (Wach & Wojciechowski, 2016; Gubik & Farkas, 2019; Nishimura & Tristán, 2011, Liñán & Chen, 2009, Autio *et al.,* 2001, Krueger *et al.,* 2000), we only know of one or two studies that came to the opposite conclusion (Pingying *et al.,* 2014; Siu & Lo, 2013).

The concept of self-efficacy comes from Bandura (1982). It is "people's sense of personal efficacy to produce and regulate events in their lives". Bandura emphasizes that these judgments, whether accurate or faulty, influence peoples' choices. People with a strong sense of efficacy make a greater effort to master challenges. In the entrepreneurship literature, entrepreneurial self-efficacy is relevant, which is the "strength of a person's belief that he or she is capable of successfully performing the various roles and tasks of entrepreneurship" (Chen *et al.*, 1998). Several studies have confirmed the positive effect of self-efficacy on business start-up intent (Autio *et al.,* 2001; Krueger *et al.,* 2000; Nishimura & Tristán, 2011; Liñán & Chen, 2009; Kautonen *et al.,* 2015; Farashah, 2015; Zellweger *et al.*, 2011; Bartha *et al*., 2018; Wach & Wojciechowski, 2016). The analysis of the Hungarian database came to the same conclusion (Gubik & Farkas, 2019). These prior empirical results allowed us to assume the following research hypotheses:

H1: The more positive a student's entrepreneurial attitude is, the greater the chances of choosing an entrepreneurial career.

H2: The higher self-efficacy of students is, the greater the chances of choosing an entrepreneurial career.

Social environment

Concerning the impact of the social environment on entrepreneurial intentions, there are usually two focal points in the literature. One focuses on the relationship between general acceptance and status of entrepreneurship in society and thus the role of positive feedback from society in the development of entrepreneurial ideas (Turulja *et al.,* 2020; Nowiński *et al.,* 2020; Shamsudin, 2017; Doanh, 2021), the other is on the role of culture in entrepreneurship (Thurik & Dejardin, 2012; Thomas & Mueller, 2000; Shane *et al.*, 1991; Zhao *et al.*, 2012).

Persistent differences (beyond economic reasons) in entrepreneurship data in individual countries suggest that cultural factors, as "a subset of stable contextual factors", may also play a role (Thurik & Dejardin, 2012). As for the role of culture, its influence on individuals' characteristics (Thomas & Mueller, 2000; Thurik & Dejardin, 2012) and aggregated entrepreneurial statistics (Shane *et al.*, 1991; Zhao *et al.*, 2012) are the focus of scientific interest. In this article, we will deal only with the influence of the perception of the individual's narrower and wider environment because we believe that these behaviours are substantially influenced by deep-rooted cultural patterns.

As far as the importance of the environment is concerned, according to Autio and Wennberg (2010), the norms and attitudes of an individual's community may have a greater impact on entrepreneurial behaviour than their attitudes and perceived self-efficacy. These links are typical for all spheres of youth engagement, including the employment relations (Bilan *et al*., 2020).

During the analysis of the social environment, the subjective norm is the most often used term. It refers to the 'perceived social pressure to perform or not to perform the behaviour' (Ajzen, 1991). Research that seeks to assess the impact of the subjective norm usually asks about the supportive nature of the respondent's environment (family, friends, colleagues, schoolmates) (Liñán & Chen, 2009; Gubik & Farkas, 2019). Some research uses different terms, but the same solutions during operationalisation. For example, Turulja *et al.* (2020) use the informal support expression, others use the social norm expression (even if it is a wider concept than subjective norms).

Regarding the role of the subjective norm, there is no consensus in the literature. Engle *et al.* (2010), Ozaralli and Rivenburgh (2016), and Kautonen *et al.* (2015) proved subjective norms to be an important predictor of entrepreneurial intention. However, other research did not find a significant correlation between entrepreneurial intentions and subjective norms (Autio *et al.*, 2001; Krueger *et al*., 2000; Nishimura & Tristán, 2011; Liñán & Chen, 2009; Wach & Wojciechowski, 2016).

The reasons for the different research results can be very diverse. Often methodological reasons may lie in the background. Some research on the relationship between entrepreneurial intentions and the subjective norm has found that norms have an indirect effect, they participate in models by influencing attitudes (Nowiński *et al.*, 2020; Gubik & Farkas, 2019; Wach & Bilan, 2021), entrepreneurial self-efficacy and risk attitudes (Nowiński *et al*., 2020).

Another reason for the different results may be the low social prestige of being an entrepreneur, which is also true for the Hungarian society (Szerb & Kocsis-Kisantal, 2008), which not only can lead to not finding a meaningful relationship, but also to the relationship becoming negative. We want to test this on our database.

Norms and values are part of the social culture that an individual acquires during socialisation. Some individual values have a great impact on entrepreneurial aspirations and intentions of university students as it is proved by Eyel *et al*. (2020), Çera *et al*. (2018). The first scene of this process is the family. From the point of view of entrepreneurial ideas, the importance of family (business) background is decisive (Belas *et al.*, 2017; Gubik & Farkas, 2019; Shamsudin, 2017). Role models are crucial in the personal decision-making process (Bosma, 2012), and these roles often come from the family. Under certain circumstances, a family business can also appear as an entrepreneurial experience, and when planning to take over a family business, it significantly determines career ideas.

Laspita and his colleagues (Laspita *et al.*, 2012) highlighted that the strength of the effect varies across cultures. As for the relationship itself, we only know of one research that found no connection. Nguyen (2018) failed to prove the relationship between the family entrepreneurial environment and entrepreneurial intention in his research among Vietnamese students. We do not know of any research that found a negative relationship. These prior empirical results allowed us to assume the following research hypotheses:

H3: Subjective norms negatively affect students 'entrepreneurial career plans.

H4: A family entrepreneurial background increases the chances of choosing an entrepreneurial career.

Education

The role of education in entrepreneurship is one of the most frequently investigated topics in entrepreneurial literature (Wach & Głodowska, 2019; Kobylińska & Lavios, 2020). Empirical studies show that formal education has a significant impact on entrepreneurial intention (Gubik, 2014), but there is a growing need for innovative solutions in education that effectively contribute to the transfer of skills and knowledge needed to start and run a business successfully (EC, 2008; Solomon *et al.*, 1994, Kickul & Fayolle, 2007; Harms, 2015; Costin *et al.*, 2018). Kurczewska *et al.* (2020) stated that education and professional experience are mutually indispensable to succeed as an entrepreneur, which draws attention to the complementarity between them.

The impact of education on entrepreneurial ideas and activity is not questioned by the scientific public, however, little is known about the mechanism of action (Gubik & Bartha, 2021). Research findings suggest that education has a direct impact on intentions towards entrepreneurship (Nowiński *et*

al., 2017; Maresch *et al.,* 2016; Turker & Selcuk, 2009; Kramarz *et al*., 2019, Karyaningsih *et al.,* 2020), Students' involvement in entrepreneurship programmes at university is positively related to start-up activities, too (Morris *et al.*, 2017).

At the same time, entrepreneurship education also indirectly influences student decisions. It is likely to be a proxy for other individual characteristics that encourage entrepreneurial attempts (Nikolova *et al.,* 2012; Dvorský *et al*., 2019). By gaining entrepreneurial knowledge, students also get an impression of their entrepreneurial aptitude (von Graevenitz *et al*., 2010), increase their self-efficacy (Egerová *et al*., 2017) and, as a result, increase their chances of running a successful business (Kolstad & Wiig, 2015).

There are three important aspects to mention in connection with entrepreneurship education. One is that entrepreneurship is not for everyone. An important task of entrepreneurship education is also to support students in learning about their abilities and drawing the right conclusion about their suitability for entrepreneurial activity. Von Graevenitz and his colleagues (2010) point out that the impact of entrepreneurship education is not uniform. It can be very different depending on what beliefs about their entrepreneurial aptitude students have, what signals they receive during education, and how these are valued.

The second is that the knowledge and experience gained can be used elsewhere. Entrepreneurship education boosts not only entrepreneurship but enhances the overall employability of students (Ling & Venesaar, 2015).

The third is that it would be a mistake to think only of the curriculum when assessing the role of education. Entrepreneurial ideas can also be encouraged by creating an entrepreneurial environment that makes clear the institution's commitment to entrepreneurial values, which should be apparent in communication and different activities (programmes, supports). We focus on this broader role in research and formulate our hypothesis accordingly:

H5: There is a positive correlation between the entrepreneurial university environment and students 'entrepreneurial career plans.

The framework of the research

In the course of the analyses, we could not measure the already presented influencers (individual characteristics, family background, universities and social environment), instead, the students' self-assessments on them (attitude, self-efficacy, subjective norms, perceived university environment and entrepreneurial models from the family). The relationship between the variables is illustrated in Figure 1.

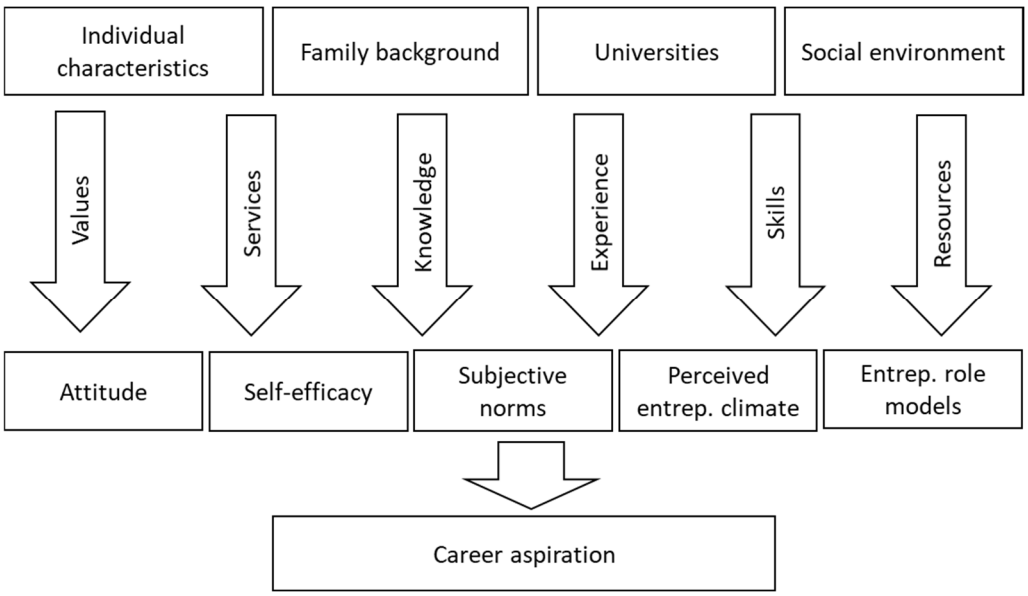

Figure 1. Career choice model
Source: own elaboration.

RESEARCH METHODOLOGY

Database

The research aims to explore the reasons behind the differences in student career plans, primarily to understand the driving forces behind choosing an entrepreneurial career. For this, we use the latest (2018) Hungarian database of the GUESSS research.

The GUESSS (Global University Entrepreneurial Spirit Students' Survey) is one of the largest entrepreneurship research in the world. The main focus of it is the entrepreneurial intentions and activity of students. Emphasis is also placed on the issue of the university environment, family background and family firm succession. The research was established in 2003, in 2018 55 countries participated and 208 636 students answered the questionnaire. The article relies on the analysis of the sample in Hungary, where 9 667 responses were collected from 19 universities. The composition of the respondents by field of study is as follows: engineering 22.3%; business, management and economics 22.2%, computer sciences/IT 9.3%; arts/humanities 8.4%; medicine, health sciences and social sciences 8.3%. 70% of respondents study on BSc and 16% on the MSc level. As regards gender distribution, the female-male ratio is 58.2% and 41.8%. The distribution by the level of education and by gender is close to the distribution of the total population, which, according to the level of education is as follows: 60% BSc, 12% MSc and 15% undivided, long-term Master's degree programme (in some fields of study, e.g. in human medicine, dentistry, pharmacy, law etc.) and by gender: 53% female, 47% male. 85.2% of respondents were born after 1990, that is, they were younger than 28 at the time of completing the questionnaire.

Variables

The dependent variable of the research was the career choice intention. Respondents were also asked to report on their career plans right after graduation and 5 years later ("Which career path do you intend to pursue right after completion of your studies?" "Which career path do you intend to pursue 5 years later?"). One of the following answers could be marked (only one per question): an employee in a small business (1-49 employees); an employee in a medium-sized business (50-249 employees); an employee in a large business (250 or more employees); an employee in a non-profit organisation; an employee in academia (academic career path); an employee in public service; a founder (entrepreneur) working in my own business; a successor in my parents'/family's business; a successor in another business; Other / do not know yet. These answers were grouped into 4 response categories during the analysis, these are: Employee, Founder, Successor and Other / do not know yet.

During the analysis we used the following independent variables:

Attitudes (ATT)

Students 'attitudes towards entrepreneurship were measured following Liñán and Chen (2009) using the following items "Being an entrepreneur implies more advantages than disadvantages to me"; "A career as an entrepreneur is attractive for me"; "If I had the opportunity and resources, I would become an entrepreneur"; "Being an entrepreneur would be very satisfying for me"; "Among various options, I would rather become an entrepreneur" (1-7 Likert scale) (Cronbach's Alpha is 0.955). Students 'attitudes were assessed by the arithmetic mean of the four items.

Subjective norms (SUB)

For subjective norms we used three items (Liñán & Chen, 2009): If you were to pursue a career as an entrepreneur, how would people in your environment react? Your close family/your friends/your fellow students (1-7 Likert scale) (Cronbach's Alpha is 0.797). Students' subjective norms were assessed by the arithmetic mean of the three items.

Self-efficacy (SEF)

Entrepreneurial self-efficacy was measured by the level of competence required for 6 entrepreneurial tasks (Chen *et al.,* 1998): "Identifying new business opportunities"; "Creating new products and ser-

vices"; "Managing innovation within a business"; "Being a leader and a communicator"; "Building up a professional network"; "Commercialising a new idea or development"; "Successfully managing a business" (1-7 Likert scale) (Cronbach's Alpha is 0.920). Students' self-efficacy was assessed by the arithmetic mean of the three items.

Family background (FAM)

In assessing the family environment, we examined whether parents are self-employed or majority owners of a business: Are your parents self-employed? No/Yes, my father is/Yes, my mother is/Yes, both are; Are your parents majority owners of a business? No/Yes, my father is/Yes, my mother is/Yes, both. By merging the two variables, we created a new variable (has/does not have a family business background).

University entrepreneurial climate (ECO)

Students rated their university entrepreneurial environment by answering the following items (Franke & Lüthje, 2004): " The atmosphere at my university inspires me to develop ideas for new businesses"; "There is a favourable climate for becoming an entrepreneur at my university"; "At my university, students are encouraged to engage in entrepreneurial activities" (1-7 Likert scale) (Cronbach's Alpha is 0.877). Students' evaluation on entrepreneurial climate was assessed by the arithmetic mean of the three items.

RESULTS AND DISCUSSION

Figure 2 illustrates the differences in students' future career plans. A significant proportion of students preferred to be employed immediately after graduation and wanted to find a job in a large company or a small and medium-sized company. Working in the public sector was also attractive to respondents. Overall, 84.9% of the students intended to become employees after graduation. Five years after graduation, the attractiveness of employee status diminished in favour of entrepreneurial career (as founders or followers). The responses suggest that students only want to start their own business after gaining a few years of employee experience.

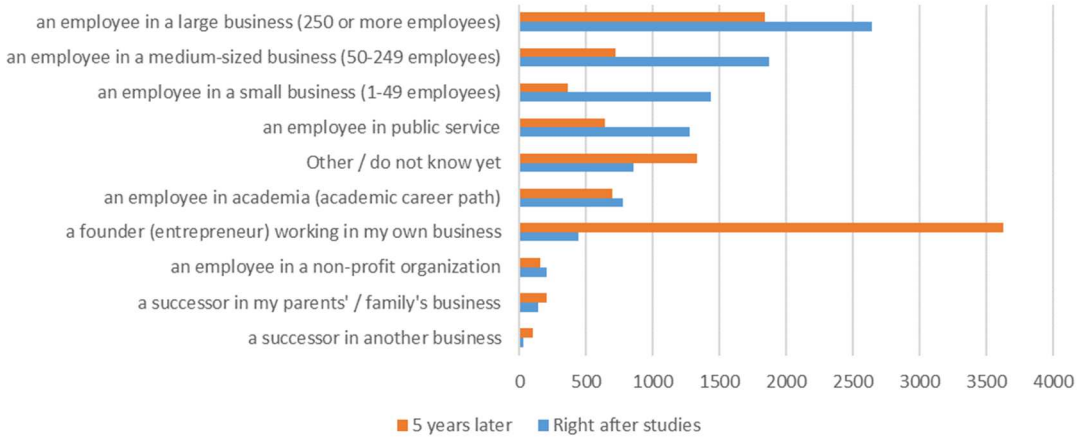

Figure 2. Career aspirations right after graduation and five years after studies (Number of students)
Source: own elaboration, N=9667.

To test the hypotheses, the first step was to calculate the arithmetic mean of the Likert scale items (attitude (ATT), self-efficacy (SEF), subjective norms SUB), perceived university environment (ECO) so that we could express each variable with one value. The variable of career plans is also aggregated because for the focus of this article the distinction according to entrepreneurial / non-entrepreneurial career is relevant, so we aggregated all employee career choices into one category. After that, we examined what assessment students give according to their career ideas. Table 1 shows that after graduation and also five years later students with entrepreneurial plans gave above-average evaluations for each variable.

As the variables are not normally distributed, we performed Kruskal-Wallis test. The significance level of the test justified the differences according to the career plans (all null hypotheses were rejected), and the pairwise comparisons showed that these differences are significant in each pairing except founder/successor comparison. The strength of the relationship was checked using Eta statistics.

Table 1. Relationship between career plans and attitudes, self-efficacy, subjective norms and perceived university environment

Variables		Right after studies				5 years later			
		ATT	SUB	SEF	ECO	ATT	SUB	SEF	ECO
Employee	Mean	3.92	5.59	3.93	3.61	3.27	5.36	3.69	3.48
	N	6239	8159	6225	8151	3827	4377	3824	4370
Founder	Mean	5.85	5.90	4.85	3.79	5.47	5.93	4.53	3.81
	N	89	436	88	437	1970	3607	1965	3600
Successor	Mean	4.94	5.69	4.50	4.13	4.54	5.82	4.36	4.03
	N	90	168	90	168	186	302	185	302
Other / do not know yet	Mean	3.45	5.31	3.31	3.32	3.27	5.30	3.37	3.30
	N	703	844	700	840	1138	1321	1129	1324
Total	Mean	3.91	5.58	3.89	3.60	3.91	5.58	3.89	3.60
	N	7121	9607	7103	9596	7121	9607	7103	9596
Eta		0.158	0.094	0.163	0.075	0.546	0.255	0.312	0.131
Kruskal-Wallis p		0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000

Source: own study.

Based on the data of Table 1, it can be seen that in the case of entrepreneurial careers, higher averages were obtained for all the variables examined. That is, the more positive entrepreneurial attitudes, the more supportive environment, the greater self-confidence and the entrepreneurial university atmosphere are more likely to go hand in hand with entrepreneurial career ideas. The direction of the relationship is uncertain, nor do these cross-sectional studies clarify how entrepreneurial ideas are shaped as a result of education.

Our fifth variable in this study is family background, the effect of which was measured through the family entrepreneurial background: namely whether there is a sole proprietor or a majority owner of a business between the parents. We found that an entrepreneurial background increases the chances of an entrepreneurial career: those who report a family business are more likely to choose an entrepreneurial career themselves. The Chi-square test is significant. To test also the strength of the association we calculated Cramer V, an indicator with a value between 0 and 1 facilitates interpretation, in our case, it shows that the relationship is rather weak.

Table 2. Relationship between career plans and family business background

Variables	Right after studies			5 years later		
	No	Yes	Total	No	Yes	Total
Employee	5809	2398	8207	3308	1097	4405
	70.8%	29.2%	100.0%	75.1%	24.9%	100.0%
Founder	283	158	441	2333	1292	3625
	64.2%	35.8%	100.0%	64.4%	35.6%	100.0%
Successor	44	124	168	120	185	305
	26.2%	73.8%	100.0%	39.3%	60.7%	100.0%
Other / do not know yet	637	214	851	1012	320	1332
	74.9%	25.1%	100.0%	76.0%	24.0%	100.0%
Total	6773	2894	9667	6773	2894	9667
	70.1%	29.9%	100.0%	70.1%	29.9%	100.0%
Cramer's V			0.134			0.167
p			0.000			0.000

Source: own study.

Once we have determined that the variables included in the study are individually related to career choice, the next step is to examine 1) the extent to which they jointly explain the career choice decision, and 2) whether they retain their explanatory power when included with the other variables in the model.

For the analysis, we used binary logistic regression, which can be performed as opposed to linear regression even if the variables are not normally distributed (as in our case). The price of the "leniency" of the method is the more difficult interpretation of the model. In the study, we used an aggregate version of the career variable (1: planning a non-entrepreneurial career, 2: planning an entrepreneurial career). As an independent variable, we used the 5 variables of our analysis (attitude, self-efficacy, subjective norms, perceived university environment and entrepreneurial family background).

The developed model is significant (Chi-square test is significant), its explanatory power is 12.6% right after studies and 41.5% after 5 years (Nagelkerke's R^2 values). The significant effect of the variables included in the model can be verified individually with the help of Wald statistics.

Table 3. Relationship between career plans and attitudes, self-efficacy, subjective norms and perceived university environment

Right after studies		**B**	**Std. Error**	**Wald**	**df**	**Sig.**	**Exp(B)**
Entrepreneurial career	ATT	0.534	0.066	65.977	1	0.000	1.705
	SEF	0.157	0.075	4.351	1	0.037	1.170
	SUB	-0.264	0.085	9.770	1	0.002	0.768
	ECO	0.074	0.054	1.888	1	0.169	1.077
	FAM	0.992	0.156	40.199	1	0.000	2.697
	Constant	-6.015	0.488	151.904	1	0.000	0.002
5 years later		**B**	**Std. Error**	**Wald**	**df**	**Sig.**	**Exp(B)**
Entrepreneurial career	ATT	0.882	0.027	1046.331	1	0.000	2.416
	SEF	0.069	0.030	5.410	1	0.020	1.072
	SUB	0.023	0.034	0.451	1	0.502	1.023
	ECO	-0.064	0.022	8.225	1	0.004	0.938
	FAM	0.401	0.069	33.943	1	0.000	1.493
	Constant	-5.028	0.204	609.109	1	0.000	0.007

The reference category is the non-entrepreneurial career. Nagelkerke's R2 =0.126 right after studies and 0.415 after 5 years
Source: own study.

An examination of odds ratios shows the role of each factor in the development of an entrepreneurial career. Given that entrepreneurial family background is a dichotomous variable (the effect of the appearance of entrepreneurial background is shown in the Table), it is unfortunate to compare its odds ratio with the effect of other variables obtained by averaging items measured on a Likert scale from 1 to 7. But logistic regression helps us to show which factors are also partially significant, i.e., keeping the effect of the other variables under control.

The role of attitudes is decisive in the development of both post-graduate plans and plans 5 years later, but its role will increase significantly in more distant career plans. In the case of the family entrepreneurial background, the case is opposite, the role of the family is much greater immediately after graduation than 5 years later, but in both periods it is a significant explanation of the student's decision. The explanatory power of self-efficacy is modest despite its significance (this is even more so for more distant plans).

In the case of career plans immediately after studies the effect of the university entrepreneurial environment and after 5 years the subjective norm is not significant, apart from these all the variables appearing in the model affect the career plans.

We also examined the effect of several other factors that are not currently part of the article, such as demographic variables (gender and age). These variables showed a significant correlation in pairs with career plans, but their explanatory power was no longer significant when we included them in the model along with the variables we examined. Their effect is presumably exerted through our variables included in the study.

Based on our calculations, we can accept Hypothesis 1 on attitudes, Hypothesis 2 on the role of self-efficacy, and Hypothesis 4 on the family entrepreneurial background. The third hypothesis can only be accepted conditionally, the negative correlation between the subjective norm and entrepreneurial ideas is significant only immediately after the studies. Our fourth hypothesis about the university entrepreneurial climate is also not acceptable for career choices in general, as its significant effect was only demonstrated on plans after 5 years of study.

Regarding attitudes, our work supports the research results learned from the literature (Wach & Wojciechowski, 2016; Gubik & Farkas, 2019; Nishimura & Tristán, 2011; Liñán & Chen, 2009; Autio *et al.,* 2001; Krueger *et al.,* 2000). Regarding the family entrepreneurial background, our results also confirm previous results (Belas *et al.,* 2017; Gubik & Farkas, 2019; Shamsudin, 2017; Bosma, 2012). Since all students were interviewed for two dates (immediately after graduation and 5 years after graduation), so our analyses shed light on the changing role of these factors over time. The role of attitudes is intensifying and the role of family background is diminishing in the development of career plans for the distant future.

We were able to show the positive effect of self-efficacy similarly to previous research (Wach & Wojciechowski, 2016; Autio *et al.*, 2001; Krueger *et al.*, 2000; Nishimura & Tristán, 2011; Liñán & Chen, 2009; Kautonen *et al*., 2015; Farashah, 2015), but we found its significance to be small in the explanatory building.

In terms of subjective norms, our results do not help resolve the debate among researchers on the topic. The peculiarity of the Hungarian economy, that the substantive development of entrepreneurship could take place only after 1990, and the supporting institutional system was not available in the right quality from the beginning, certainly determines the negative social opinion related to entrepreneurship, which does not help the development of entrepreneurial ideas.

As for the role of the university environment, universities in Hungary are making serious efforts both to transform curricula and to build other services (entrepreneurial clubs, programmes, start-up competitions, etc.), but we cannot show the remarkable impact of this in the development of career decisions yet.

There are many other aspects of deciding on career ideas. The modest explanatory power of the model (12.6% and 41.5%) also draws attention to this. At the same time, we have demonstrated the significant effects of some variables that can be mainly shaped within the framework of higher education.

Entrepreneurial careers are not an option for many students at the moment, but labour market rearrangements and the trends we experience have an impact on the spread of entrepreneurial careers. Conscious preparation for this can increase the chance for survival, profitability and so on, so university efforts are important for both the individual and society.

CONCLUSIONS

We examined the impact of the following factors: individual characteristics, family background, universities and social environment on students' future career plans. Instead of examining these directly, we focused on perceptions of students based on the fact that students perceive their opportunities and strengths very differently because of their inherent interests, different efforts and backgrounds. The five variables we analysed were attitudes, self-efficacy, subjective norms, perceived university environment and entrepreneurial family background. According to our results, we can conclude that attitudes considerably influence students' career plans. The more positive the entrepreneurial attitude of students, the more likely they are to plan an entrepreneurial career. Self-efficacy, which is about the strength of a "person's belief that he or she is capable of successfully performing the various roles and tasks of entrepreneurship" (Chen *et al.*, 1998), is also a weak but significant influencing factor.

Social norms, that is the behaviour of the environment (family, friends, etc.), also shapes plans. We were able to prove the decisive role of the family background, it conveys successful entrepreneurial patterns and experiences that contribute greatly to the formation of future entrepreneurial career aspirations. The weak negative effect of the subjective norm indicates that the social status of entrepreneurship is low in Hungary and at the same time does not significantly affect student perceptions.

Our analyses shed light on the changing role of these factors over time. The role of attitudes is intensifying and the role of family background is diminishing in the development of career plans (plans right after studies and five years later).

The university itself could be part of this environment, and the entrepreneurial ecosystem it creates could be an important favourable influence on student career plans, but our results indicate that there is still work to be done in this area.

Understanding student opinions in the context of entrepreneurship, and in particular the key drivers behind them, makes it possible to develop policies and university practices that can increase students' entrepreneurial intention and thus entrepreneurial activity.

The results suggest that to make the entrepreneurial career more attractive, a complex solution is needed, which simultaneously conveys knowledge and information and also changes students' attitude and way of thinking. This goes beyond traditional curricula, there would be a need to develop new solutions that allow students to deepen their knowledge through experience and make them possible to try out different roles. Also for services that collect information, help to develop business ideas, and also in implementation. Unfortunately, these are processes that change very slowly and require a lot of resources (both human and financial), so a serious commitment is needed from both decision-makers and university management.

There are several limitations to our work, three of which we highlight. First, we analysed only the responses of students who participated in the Hungarian higher education and not the entire youth population, which may affect our outcomes. Second, questionnaire research, by its nature, is not suitable for full-depth understanding, with many individual motives remaining hidden. Finally, although the career questions formulated for the two dates attempted to illustrate the role of temporal change, due to the cross-sectional nature of the research, the exploration of causal relationships and the understanding of impact mechanisms are incomplete. These limitations must be taken into account when interpreting our conclusions. Applying qualitative research methods (case studies and interviews) could help to ensure a better understanding of the topic.

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Acknowledgements and Financial Disclosure

This research was supported by the project no. EFOP-3.6.2-16-2017-00007, titled *Aspects on the development of intelligent, sustainable and inclusive society: social, technological, innovation networks in employment and digital economy*. The project has been supported by the European Union, co-financed by the European Social Fund and the budget of Hungary.

Conflict of Interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Entrepreneurial Business and Economics Review

2021, Vol. 9, No. 3

10.15678/EBER.2021.090304

The impact of market orientation on small businesses' performance in Vietnam: The mediating effects of the management accounting system

Quang-Huy Ngo

ABSTRACT

Objective: The objective of the article is to draw upon the contingency theory to assess the mediating effects of broad-scope management accounting systems (MAS) on the relationship between market orientation and performance in the context of small businesses.

Research Design & Methods: Data was collected from 159 small businesses located in Cantho city in Vietnam. The partial least squares structural equation modelling was used to assess the research model.

Findings: The results reveal that broad-scope MAS fully mediates the link between market orientation and performance.

Implications & Recommendations: The owners of small businesses located in Cantho city should have a sophisticated MAS design like broad-scope MAS to find performance implication when these businesses follow the market-oriented approach.

Contribution & Value Added: This study contributes to the research interface between marketing and accounting by advancing our knowledge of the impact of the MAS design on the relationship between market orientation and performance. It provides exploratory evidence of the crucial role of the sophisticated the MAS design in the performance of small businesses. It sheds light on the influencing role of organisational culture on the MAS design by assessing the Cartesian contingency fit between culture and the MAS design on performance.

Article type:	research article
Keywords:	broad scope; market orientation; management accounting systems; small businesses; Vietnam
JEL codes:	M10, M30, M41

Received: 18 June 2020 Revised: 22 April 2021 Accepted: 27 April 2021

Suggested citation:

Ngo, Q-H. (2021). The impact of market orientation on small businesses' performance in Vietnam: The mediating effects of the management accounting system. *Entrepreneurial Business and Economics Review,* 9(3), 59-72. https://doi.org/10.15678/EBER.2021.090304

INTRODUCTION

In the marketing literature, empirical evidence of the impact of market orientation on performance is mixed (Gaur, Vasudevan, & Gaur, 2011, p. 1187). It revealed the positive association (Migliori, Pittino, Consorti, & Lucianetti, 2019; Vega-Vázquez, Cossío-Silva, & Revilla-Camacho, 2016), the negative association (Grewal & Tansuhaj, 2001), or even no association (Alnawas & Hemsley-Brown, 2019; Kiessling, Isaksson, & Yasar, 2016). Thus, those authors who found an insignificant relationship argued that there is a mediating effect influencing the relationship.

Management accounting information can support marketing to improve performance (see Opute & Madichie, 2017). It has been revealed that the positive impact of market orientation on performance is indirect through the use of strategic management accounting, which is the information used for customer analysis and competitor assessment (see Cadez & Guilding, 2008; Turner, Way, Hodari, &

Witteman, 2017). A sophisticated design like broad-scope MAS influences the characteristics of informational provision used for analysing customers and evaluating competitors (Cheng, 2012, p. 185). However, there is no study addressing the problem whether or not this design influences the relationship between market orientation and performance. It limits the advancement of the knowledge of the MAS design on the relationship. Furthermore, small businesses can only support simple MAS (see Lavia López & Hiebl, 2015, p. 103). Hence, the no attention has been paid to the positive effects of sophisticated MAS in small businesses. The understanding of a sophisticated design of MAS as broad scope MAS in these businesses seems to be underexplored.

Addressing these gaps, the main goal of this study is to draw upon the contingency theory to propose the research framework to assess the Cartesian contingency fits between market orientation and broad-scope MAS on small businesses' performance. To assess this framework, according to Gerdin and Greve (2004, p. 310), the mediating effects of broad-scope MAS on the relationship between market orientation and performance should be examined. Four following hypotheses are required to establish the mediating effects of broad-scope MAS on this relationship (see Zhao, Lynch Jr, & Chen, 2010). The following hypotheses are assumed to be tested:

H1: Market orientation is positively correlated with small businesses' performance.

H2: Market orientation is positively correlated with broad-scope MAS.

H3: Broad-scope MAS is positively correlated with small businesses' performance.

H4: There is an impact of the mediating effect of broad-scope MAS on the link between market orientation and small businesses' performance.

Data conveniently collected from small businesses located in Cantho city in Vietnam were used to test the proposed model. The results show that broad-scope MAS fully mediates the link between market orientation and small businesses' performance. With respect to these findings, this study provides three contributions to the literature.

First of all, recently, this research interface has gained a lot of attention (Kraus, Håkansson, & Lind, 2015). However, much focus has been given to customer accounting in this research (see Matsuoka, 2020). Surprisingly, no attention has been paid to the role of the MAS design, although this design influences the supply of information used not only for customer and competitor accounting but also for the assessment of future-oriented opportunities (Cheng, 2012, p. 185). Therefore, there is limited knowledge on the role of the MAS design in the research interface between these two pieces of literature. This study indicates the mediating role of broad-scope MAS on the relationship between market orientation and performance. In this regard, this study advances our current knowledge on the MAS design and its support for market orientation in performance enhancement.

Second, there is a growing body of management accounting studies which have shifted their focus to small and medium-sized businesses recently. Results of these studies suggest that management accounting plays a crucial role in these businesses (see Azudin & Mansor, 2018; Shields & Shelleman, 2016). A common argument in this research is that small businesses only support simple MAS (see Lavia López & Hiebl, 2015). As a result, no attention is paid to the role of sophisticated MAS in these businesses. A question whether or not a sophisticated MAS also fosters positive effects on performance in the context of small businesses, remains unanswered. This study fills the gap by showing that broad-scope MAS, a sophisticated design of MAS improves small businesses' performance. In this regard, this study sheds light on the sophisticated MAS design on the performance implication of small businesses. Besides, by collecting data from an emerging country like Vietnam, this study also contributes to the growing accounting body of MAS in emerging countries (see Ghasemi, Azmi Mohamad, Karami, Hafiz Bajuri, & Asgharizade, 2016; Ghasemi, Habibi, Ghasemlo, & Karami, 2019).

Third, a recent review by Otley (2016, p. 51) on contingency-based research in management accounting in which prior studies focus on national culture, and little attention is paid to organisational culture. The empirical knowledge on the impact of organisational culture on the MAS design seems to be limited. Furthermore, Otley (2016, p. 52) also emphasises the determination of the framework to assess the fits. Failing to specify the analytical approach as well as the appropriate statistical methodology used to assess the fit between contingency factors and the MAS design leads to conflicting results

(Gerdin & Greve, 2004). Although this issue was addressed, recent studies (see Ghasemi *et al.*, 2016; Ghasemi *et al.*, 2019) still deal with this issue. It hampers the generalisation of the contingency theory in management accounting studies. This study borrows the marketing concept (e.g., market orientation), which refers to an organisational cultural variable (Narver & Slater, 1990) and follows the analytical approach suggested by Gerdin and Greve (2004) to establish that the Cartesian form of the fit between the culture factor and the MAS design allows high performance. In this regard, this study advances our knowledge on the impact of culture on the MAS design, and overcomes prior limitation relating to the establishment of the research framework to assess the form of fits. Lastly,by assessing the mediating approach, this study provides more empirical evidence on this approach in management accounting studies, which are dominated by the interacting approach (see Cadez & Guilding, 2008, p. 840; Kennedy & Widener, 2008, p. 304; Otley, 2016, p. 52).

The outline of this article is as follows. The next section is the provision of the literature review and developments of the hypothesis. After that, the methodology is introduced. In the next section, results and discussion are described. The last section concludes and indicates limitations as well as suggestions for future studies.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Contingency Theory

The contingency theory in management accounting research proposes that MAS only induces performance if it is designed to fit with contingency factors (Otley, 1980; 2016). In this regard, the fit between market orientation and the MAS design is necessary for performance implication. According to Gerdin and Greve (2004, p. 310), one of the fits is the Cartesian contingency, which reflects the mediating effects of the MAS design on the link between market orientation and performance. Thus, the proposed research framework is illustrated in Figure 1.

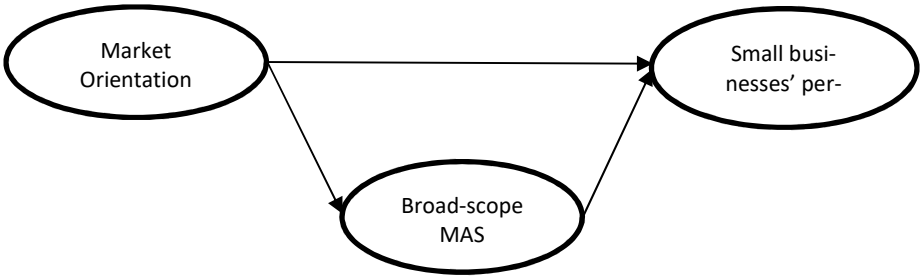


Figure 1. Proposed Research Framework
Source: own elaboration.

Market Orientation

The definition of market orientation can be traced back to the eighties, when two approaches attempted to conceptualise this variable. The first approach focuses on behavioural aspects of an organisation, which Kohli and Jaworski (1990) defined as "the organisation-wide information generation and dissemination and appropriate response related to current and future customer needs and preferences." The second approach describes this variable in a cultural aspect, which Narver and Slater (1990) refer to as "the organisation culture that most effectively and efficiently creates the necessary behaviours for the creation of superior value for buyers and, thus, continuous superior performance for the business." Although the latter approach considers this variable a culture factor, they also emphasise that this culture leads to three organisational behaviours: the acquirement of information about the customers and competitors in the market and dissemination of this information throughout the business.

The Links between Market Orientation and Performance

The resource-based theory suggests that the organisational resource promises a high degree of organisational performance (Penrose, 2009). According to this theory (Barney, 1991), gaining a competitive

advantage requires such resources to be rare and valuable. Besides, if organisations sustain such advantages, the resources must be difficult for other organisations to imitate.

Organisations benefit from market orientation because this provides a great knowledge of customers and competitors in the market (Ozkaya, Droge, Hult, Calantone, & Ozkaya, 2015). As a result, managers can select the most productive organisational resources to match the current market conditions (Slater & Narver, 1994). Drawing from the resource-based theory, market orientation is the resource which allows organisations to gain insight into the market conditions, and as such, induces performance (Morgan, Vorhies, & Mason, 2009). Consistent with this proposal, the results of previous studies reveal a positive relationship between market orientation and performance (Migliori *et al.*, 2019; Vega-Vázquez *et al.*, 2016). Similarly, this article expects that market orientation is positively associated with small businesses' performance.

H1: Market orientation is positively correlated with small businesses' performance.

Management Accounting Systems (MAS)

MAS is under the umbrella of management information systems. The role of MAS is to provide information for decision-making. Management accounting literature defines it as the systematic use of management accounting practices, which is designed to enhance the effectiveness of the decision-making process and, as a consequence, allows the achievement of organisational goals (Chenhall, 2003).

According to the framework of Chenhall and Morris (1986), MAS can be designed in between a narrow scope and a broad scope. On the one hand, the narrow-scope MAS provides information relating to financial, historical, and internal-oriented data (Tillema, 2005). On the other hand, the broad-scope MAS provides information covering external, non-financial, and future-oriented data (Soobaroyen & Poorundersing, 2008). The broad-scope MAS is a sophisticated design of MAS (Tillema, 2005).

The Links between Market Orientation and the Broad-Scope MAS

Market orientation can be considered a cultural factor that drives organisations to continuously emphasise customers and competitors (Zhao & Cavusgil, 2006, p. 406). The emphasis on customers allows an in-depth understanding of the customers' needs (Nwokah, 2009, p. 21). Besides, the emphasis on competitors provides an insight into short-term strengths and weaknesses as well as the long-term capabilities and strategies of the competitors (Nwokah, 2009, p. 21). As a consequence, managers can continuously examine the competitors' threat to develop a contingency plan. In this regard, market orientation refers to intangible resources, which allows high performance (Jogaratnam, 2017, p. 104). According to management accounting theorists, the organisational resource can only be transformed into superior performance when MAS is used because this system provides information for planning and control (McAdam & Reid, 2001; Mitchell & Reid, 2000). The broad scope MAS provides information related to the customers, competitors and future orientation (Cheng, 2012, p. 185). Hence, when small businesses follow a market-orientated approach, information relating to customers and competitors is acquired to dissimilate throughout the businesses to gain insight into customers' demand and competitors' behaviours as well as to effectively predict future opportunities. Small businesses require information from the broad-scope MAS to analyse these needs and behaviours to transform this approach into competitive advantages. In this regard, a positive association between these two variables is expected. This argument leads to the second hypothesis, as followed.

H2: Market orientation is positively correlated with broad-scope MAS.

The Links between the Broad-Scope MAS and Performance

The use of the broad-scope MAS can enhance small businesses' performance. Particularly, because of the need of scanning and monitoring the thread of potential as well as current competitors, powers of suppliers, and demands of customers to gain competitive advantage, information is crucial for businesses to survive in a competitive market (Porter & Millar, 1985). To stay competitive, MAS information is argued to be used for scanning and monitoring competitors' actions, and gaining insights into customers' needs, as well as reducing the bargaining power of suppliers (Mia & Clarke, 1999, p.

142). The broad-scope MAS is required because it provides information relating to the external environment, future orientation, and non-financial data (Chenhall & Morris, 1986). Information relating to the competitors allows an insight into competitors' strengths and weaknesses, which allows the development of the contingency plan against competitors' actions. Information associated with customers' needs allows small businesses to deliver the products/services which meet customers' demands. Lastly, small businesses can use the broad-scope MAS to quickly find alternative suppliers, which reduces the bargaining power of suppliers. Hence, the more broad-scope MAS is used, the more competitive advantage is induced. A high competitive advantage leads to high performance (Anwar, 2018). Considering this argument, the third hypothesis is as follows.

H3: Broad-scope MAS is positively correlated with small businesses' performance.

The Mediating Role of the Broad-Scope MAS

The mediator assessment has recently gained much interest from researchers (see Karyaningsih, Wibowo, Saptono, & Narmaditya, 2020; Li, Murad, Ashraf, Syed, & Riaz, 2020; Stelmaszczyk, 2020). It allows an insight into the direct effects of mediators. In strategic management studies, the relationship between various strategic orientations and small businesses' performance was revealed to be influenced by mediators (see Khan, Royhan, Rahman, Rahman, & Mostafa, 2020; Sa, Choon-Yin, Chai, & Joo, 2020). Similarly, the broad-scope MAS is expected to mediate the link between market orientation and small businesses' performance. Thus, this article proposes the last hypothesis as follows.

H4: There is an impact of the mediating effect of the broad-scope MAS on the link between market orientation and small businesses' performance.

RESEARCH METHODOLOGY

Sampling and Data Collection

Convenience sampling is appropriate because the main goal is to assess the relevance of the theoretical prediction (contingency theory) rather than generalise the findings to a larger population (see Speklé & Widener, 2018, pp. 4-5). This is in line with the majority of studies in management accounting fields which focus on theory testing (Van der Stede, Young, & Chen, 2005).

Small businesses located in Cantho city was included in the data of this study. Cantho is one of the four biggest cities in Vietnam. This city is located in the heart of the Mekong Delta. The collection process is as follows. Contact was made with the association of business in Cantho city. This association is a voluntary, non-profit, and multi-sectoral organisation which assists the development of small businesses located in this city. Due to privacy reasons, the association agreed to help only by sending e-mails to the owners of small businesses in the city. This e-mail includes a summary of the purpose of the study and the link to access the online survey.

This study also takes into account three crucial criteria. First, the number of employees working in small businesses is between 10 and 100 employees. Second, only businesses operating for more than three years are included to ensure the establishment of MAS. Third, this study only includes owners of small businesses because these owners are more likely to indicate their point of view regarding the variables included in this study. After eight weeks, the online survey shows 171 respondents successfully filling the survey. Among these, 12 observations were removed due to the missing values (e.g., the majority of empty values) and wrong target respondents (e.g., respondents are not the owners). In total, 159 observations are used for the analysis.

Measures

Three latent variables in the research model were measured by the latent constructs. To do this, in the survey the respondents were asked to indicate their opinion relating to the items' statements to measure each latent construct (Table 1). All these constructs were adapted from prior studies. A 5-point Likert scale ranging from (1) "highly disagree" to (5) "highly agree" was used to measure the items in

the first two constructs, while a 5-point Likert scale ranging from (1) "well-below the average" to (5) "well-above the average" was used to measure the items in the last construct.

Market orientation (MAR)

It was measured by using an instrument from Cravens and Guilding (1999). It was previously used in management accounting studies (Cadez & Guilding, 2008; 2012), and as such, it poses high reliability.

Broad-scope MAS (MAS)

It was measured by using the instrument of Chenhall and Morris (1986). It has been intensively used in many different contexts (Ghasemi *et al.*, 2016; Hammad, Jusoh, & Ghozali, 2013; Soobaroyen & Poorundersing, 2008).

Performance (PER)

It was adopted from Cadez and Guilding (2008), with some minor modifications, it was used to assess small businesses' performance.

Assessment of Common Method Bias

Collecting data in the same survey may be subject to common method bias. Hence, this study uses two steps to examine whether or not this type of bias affects the results. First, Harman's single-factor test was examined (Podsakoff & Organ, 1986). Second, a reliance on the marker variable technique allows this study to assess common method bias (Lindell & Whitney, 2001). The results suggest that the data can be analysed further without the concern of common method bias.

Analytical Procedure

This study uses the partial least square structural equation modelling (PLS-SEM) to assess the research model. PLS-SEM is a structural equation modelling method, which allows the estimation of the complex casual-effect relationship between latent variables (Hair, Ringle, & Sarstedt, 2011). The aim of PLS-SEM is to maximise the explained variance of the dependent latent variables (Hair *et al.*, 2011). In management accounting research, it is a sufficient method used to assess the research models (Nitzl, 2016). This method has received many compliments from these researchers because of the two following reasons (Hair, Sarstedt, Ringle, & Gudergan, 2018). It is capable of handling a small sample size and non-normality data. It is also adequate to test theories.

The evaluation of the PLS-SEM model follows a two-step analytical procedure, which consists of the assessment of the measurement and structural models (Sarstedt & Cheah, 2019). The first assessment includes the examination of the unidimensionality of constructs, convergent, discriminant validity, and internal consistency of the items of these constructs, as well as multicollinearity among these items. The second assessment is the evaluation of multicollinearity between latent variables, the predictive validity of the parameter estimates, and predictive power before assessing the significant relationship between latent variables. Last but not least, the use of PLS-SEM is also appropriate for the mediating assessment (see Sarstedt, Hair Jr, Nitzl, Ringle, & Howard, 2020). The assessment of mediating effects follows the procedure of Zhao *et al.* (2010).

Data consisting of 159 observation were examined by using SPSS 20.0 and SmartPLS 3.2.9. SPSS was only used for the assessment of unidimensionality of the constructs first. And then, SmartPLS was used for the rest of the analysis.

RESULTS AND DISCUSSIONS

Measurement Models

The unidimensionality was assessed by conducting the test of principal axis factoring with direct Oblimin rotations (see Fabrigar, Wegener, MacCallum, & Strahan, 1999). The results indicate that three factors are corresponding to the intended measuring items except for PER_3 (Table 1). This item was removed, and the above test was re-run. The results indicate that these are three factors corresponding to the items.

Table 1. Result of Principal Axis Factoring

Constructs	Items	Statements	Principal Axis Factoring	
			1st run	2nd run
MAR	MAR_1	My business has a strong understanding of our customers.	0.759	0.770
	MAR_2	The functions in my business work closely together to create superior value for our customers.	0.599	0.599
	MAR_3	Management in my business thinks in terms of serving the needs and wants of well- defined markets chosen for their long-term growth and profit potential for the company.	0.750	0.766
	MAR_4	My business has a strong market orientation.	0.542	0.558
MAS	MAS_1	Information that relates to possible future events.	0.808	0.807
	MAS_2	Quantification of the likelihood of future events occurring.	0.660	0.659
	MAS_3	Non-economic information.	0.561	0.559
	MAS_4	Information on broad factors external to your business.	0.717	0.716
	MAS_5	Non-financial information that relates to the efficiency, output rates, employee absenteeism, etc.	0.794	0.793
PER	PER_1	Return on investment	0.637	0.665
	PER_2	Margin on sales	0.652	0.654
	PER_3	Capacity utilisation	0.433	removed
	PER_4	Customer satisfaction	0.724	0.715
	PER_5	Product/service quality	0.755	0.782
	PER_6	Introductions of new products/services	0.636	0.645
	PER_7	Market share	0.727	0.714

Source: Author's own calculation, based on SPSS 20.0.

The convergent validity is established due to the average variance extracted (AVE) of the constructs higher than the 0.5 threshold (Table 3) (Hair *et al.*, 2011, p. 145). The discriminant validity is also established because the heterotrait-monotrait (HTMT) ratios between the variables are all lower than the threshold values of 0.85 (Table 3) (Henseler, Ringle, & Sarstedt, 2015).

Table 2. Cross-loadings of Items

Variable	MAR	MAS	PERF	VIF
MAR_1	**0.763**	0.311	0.164	1.642
MAR_2	**0.803**	0.434	0.194	1.526
MAR_3	**0.796**	0.363	0.193	1.698
MAR_4	**0.743**	0.377	0.139	1.417
MAS_1	0.329	**0.770**	0.189	1.868
MAS_2	0.470	**0.839**	0.367	1.992
MAS_3	0.315	**0.709**	0.301	1.486
MAS_4	0.382	**0.784**	0.255	1.808
MAS_5	0.391	**0.853**	0.344	2.250
PER_1	0.200	0.355	**0.792**	1.869
PER_2	0.112	0.194	**0.677**	1.524
PER_4	0.140	0.231	**0.734**	1.865
PER_5	0.189	0.302	**0.817**	2.068
PER_6	0.194	0.325	**0.770**	1.690
PER_7	0.149	0.251	**0.737**	1.851

Source: Author's own calculation, based on SmartPLS 3.2.9.

Table 3 indicates the establishment of internal consistency because the reliability scores and Cronbach's Alpha are higher than 0.70 threshold value (Hair *et al.*, 2011, p. 145). The VIFs of each item

is less than the threshold value of 3 (Table 2), which in turn indicates an absence of multicollinearity among measuring items (Hair *et al.*, 2011, p. 145).

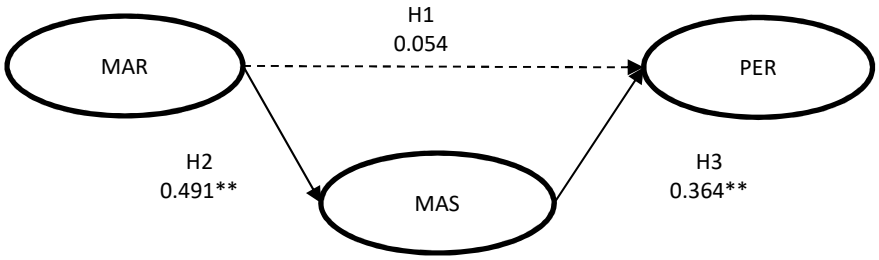
Table 3. Cronbach's Alpha, Composite Reliability, AVE,R2, Q^2 and Discriminant validity

Variable	Cronbach's Alpha	Composite Reliability	AVE	R^2	Q^2	HTMT ratios		
						MAR	MAS	PERF
MAR	0.782	0.859	0.603	–	–	–	–	–
MAS	0.852	0.894	0.628	0.234	0.134	0.577	–	–
PERF	0.851	0.888	0.571	0.145	0.072	0.264	0.419	–

Source: Author's own calculation, based on SmartPLS 3.2.9.

Structural Model

The structural model was examined by using a bootstrapping procedure with 5 000 replacements (Hair *et al.*, 2011, p. 145). The results show that VIFs of these constructs are less than the threshold value of 5 (Hair *et al.*, 2011, p. 145), and Q^2 values are more than zero (Hair *et al.*, 2011, p. 145), as well as the degree of R^2 values are sufficient. Thus, it is safe to interpret the significant degree of hypothesis paths.



** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Figure 2. Result of Research Framework
Source: Author's own calculation, based on SmartPLS 3.2.9.

The results reveal that market orientation has a positive relationship with the broad-scope MAS (β=0.491, p<0.001). A broad-scope MAS is also positively related to performance (β=0.364, p<0.001). However, the results show that the link between market orientation and small businesses' performance is insignificant (β=0.054, p=0.501). Thus, the hypotheses H2 and H3 are supported.

Assessing Mediating Effects

The results show that the indirect effect (MAR -> MAS -> PER) is significant (a*b=0.170, p<0.001), and its confident interval is from a lower bound of 0.083 to an upper bound of 0.259, indicating the exclusion of zero. Hence, it confirms the mediating effects of the broad-scope MAS on the link between market orientation and this performance. Moreover, the results reveal that the insignificant direct effects between market orientation and the performance (c=0.054, p=0.501) when controlled by the mediator. Hence, it supports that the broad-scope MAS fully mediates the relationship between market orientation and small businesses' performance. In summary, hypothesis H4 is supported.

Discussion

First of all, this study indicates a positive relationship between market orientation and the broad-scope MAS. It implies that when small businesses follow a market-oriented approach, they are more likely to use the broad-scope MAS. Small businesses have a high degree of flexibility, which allows them to have a strong relationship with customers (Nooteboom, 1994, p. 339). When small businesses develop a strong relationship with customers, these businesses follow a market-oriented approach (Narver & Slater, 1990, p. 21). This approach is considered as the crucial resource, which allows higher perfor-

mance (Morgan *et al.*, 2009). Management accounting theorists argue that MAS is required to effectively transform organisational resources into high performance because the main function of this system is to provide adequate information for planning and control (McAdam & Reid, 2001; Mitchell & Reid, 2000). Hence, the broad-scope MAS, which provides information relating to customers' preferences, competitors' costing and pricing strategies and future opportunities (Cheng, 2012), is required to be effectively used in order to gain more insight into customers' demands and competitors' actions when small businesses follow market-oriented approaches. This leads to a positive association between market orientation and the broad-scope MAS. Similar to this finding, Cadez and Guilding (2008) and Turner *et al.* (2017) found a positive correlation between market orientation and the use of strategic management accounting in large businesses.

Second, the results reveal a positive association between the broad-scope MAS and small businesses' performance. It implies that the broad-scope MAS is relevant for small businesses to improve their performance. In management accounting literature, the theorists strongly propose that management accounting information supports businesses' functions by providing relevant information for management and control (Burns & Scapens, 2000). Relevant information allows higher performance (Choe, 2004; Leach-López, Stammerjohan, & Lee, 2009). Thus, prior empirical studies strongly support the positive association between the broad-scope MAS and performance at the individual level (Ghasemi *et al.*, 2016; Ghasemi *et al.*, 2019) and at business unit levels (Chong & Chong, 1997).

Although the relationship between the broad-scope MAS and performance is strongly supported by previous empirical evidence, the findings are relevant in the contexts of large businesses (see Ghasemi *et al.*, 2016; Ghasemi *et al.*, 2019; Hammad *et al.*, 2013; Soobaroyen & Poorundersing, 2008). A concern is that due to the differences in nature, MAS in small businesses is simpler than one in a large business (see Lavia López & Hiebl, 2015). It questions the relevance of the broad-scope MAS in the context of small businesses because it refers to a sophisticated design of MAS (Tillema, 2005). The results seem to clear such a concern because it is shown that the positive effects between the broad-scope MAS and small businesses' performance. With this regards, it is consistent with the argument, which is that small businesses also require more sophisticated MAS to improve their performance (see Nandan, 2010, p. 65).

Third, the results reveal that there is an insignificant relationship between market orientation and small businesses' performance. It is also indicated that the broad-scope MAS mediates this relationship. This finding can be interpreted that market orientation cannot directly influence small businesses' performance. Instead, market orientation has an effect on the performance indirectly through the broad-scope MAS. It is implied that when small businesses follow a market-orientated approach, they use broad-scope MAS information more to find performance implication. One proper explanation is that the market-oriented approach allows a high focus on customers to adapt to the customers' tastes and, in turn, provides products/services to meet their needs (Nwokah, 2009, p. 21). It also allows a high focus on the competitor to gain insight into competitors' behaviours (Nwokah, 2009, p. 21). the broad-scope MAS provides information relating to customers and competitors as well as future-orientated events (Cheng, 2012). Thus, this system can support small businesses to the extent to which it provides relevant information to gain insight into customers' demand as well as competitors' behaviours when small businesses select a market-orientated approach. It allows these businesses to provide their products/services to meet customers' needs and develop contingency plans against competitors' actions, which in turns leads to higher performance by gaining competitive advantages.

These results are similar to the results of recent management accounting studies, which indicate that the mediating effects of the broad-scope MAS on the link between contingency factors and managerial performance (see Ghasemi *et al.*, 2016; Ghasemi *et al.*, 2019). They are also consistent with recent marketing studies, which reveal that the positive effects of market orientation on performance are indirect, through mediators, rather than direct (see Alnawas & Hemsley-Brown, 2019; Kiessling *et al.*, 2016).

This study provides some managerial implications for the owners of small businesses located in Cantho city in Vietnam. More specifically, when small businesses follow the market-oriented approach, they put an emphasis on customers and competitors. High emphasis on customers allows small businesses to gain insight into customers' demand, while high emphasis on competitors allows the devel-

opment of contingency plans against competitors' actions. The results imply that these emphases cannot be transformed into higher performance if the MAS design is not taken into consideration. It requires from the owner to design the broad-scope MAS, which provides information relating to the market such as customers' taste, competitors' behaviours and future-oriented data. This information supports small businesses following a market-oriented approach by allowing the owners to analyse customers' demands, competitors' actions as well as to predict market trends. In this regard, the owners can gain insight into the market situation as well as acknowledge market trends and thus make managerial decisions effectively, which in turn allows their businesses to find performance implication.

CONCLUSIONS

The aim of this study is to assess the mediating effects of the broad-scope MAS on the link between market orientation and the performance of small businesses located in Vietnam. Data collected from 159 small businesses was used to test the research model. The results show that the broad-scope MAS fully mediates the link between market orientation and small businesses' performance.

The interpretation of this study results should take into account some limitations. First, the results are subject to generalised issues due to the collection of data from small businesses located in Cantho city. Second, the results also subject to a limitation due to low response rates.

This study provides a path for future studies. First, one possible extension of this study is to use probability sampling to replicate this study. In this regard, it allows the generalisations of the study results to a large population. Second, strategic variables can be included in the research model when using contingency theory to predict the relationship between market orientation, the use of strategic management accounting and performance because each strategic type requires a specific design of MAS (Chong & Chong, 1997) and is suggested to have a link with market orientation (Lee, Kim, Seo, & Hight, 2015). Therefore, the future study can extend this study by including strategic variables into the research framework. Lastly, one aspect of the MAS design, like the broad-scope MAS, was included in this study. According to Chenhall and Morris (1986), there are three other aspects of the MAS design. Thus, the future study should include all four aspects of the MAS design into the research model to gain more insight into the impact of the MAS design on the link between market orientation and performance.

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Acknowledgements and Financial Disclosure

The author would like to thank the anonymous referees for their useful comments which allowed to increase the value of this article. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of Interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Entrepreneurial Business and Economics Review

2021, Vol. 9, No. 3

10.15678/EBER.2021.090305

Innovation capital, sustainable entrepreneurial orientation, and the moderating role of entrepreneurial resilience

Wael Hatem Nasser

ABSTRACT

Objective: The objective of the article is to know the nature of the relationship between creative capital as a positive personal touch capable of promoting sustainable entrepreneurial orientation (SEO). To increase the effectiveness of this orientation, I identified entrepreneurial resilience as an interactive variable.

Research Design & Methods: The SPSS macro process program was used to test the study hypotheses by adopting questionnaire forms. These forms were utilised as a tool to collect data from a group of managers of the Southern Oil Company in Iraq. The study distributed 345 forms and received 308 valid forms for analysis.

Findings: By testing a set of main and sub-hypotheses, the results showed the role of innovation capital in promoting sustainable entrepreneurial direction. This influence relationship increases with the presence of entrepreneurial resilience as an interactive variable.

Implications & Recommendations: The results show the importance of personality traits in creating a sustainable entrepreneurial orientation. Nevertheless, it is important to focus on personal traits such as openness and acceptance by others, which enhance social relationships, because these relationships are significant in attracting or marketing ideas related to the environment.

Contribution & Value Added: With the decline in the growth rates of countries and companies, especially with the Covid-19, it is expected that the rate of consumption of natural resources will increase. This increase helps to compensate for the losses and the decrease in profits. Thus, this study is important because it emphasizes the significance of production while maintaining principles of sustainability and requirements of preserving natural resources.

Article type: research article

Keywords: innovation capital; entrepreneurial resilience; sustainable entrepreneurial orientation

JEL codes: M21, O12, O1

Received: 27 November 2020 Revised: 15 February 2021 Accepted: 21 February 2021

Suggested citation:

Nasser, W.H. (2021). Innovation capital, sustainable entrepreneurial orientation, and the moderating role of entrepreneurial resilience. *Entrepreneurial Business and Economics Review,* 9(3), 73-85. https://doi.org/10.15678/EBER.2021.090305

INTRODUCTION

The global economic crisis of 2008 had a major impact on the financial and environmental system in which we live today. The economic and financial damage inflicted on many countries and organizations affected decision-makers' tendency to fulfill their obligations towards the environment. There was an attempt to compensate for these losses and achieve profits faster by increasing industrialization, which means higher consumption of natural resources that negatively affects environmental sustainability and community cohesion (Kraus, Burtscher, Vallaster, & Angerer, 2018). Now, the Covid-19 crisis is expected to have negative economic consequences on the growth rates of countries and companies. Besides the economic conflict occurring between the two largest economies in the world, China and the United States of America, caused negative consequences on the discourse and performance directed to promoting the concept and principles of sustainability because of pursuing rapid economic gains to offset losses and exploit opportunities instead of competitors (Pushpakumara, Atan, Khatibi,

Azam, & Tham, 2018). On this basis, this study seeks to prevent current and emerging companies from ignoring principles of sustainability – especially now – and to strengthen the discourse of commitment to principles of environmental sustainability. Moreover, the article aims to improve the strategic position of companies by integrating environmental and social goals and preventing ideas that promote costly environmental sustainability projects and reduced profits and expected productivity.

The achievement of financial returns and development of a productive process is not related to investors only. However, entrepreneurs have a major role in the process of development and success. Therefore, studying the value of environmental sustainability for entrepreneurs attracts more attention of researchers, especially with the increasing social awareness about the negative impact of such concepts as globalization, global warming, or soil and water pollution. Furthermore, the increase in the trend towards seizing any opportunity contributes to rapid and profitable production (Criado-Gomis, Cervera-Taulet, & Iniesta-Bonillo, 2018). Therefore, studying the concept of sustainable entrepreneurship has a strategic dimension in how to sustain investment in resources and activities (Habib, Bao, & Ilmudeen, 2020). However, there is still a knowledge gap in understanding how entrepreneurial organizations can develop opportunities that achieve sustainable development so they can be exploited to create new value for the society, the environment, and stakeholders. Calling researchers to study the entrepreneurial trend from an environmental perspective reflects the importance of this topic in achieving interconnection between material and immaterial values of stakeholders of organizations and societies (Pushpakumara *et al.*, 2018). For developing countries that undergo an economic transformation such as Iraq, the entrepreneurial orientation of sustainability can play a big role in shaping economic development in this direction. Therefore, we need more empirical research to confirm the importance of the sustainable entrepreneurial trend in establishing economic, social, and environmental values (Hernández-Perlines & Ibarra Cisneros, 2018).

Environmental complexity and constant change force entrepreneurs to provide innovative solutions capable of dealing with the challenges and requirements of sustainability. Therefore, we should study the causal relationship that enhances the ability of entrepreneurs as key innovators. Wu, Wang, Lee, Lin, and Guo (2019) and Habib *et al*. (2020) analyse the effect of personality traits on sustainable entrepreneurial orientation which represents part of the truth. A more comprehensive framework is required, which is what this study seeks to achieve by studying the effect of personal traits and social relationships in promoting sustainable entrepreneurial ideas. Keeping in mind the importance of this causal relationship, we should realize that adherence to environmental values means facing many obstacles and challenges, so it is vital to have the flexibility to adapt to these challenges (Hayward, Forster, Sarasvathy, & Fredrickson, 2010).

LITERATURE REVIEW

The revolution in awareness and thinking we now experience has a great impact on society and organizations today. Part of this awareness within the administrative context of decision-makers focuses on how to direct activities and events to achieve both profit and non-profit gains. The concept of sustainable entrepreneurial orientation is part of this awareness. Over two decades ago, Wiklund (1999) was the first to use the term sustainable entrepreneurship. However, Wiklund's interpretation of the concept concentrates on sustaining entrepreneurial performance in a way that enhances productivity and profitability, neglecting environmental or social impacts. With the passage of time, the notion of sustainable entrepreneurship was employed to reflect the development of awareness and way of thinking among stakeholders about how to achieve profitability gains and environmental sustainability together. Thus, scholars notice the importance of the role of entrepreneurship in solving environmental and social problems promoting sustainability principles of resources and profits (Kraus *et al.*, 2018; Thelken & de Jong, 2020; Onwe, Ogbo, & Ameh, 2020). With this large area of interest in the topic of sustainable entrepreneurial, researchers try to explain the concept of sustainable entrepreneurship in different terms, such as Green Entrepreneurial Orientation (Jiang, Chai, Shao, & Feng, 2018; Guo, Wang, & Chen, 2020), Ecopreneurship (Schaltegger, 2002), or Sustainopreneurship (Abrahamsson, 2007; Aghelie, Sorooshian, & Azizan, 2016). These discrepancies reveal the absence of an agreed theoretical framework in interpreting

the notion of sustainable entrepreneurship because each study was based on an interpretation of a specific theory according to study variables, sectors, and cultures in which the study was organized. This represents a knowledge gap that calls for deeper research to build a theoretical framework that could receive common recognition (Tilley & Young, 2009; Kraus *et al.*, 2018) based on stakeholder theory in approximating viewpoint as a strategic concept for entrepreneurship. Sustainable entrepreneurship seeks to achieve social and environmental gains. Solaja (2017), Pushpakumara *et al.* (2018), and Teles and Schachtebeck (2019) use ecological modernization theory to explain entrepreneurial sustainability within the structural dimension to create a trend that integrates environmental and economic activity within an integrated framework. They also manipulate other theories – such as game theory – to show how entrepreneurs influence the game of competition through the sustainability of environmental orientation (Pineiro-Chousa, Vizcaíno-González, & López-Cabarcos, 2016).

Most studies try to frame the concept of sustainable entrepreneurship orientation (SEO) on three main axes: environmental, social, and economic (Hernández-Perlines & Ibarra Cisneros, 2018). The concept of SEO was interpreted through the combination of environmental sustainability and entrepreneurial orientation of decision-makers. This combination was conducted in an innovative manner capable of achieving material and environmental gains while simultaneously enhancing the concept of social cohesion for stakeholders inside and outside organizations. This confirms that SEO is based on the commitment of individuals, organizations, and societies towards creating a qualitative shift in the importance of non-material gains alongside profitability and competition (Alfalih & Ragmoun, 2020; Guo *et al.*, 2020).

Creative capital is not analysed as an individual characteristic that explains a person's endeavour to gain support for ideas or successfully promote what they want. However, to the study of creative capital as a process can be developed over time to achieve success in creativity (Mention, 2012; Tanideh, 2013). This process is related to the development of a set of skills for the leadership and management of co-workers by introducing new and more creative ideas that answer the question: "Who are you? A creative person." However, creativity does not suffice unless the ideas are presented to others, who can then benefit from the ideas and experiences to enhance the creative process. This is the essence of human capital linked to success based on innovation (Gökhan & İlhan, 2017). In order to achieve the sustainability of creative orientation, we must have social capital to promote and enhance current and future ideas. The Social Capital Axis tries to answer the major question: "Who do you know?" The answer to this important question is to ensure the sustainability of the major source for the future ideas with the possibility to develop current ideas through knowing what others have in terms of skills and experiences necessary for creativity. To achieve the optimal investment in the concept of creative capital, we must answer another basic question: "What you know?" It is difficult to talk about creativity unless others accept those ideas and have a clear response from others to those innovations of goods or services (Yang & Kang, 2008; Wang, 2011). The ability to promote ideas is important in earning capital as a reputation that enhances one's future investments in attracting more important ideas and building a creative attitude (Aghion & Howitt, 2007; Kaszowska-Mojsa, 2020). This reflects the importance of social capital in creating a positive impression of oneself and ideas in such a way that reflects credibility in dealing with increasing personal success goals (Wu, Chen, & Chen,2010). Furthermore, creativity capital depends on own ability to develop ideas from personal knowledge and experience. However, social relations have an important role in guiding ideas to serve personal aspirations and others. Moreover, the support that others can provide help to obtain new ideas and experiences, which are what social capital does by trying to answer the basic question: "How to receive support from others?" (Chin, Lee, Kleinman, & Chen, 2006; Chang & Hsieh, 2011).

Innovation capital and entrepreneurial orientation are essential components of successful organizational performance and renewal. This means socialization plays a role in building an organizational culture capable of dealing with entrepreneurship as a process based on seizing and investing in opportunities. This kind of social connection must be creative in order to build a successful entrepreneurial trend, with rapid changes and increasing complexity, getting opportunities and ideas based on cooperative effort besides individual effort (Głodowska, Maciejewski, & Wach, 2019; Nascimento & Salazar, 2020; Wach, Głodowska, & Maciejewski, 2018). This importance increases with

the development of life and the emergence of recent issues that affect reality. The problem of environmental sustainability is one of the most important issues in the twenty-first century that emerged with the increase of social and governmental awareness and their quest for a clean environment – free of pollution – and the sustainability of environmental resources. The entrepreneurs' success in seizing such entrepreneurial opportunities is important to have social relations with stakeholders in a way that enables them to seize sustainable entrepreneurial opportunities and to ensure a major source of ideas related to sustainability in which one may invest. This investment is the focus of creativity capital (Boudreaux & Nikolaev, 2019; Prasetyo & Kistanti, 2020), which means that this effect can improve the ability of entrepreneurs to obtain good opportunities and reduce failure rates when seeking an innovative approach by discovering and exploiting opportunities that address environmental and social issues (Manev, Gyoshev, & Manolova, 2005). Thus, I propose the following hypotheses:

H1: Innovation capital has a positive influence on sustainable entrepreneurial orientation.

H2: Intellectual property has a positive influence on sustainable entrepreneurial orientation.

H3: Intangible assets have a positive influence on sustainable entrepreneurial orientation.

Recent years have seen marked interest in the concept of entrepreneurial resilience. However, until now, there is no commonly agreed concept of entrepreneurial resilience, which reflects the need for a deeper understanding of this topic, especially with the increase in complexity and dynamism of change, which means growing interest in entrepreneurial resilience at three levels: individual, organizational, and social (Fatoki, 2018). Researchers differ in interpretations and analyses of resilience. Some argue that it is a psychological state related to a person who differs from others, and they try to explain this predicament with the theory of traits. Others enhance the understanding of entrepreneurial resilience as a process based on a set of variables present within the economic, social, and even psychological context. This disparity in interpretation results from the contexts in which the subject of flexibility and cultural differences was tested (Leskinen, 2011). This study's viewpoint is that it is difficult to separate entrepreneurial resilience as an attribute or process as the former complements the latter, and vice versa. The reason for this is that we cannot explain the ability of the entrepreneur to respond to pressures and complexities unless people are open to new ideas and capable of overcoming failures and complexity (Sun, Buys, Wang, & Stewart, 2011). Some studies focus on understanding entrepreneurial resilience in how to get out of difficult negative circumstances such as stagnation or organizational disorders. Moreover, they concentre more on psychological characteristics to explain how to control oneself and face complications, while other studies stress the importance of understanding entrepreneurial resilience as a strategic characteristic that can be relied upon in seizing opportunities, ability to innovate, and direct goals (Bullough & Renko, 2013; Evans & Wall, 2020). Entrepreneurial resilience does not only represent a response to pressures and environmental variables. Rather, it adapts according to a future vision that achieves strategic goals through perseverance and willingness to learn and respond to all risks in a calculated manner. It represents a complex structure that is affected by a set of internal or external variables and personal abilities to face failures (Corner, Singh, & Pavlovich, 2017). These factors are dynamic and develop over time. This type of flexibility explains how to respond to economic and social variables to solve current problems in a manner based on self-confidence with a future vision. The nature of entrepreneurial flexibility may require a change in strategy, meaning that this type of response that does not impose a single course of action for success. According to Hayward *et al.* (2010), this type of resilience is an evolving process linked to the concept of "thought-action repertoires," which has a positive effect by creating a rapid response to changes based on emotional, cognitive, and social resources. Furthermore, entrepreneurial pursuit aims to achieve strategic goals in which personal capabilities and social relationships are the infrastructures to face uncertainty and risk. Entrepreneurial resilience can have a strategic role in promoting long-term commitments to social and environmental issues (Leskinen, 2011; Corner *et al.*, 2017). This is by focusing on stimulating investment in social relations and personal capabilities according to the challenges that can be faced, with a positive view of complexities as opportunities that can be adapted better, especially with

environmental problems and their complexities (Wu *et al.*, 2019; Santoro, Messeni-Petruzzelli, & Del Giudice, 2020). Thus, I propose the following hypotheses:

H2: Entrepreneurial resilience acts as a moderating variable between innovation capital and SEO.

Ha2: Entrepreneurial resilience acts as a moderating variable between intellectual property and SEO.

Hb2: Entrepreneurial resilience acts as a moderating variable between intangible assets and SEO.

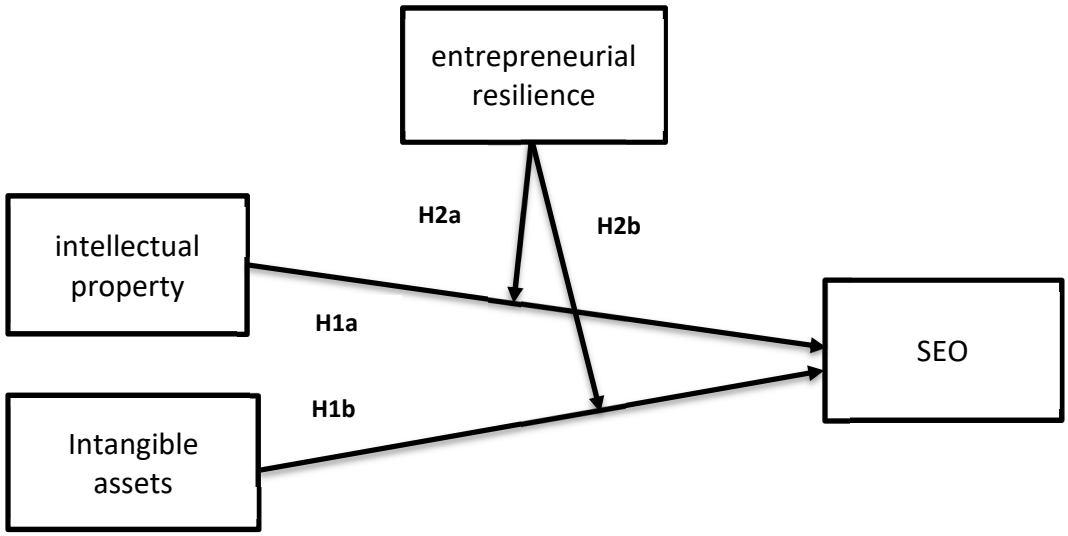

Figure 1. The hypothesized model of processes linking sustainable entrepreneurial orientation and innovation capital, moderated by entrepreneurial resilience

Source: own elaboration.

RESEARCH METHODOLOGY

Measurement

SEO. There are several metrics used to measure the sustainable entrepreneurial variable such as the Bacq and Janssen (2011) scale, the Avery and Bergsteiner (2011) scale, and finally, the Parrish and Tilley's (2010) SEO scale. The current study employed the Bacq and Janssen as it is more common and provides more comprehensive dimensions in relation to the environment and society. This scale comprises nine items and the responses are categorized into five levels.

Innovation Capital. Several measures are designed to explain the variable of creative capital, most notably the Andersson and Åstrand (2011) scale or the Furr, Dyer, and Lefrandt (2019) scale. Most of the adopted standards attempt to explain the innovation capital variable through two sub-dimensions: intellectual property and intangible assets, according to McElroy's (2002) classification for interpreting innovation capital. In this work, we used the Furr *et al.* (2019) scale, because it is the most recent and comprehensive measure of the innovation capital variable. The intellectual property sub-dimension was measured with four items and – after intangible assets – with four items as well.

Entrepreneurial Resilience. Among the most popular measures of entrepreneurial resilience is the Connor-Davidson's scale. Its main purpose is to verify the ability to deal with stress during a change process. Connor-Davidson developed this scale in 2003 to be more comprehensive in measuring individual characteristics of optimism and belief in goals. I adopted this scale in this study to measure entrepreneurial flexibility with a five-point scale comprising 10 items.

Sampling and data collection

The population of the current study was the oil extraction sector. The reason for that was that this sector causes major environmental problems due to gas emissions and soil pollution (Wach, Głodowska, Maciejewski, & Sieja, 2021). The sample of the study was the department and divisional managers

in the Southern Oil Company in Iraq, which used quantitative approach. The data were collected through a questionnaire, whose forms (350) were distributed to department managers. The number of retrieved forms was 321 at a rate of (91.7%) of the total distributed forms. Furthermore, 13 forms were not valid for analysis (14.1%) and were excluded. The final number of valid forms for analysis was 308 which made 95.9% of the original forms retrieved. Table 1 below shows information about the study sample.

Table 1. Demographic information and response rate

Category	Characteristic	Frequency	Percentage (%)
Gender	Male	222	72.1
	Female	86	27.9
Age	Below 30	61	19.8
	31-40 years	96	31.2
	41-50 years	93	30.2
	More than 50 years	58	18.8
Tenure of respondents	<5 years	48	16
	6-10 years	63	20
	11-15 years	83	27
	16-20 years	74	24
	More than 20 years	40	13
Educational level	Diploma	57	19
	Bachelor's degree	179	58
	Master's or PhD	72	23

Source: own study.

Assessment of the study measurement model

It is important to verify the reliability of each component of the scale as a first step towards testing the study hypotheses. Table 2 shows the results of the reliability tests with Cronbach's alpha and McDonald's omega. The tests were within acceptable limits (α; Omega: $p > 0.70$). Moreover, the average variance extracted (AVE) had to be greater than (0.5; Fornell & Larcker, 1981; Hair, Black, Babin, & Anderson, 2010). Table 2 shows the high reliability of the results of the analysis.

Table 2. Confirmatory factor analysis and reliability

Variable	Items	Factor Loading	McDonald's Omega	Cronbach's α	AVE
Sustainable Entrepreneurship Orientation (SEO)	SEO1	0.901***	0.943	0.801	**0.650**
	SEO2	0.791***			
	SEO3	0.821***			
	SEO4	0.838***			
	SEO5	0.784***			
	SEO6	0.766***			
	SEO7	0.807***			
	SEO8	0.759***			
	SEO9	0.781***			
Intellectual Property (IPP)	IP1	0.823***	0.871	0.863	**0.630**
	IP2	0.861***			
	IP3	0.698***			
	IP4	0.784***			
Intangible Assets (IAA)	IA1	0.892***	0.883	0.847	**0.657**
	IA2	0.867***			
	IA3	0.781***			
	IA4	0.688***			

Variable	Items	Factor Loading	McDonald's Omega	Cronbach's α	AVE
Entrepreneurial Resilience (ERR)	ER1	0.752***	0.944	0.869	**0.633**
	ER2	0.803***			
	ER3	0.834***			
	ER4	0.672***			
	ER5	0.879***			
	ER6	0.854***			
	ER7	0.733***			
	ER8	0.874***			
	ER9	0.658***			
	ER10	0.859***			

Note: n= 308 *** = $p \leq 0.001$; ** = $p \leq 0.01$; * = $p \leq 0.05$. Abbreviations: AVE – average variance extracted; SEO – Sustainable Entrepreneurship Orientation; IPP – intellectual property; IAA – intangible assets; ERR – entrepreneurial resilience.
Source: own study.

The discriminant validity test was performed as shown in Table 3. This test revealed that there was a discriminant validity between the combinations of the hypothesis model and the sub-dimensions. This showed the reliability of the entire study scale to test the hypotheses. Moreover, the correlation matrix shows the existence of a positive and significant correlation ($p < 0.01$) between the study variables (entrepreneurial resilience, SEO and innovation capital).

Table 3. Correlations matrix and discriminant validity

Variable	Minimum	Maximum	Mean	Std. Deviation	1	2	3	4	5
IPP	1.00	5.00	2.302	1.174	**0.793**				
IAA	1.00	5.00	1.948	1.207	0.156**	**0.810**			
SEO	1.00	5.00	2.227	1.002	0.199**	0.603**	**0.806**		
ERR	1.00	5.00	2.575	1.112	0.009	0.510**	0.505**	**0.795**	
ICC	1.00	4.88	2.332	0.858	0.504**	0.531**	0.452**	0.288**	**0.801**

Note: n = 308; *** = $p \leq 0.01$. Abbreviations: ERR – entrepreneurial resilience; SEO – sustainable entrepreneurship orientation; ICC – innovation capital; IAA – intangible assets; IPP – intellectual property; **in bold** – square root of AVE value.
Source: own study.

Overall Fit of the Model

To verify the quality of conformity to the scale, exploratory factor analysis was performed through three main models. The first was loaded: entrepreneurial resilience, SEO, and innovation capital within one latent variable. In the second model, entrepreneurial resilience and innovation capital were placed within a single measurement model, and the results show a better fit than the individual model. Finally, the results of the third model comprise three factors that have a better fit compared to the other models (χ2/df = 0.981; GFI = 0.889; RMSEA = 0.067; NFI = 0.972; TLI = 0.983; SRMR = 0.043). This means all the indicators are within the limits of acceptability (Miles & Shevlin, 1998; Hu & Bentler, 1999; Hoyle, 2000; Kline, 2011), as presented in Table 4 below:

Table 4. Confirmatory Factor Analysis for model fit indices

Models	χ^2/df	RMSEA	TLI	SRMR	CFI	GFI	NFI
Model 1	51.08	0.073	0.452	0.091	0.487	0.531	**0.711**
Model 2	4.79	0.381	0.760	0.150	0.613	0.764	**0.838**
Model 3	1.982	0.067	0.983	0.043	0.954	0.889	**0.972**
Thresholds	≤ 3	≤ 0.08	$0.95\geq$	≤ 0.08	$0.95\geq$	$0.95\geq$	**$0.95\geq$**

Abbreviations: NFI – normed fit index; SRMR – standardised root mean square residual; TLI – Tucker-Lewis index; RMSEA – root mean square error of approximation; CFI – Comparative fit index; χ^2/df – normed chi-square statistic; GFI – goodness-of-fit statistic.
Source: own elaboration in Amos.

Hypothesis Testing

Table 5 below indicates that there is a significant effect of the independent variable of innovation capital and its sub-variables on SEO (H1; H1a; H1b: $p < .01$).

Table 5. Test of H1, H1a, and H1b

H1	β	S.E	t (p)	Supported
SEO <--- ICC	**0.452**	**0.060**	**8.853*** **	yes
Model summary	**R^2**	**mse**	**F**	p
	0.203	**0.802**	**78.38**	***
H1a	**β**	**S.E**	**t (p)**	Supported
<--- IPP SEO	**0.199**	**0.048**	**3.554*** **	yes
Model summary	**R^2**	**mse**	**F**	p
	0.040	**0.967**	**12.629**	***
H1b	**β**	**S.E**	**t (p)**	Supported
SEO <--- IAA	**0.603**	**0.038**	**13.206*** **	yes
Model summary	**R^2**	**mse**	**F**	p
	0.363	**0.641**	**174.394**	***

Note: n = 308; *** = $p \leq 0.01$; ** = $p \leq 0.05$. Abbreviations: ERR – entrepreneurial resilience; t – calculated value of t; β – standardized regression coefficient; SEO – sustainable entrepreneurship orientation; ICC – innovation capital; IAA – intangible assets; MSE – mean squared error; IPP – intellectual property; R2 = R – squared or coefficient of determination.
Source: own elaboration in SPSS.

Using the Johnson-Neyman technique, the hypothesis H2 about the effect of entrepreneurial resilience is tested as an interactive variable between innovation capital and SEO, as shown in Table 6. According to the results, there is a significant effect of the relationship (H2: $p < 0.01$). Moreover, regarding the testing of sub-hypotheses, the results showed the significance of the positive effect entrepreneurial resilience acts as a moderating variable (H2a: $p < 0.01$; H2b: $p < 0.05$) using SPSS macro process.

Table 6. Test of H2, H2a, and H2b

Moderation model summary	**R**	**R^2**	**mse**	**F (*p*)**	**R^2-chang**	**Result**
	0.6281	0.3945	0.6137	66.0183***	0.0369	
Hypotheses 2	***β***	**Se**	**t(*p*)**	**LLCI**	**ULCI**	
SEO <--- ICC	0.3266	0.0563	5.7962***	0.2157	0.4375	**Supported**
SEO <--- REE	0.3681	0.0420	8.7625***	0.2854	0.4507	
SEO <--- REE*ICC	0.1955	0.0454	4.3049***	0.1061	0.2848	
Moderation model summary	**R**	**R^2**	**mse**	**F (*p*)**	**R^2-chang**	**Result**
	0.5494	0.3018	0.7076	43.8014***	0.0085	
Hypotheses 2a	***β***	**Se**	**t(*p*)**	**LLCI**	**ULCI**	
SEO <--- IPP	0.1609	0.0410	3.9250***	0.0802	0.2416	**Supported**
SEO <--- REE	0.4504	0.0432	10.4174***	0.3653	0.5355	
SEO <--- REE*IPP	0.0718	0.0364	1.9725**	0.0017	0.1414	
Moderation model summary	**R**	**R^2**	**mse**	**F (*p*)**	**R^2-chang**	**Result**
	0.6747	0.4552	0.5522	84.6553***	0.0392	
Hypotheses 2b	***β***	**se**	**t(*p*)**	**LLCI**	**ULCI**	
SEO <--- IAA	0.2756	0.0473	5.8284***	0.1825	0.3686	**Supported**
SEO <--- REE	0.2625	0.0446	5.8858***	0.1748	0.3503	
SEO <--- REE*IAA	0.1585	0.0339	4.6755***	0.0918	0.2252	

Note: n = 308; *** = $p \leq 0.01$; ** = $p \leq 0.05$. Abbreviations: ERR – entrepreneurial resilience; IPP – intellectual property; t – calculated value of t; *β* – standardized regression coefficient; ICC – innovation capital; IAA – intangible assets; MSE – mean squared error; R2 = R – squared or coefficient of determination; SEO – sustainable entrepreneurship orientation.
Source: own elaboration in SPSS software.

CONCLUSIONS

The study allowed me to build a conceptual model that tests the relationship between innovation capital and sustainable entrepreneurship orientation, with entrepreneurial resilience as an interactive variable, within the oil sector in the Iraqi environment. The results of Table 5 indicate the significant effect of the creative capital variable on sustainable entrepreneurial orientation (β = .452; t = 8.853; *p*-value $\leq$ .01). Moreover, the results of the H1 test agree with those of previous studies (Santoro *et al.*, 2020; Nascimento & Salazar, 2020; Guo *et al.*, 2020) in terms of the influence of some personality traits on entrepreneurial orientation. Jonason and Webster (2010) find that results show the effect of some negative personality traits on self-abilities when adopting a long-term commitment. The current study is a continuation of Jonason's and Webster's (2010) study, as it identifies the effect of some positive personality traits on the possibility of creating a long-term positive trend towards the environment and society. The state of uncertainty and the probability of failure motivates the entrepreneur to adopt more complex and long-term goals. Thus, there is a need for a degree of flexibility that achieves a faster response to environmental conditions and variables. In the field of entrepreneurship, it is difficult for an entrepreneur to fulfil the requirements of renewal so as to move from traditional economy to an economy based on environmental sustainability, unless there is sufficient resilience to help entrepreneurs to realize the value of creative ideas that contribute to achieving the optimal exploitation of environmental opportunities (Duchek, 2018). Table 6 above tests the impact hypothesis of entrepreneurial resilience as an interactive variable between creative capital and sustainable entrepreneurial orientation (H2: R^2 = .3945; F = 66.0183; *p*-value $\leq$ .01). Investing in innovation has become part of the culture of senior management to achieve success and is an important capital to promote a sustainable entrepreneurial trend, as shown by the results of the hypothesis test (H1; H1a; h1b). Innovation is an important approach to creating value through searching for new ideas and influential social relations for entrepreneurial activity, especially environmental sustainability requirements. These environmental, economic, and social challenges must have psychological resilience capable of the problems and complexities solved by responding in an appropriate and rapid manner. The essence of entrepreneurial activity is innovation. The focus still lies in achieving material gains and searching for the shortest way to achieve profits. This focus has negative consequences on the economic environment. This might be a cause for future studies to search for a more comprehensive indicator that considers both financial and environmental performances when studying the sustainable entrepreneurial orientation. This approach agrees with Hernandez-Perlines and Cisneros (2018), who call for focus on improving financial performance by reducing operational costs and the consumption of resources. Thus, I recommend that future studies conduct longitudinal studies to measure the effectiveness of the sustainable entrepreneurial orientation before and after Covid-19 so as to learn the impact of this crisis on the Iraqi environmental reality.

The limitation of this study lies in approaching sustainable entrepreneurship from the viewpoint of senior management. Future studies should search for a more comprehensive multi-level framework from the perspective of senior management, employees, and beneficiaries of the product or service provided. This study focused on the quantitative approach, while future studies could adopt the mixed methods approach in analysing and interpreting the creative capital and entrepreneurship.

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Acknowledgements and Financial Disclosure

Thank you to all who took the time to fill out the surveys. I also thank two anonymous reviewers from the *Entrepreneurial Business and Economics Review* for their insightful comments and feedback, which helped us create an earlier version of this article.

Conflict of Interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Entrepreneurial Business and Economics Review

2021, Vol. 9, No. 3

10.15678/EBER.2021.090306

Identity crisis of artists during the Covid-19 pandemic and shift towards entrepreneurship

Michał Szostak, Łukasz Sułkowski

ABSTRACT

Objective: The objective of the article is to understand the changes in artists' identity facing the global obstacle caused by the Covid-19 pandemic and the impact of the identity crisis into the shift towards entrepreneurial behaviours. Creative individuals seems to be perfect examples of adjustments to the changing environment.

Research Design & Methods: The qualitative research was conducted in form of in-depth interviews with key informants (artists with different entrepreneurial experiences from different countries and cultures) and auto-ethnography.

Findings: The Covid-19 pandemic caused a crisis of the artist's identity. Individuals with complex identities deal with the crisis better than sole identity individuals. Artists-entrepreneurs are increasingly looking for new forms of activity during crisis. The Artistry-Creativity-Entrepreneurship Matrix which allow to understand the shifts among complex identity individuals towards one fractional identity in case of a crisis.

Implications & Recommendations: The results can be used by: individuals (entrepreneurs, managers, artists) having complex/mixed identities for better understanding of a crisis situation and its impact and possibilities flowing from different layers of human personality with underlining of creativity; 2) business looking for new types of customers and/or wanting to understand more complex market participants.

Contribution & Value Added: The article describes the unexplored areas of artistry among creative entrepreneurs. Distinction between artistry and creativity is marked here clearly. The application of the theory of aesthetics from the field of artistic creativity as a basis for the analysis of the phenomenon of entrepreneurial creativity, opens up new potential research areas of creativity among entrepreneurs.

Article type:	research article
Keywords:	artist's identity; entrepreneur's identity; creative identity; complex identity, identity crisis; paradoxical thinking; creativity; Covid-19 pandemic; entrepreneurship
JEL codes:	D91, M30, Z11

Received: 16 November 2020 Revised: 28 March 2021 Accepted: 1 April 2021

Suggested citation:
Szostak, M., & Sułkowski, Ł. (2021). Identity Crisis of Artists during the Covid-19 Pandemic and Shift towards Entrepreneurship. *Entrepreneurial Business and Economics Review,* 9(3), 87-102. https://doi.org/10.15678/EBER.2021.090306

INTRODUCTION

Wuhan, China is where the new viral lung disease broke out in December 2019. Than the pandemic waves have gone by each continent. In March 2020 the WHO announced the global scale of the spread of the virus (Kufel, 2020), disrupting human populations, economy and trade. Governments choose very diverse strategies to reduce the destructive effects of the pandemic (Phelan, Katz, & Gostin, 2020; Liu *et al.*, 2020; Sułkowski, 2020). With Covid-19 outbreak times have changed forever. Despite the relatively short time for in-depth research on the impact of the pandemic on society, it is worth highlighting several areas that have become the subject of scientists' interest: economy (Lipkind & Kitrar, 2021), entrepreneurship (Ratten, 2020a; Zahra, 2021), entrepreneurial intentions and opportunity recognition (Loan *et al.*, 2021), banking sector and financial markets (Korzeb & Niedziółka, 2020; Dias *et al.*, 2020; Pardal *et al.*, 2020), sport entrepreneurship (Ratten, 2020b), technology innovation in

small business (Akpan *et al.*, 2020), family firms (Marjański & Sułkowski, 2021), digital deprivation (Kuc-Czarnecka, 2020), pandemic impact upon particular markets and their clients' attitude (Marona & Tomal, 2020), economic policy towards the challenges of the pandemic in particular countries (Kinnunen *et al.*, 2021; Żak & Garncarz, 2020; Migała-Warchoł & Pichla, 2021). The public support for entrepreneurship, especially in favour of shaping entrepreneurial intentions of the youth is particularly important during the ongoing pandemic (Nowiński *et al.* 2019; Wach & Bilan, 2021). The pandemic is sure to change the face of the present-day entrepreneurial economy (Sieja & Wach, 2019)

The identity is a delicate issue but it determines whole life of an individual. Having more than one identity – while giving more opportunities – in other side it can reveal more problems and challenges proportionally. People with many identities are dealing with identity tensions which are intensified in the contexts of change and uncertainty (White, 1992). Except the internal factors, we observe the external factors of identity crises. Some individuals – dealing with creative industries and arts especially – experience lower tendency to feel negative consequences of identity crisis. The Covid-19 pandemic can be considered as one of the most important changes in the organisation of the whole world since World War II and it has been increasing the uncertainty dramatically (Androniceanu, 2020). We can assume that the pandemic situation should increase the creativity's level among creative personality of individuals positively. The dissonance between desires and reality restricted by the pandemic, can cause also new creative solutions, including partnership (Androniceanu & Tvaronavičienė, 2019). But in the pandemic situation, an identity approaches a new problem: large and fast change of basic elements of reality influencing the individual's identity can cause negative consequences. Lockdown, closed institutions, social distancing, business troubles and their psychological consequences – everything can lead to the crisis of identity as well.

Because our research interest is focused on crossing the borders of arts and business in area of creativity, we deal in this paper with the identity of creative artists-entrepreneurs and their reaction on the Covid-19 pandemic. Our observations of the artist's identity during the crisis, lead to the following initial statements. Artists – working on fixed contracts, while having guaranteed remuneration even when public performances are cancelled – are waiting for the "normality" passively; their regular routine of private practicing art nor material status are not changed in comparison to pre-pandemic time. The freelance artists (entrepreneurs) need to look for new solutions on their own, because their sources of income and perspectives stopped immediately. But how to do it if there are legal restrictions and the audiences are not interested – or not allowed – in the active participation in the "aesthetic situation" in public?

On the base of above considerations, we set the following research questions:

RQ1: In what way did the Covid-19 pandemic cause a crisis of artist's identity?

RQ2: Do artists-entrepreneurs deal with the identity crisis better than artists without creatively entrepreneurial identity?

RQ3: Do creative artists-entrepreneurs look increasingly for new forms of activities during crisis?

The following parts of the article consist the literature review, description of methods and materials used, results with discussion, conclusions, and list of references.

LITERATURE REVIEW

The literature review methodology was based on a qualitative choice of the literature taken from databases: EBSCO, Google Scholar, JSTOR and Scopus. The methodological approach based on interdisciplinary and multi-paradigm approach taking into account the publications from the areas of arts, aesthetics, entrepreneurship, psychology and the impact of Covid-19 pandemic on identity.

Artistry and entrepreneurship

Following Andy Warhol's claim that "b*eing good in business is the most fascinating kind of art; making money is art and working is art and good business is the best art*" (Bureau & Zander, 2014), there is no clear agreement of knowledge, skills and abilities deemed important to the success of arts entrepreneurs

(Roberts, 2012). There is at least the entrepreneurship factor but probably also the creativity factor. The majority of creative artists are self-employed but relatively few arts schools develop capabilities for venture creation effectively. It leads to the conclusion that area of crossing borders between arts and entrepreneurship is not well understood. Conceptual and philosophical issues encountered by arts educators, arguing that among the three important factors to career success in the arts (creation of new organisations, management of own career, being venturesome) entrepreneurship is crucial.

The common definition of entrepreneurship is a "skill in starting new businesses, especially seeing new opportunities", but the management science expands the second element of the issue: seeing new opportunities (Terán-Yépez & Guerrero-Mora, 2020; Nagy, Jámbor, & Freund, 2020; Mensah, Asamoah, & Jafari-Sadeghi, 2021; Chmielecki & Sułkowski, 2016; Goldman, & Tselepis, 2021). Entrepreneurship is more an approach than just the skill (Gancarczyk & Ujwary-Gil, 2021). We distinguish different types of entrepreneurship depending on the context: ethnic (Chaudhary, 2015), institutional (Almeida *et al.*, 2014), cultural (Patriotta & Siegel, 2019), feminist (Lewis *et al.*, 2016), millennial (Wilmouth, 2016), nascent (Kim *et al.*, 2015), organizational (Moghaddam *et al.*, 2015), business (Coppola, Ianuario, Chinnici, Di Vita, Pappalardo, & D'Amico, 2018), project-based (Ferriani *et al.*, 2009), social (Thompson, 2002). The context shapes what becomes entrepreneurial and the context should be the unit for analysis, instead of entrepreneurial individuals nor outcomes. This optic created the scale from individually- to socially-shaped entrepreneurship. Entrepreneurship appears simultaneously to be both, existing in multiple states regardless of the observer and the observation (Gaddefors & Anderson, 2017; Meyer 2019). There should be kept a clear distinction between using particular arts or artistic techniques (e.g. drawing) for development of personal or organisational entrepreneurship (Clarke & Holt, 2019), particular art (e.g. architecture) as the distinctive element in sustain development (Pinto *et al.*, 2020), and using theory of arts (e.g. aesthetics) in development of entrepreneurship as a process (Szostak & Sułkowski, 2020a).

A word "entrepreneur" – in the meaning of an organizing, managing, and assuming the risks of a venture person – has been in use since at least the 1850s. During the next century, it was also used for description of a person undertaking any kind of dynamic pursuit. By the early 20th century, this word had been applied to an individual owner of a business organisation, being a close concept to an "entrepreneurial spirit" (Wach & Głodowska, 2021). The basic dichotomous division of entrepreneurship concerns the opportunity- and necessity-driven activities. Research shows that entrepreneurs in arts are necessity-driven because of limited possibilities for being employed in long time horizon (Albinsson, 2018), which is current trend in labour market even for employees with less unique skills (Bilan *et al.*, 2020). Nonetheless the new firm founders belong to particular social identities with their risk-taking actions (Fauchart & Gruber, 2011): Darwinians, dominating in business and competitive situations; Communitarians, who view their companies as social objects; Missionaries, who see their businesses as politically aware items. There are also concepts of the nature of entrepreneurial passion as consciously accessible, intense positive feelings experienced by engagement in entrepreneurial activities associated with roles that are meaningful and salient to the entrepreneur self-identity (Cardon *et al.*, 2009). The practice of art entrepreneurship is meaningfully diverse from the practice of business entrepreneurship (Honig & Samuelsson, 2021). Firstly, because of the artist's drivers and aims; secondly, because of the character of occasions, circumstances and practises (Bridgstock, 2012), particularly due to the changes in cultural and creative industries (Černevičiūtė *et al.*, 2019; Kačerauskas, 2018).

Arts, being not a well-defined and homogeneous field, can be understood through the analysis of certain practices in specific configurations and regimes of identification allowing for certain social functions or political possibilities (Dronsfield *et al.*, 2008). Artist is someone who creates things with great skill and imagination. The medieval practical perception of art says: artist is "someone who works through tools on matter". Synonyms are: master, expert, geek, guru, virtuoso, wizard. Antonyms are: amateur, inexpert, nonexpert. The artist concept has changed over time and is even off-defined lately (Sztabiński, 2002). There are key issues defining an artist: imagination, thought, knowledge, wisdom, the idea in artist's mind, abilities in using the art rules; in art, only the artist is the legislator (Tatarkiewicz,

2015). The artist's features are: creativity, sensitivity, intuition, "getting lost" in the creative process, putting everything in the creative process, self-analysis and self-correction (Szyszka & Białowąs, 2019). Effective implementation of artistic goals require: persistence/consistency, hard work, self-discipline, mental resilience, responsibility, ability to observe the world, perceptiveness, openness. The artist's goals have changed over time, although the most persistent ones include: materialization, giving the form of universal ideas, passing on values, giving satisfaction and pleasure to the client and/or the recipient, bringing the recipient to the *catharsis* state, transforming ugliness into beauty (Szostak & Sułkowski, 2020a).

Artist's identity has been developing from the beginnings of humanity: a doer, a God's will doer (Tatarkiewicz, 2015), an artisan, a master, a genius, a holy man touching the unseen, a cultural aristocrat, a professional, a knowledge worker, an entrepreneur, an influencer, a freedom maker (Hermes *et al.*, 2017), an artist by vocation, a value/idea guardian, a superman. Using creativity and efficiency dimensions, the following artist's identities can be set: a conceptualist, a copyist, an artistic craftsman (artisan) and a creator (Szostak & Sułkowski, 2020a). The differences between artist's identity and perception of an artist's role should be underlined here (Szostak, 2020b; Szostak & Sułkowski, 2021a, 2021b).

Identity of artist-entrepreneur

Trying to analyse the phenomenon of an artist-entrepreneur, we should ask the question: why artists became the artists-entrepreneurs? Do they look for more freedom (being not dependent on one person nor one organization), possibilities, income (even when it is connected with more risk and uncertainty)? Or maybe being an entrepreneur is an immanent part of artist's identity, which is turning on when problems arise? An artist-entrepreneur – because he is strongly embedded in the "aesthetic situation" (Gołaszewska, 1984) – subordinates the entrepreneur's identity to the world of universal values (Szostak & Sułkowski, 2020a). That is why a significant part of artists-entrepreneurs stop at satisfying their basic existential needs and the possibilities of carrying out their artistic activities (Albinsson, 2018). Entrepreneurial artists hardly sacrifice art for building a financial empire underlying the importance of the universal value world. It can be said that artist-entrepreneur is a kind of sustainable form of entrepreneur with a highly developed sphere of ethics and CSR.

Looking into aesthetics theory of creativity, the sources of artistic creativity may result from (Gołaszewska, 1984): inspiration; act of creation in the image of nature; discovering and incorporating timeless ideas in a work; imitation of divine creativity; meeting the needs of social group (sociological theory of creativity); excess energy remaining after basic needs fulfilment (human life physiology); the state of culture having various artistic ideals at a certain level of human development (cultural approach); sums of socio-economic (ideological) conditions in which the artist lives (historical approach); expression of the creator's personality (psychological approach). The following psychological theories of artistic creativity may be key in the analysis of entrepreneurial creativity phenomena: "creativity as an inspiration", "creativity as a labour" and "creativity as a personality expression" (Szostak, 2020a). In the theory of creativity as inspiration, the creator achieves significant artistic results thanks to inspiration; the results of inspiration are unpredictable; in this theory, creativity is understood as a mysterious gift that man does not control; it can be said that the uniqueness of the product is the uniqueness of the mental process that led to the work; we are dealing here with a combination of the theory of inspiration and the theory of genius and individualism (Szostak, 2018). The theory of creativity as a labour points to factors such as work, toil, overcoming obstacles and effort; a man has natural abilities, but he must work on them to create true art works; the necessary conditions for creativity are knowledge and the ability to use the creation rules; labour remains an inalienable element of the creative process. The theory of creativity as a personality expression suggests that the creator can also express what others feel through expression; the expression that underlies creativity is controlled by the creator's consciousness; art is a way of communicating and its role is to communicate internal states; artists externalize their states of mind to enable recipients to achieve similar states (Szostak & Sułkowski, 2020; Szostak, 2020).

There are following elements of identity that artists and entrepreneurs have in common: intuition, creativity, imagination, obsession according to their activities, getting the artwork/product into the mar-

ket, perfectionism, getting attention of others, producing in quantity to discover quality, purpose of activity, need to delegate the obligations to be able to create. Artists and artistic organizations may apply entrepreneurial attitudes to the improvement of their artistic works (Nytch, 2012; Szostak & Sułkowski, 2020a). Poorsoltan (2012) analysed among the artists the three chosen traits attributed to entrepreneurs: tolerance for ambiguity, risk-taking, and internal locus of control. Being creative individuals, artists are tolerant to ambiguity and prepared for unstructured situations. There are positive relationship between creativity and ambiguity tolerance. Artists, by act of creating, are risk-takers; their environment is highly competitive and not much rewarding. Risk-taking experimenting artists blur the boundaries of the traditional disciplines. Artists have internal locus of control being comfortable with ambiguities; they believe in themselves and state they are in control of their decisions and activities.

Wyszomirski and Chang (2015) – defining five analytical levels of arts entrepreneurship: individual character traits, goals, strategies, tactics, and context –propose a broad definition of "arts entrepreneurship" being a management process through which cultural workers seek to support their creativity and autonomy, advance their ability for adaptableness, and create artistic, economic and social values. To identify arts entrepreneurs, we must focus on the inventive blends of strategy, personal abilities and mind-set operating in arts entrepreneurship and its context. Albinsson (2018) described the "cultural entrepreneurship" on the base of the "quadruple bottom line of cultural entrepreneurship" including: economic wealth, social transformation, artistic novelty, institutional progress. This optics indicates the dynamic development of intangible cultural features in and between societies, but it may correspondingly involve the progress of infrastructure and organizations. These factors may define a musician's work as an entrepreneur. However, self-defining as an entrepreneur is not so obvious among artists. According to Albinsson (2018) the lion's share of artists accept regarding themselves as artist entrepreneurs. But people who started their careers in the 1960s and 1970s were not willingly to call themselves as entrepreneurs. The majority only unenthusiastically admits entrepreneurship as part of their artistic identity and they regard it as necessity-driven. A part of artists state to be entrepreneurs not interested in profit maximisation only; they want to contribute to the cultural sphere of humanity and earning just a satisfactory revenue. The entrepreneurship of artists from the charitable music segment bears vital parallels with social entrepreneurship. There is a strong element of necessity-driven entrepreneurship among freelance artists. The opportunity-driven entrepreneurship refers to a higher degree of creativity, innovation and novelty in comparison to necessity-driven entrepreneurship (Andersson *et al.*, 2011). Artists-entrepreneurs hold qualities of entrepreneurship driven by necessity and opportunity. Effective entrepreneurs are full of passion predominantly. The lack of effective entrepreneurial education among artists may lead to their identity crises, especially when they will enter the market and will see no interest about their professional skills.

The phenomena of subversion and resistance in art are explored rarely in case of entrepreneurship (Bureau & Zander, 2014), although the concept of "creative destruction" is commonly used (de Mateo Pérez, 2015; Poorsoltan, 2012). There is also a need to add these lenses into creativity area. Having all three elements, which can be named as separate identities, and seeing all three of them through the lenses subversion and resistance, we are able to find new conclusions in area of "complex identities".

Creativity in entrepreneurship and artistry

Creativity and entrepreneurship, as well as artistry and entrepreneurship, are not the same. There are non-creative individuals being strongly entrepreneurial, and non-entrepreneurial individuals being strongly creative. In opposite, we find individuals being artfully and/or creatively entrepreneurial (Bureau & Zander, 2014). Entrepreneurship and innovation are seen as formulas putting an end to all crises, but those who repeat the statement mislead the right sense of creativity, innovation and entrepreneurship (Benazzouz, 2019; Borowiecki & Makieła, 2019; Borowiecki & Dahl, 2021; Bigos & Wach, 2021). The entrepreneurial person works in areas of opportunity recognised by Drucker: the unexpected; the incongruity; the innovation based on process need; changes in the industry and market structure; demographics; changes in perception, mood and meaning; new knowledge, both scientific and non-scientific (de Mateo Pérez, 2015). A complete and interdisciplinary consideration of the impact of the creativity

into entrepreneurship theory and practice is described by Fillis and Rentschler (2010). Randomness, uncertainty and ambiguity must be seen in wider business and social contexts. They researched creativity's link with motivation, actualisation, innovation and interrogation of entrepreneurial artists as owners/managers, concluding that creativity has crucial impact into successful entrepreneurship practice. Creativity, among personality and cognitive style, is the crucial factor in entrepreneurial decision making (Doanh, 2021).

The features of an entrepreneur can be described as: focused on opportunities, inventive, open to modification, individuality motivated, functioning under resource limits, colloquial knowledge use, entrepreneurial interacting. Among entrepreneurial competencies we can list: enthusiasm, vigour, perseverance, dedication, determination, focus on opportunities, vulnerability to risks, indigence for achievement, locus of control. One should add that education positively influences the shaping of entrepreneurial skills and competencies (Solesvik, 2019). The learnable intellectual abilities, being situational personality features – i.e.: imagination, inventiveness, ability to create ideas, intuition, flexibility, motivation, fearless, emphasis on opportunities, exploitation of links, analytical skills, judiciousness, willpower, aspiration, novelty, unrestricted thinking, self-belief, positive approach to a change – have impact on the creativity. Creativity in area of entrepreneurship may be seen as: tactical missile, fixed viewpoint, competitive advantage, providing to entrepreneur and his workers impetus, developed functioning as well as problem solving (Bureau & Zander, 2014).

The relations between creativity and artistry were described in detail by Szostak and Sułkowski (2020) especially in area of semantic distinction between these two dimensions. Win (2014) underlined the factor of innovative entrepreneurship as one of general contemporary trends in arts. We can add here an example of Ferran Adrià, a culinary artist, entrepreneur and creator (DeFillippi *et al.*, 2007). His all three spheres of activity are managed and developed separately: developing new enterprises (consulting agency) to gain profits for creativity development (kitchen laboratory research) to use the creative achievements in artistic sphere (own restaurant).

Identity (personality) crisis

Artists, being sensitive individuals, can be much more vulnerable for all kinds of identity crises, although their ability to use the paradoxical thinking in managing identity tensions is not well described jet. The identity can be discussed at two levels: independent (the identity is constructed in terms of its difference from others) and social (the interactions are viewed in terms of the connections with others). The social self can be divided into two dimensions: the relational and the collective. On this base, there are three self-concept systems depending on the activation factors and circumstances: independent, relational, and collective (Brewer & Gardner, 1996). Taking into the consideration the above identity concepts, the pandemic impact on the relations between individuals (self-isolation and social distancing especially) are the main factors leading to the personality crises.

Identity crisis is a feeling of being uncertain about who or what the person is. The reasons of identity crisis may be caused by new situations in life (marriage, relative's birth or death, unemployment) but also by migrations, economic/financial situation, injury, destroy of heritage, shock in culture, or the pandemic. Destruction of the cultural heritage examines the attachment of people to the cultural heritage that reflects on their daily rituals, memories, and community life, and it shows the constructions of identity and the understanding of intangible cultural heritage of the people. The solution comes from the aspiration to rebuild a sense of identity (Harles & Rajbhandari, 2017). On the base of the concepts of home, identity and exodus, ideas such as integration, reception and interdependence are crucial in finding a solution of the crisis (Sánchez-Escalonilla García-Rico, 2019). Art itself can be healing because of the distance it creates from the current socio-political matters (Rikou & Chaviara, 2016). The crisis situation takes to the forefront the aspect of social experience in its incoherence and the complexity of practises growing beyond individual control. The crisis may be paradoxically seen as an occasion for the artists to offer their work in new geographical or psychological zones. Artistry during crisis may magnify ways that people visualise their existences. An art receivers reveal, remark, and intervene in community on the situations that brought about these key modifications (Szostak, 2020a). The artworks produced during crisis times determine responses oscillating around attempts to keep a

detachment from the stream of events. Each work of art came into being as an outcome not only of an individual but also of a bond of associations being crucial to cure the crisis of identity. A diversity of orientations can be used for identity construction. The creativity in managing identity references rather than normative cultural sincerity turned out to be a prerequisite for emotionally important identification. The identification selections are constructed on the foundation of the perception of collective strategies offered by external factors, the individual creativity and dialogical practices (Masso, 2010). There are many suggestions how to deal with mental challenges after getting into the crisis: give yourself the space to rest; stay involved with your art in "new" ways; remove yourself entirely; stay on a schedule; celebrate small victories; find other creative outlets; cross-train; find a group or a therapist; take advantage of the time off (Rasminsky, 2019).

Young professionals entering the market as entrepreneurs describe three ways of reactions for high degree of insecurity internalizing their new role: rejection, adoption, conversion. They also underline the meaning of learning and internalisation of new standards of working behaviour, especially those of entrepreneurial labour: self-promotion, availability, self-learning, adaptation to market constraints, autonomy and accountability (Vivant, 2016). These conclusions can be applied into the theory of identity crisis caused by external factors, like pandemic. Artists, whose creativity is centred on environmental aesthetics, need freeing up from financial constrictions to work effectively; it requires significant shifts in consciousness (Dahlsen, 2015). These artists' diverse and fragile career paths necessitate their downfall during tough economic times and compromise their creativity expressing individualism. History shows that arts are able to survive even the worst circumstances. Arts can be healing in those situations. Arts are able to live even if their creators suffer hunger, pain and loss of sense. Arts can revive from the ashes. But still, artists pay the whole price of the individual creation process.

METHODS AND MATERIALS

The qualitative research was conducted in form of in-depth interviews with key informants and auto-ethnography. The key informants were people who are artists in their professional life with different "experience" in area of entrepreneurship. The research sample was not limited to persons who currently play both roles at the same time; among the respondents were also people who played both roles at different periods of their lives, to varying degrees and at different levels. The selection of the research sample was justified by the availability of people with possibly diverse artistic and entrepreneurial experience from different countries and cultures. We asked 32 artists for the participation; finally, 21 (66%) of them agreed to take part in the research. The majority of the interviews were conducted in February and March 2020 in the form of a face-to-face or online conversation; several respondents completed the questionnaire with 36 questions in writing. Interviews with Polish respondents were conducted in Polish, while interviews with other respondents were conducted in English. Then, all non-English interviews were translated into English. The majority of the sample was from Poland (n=11, 52%), three from the USA (14%), two from the UK (10%), one person from Bulgaria, Nigeria and Ukraine (4,5% each). Furthermore, the majority of the respondents were men (n=15, 71%), have experience from the music field (n=18, 86%). There was no effort to achieve a balance in area of sex nor age of the participants, neither we did not balance the sample according to their professional experience length nor their art form chosen. Due to qualitative character of this research, we also did not differ our respondents according to their personal features (e.g. optimist-pessimist, pro-active-passive). We are fully aware of the impact of these elements on the research results but – due to the character of this study and the rapidly changing pandemic situation – we continued with the findings and the conclusions. All answers of each respondent were listed in the table together with the basic categories defining them. The fragment of this material is shown in Table 1. This article contains a minor part of conclusions from the research materials only.

RESULTS AND DISCUSSION

There was no hesitation among the respondents to describe themselves as an artist. Their artist's identity referred to their professional activities in different arts (music, painting, handcraft) and/or to their

education (formal and informal). In reference to an entrepreneurial identity, approximately half of the respondents was confident in this area underlining their own professional activities (establishing and/or running a company, an organisation or a project) and own responsibility for professional and financial stability and development. But another half of the respondents – those who do not run own business nor organisation – had problems with naming themselves as an entrepreneur, even that they have been doing activities fitting into different definitions of entrepreneurship (we did not provide any definition of entrepreneurship). It was seen that for majority of the respondents, being an entrepreneur equals to running own business or organisation; they do not perceive the entrepreneurial identity in non-business nor non-organisational environment. In case of creativity, the respondents were more unequivocal like in case of artistry; almost all found themselves as possessing the creative identity equalling it with artistry without any doubt (following the common sense of creativity and artistry): if I am an artist, I am a creative person too. Referring to our previous research analysis (Szostak & Sułkowski, 2020a), being an artist is not equal being creative.

Table 1. Description of the research sample

Nationality	Birth year	Sex	Activity as an artist	Activity as an entrepreneur
USA	1965	M	Instrumentalist; choir director, teacher	None
USA	1947	M	International instrumentalist	Self-employed entrepreneur in area of art
Russian-USA	1977	F	Instrumentalist	Coordinator and designer of art projects
Ukraine	1990	M	Poet, translator	Entrepreneur; concert house director; orchestra director
British	1948	M	Instrumentalist	None
British	1981	M	Instrumentalist, choir trainer, choir conductor	Music department manager; concert hall manager
Nigerian	1995	M	Composer, instrumentalist, choir director	None
Bulgaria	1978	M	International vocalist, lecturer	International art agency creator, owner and manager
Poland	1989	M	Instrumentalist	Creative manager at a cultural institution
Poland	1981	M	Independent origami lamp and graphic creator	Entrepreneur, own business manager; 17 years
Poland	1974	M	Singer-soloist at operas, philharmonics, ensembles	Opera impresario; head of artistic department at opera house
Poland	1999	M	Concert musician; 12 years	Creator, owner and teacher at music school; orchestra founder and director; promotion agency founder and manager
Poland	1992	M	International conductor	None
Poland	1980	M	International concert instrumentalist; music teacher; 18 years	Entrepreneur (own business); manager in international companies (16 years); NGO founder and CEO
Poland	1964	F	Painter and visual artist; 23 years	Self-employed art entrepreneur; artistic associations member
Poland	1999	F	Instrumentalist	Creative manager in artistic agency
Poland	1991	M	Instrumentalist	Promotion and program departments at cultural institutions, NGO creator
Poland	1952	F	Vocalist; 25 years	Musician associations president; dance group manager and co-founder; arts impresario
Poland	1978	F	Vocalist; book author	Self-employed arts entrepreneur, employing dozen people
Poland	1970	M	Actor, opera singer; 30 years	Self-employed; creator of an young musicians' stage; organiser of concerts and own artistic career
Poland	1982	F	Instrumentalist	None

Source: own study.

The next general conclusion from all respondent's answers is that the pandemic – especially its social restrictions – caused deep structural changes in life of artists: both in the creative/artistic area and in financial/safety area. Situations described by the respondents can be recognised as the artist's identity crisis ("nobody wants me," nobody is interested in my art," "people are afraid to participate in arts because health is more important than art"). The majority of respondents – because of the turbulences caused by the pandemic and the following waves of restrictions – focused on creative and entrepreneurial identities to find new options. The creative and entrepreneurial identities determined the effects of the external crisis and its impact on artist's identity. We can say that having developed entrepreneurial identity is the basic step towards healing the artist's identity crisis caused by the pandemic. All respondents underline the dramatic decline in demand on their new artistic creations – ongoing projects were finalised (if possible) or frozen, but nothing new (in traditional meaning) started, no new traditional projects emerged. In this situation an artist started to feel itself unnecessary and not important element of the society. Additionally, or in the consequence of the above, the money issue appeared: no work – no money – no possibility to pay the bills. This factor was also underlined be the respondents.

The respondents had problems to verbalize the differences between artistry, creativity and entrepreneurship in their identity. Many of the respondents had the ideas where to look for solutions but not all of them started to act. Another group tried to copy others' ideas starting new activities and projects (e.g. online performances, workshops, contests); unfortunately, without creative approach nor creative implementation it was not successful. Here, the type of a follower of others' ideas was dominant.

The issue of entrepreneurship versus creativity among artists-entrepreneurs can be seen in actions undertaken by professional artist organisations as well. E.g. *The American Guild of Organists* from the USA, *The Royal College of Organists* from the UK – immediately after the beginning of the pandemic and the lockdown in western countries (March 2020) – started to develop the virtual programs for their members, underlying the element of the identity maintaining, giving the sense of practicing and looking for new possibilities for artistic development. But after a few months of the pandemic, the efforts diminished and not much left of these ideas. It can be an example of entrepreneurship without creativity – doing something without creative analysis of needs or possibilities of participants or general sense. It can be stated that organisational entrepreneurship without minimum of creativity, in medium-long perspective, was lost in many cases. In opposite, even small "amount" of creativity can gain "good" effect; e.g. online performances for special group of participants, online contests formulated especially for musicians-performers who suffer lockdown (e.g. *Sound Espressivo Global Contest*). Any kind of activities which allow the artists to do their profession was named as healing in reference to the artist's identity crisis. Even short moment of online public performance catalysed the need of preparation, the possibility of artistic creation, it gave the hope for the end of the crisis.

The application of the theory of aesthetics from the field of artistic creativity as a basis for the analysis of the phenomenon of entrepreneurial creativity, opens up new potential areas of analysis of creativity in area of arts and entrepreneurship among entrepreneurs. The novelty of this approach in area of theory of entrepreneurship as well as empirical results described in our research, allow to catch sight of new optics of the problem.

Summarizing conclusions from the interviews and auto-ethnographical analysis, we created the matrix which combines the three crucial identities among which the interviewers surfed while giving the answers: artistry, creativity and entrepreneurship (Figure 1). On this base, we found the three basic types of complex identity of artists-entrepreneurs characterized by the following features: 1) Artistry and creativity but no entrepreneurship; 2) Artistry and entrepreneurship but no creativity; 3) Creativity and entrepreneurship but no artistry. In the middle of the all above types of complex identity, there is the fourth type of the complex identity possessing all three features of simple identities: 4) Artistry, creativity and entrepreneurship. We found that an external crisis (like the Covid-19 pandemic) changes the position of the "pendulum" moving between simple identities towards entrepreneurial identity with the fundamental role of the creativity factor and not an easy task of adjustment in artistry (to keep the appropriate level of artwork – without shift towards kitsch). There is high probability that, when the crisis feature disappears, the pendulum moving between the fractional identities will go back to the "normal", neutral position.

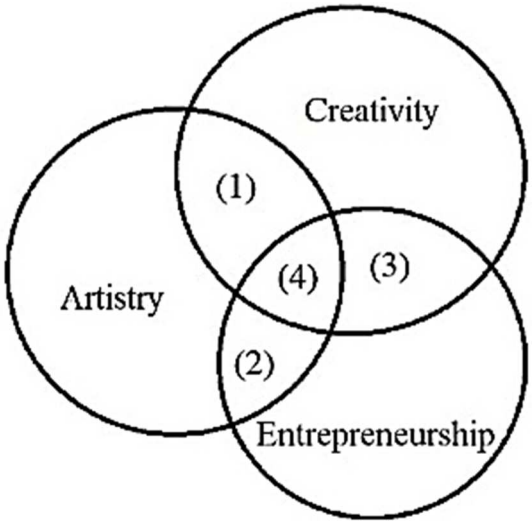

Figure 1. Artistry-Creativity-Entrepreneurship Matrix
Source: own elaboration.

CONCLUSIONS

Using the aesthetic theories of artistic creativity, and referring to the research questions, we assume that artists-entrepreneurs – who use sociological theory of creativity (meeting the needs of social groups), cultural approach (the state of culture having various artistic ideals at a certain level of human development) or creating artworks in the image of the nature – while losing the social context or the natural order context, can feel the identity crisis due to the pandemic. Artists-entrepreneurs – who use other theories of creativity (internal inspiration, discovering timeless ideas, imitating the divine creativity, creating according to the human life physiology theory, ideological theory, or using the psychological approach) – can be more resistant against the crisis and its impact on their complex identity. We see that the Covid-19 pandemic have deep impact on artist's identity and this situation has all features of the identity crisis. Artists, possessing the entrepreneurial identity, deal with the crisis better than artists without creatively entrepreneurial identity. The description "better" means: they are able to look and find the solutions; they do not feel deep internal pain because their additional identity is able to manage the process of change. Creative artists-entrepreneurs are increasingly looking for new forms of activities during crisis. The pandemic confirms that combination of different identities is helpful in situations of change and uncertainty.

Among limitations of the research we need to underline: 1) The research was conducted during the beginning phase of the Covid-19 pandemic and – in the moment of sending this article to the editors – we still don't see the end of the situation; 2) In case of a crisis, art and other "high cultural" areas of human life are going to the second plan of consideration for majority of the receivers; 3) We did not differ interviewers according their personal characteristics – qualitative character of the research does not allow to draw more detailed conclusions.

The results of the research can be used by: 1) Individuals (entrepreneurs, managers, artists) having complex/mixed identities for better understanding of a crisis situation and its impact and possibilities flowing from different layers of human personality with underlining of creativity; 2) Business looking for new types of customers and/or wanting to understand more complex market participants; 3) Researchers who want to investigate the issue of: a) the perception of complex identities (e.g. artists-entrepreneurs), b) the designation of distinguishing features of artistry, creativity and entrepreneurship among artists-entrepreneurs, c) the impact of personal characteristics of artists-entrepreneurs into their own complex identity (there is high probability that the personal features

are the dominant factors in case of artistry, creativity and entrepreneurship of an individual). Potential research questions for future qualitative research or the hypothesis for further quantitative research may be: 1) Majority of the society does not recognize the difference between creativity and artistry); 2) We will observe the turn into remote methods of participation in arts and artistic communication (even that it is worse way to participate in classical arts, it is still easier, faster and safer to maintain the connection between artists and audiences); 3) There will be the turn to marketing approach in aesthetical situation[1] (art will be more willing to fulfil audiences' needs than being a tool for mission and education; if the "content" of the performance will not be interesting, the audience will switch off the streaming or the record; in the traditional circumstances, the audience is more obliged to "stay physically present" until the end of performance).

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[1] Detailed description of the "aesthetical situation" was made by Szostak and Sułkowski (2020a).

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The contribution of co-authors is equal and can be expressed as 50% for each of the authors: Ł. Sułkowski prepared the concept of the research, methodology and conclusions, while M. Szostak prepared the literature review, interviews, data analysis, results and discussion, and conclusions.

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Acknowledgements and Financial Disclosure

The authors would like to thank the participants of the interviews and the anonymous referees for their useful comments, which allowed to increase the value of this article

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Entrepreneurial Business and Economics Review

2021, Vol. 9, No. 3

10.15678/EBER.2021.090307

Conceptual foundations of entrepreneurial strategy: A systematic literature review

Lidia Branco, João Ferreira, Shital Jayantilal

ABSTRACT

Objective: The objective of the article is to contribute to a greater and deeper understanding of the ES conceptualisation. The relevance of the topic of Entrepreneurial Strategy (ES) stems from growing interest of society in entrepreneurship, which has become extensively discussed although the concept of ES is still poorly understood.

Research Design & Methods: A systematic literature review (SLR) referring to 427 articles from the Web of Science and Scopus databases was conducted.

Findings: The results made it possible to identify five ES conceptual foundations: i) economic theory and entrepreneurship; ii) entrepreneurial strategies, concept – theory; iii) entrepreneurial strategies, framework – models; iv) entrepreneurial strategies, contexts – application; and v) entrepreneurial strategies, application - metrics.

Implications & Recommendations: This SLR can help to highlight the gap in theories on ES, its conceptualisation and the fundamentals found in the literature. A research agenda is suggested for each ES foundation identified.

Contribution & Value Added: The study is innovative given there have been no other identified SLR studies on the ES concept. The study attempts to contribute towards the literature by offering a model of interactions of the ES foundations.

Article type:	theoretical article
Keywords:	entrepreneurial strategy; conceptualisation; entrepreneurship; strategy; systematic literature review
JEL codes:	L26, M01, M21

Received: 7 January 2021 | Revised: 11 March 2021 | Accepted: 16 March 2021

Suggested citation:
Branco, L., Ferreira, J., & Jayantilal, S. (2021). Conceptual foundations of entrepreneurial strategy: A systematic literature review. *Entrepreneurial Business and Economics Review,* 9(3), 103-118. https://doi.org/10.15678/EBER.2021.090307

INTRODUCTION

The importance of the topic of entrepreneurial strategy (ES) has increased in recent years, whether in the microeconomic framework for the analysis of enterprise performance or in a broader macroeconomic framework of growth and economic development of countries. Several authors agree that the development of ES in firms places them in positions to regularly and systematically recognize and exploit entrepreneurial opportunities, and it is a "path to success" (Ireland, Covin, & Kuratko, 2009). Ireland *et al.* (2009) report that ES fosters the renewal of businesses and makes them more innovative, and it enables innovation, creativity, and making responsible decisions (Meyer & Heppard, 2000).

In the last few decades, bigger and bigger growth in the entrepreneurial spirit of economic agents has been witnessed, both at the individual level and at the level of organisations, which has contributed to the research on entrepreneurial strategies (ES) and increased attention of the academic world. Murray (1984) was one of the first authors to develop a reflection on the ES conceptualisation, character, and stimuli to entrepreneurial behaviour. According to the author, an ES is how a firm defines and redefines its core set

of connections with the environment in which it operates. Globalisation and consequently more and more dynamic market has required from companies to adopt more proactive and entrepreneurial behaviour, and thus the adoption of an ES has become a mandatory path for the success of organisations (Morris, Kuratko, & Covin, 2008). ES involves employing a method to manage entrepreneurship (Ireland *et al.*, 2009; Morris *et al.*, 2008) to find a viable goal in the economic ecosystem and define a coherent path to achieve it. According to Kuratko and Audretsch (2009), strategy attempts to capture where the firm wants to go and how it plans to get there. When entrepreneurship is introduced to strategy, the possibilities regarding where the firm can go, how fast, and how it gets there are greatly enhanced.

An effective ES involves a proactive search for new opportunities and requires effective management of innovation processes that will bring value to the company, processes based on three dimensions of the Entrepreneurial Orientation (EO) that were historically identified (Miller, 1983) as characterising the strategic attitude of the company: innovativeness, proactiveness, and risk-taking. More recently, Wales (2016) found that EO has become one of the most established constructs in entrepreneurship as the subject of extensive research. Entrepreneurial orientation was defined in various ways in previous research. For example, Anderson, Covin, and Slevin (2009) present a succinct definition of EO: company decision-making, practices, management philosophies, and strategic behaviour of entrepreneurial nature. Zhang (2017) defines ES as a construct that specifically discloses the company's EO (Ireland *et al.*, 2009), and it is perceived as a potential source of competitive advantage of firms.

However, despite entrepreneurship being the object of different theoretical approaches, especially concerning the dominant approach that emphasizes analysis (innovation, leadership, organisation, knowledge, culture, psychology, etc.), from the literature we conclude that they all share the idea that the phenomenon always comes within the creation/development of business activities as a result of identifying opportunities and their operation (Companys & McMullen, 2007).

All the approaches also share the basic assumption that entrepreneurship is a phenomenon that can only be conceptualised in a multifactorial way, since it is undoubtedly conditioned by various external social factors (context variables). Its genesis cannot just be explained by recourse to the analysis grid of economic theory. This is the focus adopted by various articles studied, in addition to the economic matrix, other causalities of institutional, cultural and even psychological nature, arguing that the emergence of entrepreneurship takes place with the backdrop of a complex network of social relations which will determine the profile of the interactions among the entrepreneur, resources and opportunities (Xiao, 2015; Khan, Li, Safdar, & Khan, 2019). Much has been discussed about what an ES can do for a company (Ireland, Covin, & Kuratko, 2009; Ireland, Hitt, Camp, & Sexton, 2001). Zahra, Jennings, and Kuratko (1999) highlighted the demand to survey different ES conceptions at the company level. Previous studies have shown that despite its importance and a potential source of competitive advantage for companies, an exact conceptualisation of ES has been vague (Ireland, Covin, & Kuratko, 2009; Meyer & Heppard, 2000). Many scholars and academics have defined ES differently and through various approaches (Ireland, Covin, & Kuratko, 2009; Drucker, 1985; Murray, 1984).

In this context, an ES has a conceptual breadth that goes beyond the so-called corporate entrepreneurship – when the focus is on companies' internal renewal strategies, as a result of the adaptation of the organisation in response to markets and/or competitors (Kuratko & Audretsch, 2013) or when the focus is on the renovation/ expansion process through the acquisition of small companies, but from innovative sources (corporate ventures) (Hind & Steyn, 2015).The vast majority of research lacks systematisation and categorisation.

Undertaking a systematic review of literature in its fragmented field provides the opportunity to pose the following research questions:

RQ1: What are entrepreneurial strategies?

RQ2: How are they and their fundamentals conceptualised in the more general framework of economic theory?

The answer to these research questions makes a contribution to the clarification of the concept of ES and the construction of explanatory categories of the conceptual foundations of entrepreneurial strategies.

There is a relevant need to systematise research on what entrepreneurial strategies are and on their conceptualisation to further advance and summarise different approaches in this research area. Therefore, this study aims to fill this gap, thus contributing to a greater and deeper understanding of an ES and its conceptual foundations. Thus, we aim to identify the most dominant approaches in the literature and define a research agenda based on a systematic literature review to discuss the application of the concept of ES in the most diverse contexts.

First, we will present the methodology and the method, then the following part is dedicated to conceptual foundations of entrepreneurial strategies and the construction of explanatory categories. Next, the conclusions are presented and discussed and some topics are proposed to a new research agenda.

MATERIAL AND METHODS

We followed the process of a systematic literature review (SRL) proposed by Denyer and Tranfield (2009) and Nolan and Garavan (2016). In this context, the general methodological characteristics of a SLR reflect epistemology that stipulates that knowledge should be acquired through scientific objectives, using an impartial process (Denyer & Tranfield, 2009). In this regard, Denyer and Tranfield (2009) set the SLR as a specific methodology that locates existing studies, selects and evaluates contributions, analyses and synthesizes data, and reports evidence in such a way that it allows reasonably clear conclusions to be reached about what is and what is not known on the topic being investigated.

Using the Scopus and Web of Science databases and aiming to create a comprehensive database about Entrepreneurial Strategy (ES) and its conceptualisation, documents were identified by using the search terms “entrepren* strateg*”. To these search terms we applied the following filters: language (English), type of document (articles and scientific publications), and subject categories (Management, Business, Economics). At the beginning, 427 documents were identified that could somehow be connected with ES. Faced with such a broad spectrum of results, the documents were divided into two broad categories: i) those located essentially within a theoretical framework, and; ii) those run by empirical studies as the basis for the concept definition, whether eminently qualitative or quantitative. In this regard, various models and analysis grids, instruments, and performance measures were used, and the results aimed to validate some of the advanced conceptual assumptions. This procedure yielded a process of the selection and validation, whose synthesis is schematically summarised in Figure 1.

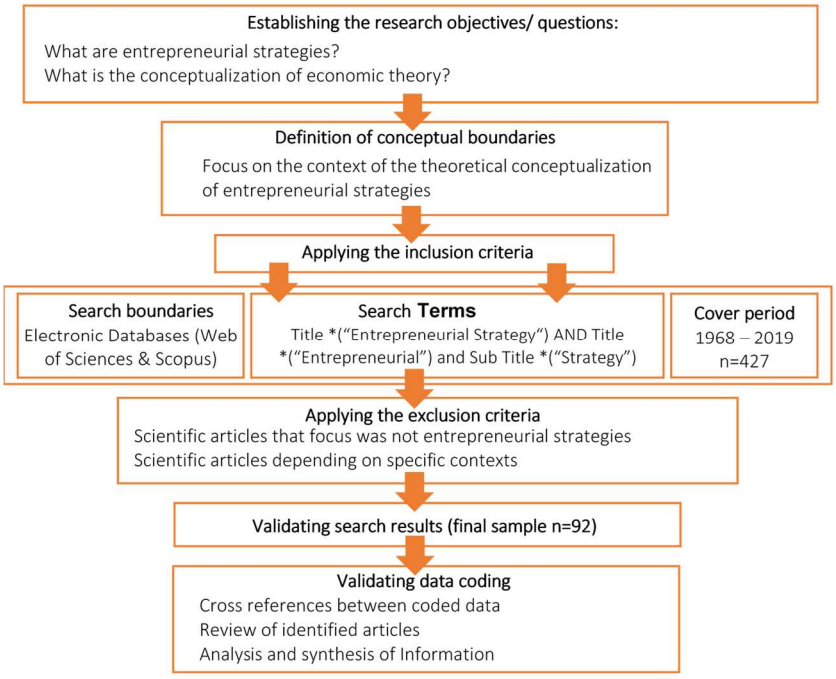

Figure 1. Steps of the SLR Process
Source: own elaboration.

After applying the principles and criteria mentioned above, we reached the final sample of 92 documents (Table 1).

Table 1. Typology of documents obtained in the study

Entrepreneurial Strategy (ES)	No. of Articles	% Sample	% Total
Economic Theory and Entrepreneurship (ETE)	12	13.04%	2.81%
Concepts – Theory (CT)	30	32.61%	7.03%
Framework – Models (FM)	14	15.22%	3.28%
Contexts – Application (CA)	14	15.22%	3.28%
Application – Metrics (AM)	22	23.91%	5.15%
Total	**92**	**100%**	**21.55%**

Source: own study.

Descriptive Analysis

Figure 2 shows the evolution of publications over the period under analysis (1968-2019). The number of publications in this field has grown significantly since the late 60s of the last century.

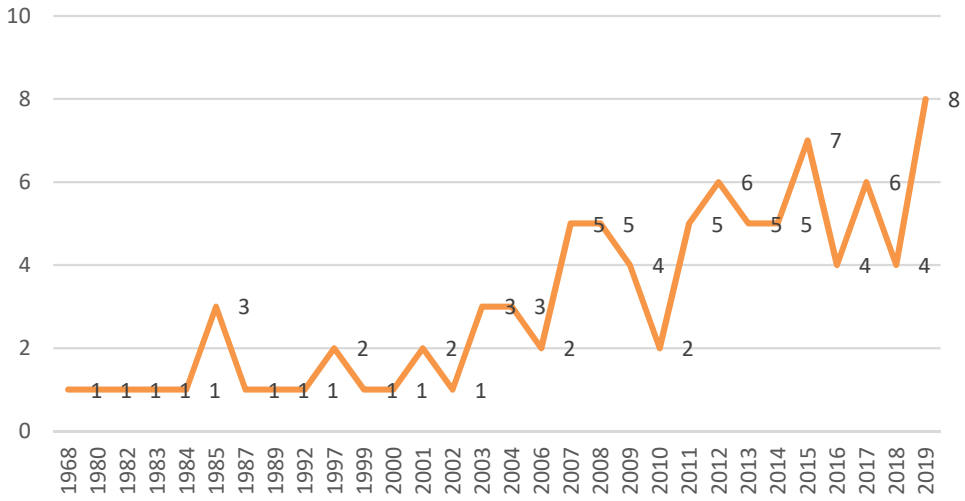

Figure 2. Timeline of the number of publications (1968-2019)
Source: own elaboration.

By studying the number of articles per year, the results show that research on ES increased significantly in the last decade. In 2010-2019, 52 articles were published, a much larger number than the number of articles published in the previous 41 years (40 items between 1968-2009). Therefore, over 57% of the ES area published appeared in the last nine years. Table 3 shows the journals with the most published studies (top 20) on the ES topic and identifies the study type. The *Strategic Management Journal* leads with five articles, followed by *Small Business Economics* and *Entrepreneurship: Theory and Practice*, both with four published articles.

The majority of studies are theoretical (62%), and only 38% are empirical. Qualitative studies represent 8% and quantitative studies 30%. Table 4 shows the most cited articles (top 15). The article most cited is Miller's (1983) article, with 1813 citations. This article is followed by Miller and Friesen (1982) article with 1163 citations, and Hitt *et al.* (2001) with 679 citations. Additionally, another aspect to emphasise is that about 53% of these articles correspond to US publications. This percentage is more than six times higher in comparison with the country on the next position, namely, the United Kingdom (8.7%).

In view of the diversity of the selected articles, only the work of the construction of a classification instrument could lead us to: 1) discovering possible theoretical contact bridges; 2) discovering possible similarities in the theoretical conception of ES; 3) progress – from 1) and 2) towards the construction of the answer to our essential starting question, that is, what entrepreneurial strategies are. And that was exactly the methodological approach we followed.

Table 3. The list of top 20 journals

No.	Journal	Number of Articles	Type of research		
			Empirical		Conceptual
			Qual	Quant	
1	Strategic Management Journal	5	0	2	3
2	Small Business Economics	4	0	2	2
3	Entrepreneurship: Theory and Practice	4	0	2	2
4	Business Horizons	3	0	1	2
5	Strategic Entrepreneurship Journal	3	0	1	2
6	Technological Forecasting and Social Change	2	0	1	1
7	International Journal of Management Reviews	2	0	1	1
8	Mediterranean Journal of Social Sciences	2	0	2	0
9	International Small Business Journal	2	0	1	1
10	Handbook on Organizational Entrepreneurship	2	0	0	2
11	International Small Business Journal	2	0	0	2
12	International Entrepreneurship and Management Journal	1	0	0	1
13	Management Science	1	0	0	1
14	Journal of Small Business Strategy	1	0	0	1
15	Journal of Small Business Management	1	0	1	0
16	The Wiley Handbook of Entrepreneurship	1	1	0	0
17	regional Studies	1	0	1	0
18	Journal of Business Research	1	0	0	1
19	Management Science	1	0	0	1
20	The American Economic Review	1	0	0	1
	Total	**40**	**1**	**15**	**24**

Source: own study.

LITERATURE REVIEW AND THEORY DEVELOPMENT

In the review of the selected documents, we identified five main entrepreneurial strategies (ES) foundations (Table 4), namely: 1) Economic Theory and Entrepreneurship (ETE): debating the role and foundations of entrepreneurship integration in economic theory; 2) Concept and Theory (CT): proposing a full discussion and theoretical, conceptual framework for Entrepreneurial Strategies; 3) Frameworks and Models (FM): discussing and presenting models and tools for the assessment of Entrepreneurial Strategies; 4) Contexts and Applications (CA): for debating and/or assessing the implementation of Entrepreneurial Strategies in the context variables function; 5) Application and Metrics (AM): quantitatively evaluating the result of the implementation of ES in the scope of their application in specific types of organisations, industries, or other specific contexts.

Table 4. Conceptualisation themes

ES Categories	Conceptualisation	Authors
(1) Economic Theory and Entrepreneurship (ETE), (N= 12 documents)	Integration of entrepreneurship in economic models and other variables that explain the factors that foster the emergence of entrepreneurial agents in an economy.	Baumol (1968)
	Concept of competitive advantage of companies implies the existence of SE strategies.	Porter (1980)
	Using an ES for the company to achieve the leadership in a new market or a new industry through innovation. Research into the nature, background, and effects of business entrepreneurship.	Drucker (1985) Zahra, Jennings, & Kuratko (1999)
	Entrepreneurship is considered as a vital force in the economies of countries.	Audretsch & Keilbach (2004)

ES Categories	Conceptualisation	Authors
(1) Economic Theory and Entrepreneurship (ETE), (N= 12 documents)	There is no room for entrepreneurial activities, an economy of production, a perfect balance of information and scenario. Entrepreneurship is crucial in building a sustainable competitive organisation in today's business environment. Search for new directions of research into ES.	Ott, Eisenhardt, Bingham (2006)
	A framework of strategic entrepreneurship. Entrepreneurship can lead companies to establishing competitive advantages and creating wealth in today's competitive environment.	Foss & Lyngsie (2011)
	Individuals or companies carry out strategic entrepreneurship.	Djordjevic (2013)
	Entrepreneurship is decisive in getting better and more efficient combinations of factors. Relationship between the business model and the ES in a mature environment and applied to SMEs.	Hoeyi & Dzansi (2014) Roaldsen (2015)
	Entrepreneurship is a state's or an organisation's quality and not an anomaly, and entrepreneurial orientation manifests itself through sustained entrepreneurial behaviour.	Wales (2016)
	Conceptualisation of ES through the matrix-based forms of corporate entrepreneurship.	Omotosho (2019)
(2) Concept and Theory (CT), (N = 30 documents)	Entrepreneur model assumes that innovation is always very high unless policymakers are advised to slow down.	Miller & Friesen (1982)
	Discovery of the key determinants of entrepreneurship, the process by which organisations are renewed by being pioneers, innovation, and risk-taking.	Miller (1983)
	Conceptualisation of ES.	Murray (1984)
	ES arises as a mutation process itself in the economic and technological environment.	Dilts & Prough (1987)
	Research into the nature, background, and effects of business entrepreneurship.	Zahra, Jennings, & Kuratko (1999)
	Definition of ES and an explanatory model directed essentially to the existing businesses, corporate ES.	Ireland, Covin, & Kuratko (2009)
	Conceptual framework of entrepreneurship integrating strategy.	Kuratko & Audretsch (2009)
	Synthesis of the conceptual evolution of corporate entrepreneurship.	Kuratko & Audretsch (2013)
	The essence of ESs is defined by individuals with a long-term view and makes investments driven by a sense of duty and a belief in a future vision, rather than short-term returns. In this model, ES combined with an innovative character will mean success and economic development.	Feldman (2014)
	Review of several authors discussing the conceptualisation of entrepreneurial orientation and reviews of new directions of entrepreneurial orientation research.	Wales (2016)
	Framework for the nature of the entrepreneurial choice process.	Gans, Stern, & Wu (2019)
(3) Frameworks and Models (FM), (N = 14 documents)	Innovation models in different contexts.	Miller & Friesen (1982)
	Evaluation models are associated with an ES in the broadest sense.	Miller (1983)
	Evaluation models associated with an ES depending on leadership.	Ray (1993)
	Evaluation models associated with ES as innovation levels.	Sonfield & Lussier (1997)
	Evaluation models associated with ES and their relationship to performance.	Dess, Lumpkin, & Covin (1997)
	Evaluation models associated with ESs, the macroeconomic impact of these on the overall economy.	Werker (2003)
	Evaluation models associated with an ES depending on leadership.	Hansson & Monsted (2008)

ES Categories	Conceptualisation	Authors
(3) Frameworks and Models (FM), (N = 14 documents)	Evaluation models associated with ES, which use process simulation.	Ihrig (2010)
	Evaluation models associated with a strategic framework for entrepreneurial activities and identification of four sub-dimensions of ES.	Song (2011)
	Evaluation models associated with an ES in a broad sense.	Ihrig (2012)
	Evaluation models associated with an ES depending on leadership.	Jia, Wang, Zhao, & Yu (2014)
	Evaluation models associated with ES, using the theories of complexity to operationalise the model. Evaluation model associated with ES and the sources of competitive advantage among entrepreneurial firms.	Crawford & Kreiser (2015) Johnson & Van De (2017)
	Evaluation models associated with ES as innovation levels.	Kim & Boh (2017)
	Evaluation models associated with the entrepreneurial choice process.	Gans, Stern, & Wu (2019)
(4) Contexts and Application (CA), (N = 14 documents)	Adaptation of ES with public policies.	Doh & Pearce Ii (2004)
	Adaptation of ES with HR management.	Hayton, Hornsby, & Bloodgood (2013)
	Adaptation of ES rapidly changing scenarios.	Page & Wiersema (1992)
	Adaptation of ES with changing scenarios of markets.	Dilts & Prough (1987)
	ES in new business opportunities. Application of ES in new businesses in a life cycle model. Addresses the issues of creation, diffusion and growth of knowledge and the role assigned to the dynamic entrepreneurial processes. Application of ES to mature companies.	Companys & McMullen (2007) Gundry & Kickul (2007) Braunerhjelm (2008) Chandra & Yang (2011)
	ES with accounting methods of evaluating the value of companies and their capital.	Bratland (2012)
	Application of ES and innovation in all kinds of industries.	Djordjevic (2013)
	Application of ES in regional innovation clusters.	Feldman (2014)
	Application of ES integrated with entrepreneurship to increase the competitiveness of enterprises. Application of ES in mature companies.	Dhilwayo (2012) Roaldsen (2015)
(5) Application and Metrics (AM), (N = 22 articles)	Measurement of ES on the impact of industrial work. One of the sources of variation in small businesses' presence is attributed to ES developed for them.	Stites (1985) Acs, ZJ, & Audretsch (1989)
	Reveals strategy formulation issues and provides recommendations for effective processes ES.	Karami (2012)
	Entrepreneurial orientation as an antecedent explanatory construct of entrepreneurship within a business performance chart.	Moruku (2013)
	Examines the significance of innovation for organisations that follow entrepreneurial orientation strategies and improved performance in these organisations.	Jarrar & Smith (2014)
	Orientation and entrepreneurial versus executive powers business performance both have a positive influence on corporate performance.	Jia *et al.* (2014)
	Entrepreneurial orientation versus business performance.	Sonfield & Lussier (2014)
	Theory of social networks and the resource-based view affects ES and survival.	Xiao (2015)
	A new model of ES approaches with a procedural perspective by building its link with the theory of complexity and process philosophy and contribution to success.	Zhang (2017)
	Measurement of entrepreneurial strategy on innovation in companies with resource constraints.	Kim & Boh (2017)
	Intellectual capital and new businesses versus competitive advantages.	Anwar, Zaman, Khan, & Khan (2018)
	Measurement of ES on corporate performance.	Gao, Ge, Lang, & Xu

ES Categories	Conceptualisation	Authors
(5) Application and Metrics (AM), (N = 22 articles)	Entrepreneurial orientation versus generation of market value capital.	(2018) Gupta, Mortal, & Yang (2018)
	Measurement of ES on the emergence of new businesses and new companies.	Muramalla & Al-Hazza (2019)
	Control versus running in uncertain scenarios.	Ching, Gans, & Stern (2019)
	Performance of ES along with simultaneous testing of multiple businesses can boost performance.	Hietaniemi & Peltonen (2019)
	Performance measurement versus building effective networks of ES and links to external agencies.	Khan *et al.* (2019)
	Measurement of entrepreneurial orientation dimension on performance and moderating roles of social capital from political and business connections in the context of a transition economy.	Luu & Ngo (2019)

Source: own study.

(1) Economic Theory and Entrepreneurship (ETE)

In economic literature – surprisingly, or perhaps not – the entrepreneur was left out for many decades. Entrepreneurship is an important issue and was neglected for a long time (Foss & Lyngsie, 2011), although the situation has changed recently. The reasons for this are not entirely unrelated to how the neoclassical general equilibrium model is constructed. In the neoclassical framework, in an economy of production, agents maximise their utility by applying labour and human capital in a given set of opportunities. In the case of Keynesian theory, the entrepreneur's role was considered narrowly in expectations that determine investment. The expectations would depend on the investor's animal spirits, their level being determined by mere individual psychology. Thus, in terms of the model, the interest rate was the only variable explaining investment decisions: "Most, probably, of our decisions to do something positive, the full consequences of which will be drawn out over many days to come, can only be taken as a result of animal spirits of a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities" (Keynes, 1936, p. 161).

One of the first items to draw attention to these limitations of economic theory was Entrepreneurship in Economic Theory (Baumol, 1968) which referred to the need to integrate entrepreneurship in economic models and going beyond just maximising (or minimising) problem-solving. As a result, becoming part of other variables – even of sociological nature – to explain the factors that foster entrepreneurs' emergence in an economy. Before that, the most important consideration of the entrepreneur's role had been made by Schumpeter, who put the innovative entrepreneur in the centre of the driving forces of economic growth and progress of societies, an agent in charge of creative destruction resulting from the introduction of innovations (Schumpeter, 1934). After that, there comes the concept of competitive advantage of companies in the market over its competitors, which is shown as being dependent on lower costs or product differentiation which, in any case, implies the existence of strategies aimed at innovation and risk-taking in a durable, sustainable, and replicable manner (Porter, 1980), therefore, we can say that it would imply the existence of ESs.

Advancing in the chronology and trying to identify, in short, the most recent contributions of the literature found on this issue, we can then present some proposals concerning entrepreneurship: 1) Entrepreneurship is decisive in getting better and more efficient combinations of factors (Hoeyi & Dzansi, 2014) and should be incorporated into the context of a reformulation of the firm's economic theory (Foss, Klein, & Bylund, 2011); 2) Such increased efficiency derives from the entrepreneurial agent's characteristics: a) an entity that discovers and explores new opportunities; b) an organisation that creates and motivates change processes. These characteristics determine a behaviour which is guided by risk-taking, by intuition, alertness, and creation of new businesses; by leadership and the initiation of new modes of operation, by the identification of new business opportunities, and by the creation of new companies (Cuervo, Ribeiro, & Roig-Dobón, 2007); 3) There is a broad consensus that

entrepreneurship is a vital force in the economies of developed countries – the consensus is not evident as to what entrepreneurial activity is – most notably three transmission mechanisms through which a capital entrepreneur influences the product of economies: a) the impact of the knowledge generated; b) an increase in the competition inherent to an increase in the number of companies; c) an increase in the diversification of companies themselves (Audretsch & Keilbach, 2004; Braunerhjelm, 2008); 4) Entrepreneurship becomes strategic entrepreneurship when an entrepreneurial action is performed in a strategic perspective, more specifically, when this involves the simultaneous search of opportunities and competitive behaviour to pursue benefits for the design and implementation of business strategies driven by wealth creation. These actions can be carried out by individuals or companies (Djordjevic, 2013). When the search inherent to entrepreneurship opportunities is combined with the demand for advantages inherent to strategic management, articulating in a collaborative process, we are in the framework of strategic entrepreneurship (Foss & Lyngsie, 2011).

(2) Concept and Theory (CT)

To build this "concept and theory" category, 30 articles were identified and included. As can be seen, the academic silence on the role of the entrepreneur and entrepreneurial strategies of companies began to break up in the late 60s of the last century, as was said in 1999: "Research into the nature, antecedents, and effects of firm-level entrepreneurial activities has proliferated over the past 25 years" (Zahra, Jennings, & Kuratko, 1999). Thus, these authors in the same publication – one SLR on entrepreneurship in companies – isolated 45 empirical studies on the subject, published in the 70s, 80s and 90s, referring to Miller and Friesen (1982) proposals from Miller (1983). At the time, these were the dominant models of companies' entrepreneurship, which is consistent with the fact that these two articles today are the most cited in our survey.

Previously, the first article on the conception of ES had appeared (Murray, 1984), which was mentioned in the introduction but to which we will return. The argument about whether a strategy will have an entrepreneurial character or not is placed on a global change – a period of life of decisions of companies in which strategies are changing rapidly and more or less simultaneously. This leads the author to stress three key elements of entrepreneurial strategies: 1) continued adaptation of the company to the environment in which it operates, which is, necessarily, changeable and dynamic; 2) making decisions rupture in its internal organisational behaviour and input-output parameters of the production process; 3) a continued focus on change and a long-term perspective and not as an occasional response to an external shock, "a conservative company can, after all, continue entrepreneurial strategies" (Murray, 1984, p. 2).

Moreover, another decisive factor is the characteristics of entrepreneurial strategies, which can differentiate the concept's application to the established companies in confrontation with new companies. While in the first case entrepreneurial strategies arise as a process of adaptation to the environment in which companies operate, in the second scenario, new companies and/or new products will be instruments of change in the surrounding economic and technological environment itself, leading to such a change, which in turn causes structural changes in the companies (Dilts & Prough, 1987). Kurakto and Audretsch (2013) offer a synthesis of the conceptual evolution of corporate entrepreneurship, from the 70s to the present day, anchored in the list of relevant literature on the subject. Being the first attempts at the conceptualisation of entrepreneurial strategies, this has come to be considered insufficient, as this process which "has been depicted in the literature is the failure to produce satisfyingly cumulative knowledge on the topic" (Ireland, Covin, & Kuratko, 2009, p. 20). Our choice for this model is based on the fact that the authors, Ireland, Covin, and Kuratko (2009), place the ES at the centre of all the company's strategic action, and not as a consequence of the pursuit of any other strategic decision vector where entrepreneurship has to exist secondarily, eventually for reasons of competition in the markets. Consequently, we have a model that responds to what entrepreneurial strategies are, and elucidates factors that determine them, and clarifies the conditions for the process of implementation to be successful. We have not identified other relevant articles in opposition to this model, but rather complementary ones based on the contextual factors in the operating model and the interconnections between them.

(3) Frameworks and Models (FM)

This set of studies included in this approach (14 documents), consists essentially of empirical studies which show tools to assess the degree of the implementation of business strategies or to assess the impacts of this implementation on the overall performance of companies or a specific element of this measure of performance. Given the conceptual framework proposed by Ireland, Covin, and Kuratko (2009, p. 40), measuring ES does not seem easy. The authors recognize this as a challenge leading them to stating that the entrepreneurial vision is easier to conceptualise than measure. Therefore, some of the evaluation models focus primarily on specific manifestations associated with entrepreneurial strategies, as innovation levels (Kim & Boh, 2017; Miller & Friesen, 1982; Werker, 2003); others put the competence of the leadership at the centre of analysis (Endres & Weibler, 2017; Hansson & Mønsted, 2008; Jia, Wang, Zhao, & Yu, 2014; Ray, 1993). Some authors try to assess the ES in a broad sense (Dess, Lumpkin, & Covin, 1997; Ihrig, 2010; Johnson & Van De, 2017; Miller, 1983); others use the theories of complexity to operationalise Ireland, Covin, and Kuratko's (2009) model (Crawford & Kreiser, 2015).

In addition, some models use simulation processes (Ihrig, 2010), recent tools of artificial intelligence (AI), and neural networks (DaPeng, Ning, & Songting, 2016) to obtain results in the measurement of entrepreneurial strategies. Finally, there are also studies that present econometric evaluations of certain specific impacts (Lee & Liu, 2018), both of the context factors of entrepreneurial strategies and their macroeconomic impact on the economy as a whole (Werker, 2003). Faced with such a diversity of instruments, we can conclude that there is no uniform method of the assessment of ES that can be used in all types of companies and markets. The ES deemed most appropriate does not have to be the same for all companies as it is affected by the specific assets (patents, own skills, brands, talent, etc.) each company has. "Strategic management requires companies to establish and exploit competitive advantages in a specific environmental context, while entrepreneurship promotes the search for competitive advantages through products, processes, and innovations in the market" (Kuratko & Audretsch, 2009, p. 5). It is the integration of entrepreneurship with a strategy that defines the ES.

(4) Contexts and Applications (CA)

This set of theoretical articles (14 documents) is intended to study the application of ES in specific contexts, either problematising the implementation of ES or linking this implementation to certain variables characterising the environment in which companies operate. The variability of the studies is large, and their common denominator is their relationship with the items included in the four major groups proposed in the conceptual reference model of ES that was previously assumed, namely: 1) the external environment conditions; 2) organisational pro-entrepreneurship architecture; 3) individual entrepreneurial cognition; 4) entrepreneurial processes and behaviours.

Thus, we have studies on the connection/adaptation of entrepreneurial strategies with public policy (Doh & Pearce II, 2004); with the human resources management (Hayton, Hornsby, & Bloodgood, 2013); with rapidly changing technology scenarios (Page Jr. & Wiersema, 1992); with changing market scenarios (Dilts & Prough, 1987); with the research and discovery of new business opportunities (Companys & McMullen, 2007), and with the accounting methods of evaluating the value of companies and its capital (Bratland, 2012). Additionally, there are also studies on the application of entrepreneurial strategies in specific entities or certain types of companies, as in public departments (Page, 2003); in mature companies (Roaldsen, 2015); in regional innovation clusters (Feldman, 2014); in new companies as part of their integration into a business lifecycle model (Gundry & Kickul, 2007). Furthermore, those studies are connected with individual cognition of entrepreneurial decision-makers in terms of leadership and psychology (Felin & Zenger, 2009).

(5) Applications and Metrics (AM)

This group of empirical studies (22 documents), both quantitative and qualitative, tries to measure: 1) the impact of certain context variables on the design and implementation of entrepreneurial strategies;

2) or the impact of entrepreneurial strategies on various economic attributes of companies; 3) or interconnections between certain context variables and from there discuss the final effect on entrepreneurial strategies and businesses. The range of studies is large so that the variables represented in the studies on interconnections will be derived, among others, from: a) culture versus innovation (Sayan & Dinesh, 2012); b) imitation versus innovation (Ching, 2013); c) orientation versus entrepreneurial behaviour of an entrepreneur (Kemepade Moruku, 2013); d) guidance versus entrepreneurial business performance; e) entrepreneurial education versus strategic decision making (Sonfield & Lussier, 2014); f) intellectual capital and new businesses versus competitive advantages (Anwar, Zaman Khan, & Khan, 2018); g) control versus running in uncertain scenarios (Ching, Gans, & Stern, 2019). With regards to measurement referring to entrepreneurial strategies they will be on the impact of: a) manufacturing work (Stites 1985); b) on business performance (Gao, Ge, Lang, & Xu, 2018); c) on the emergence of new businesses and new enterprises (Muramalla & Al-Hazza, 2019); on innovation in companies with constrained resources (Kim & Boh, 2017). Finally, the interaction between entrepreneurial strategies and some context variables is quantitatively studied (Gupta, Moral, & Yang, 2018; Hietaniemi & Peltonen; Khan, Li, Safdar, & Khan, 2019; Jia, Wang, Zhao, & Yu, 2014; Xiao, 2015; Zhang, 2017).

CONCLUSIONS

This literature review can highlight the gap in theorising entrepreneurial strategies (ES), their conceptualisation, and the fundamentals found in the literature. Our analysis is the conceptualisation focused on five ES foundations: 1) Economic Theory and Entrepreneurship (ETE); 2) Concept and Theory (CT); 3) Frameworks and Models (FM); 4) Contexts and Applications (CA); and 5) Application and Metrics (AM). As a result, we have built a model of interactions (Figure 3) that summarises the five foundations identified throughout the literature review.

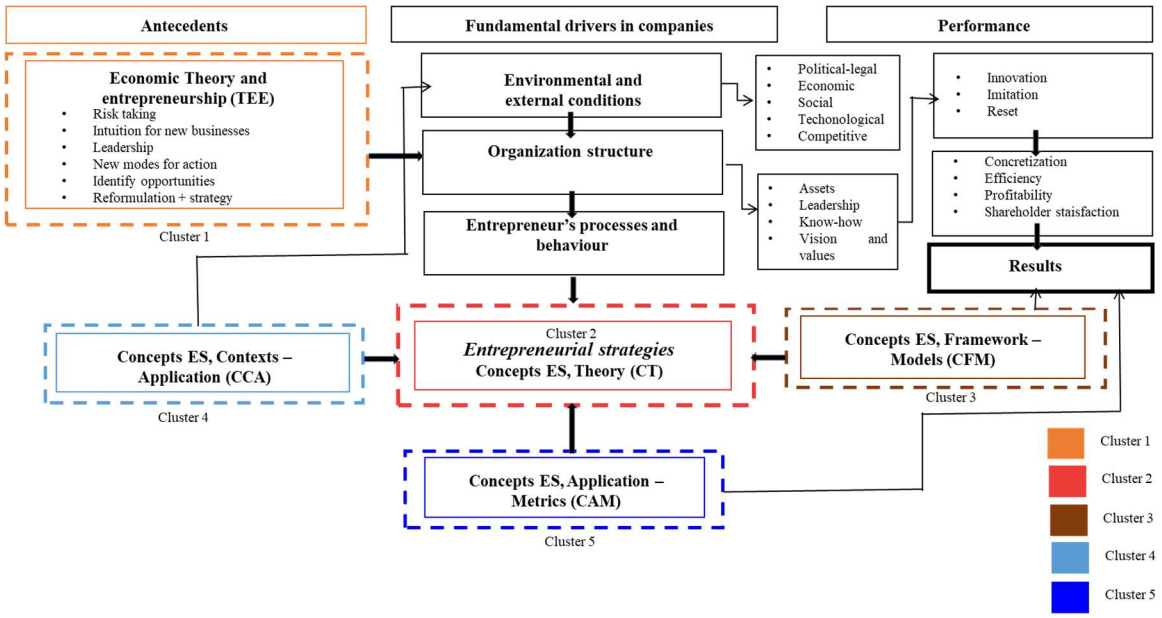

Figure 3. The conceptual model followed in the path of the SRL
Source: own elaboration.

In summary and placing the focus on the conceptual model of ES we elect as having the greatest explanatory capacity (Ireland, Covin, & Kuratko, 2009), we will present some proposals that we consider to have been acquired for each ES foundation: 1) The concept of an enterprising entrepreneur created by Schumpeter added a new dimension to economic theory. Entrepreneurs are the economic agents being proactive in research, promotion and implementation of innovation, introducing changes that radically alter the structure of the economic system. Entrepreneurial behaviour is guided by the recognition of new opportunities and the consequent exploitation of these opportunities, and this marked process

for entrepreneurs' beliefs, attitudes and values, which ultimately determine their entrepreneurial vision from which the characteristics of the need for realisation, willingness to take risks, and self-confidence emerge; 2) In the context of the company, the competitive business management is combined with entrepreneurship, we move to the conceptual level of strategic entrepreneurship, to the conceptual level of entrepreneurial strategies; 3) Achieving entrepreneurial strategies will lead companies to increase their results and performance, whether existing ones or emerging small and medium-sized innovative companies, depending on leadership, innovation in different contexts and associated with the entrepreneurial choice process; 4) Several conditions positively influence entrepreneurial behaviour, then the guidance for entrepreneurship (EO) and the implementation level of entrepreneurial strategies – higher education, training, goods market efficiency, labour market efficiency, technological readiness, and size of the market; 5) The performance increase is negatively correlated with the degree of uncertainty inherent to the environment in which companies operate (context variables), but positively correlated with the level and the speed of entrepreneurial learning in an ongoing trial and sequent proactive adaptation process. A high level of entrepreneurial strategies in more business structures generates a higher level of economic development, as demonstrated by several studies that we assessed.

This SLR allows to fill the gap in the concept of ES and its theoretical foundations, it also demonstrates that the diversity of research has been carried out – with conclusions not identical – on the subject of entrepreneurship and entrepreneurial strategies. This subject is far from being exhausted, either in theoretical or in empirical terms.

Regarding future research lines, when the literature points out the environmental factors that can be taken as limiting the implementation of entrepreneurial strategies, there is practically no reference to financial constraint. It is assumed that a clear entrepreneurial orientation at the organisation level is financially assured. The existence and support of an ES vision within the organisation necessarily implies an acknowledgment and assumption of costs, their measurement function, and a financial plan capable of supporting them continuously and for an uncertain period from which a return can be expected, respectively. Undoubtedly, these issues are relevant in established companies, when creating new companies, and during the emergence of new business. Therefore, in our view, it should be taken into account in future research lines. We assume some limitations in this research, particularly the use of only two databases for the collection of items that constitute the systematic literature review. Finally, other limiting drivers of the review may be the exclusion/inclusion criteria, especially the time constraints.

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Conflict of Interest

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Entrepreneurial Business and Economics Review

2021, Vol. 9, No. 3

10.15678/EBER.2021.090308

Assessing regional growth of small business in Russia

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ABSTRACT

Objective: The objective of the article is to estimate small business development across regions of the Far Eastern District in Russia with regard to economic, social and environmental dimensions of sustainability.

Research Design & Methods: For this, a mathematical model was built. Based on the relationship between the basic indicators of small business development, the growth leaders and laggers among the examined regions were identified.

Findings: The results of modelling suggest that small businesses in the Far Eastern District will not be able to enhance their profitability and offer larger salaries by 2024.

Implications & Recommendations: Hence, one of the major challenges is the search for ways to increase profitability. Emissions from stationary sources per small enterprise will continue to grow during the next 20 years.

Contribution & Value Added: The results of this study may be useful in determining business policy directions, appropriate mechanisms, and parameters to ensure effective business development at the local, regional, and global levels.

Article type: research article

Keywords: regional growth; enterprise; entrepreneurship; small business; profit; salary; emissions; performance; model

JEL codes: M10, M19

Received: 18 January 2021 Revised: 13 April 2021 Accepted: 30 April 2021

Suggested citation:

Mutalimov, V., Kovaleva, I., Mikhaylov, A., & Stepanova, D. (2021). Assessing the regional growth of small business in Russia. *Entrepreneurial Business and Economics Review,* 9(3), 119-133. https://doi.org/10.15678/EBER.2021.090308

INTRODUCTION

A favourable business environment is a basis for business development and economic growth. Today's economic climate creates opportunities for the broad mobilisation of financial, labour, information, material and other resources. Small-scale business with its flexibility and agility can be considered a key area of entrepreneurship development. Small businesses are more effective in reaching markets than larger ones, building closer relationship with consumers, and unlocking the intellectual potential of all employees (Aymen *et al.,* 2019). Small and medium-sized (or midsize) businesses are among the major drivers of a country's economic performance, job creation, and international competitiveness (Gričar *et al.,* 2019). They generate a substantial portion of goods and services provided. Today, small and mid-size businesses (SMBs) belong to the fastest growing segment of businesses (Ramdan *et al.,* 2020). Countries leading the world in economic growth provide support to SMBs, thereby stimulating innovation within organisations, enhancing the competitiveness of products and services, and contributing to a high standard of living (Scuotto *et al.,* 2020).

The global business environment is highly competitive and hence companies must be proactive and able to withstand the competition. Thus, entrepreneurial orientation is a strategic means of improving SMBs' performance. The development of market relations is directly linked to performance. A strong small business ecosystem as a driver of international competitiveness is characteristic of a developed economy. In modern conditions, small business is no longer only a factor of a country's welfare, but a

determinant of sustainable development, capable of influencing the solution of regional and global problems. At the same time, compliance with the principles of sustainable development is of particular importance, since the functioning of small businesses must be supported by economic, social, and environmental components (Dudin *et al.,* 2019). At the same time, there are differences in the analysis of each of the constituent components of sustainable development of small business, which consist in varying speed of the changes being made in the corresponding specific indicators. There is a need for the development of methodological tools for diagnosing the development of small businesses in regions, which makes it possible to take into account the components of their sustainable growth. Therefore, this study is aimed at filling the identified scientific gap by determining the conditions for the successful functioning of small businesses as a component of a sustainable business environment.

The scientific contribution of this study is the formation of a methodological approach to assessing the development of small businesses in regions, which allows the integration the economic, social, and environmental components of this process. It provides an opportunity to take into account the differences in the development of each of the constituent elements, identify the most vulnerable component and substantiate appropriate measures to increase the level of development of small businesses. It allows one to model taking into account different combinations of the influence of one or another component. This can serve as an additional tool for making strategic and political decisions at the state level, which can also affect global sustainable development as a whole.

The methodology of this study is based on a system of differential equations in combination with regression modelling. In this case, the development process is defined as a change in the corresponding indicators over time, taking into account the dynamics of indicators of the economic, social, and environmental components.

The research structure includes Literature Review, Materials and Methods, Results and Discussion, and Conclusions. The study conducted a literature review based on modern sources, which indicates that the same factor of entrepreneurship can influence small businesses in different ways depending on a region and its development. The Materials and Methods section reveals the logic of the proposed methodological approach to assessing the development of entrepreneurship. In the Results, the modelling of real processes of the development of small business was carried out using specific indicators for the economic (total profit of small enterprises), social (average monthly wages of those employed in small enterprises), and environmental components (emissions of harmful substances from stationary sources of pollution per one small enterprise). The discussion part is also described, including the advantages and limitations of this study in comparison with the achievements of other scientists. Based on the testing of the proposed methodological approach, conclusions are formed that emphasize the obtained results, include recommendations for the development of small businesses in Russian regions, and describe the prospects for research.

LITERATURE REVIEW

The new forms of business are economically attractive. Small businesses are easier to manage in a turbulent environment when compared to larger companies, hence, small business executives have fewer troubles making regular tax payments (Peprah *et al.*, 2020). The development of small business falls under the responsibility of institutions providing employment services. At the same time, it facilitates the creation of more comfortable and convenient living conditions in a country (Salcedo-Perez & Contreras, 2018). In times of a crisis, SMBs have unique development prospects. Thanks to their mobility and flexibility, they can successfully overcome the employment-related challenges, help employees terminated from large companies to socially adapt by hiring them for specific jobs, create new segments in the market, and provide new opportunities for economic growth (Ismail *et al.*, 2018). At the same time, the current policy regarding SMBs is not enough and new support mechanisms must be created.

All dimensions of entrepreneurial orientation have a significant impact on SMBs' performance; business opportunity, inclusive innovation, dynamic operations, value adding activities, risk-taking, and innovative decisions are among them (Adegbuyi *et al.*, 2018). The strength of the behavioural de-

velopment of small business managers relies on a greater focus on the market and resources, on improving planning and organisation strategies, and on raising awareness of the need for innovation (Coda *et al.*, 2018). Microfinance products, especially microloans, among other things, have a positive effect on the growth of small businesses (Gyimah & Boachie, 2018). The advancement and availability of information and communication technologies (ICTs) help business organisations to effectively produce and sell their products and services in the global market. Yet, many small companies have not adopted such technology, especially online stores and marketing innovations, to support their business activities (Boichenko *et al.*, 2020; Suhartanto & Leo, 2020).

The role of small businesses in the economy stems from their unique functions. In a sense, small businesses are monopoly killers: the more independent sellers on the market offering identical goods or services, the lower risk of price manipulations (Rohaeni & Sutawidjaya, 2020). Because small businesses are more sensitive to market changes, the substantial share of the small businesses sector in the structure of national economy makes it more flexible (Sohilauw *et al.*, 2020). The contribution of small businesses to scientific and technological development is significant, especially in areas such as electronics, cybernetics, and computational technology. Small firms accelerate the application of modern technology-related and economic ideas and release more high-tech products than large firms do. By doing so, they benchmark the enterprise standards (Fitriatia *et al.*, 2020). The small businesses growth creates new jobs and hence drives employment (Amoah & Amoah, 2018). Another important function of small business is to smooth over social tensions and democratic market relations (Mpaata *et al.*, 2020). Consequently, the core function of small business is to enhance socio-political sustainability while offering a broad range of business activities and methods for firms to choose from.

To date, eight approaches to modelling small business development have been identified. They include stochastic, evolutionary, resource, managerial, econophysical, knowledge-based, phased, and sustainable approaches (Wach, 2020). Reducing the environmental impact of SMBs in the production of goods and services is a key success factor in greening the economy (Baranova & Paterson, 2017). Even when it is known that improving environmental performance improves the competitiveness of a small business, a lack of relevant knowledge and experience discourages the use of environmentally sound options. At the same time, the limited internal resources of small enterprises contribute to the choice of a development strategy with minimal risks, with less willingness to invest in new technologies, partly as a result of the uncertainty of the payback period (De *et al.*, 2020). One of the main competitive advantages of a company is also a modern reality characterised by sustainable development. Taking only one approach to sustainability and ignoring others can make it difficult for businesses to compete at a high level (Álvarez Jaramillo *et al.*, 2019).

One factor can influence small business in different ways depending on a region and its level of development. At the same time, it is impossible to draw an accurate list of entrepreneurship factors influencing small businesses in Russian regions. For this, it is necessary to evaluate entrepreneurs' opinions and conduct a statistical analysis of factors across regional clusters (Shamalova *et al.*, 2020). Over the past years, significant efforts were undertaken in Russia to create favorable conditions for entrepreneurship development. As a result, the entrepreneurship sector has undergone quantitative and qualitative changes. Nevertheless, Russian economic levers to enhance small business sometimes do not take into account the regional specifics of entrepreneurial activity, which play an important role in developing the whole business sector (Pinkovtskaia *et al.*, 2019). The multidimensionality of the above issues predetermines the need for a qualitatively new direction of the research into the prerequisites, levels of development, and odds of business activity in the Far Eastern Federal District.

Considering the scientific potential of the given problem, there is a need for a more in-depth conceptual study of provisions regarding the formation of structural, organisational and economic foundations for regional small business development. For this, the study builds a model showing the consequences of the key socio-economic determinants, improves the mechanism of infrastructural support, and develops a range of appropriate proposals for transforming the interaction between business entities. The purpose of the study is to estimate small business development across regions of the Far

Eastern District of the Russian Federation with regard to economic, social, and environmental dimensions. In the process of achieving the goal, taking into account the review of modern literature, the following hypotheses were formed:

H1: the effectiveness of small business development in Russian regions depends on changes in economic indicators only.

H2: the effectiveness of small business development in Russian regions should have a comprehensive basis, including economic, environmental, and social components.

To confirm or refute the hypotheses formed in the study, the following scientific questions were posed:

- first, to determine the relationship between the number of small businesses and their turnover, as well as the number of small businesses per 10 000 people and their average number in the regions to highlight distribution trends;
- secondly, to carry out modelling of the economic, social, and environmental components of the development of small businesses in regions;
- thirdly, to determine the level of efficiency of small business development in the studied regions, taking into account three components.

RESEARCH METHODOLOGY

This study assumes that small business development in the Far Eastern District takes place in a sustainable way and has three dimensions: economic, social, and environmental. The rate of quantitative business changes varies between dimensions. For business entities, the process of development can be expressed by the following differential equation:

$$F(\bar{y}', t) = \frac{d\,\bar{y}\,(t)}{dt} \tag{1}$$

where $F(\bar{y}', t)$ is the function of dependence between the process of development and a vector derivative of $\bar{y}$ with respect to time; $\bar{y}$ is the vector of indicators representing the forms in which economic, social, and environmental components of development manifest; $d\,\bar{y}\,(t)/dt$ – is the first-order derivative of $y(t)$ with respect to time. In general, the first-order derivative reflects the instantaneous rate of change.

When modelling small business development, one should keep in mind that alterations in all components are interrelated. Therefore, the system of differential equations for the economic, social, and environmental components of development will be expressed as:

$$\begin{cases} F_1(y', t) = \dfrac{dy(x, z, t)}{dt} \\ F_2(z', t) = \dfrac{dz(x, y, t)}{dt} \\ F_3(x', t) = \dfrac{dx(y, z, t)}{dt} \end{cases} \tag{2}$$

where:

$F_1(y', t)$ - is the function of dependence between the economic component of development and the rate of change in y with respect to time;

$F_2(z', t)$ - is the function of dependence between the social component of development and the rate of change in z with respect to time;

$F_3(x', t)$ - is the function of dependence between the environmental component of development and the rate of change in x with respect to time;

$y(x, z, t)$ - is the function of the economic component of development with respect to the social component *z*, environmental component *x*, and time t;

$z(x, y, t)$ - is the function of the social component of development with respect to economic component *y*, environmental component *x*, and time *t*;

$x(y, z, t)$ - is the function of the environmental component of development with respect to the social component *z,* economic component *y,* and time *t*.

The right-hand side of the equation $df(t)/dt$ is the first-order derivative of *f(t)* with respect to time. The first-order derivative reflects the rate of change, that is, the change per unit of time. Hence, the process of small business development can be defined as a change over time in any of the three components of development with respect to other two components. The process of mathematical model specification of small business development consists of two steps. In step 1, indicators are selected that form a particular component of development. In step 2, the dependence between the selected indicators is found. The climate for business development can be assessed by looking at the operational performance of small firms. From this perspective, the indicators of economic development include the total profit and the gross output of small enterprises (both in absolute terms and per enterprise). Similarly, social development can be quantified with the help of indicators, such as social spending, social income, social effects, and social losses (in value terms). The value of tangible variables in the social component will change along with the economic indicators, and the value of intangible variables will show a decelerating logarithmic growth. The behaviour of economic, social, and environmental indicators can be estimated using a logistic function (da Costa Campos, 2019):

$$\frac{dy(t)}{dt} = \alpha \cdot \left[\frac{y_{max} - y(t)}{y_{max}} \cdot y(t)\right] \quad (3)$$

where:

$\frac{dy(t)}{dt}$ - represents the rate of change in y;

α - is the average annual rate of change in *y* on a per-unit basis;

y_{max} - is the maximum value of y recorded;

$y(t)$ - is the value of *y* for the selected value of t;

$\frac{y_{max}-y(t)}{y_{max}}$ - represents the impact of business environment that hinders the exponential growth of *y*.

The right side of the equation can be roughly divided into two parts. The first part α shows the contribution of one unit of something within the conditional frame of time $\Delta t = t_n - t_{n-1}$: for example, if *y* represents profit, then *α* will show the amount of additional profit a firm will obtain per dollar of revalue gained during the given time period *Δt*. The second part $\left[\frac{y_{max}-y(t)}{y_{max}} \cdot y(t)\right]$ reflects the value of *y* for the selected value of *t*with regard to the impact of the business environment. The expression $\frac{y_{max}-y(t)}{y_{max}}$ shows how much is left to reach the maximum value of *y*. To tailor the equation to the requirements of modelling, it is necessary to consider the influence of factors other than time on the selected indicators. For this, the right side of the equation was revised as follows:

$$\frac{\partial y(\underline{x}, t)}{dt} = \alpha \cdot \left[\frac{y_{max} - y(\underline{x}, t)}{y_{max}} \cdot y(\underline{x}, t)\right] + y(\underline{x}) \quad (4)$$

where $\underline{x}$ is the vector of a certain factor affecting y; and $y(\underline{x})$ is the function of dependence between y and $\underline{x}$.

The least complicated version of the function $y(\underline{x})$takes the form of a linear regression equation:

$$y(\underline{x}) = a_0 + a_1x_1 + a_2x_2 + \ldots + a_nx_n \quad (5)$$

where a_0 is the intercept; $a_1, a_2, \ldots a_n$ are regression coefficients for factors $x_1, x_2, \ldots x_n$.

The regression coefficient estimates the change in the indicator per unit increase in x_k. The upper bound of y_{max} shifts when adding more variables to the equation. However, the existence of a threshold value is not to be denied, since the growth of y_{max} will gradually slow down until constant when factors reach their critical value. This is due to the fact that the *x* variables also change along the logistic curve.

In this study, the factor affecting the social and environmental components of small business development is the economic component of development. The first two components, however, have little impact on the economic one, and here is why. Because the growth of the small businesses

sector is a recent event, the economic component of its development relies specifically on the time factor, that is, on the profit gained in previous years. Therefore, the system of differential equations for the economic, social, and environmental components of development will take the following form (6):

$$\begin{cases} \dfrac{dy(t)}{dt} = \alpha \cdot \left[\dfrac{y_{max} - y(t)}{y_{max}} \cdot y(t)\right] \\ \dfrac{\partial z(y,t)}{dt} = \beta \cdot \left[\dfrac{z_{max} - z(t)}{z_{max}} \cdot z(t)\right] + a_1 y(t) \\ \dfrac{\partial x(y,t)}{dt} = \gamma \cdot \left[\dfrac{x_{max} - x(t)}{x_{max}} \cdot x(t)\right] + a_2 y(t) \end{cases} \quad (6)$$

where:

$\frac{dy(t)}{dt}$ - is the rate of change in y;

$\frac{\partial z(y,t)}{dt}$ - is the rate of change in z;

$\frac{\partial x(y,t)}{dt}$ - is the rate of change in x;

$y_{max}, z_{max}, x_{max}$ - are the maximum values of economic, social, and environmental components, respectively;

$y(t), z(t), x(t)$ - are the values of economic, social, and environmental components with respect to time;

α, β, γ - are the average annual rates of change in $y, z, and\ x$ on a per-unit basis;

a_1 - is the regression coefficient (estimates the change in $z(t)$with resect to $y(t)$);

a_2 - is the regression coefficient (estimates the change in $x(t)$ with resect to $y(t)$); t is the selected value of time.

t - is the selected value of time.

The mathematical model of small business development uses three types of indicators: the economic (the total profit small enterprises make in the Far Eastern District), social (the average monthly salary of those employed at small enterprises in the Far Eastern District), and environmental (emissions from stationary sources per small enterprise). The average annual rate of change in these indicators was determined on the basis of the results of the regression analysis. It is found that the average annual rates of change in total profit are 0.32 million USD (α = 0.32), salary 0.13 USD (β = 0.13) and emissions 0.28 tonnes (γ = 0.28). The regression coefficient (a_1 = 169) indicates that a 1 million USD increase in profits generated by a small enterprise results in a 169 USD increase in salary. From data in Table 1, it is evident that the value of the determination coefficient of a linear regression model is relatively low.

Table 1. The results from the regression analysis of profit-salary relationships in small enterprises in the Far Eastern District

Regression model	Variable	Coefficient of determination
Linear	$z = 468.3 + 24.7y$	0.58
Logarithmic	$z = 218 + 169\ln(y)$	0.64
Exponential	$z = 512.4e^{0,034y}$	0.61

Source: own study.

Therefore, the right side of the equation estimating the rate of change in salary will be transformed into an expression with the highest coefficient of determination possible, that is, the logistic one:

$$\frac{\partial z(y,t)}{dt} = \beta \cdot \left[\frac{z_{max} - z(t)}{z_{max}} \cdot z(t)\right] + a_1 \ln(y(t)) \quad (7)$$

The input variables are depicted in Table 2. Given the absence of a close relationship between the variables of total profit and emissions, the part of the equation (6) with $a_2 y(t)$ was not used in modelling the growth of small business.

Table 2. Input data for modelling small business development across regions of the Far Eastern District

Variable	Designation	Value
The highest (maximum) profit, million USD	y_{max}	500
The highest (maximum) salary, USD	z_{max}	5000
The highest (maximum) level of emissions from stationary sources per small enterprise, tonnes	x_{max}	70
The average annual rate of change in profit, million USD per year	α	0.32
The average annual rate of change in salary, USD per year	β	0.13
The average annual rate of change in emissions from stationary sources per small enterprise, tonnes	γ	0.28
Regression coefficient, USD/million USD	α_1	169

Source: own study on the basis of their own calculations and data (Federal State Statistics Service, 2020a, 2020b, 2020c).

RESEARCH METHODOLOGY

The relationship between the number of small businesses and their turnover across regions in 2019 is depicted in Figure 1. As it can be seen, there are 125.7 thousand small enterprises operating in the Far Eastern District (Federal State Statistics Service, 2020), with the highest concentrations found in the Khabarovsk and Primorsky Krai.

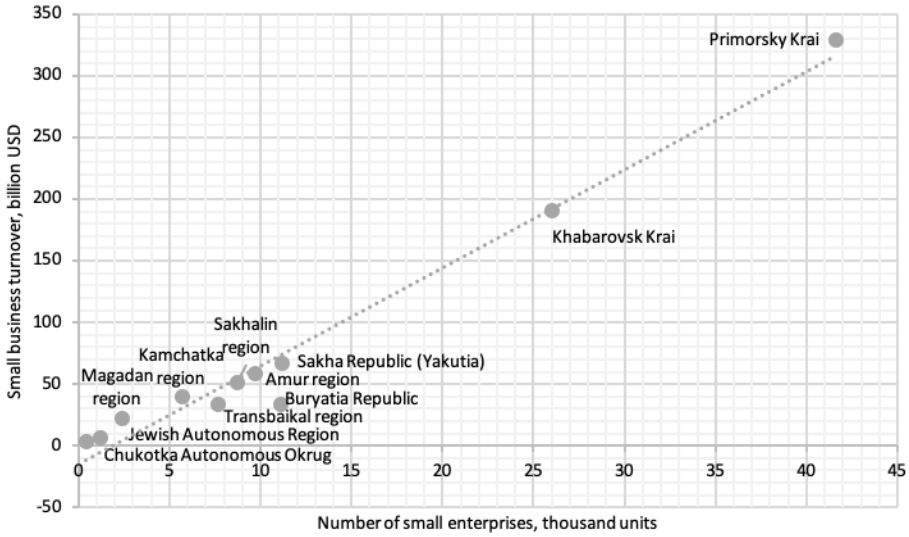

Figure 1. The relationship between the number of small businesses and their turnover across regions in the Far Eastern District as of 2019

Source: own study on the basis of data (Federal State Statistics Service, 2020a, 2020d).

The highest proportion of small businesses and the highest turnover were recorded in the Primorsky Krai, which makes it the region with the best small business statistics. The Khabarovsk Krai also has a substantial number of small firms and enterprises with sufficient turnover but it is far behind the Primorsky Krai. The smallest number of small businesses and the lowest turnover are attributable to the Chukotka Autonomous Okrug.

The analysis of the relationship between the average number of small business employees and the number of small enterprises per 10 000 population (Figure 2) indicates the absolute leadership of Khabarovsk and Primorsky Krai.

The smallest number of small businesses per 10 000 population was recorded in the Trans-Baikal and the smallest number of employees was found in the Chukotka Autonomous Okrug. This unevenness may be due to a range of factors. First, the regional growth of small business in the Far Eastern regions is hampered by the low density and unequal distribution of the population. The level of business activity was found to be more prominent in large urban agglomerations. Second, the Far Eastern District has a

large area, which determines the significant differences in the physical and climatic characteristics between regions. Northern regions such as Chukotka, Magadan, and Kamchatka have harsh climatic conditions, which make them unattractive for living and doing business. It should be noted that these regions also lack a sufficiently developed transport infrastructure. In regions where agriculture is on rise (the Jewish Autonomous Region and the Amur Region), small businesses are not common. Hence, the presence of natural resources is an equally important factor for the regional economic development.

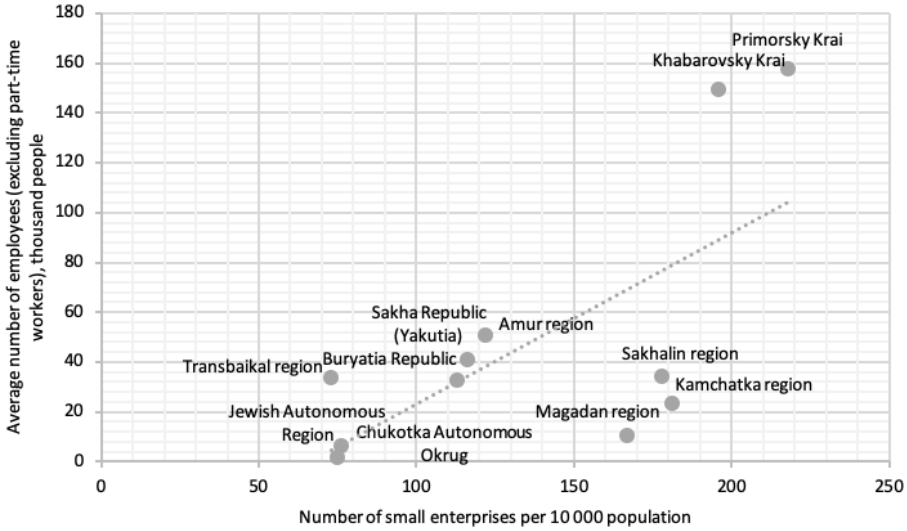

Figure 2. The relationship between the average number of small business employees and the number of small enterprises per 10 000 population across regions in the Far Eastern District as of 2019
Source: own study on the basis of data (Federal State Statistics Service, 2020a, 2020d).

The results of mathematical modelling suggest that it would take 4 years for small enterprises in the Far Eastern District to reach the maximum total profit possible without expanding the market (Figure 3).

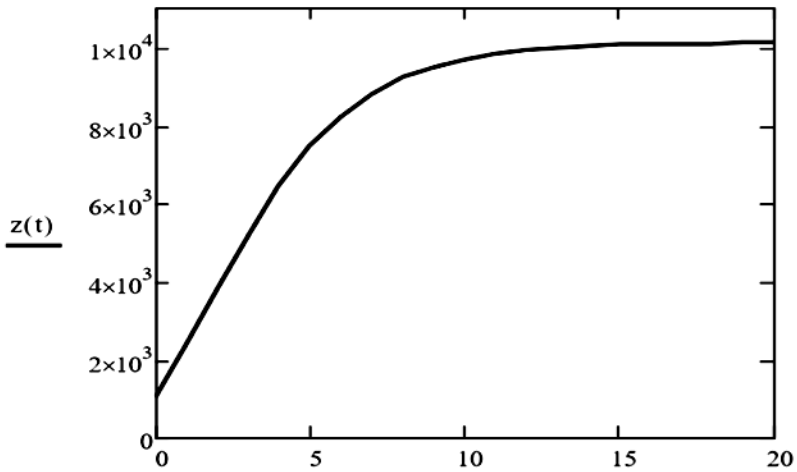

Figure 3. The changes over time in the economic component of small business development
Source: own study.

The Far Eastern District has a rather strong climatic and natural-resource potential. For instance, Sakhalin and Sakha Republic (Yakutia) can benefit a lot from mineral extraction. The standard of living in these regions is relatively high, which contributes positively to small business development. This determines the potential and scale of small business development and growth. Nevertheless, the regional growth rate of small businesses largely relies on the actions of the local government. The results of the study indicate that one of the major challenges for small businesses 3-4 years from now might

be the search for ways to increase their own profit past the limit. The solution might be innovation. As the profit grows, it would take 4 years to reach the maximum salary of 5 000 USD (Figure 4).

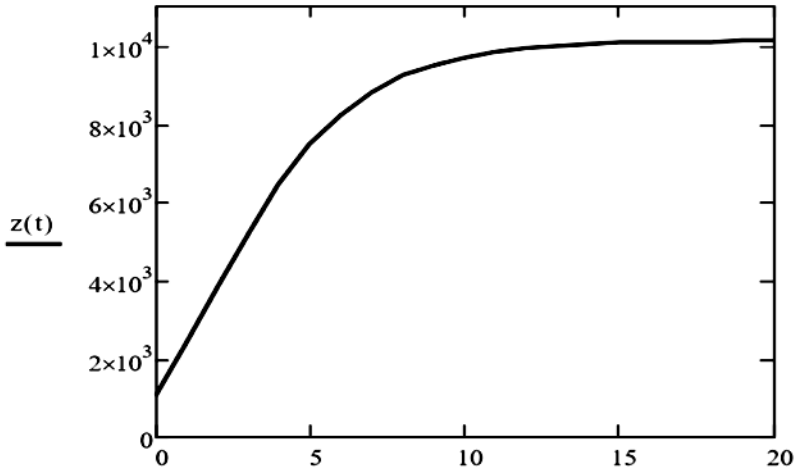

Figure 4. The changes over time in the social component of small business development
Source: own study.

In 2022, the salary increase may be up to 2 thousand USD per month, 1 thousand USD past the limit. The salary for small business employees is a figure that consists of salaries for both family and other employees. The above increase stems from profit growth.

It was also found that the volume of emissions per small enterprise is unlikely to reach its maximum value over the next 20 years (Figure 5).

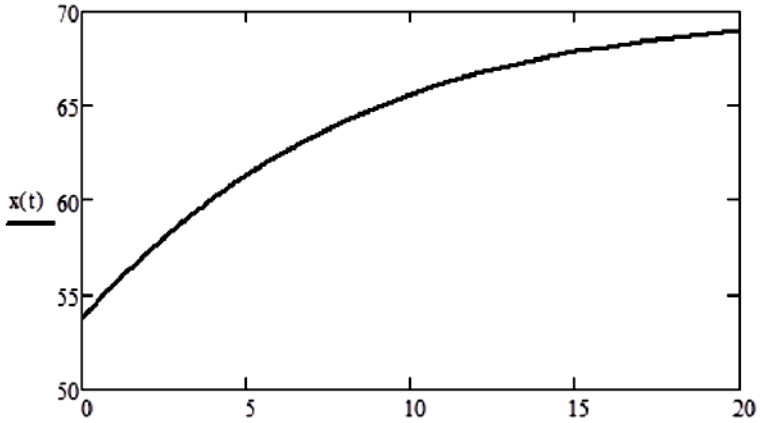

Figure 5. The changes over time in the environmental component of small business development
Source: own study.

Although the growth rates of emissions are relatively low, it is a problem to have them grow in the first place. Therefore, there is a need to introduce operational innovations to small businesses running in the Far Eastern District to prevent the negative environmental footprint from further growing. The development is a process of change, which in this study is addressed as the rate of change. Figure 6 shows that the salary growth rate may fall significantly during the first two years, and changes in the profit growth rate are likely to be much less significant.

At the same time, the higher the rate of increase in profits, the faster the salary will grow. One of the challenges for small businesses in the Far Eastern District is their economic underperformance. Profitability in this case is achievable through the mathematical model of logistic growth (equation 3). To estimate the lag of the regional small business behind the country-level alternatives, it is advisable to apply an approximation coefficient, which is defined as 1 minus a lag coefficient. The maximum

value of the approximation coefficient is $y_{max} = 1$. The change in the average annual rate is $\alpha = 0.17$ and the initial value of y_{max} is 0.4. The results from the modelling of profitability enhancement are depicted in Figure 7. As it can be seen, small enterprises operating in the Far Eastern District will be able to achieve the all-Russian level of economic development within the period of 17 years if nothing changes. Thus, a mechanism is needed to increase profitability of regional small enterprises and create conditions for their effective performance.

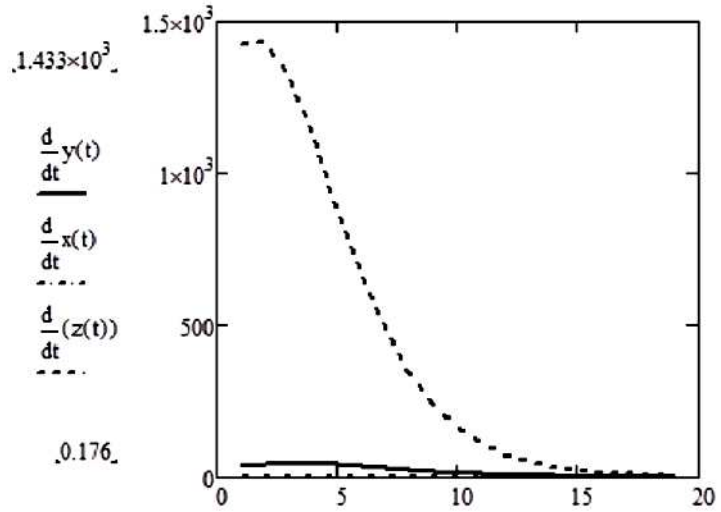

Figure 6. The rate of change in economic, social, and environmental variables
Source: own study.

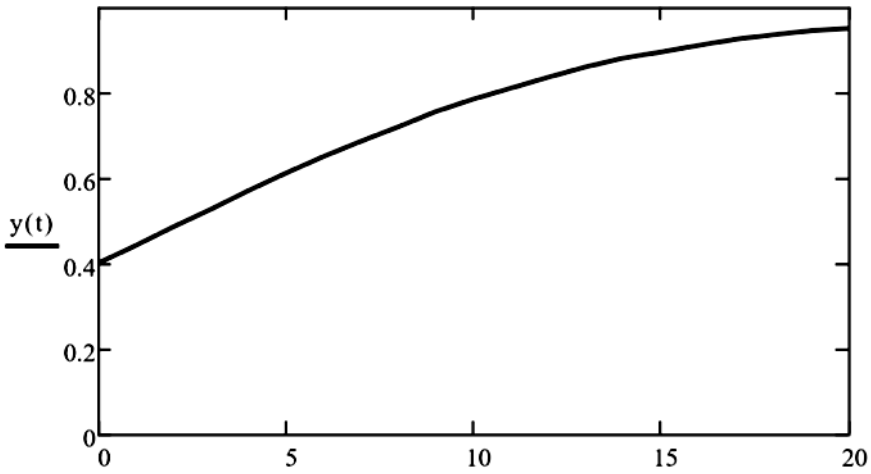

Figure 7. The changes over time in the value of profitability of small enterprises
Source: own study.

The study shows that the modelling of regional small business development should be based on the assumption that it is consistent with the basic principles for sustainable development. This assumes the rejection of hypothesis H1 and confirms the formed hypothesis H2 since the development of small businesses in Russian regions has to be integrated. At the same time, it is advisable to express the mathematical model as a system of differential equations reflecting the rate of change in indicators of economic, social, and environmental development.

The main advantage of the proposed methodological approach is that it conducts a joint assessment of the economic, social, and environmental components of small business development. The present research has a similar direction to the results of research by Dudin *et al.* (2019). They are also focused on the sustainable development of entrepreneurship, but they do not take into account the rate of change

in quantitative indicators, namely, their variation from one to another. Research by Salcedo-Perez and Contreras (2018) accumulates results on the change in business value for a circular economy, which also confirms the need for sustainable enterprise development. Asim *et al.* (2019) studied SMBs' sustainability and used regression analysis, but this was based on a survey of respondents.

Burrus *et al.* (2018) have results at the US county level that correlate the levels of innovation in regions and enterprise performance in those regions. The present study findings indicate that small businesses also need to focus on innovation and reinvestment in innovation to improve competitiveness; this complies with the study by Hughes *et al.* (2020). However, the proposed model is notable for its versatility, allowing one to evaluate changes in any indicator. The research results show that while maintaining the current level of development of the productive forces, profit growth will be significantly limited.

Garrigós Simón *et al.* (2017) emphasized encouraging social entrepreneurship by a state to improve a population's welfare. However, one cannot fully agree with this, since the source of social development of business should be a small business, which forms the basis for social security of a state. However, the proposed model can help small business owners determine how to achieve growth (Li *et al.*, 2020). Future studies can measure levels of sustainable development across the regions surveyed by Neumeyer and Santos (2018). The range of indicators of environmental development can be expanded in several directions to include environmental spending (expenditures for environmental protection, public health, etc.), environmental income (monetary benefits of environmental activities for a population), environmental effect (environmental income minus environmental spending), and environmental losses (expenditures due to pollution). This comprehensive approach is supported by a study by Buffa *et al.* (2018).

Individual components are highly dependent on timing and other components. In this context, the results of the present study are similar to Johnstone (2020), as indicators can have either a stimulating or a constraining effect on small business growth. On the other hand, there are environmental indicators that tend to decrease, and the rate of their change is slowing down. However, research by Rekik and Bergeron (2017) indicates that, in practice, such rates tend to rise up to the government-set limit.

The proposed approach to estimating small business development allows to identify areas of regional policy that need adjustment (Pichler, 2018). In addition, it indirectly allows for a comparative performance analysis of public authorities across regions. This contributes to a holistic vision of how a state policy for regional development should be designed with respect to the potential of a region for which it will be designed.

CONCLUSIONS

The results of the study show that large urban agglomerations, such as Khabarovsk and Primorsky Krai, have a stronger small business landscape when compared to other regions. The least strong small business landscape emerged in the Trans-Baikal region and the Chukotka Autonomous Okrug due to the low density and unequal distribution of the population in those territories. Northern regions such as Chukotka, Magadan, and Kamchatka were found to be unattractive for doing business due to harsh climatic conditions.

Despite the important role of the economic component for the functioning of small businesses, Russian regions must develop in an integrated manner. The higher the growth rate of profit, the faster the growth rate of salary. The results of modelling suggest that small businesses in the Far Eastern District will not be able to enhance their profitability and offer larger salaries by 2024. While the growth rate of salary is expected to decrease significantly during the first two years, changes in the profit growth rate will be much less significant. Hence, one of the major challenges is the search for ways to increase profitability. This can be done through innovation. Emissions from stationary sources per small enterprise will continue to grow during the next 20 years. In current market conditions, it will take 17 years for small enterprises in the Far Eastern District to reach the all-Russian level of economic development. Thus, a mechanism is needed to increase profitability of regional small enterprises and create conditions for their effective performance.

The limitation of the study is that the change in each component is due to both the time and changes in other components of development. Future studies will benefit from expanding the range of indicators for the model and from looking at other regions and countries. They also may estimate the overall business sector. The results of this study may be useful in determining business policy directions, appropriate mechanisms, and parameters to ensure effective business development at the local, regional, and global levels.

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The contribution of co-authors is equal and can be expressed as 25% for each of the authors: V. Mutalimov prepared the concepts, I. Kovaleva prepared the literature review, A. Mikhaylov prepared the methodology, while D. Stepanova prepared the survey.

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Acknowledgements and Financial Disclosure

The authors received no financial support for the research, authorship, and/or publication of this article.

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Published by Cracow University of Economics – Krakow, Poland

Entrepreneurial Business and Economics Review

2021, Vol. 9, No. 3

10.15678/EBER.2021.090309

Local government policy towards the financial instruments supporting entrepreneurship

Tomasz Skica, Jacek Rodzinka

ABSTRACT

Objective: The objective of the article is to determine the scope of the use of financial instruments to support entrepreneurship by communes in Poland.

Research Design & Methods: The article is a quantitative study. The source of data was a survey carried out among Polish Local Government Units (LGUs). In the article several methods were used: descriptive statistics methods, variable classification and grouping, Pearson's chi-square coefficient, Cramer's V coefficient and comparative analysis.

Findings: The research results indicate that LGUs conduct inefficient fiscal policies. LGUs do not measure the results of their policies and do not address their activities oriented on entrepreneurship support well. As a result, one in five of the surveyed units was exposed to negative budgetary effects because of the policy on the tax on means of transport and more than every fourth one in relation to the real estate tax.

Implications & Recommendations: LGUs should diagnose local economic conditions in terms of individual needs and choose instruments that match the unique conditions of the local environment. LGUs should also pay more attention to measuring the effects of their activities in order to stop ineffective activities and reorient associated financial streams.

Contribution & Value Added: Due to the scope, multifacetedness and uniqueness of the collected data, the article is a significant added value in terms of recognizing the scope and diversity of LGUs' use of financial instruments to stimulate entrepreneurship in Poland. The undertaken topic related to the widespread problems with LGU financing is an important contribution to the discussion on strengthening the effectiveness of the financial policy of Polish LGUs.

Article type: research article

Keywords: entrepreneurship support instruments; financial support; local government units; local policy

JEL codes: H10, H30, L26

Received: 6 November 2020 Revised: 22 February 2021 Accepted: 16 April 2021

Suggested citation:

Skica, T., & Rodzinka, J. (2021). Local government policy towards the financial instruments supporting entrepreneurship. *Entrepreneurial Business and Economics Review,* 9(3), 135-147. https://doi.org/10.15678/EBER.2021.090309

INTRODUCTION

A local government unit's (henceforth LGU) responsibility for supporting entrepreneurship is the result of the decentralisation of public administration (Bartlett *et al.*, 2013) and related equipment of local governments with assets, sources of income and legal personality. Of all the solutions available to local governments to shape the local economic environment, financial solutions play a special role (Riedel *et al.*, 2020). Their introduction, however, should be well thought out and well adapted to the specificity of a given territorial unit, and at the same time skilfully applied (Gabe & Bell, 2004). The experience of LGUs' activities proves a kind of the universalisation of approaches in conducting development policies. Meanwhile, individually developed solutions to support entrepreneurship has the chance to strengthen development effects, reduce unnecessary expenditures on activities that do not translate

into support for entrepreneurship, and ultimately contribute to the visibility of local competitive advantages (Thurik, 2008). It is therefore necessary to identify patterns in entrepreneurship support policies conducted by LGUs that optimise the effects for economic development supported by instruments that individualise the potential of individual communal self-governments (Cheshire & Gordon, 1998). This problem is not sufficiently recognized, and it is best evidenced by incorrectly implemented local policies, which, often paid for by contributing to their development and implementation, do not bring expected results (Curran, 2000; Easson & Zolt, 2002).

This article aims to make a precise diagnosis of the scope of application communes of financial instruments for supporting entrepreneurship in Poland by communes. On this basis, the authors intend to indicate changes in the directions of local public policies that will make it possible to strengthen the effectiveness of the implemented financial instruments in supporting entrepreneurship.

The biggest value added of this article is presenting the results of the research on public entrepreneurship support policies implemented at the local level in a much more comprehensive and inclusive way than previous studies on this topic. Both the scope and size of the sample predispose the research presented in this article to be one of the most important and comprehensive in Poland. The article is cognitively valuable because its findings relate to the largest economy from CEE in the EU, a country that is an example of a successful systemic transformation. Hence, the conclusions contained in it may also be extended to other countries at a similar level of development and with similar systems of public finances. The article explores the issues of entrepreneurship support instruments applied by local government units, and fills the gap in the knowledge of the availability and scope of their use in local public policies. The implementation of the research goal will be carried out using the CATI survey method.

This article begins with an analysis of the literature and research results dedicated to the financial forms of entrepreneurship support used by local government units and the accompanying results. The research methodology part covers data sources, the method of their collection and the presentation of the research methods used by the authors in the article. The results and discussion part is a presentation and analysis of the results of the research carried out. The conclusions, on the other hand, provide guidance for policy makers to make the financial support instruments be used more effectively.

LITERATURE REVIEW

Financial instruments to support entrepreneurship are the object of research for many economists and public finance practitioners. At the same time, these studies often divide financial instruments into income and expenditure nature (Bruce *et al.*, 2019). Taxes, as instruments for supporting entrepreneurship, are examined in the works by Cullen and Gordon (2007), Gurley-Calvez and Bruce (2013), Holtz-Eakin (2000), and Gentry and Hubbard (2000). In turn, expenditure support for entrepreneurship is undertaken in works by, among others, Krichevskiy and Snyder (2015), Gabe (2001), as well as Sutaria and Hicks (2002) and Amorós *et al.* (2019).

The results of research presented in the works by the recognized authors lead to several conclusions. The first is the dominance of approaches based on a separate study of the use of the above-mentioned forms of support by local governments and the accompanying results (see Perska, 2014). Secondly, the attempts made by the authors to explain the issue of the instrumentalisation of entrepreneurship support by local government units are much more focused on examining individual instruments (e.g. preferences in property tax) and referring them to only one category of communes rather than on research including all types of local units in Poland (see Barej, 2011). As a result of the presented approaches to research in the literature, there is still a lack of knowledge about differences in the use of financial instruments due to the criterion of the commune's type category. At the same time, in the literature, the approach that differentiates the forms of support depending on whether they are dedicated to supporting entrepreneurship in rural areas, in cities or in intermediate places is considered important and cognitively valuable (Renski, 2008; Arauzo-Carod & Teruel-Carrizosa, 2005).

Considering the observations made, in the first stage of work on this article, financial instruments for supporting entrepreneurship available to local governments were identified and grouped (see Pergelova & Angulo-Ruiz, 2014; Lee *et al.*, 2017). Not all actions that can be taken by local governments

(i.e. be implemented) were listed, but the importance of those which - according to the results of the above-mentioned authors – in a real way contribute to the development of entrepreneurship, was emphasized (see Pahwa *et al.*, 2006). Table 1 is the result of literature studies.

Table 1. Financial entrepreneurship support instruments used by communes in Poland

Financial instruments of direct support (tax policy)	Financial instruments of indirect support (acquisition of investors and external funds)
1. Lease or sale of communal property to entrepreneurs intended for business activities; 2. Involvement of local authorities in financial support for entrepreneurs through preferential prices for communal services; 3. Applying preferential tax rates and tax breaks for new businesses; 4. Granting sureties and loan guarantees to entrepreneurs; 5. Establishing a micro-fund to support economic initiatives.	1. Conducting marketing activities, external advertisement of LGU; 2. LGU's support in finding spare lands or premises; 3. Involvement in legal and financial advice for entrepreneurs; 4. Provision of personalised service during business registration; 5. Using websites as means of disseminating information about LGU being a place for capital location; 6. Using informational and promotional materials about LGU in a foreign language; 7. Promoting LGU at foreign fairs; 8. Separation of a unit or position at the office dedicated to servicing foreign investors; 9. Location of a Special Economic Zone on LGU's territory.

Source: own study.

A comparison of possibilities of using instruments belonging to both groups in relation to local government units of different levels indicates the relative advantage of solutions based on public expenditure (Tödtling & Wanzenböck, 2003). These instruments (in vast majority) can be successfully used by all of the stages of decentralised governments, while income instruments based on local taxes are the domain of communal governments only (Parker, 2009). According to the applicable regulations, communes have limited tax authority. Paradoxically, the financial independence being the domain of communes may be its weapon but also the greatest weakness (Villela *et al.*, 2010; Bykov & Zimmermann, 2018). An improperly conducted tax expenditure policy results in significant threats to the budget stability, and thus the ability to undertake and conduct development activities. For example, Dziuba (2016) shows that the application of fiscal preferences reduces local budgets, and their scale varies depending on the type of taxes and the type of communes applying them. These effects are most noticeable in taxes on transport and real estate in urban communes. Moreover, the propensity to use tax instruments varies geographically. According to Filipiak (2016), in Poland these solutions are most often used by local government units in the south-east (Lublin Voivodship, i.e. less developed part of the country) and least often in the south-west (Silesian Voivodship, i.e. much more developed region of Poland). Similar conclusions are provided by Klun (2012) for Slovenia and by Morgenroth (2010) for Ireland.

An improperly conducted expenditure policy can also be a source of dangers to a local government's finances and thus the ability of communes to conduct effective entrepreneurship support policies (Prud'Homme, 1995). In Poland, examples of "bankruptcies" of communal self-governments due to excessive investment activity are known. The Ostrowice commune is worth mentioning. Similarly, there is a larger number of communes in Poland, i.e. Rewal and Dziwnów, Byczyna and Wałbrzych. This narrative fits the position of Holcombe and Williams (2009), who prove that one cannot speak of economies of scale as a result of increased budget spending at the local level. This fact justifies the discussion about the effectiveness of expenditure development support instruments for the local economy (Shen *et al.*, 2015; Solé-Ollé, 2006; Bayoumi, 1991). As it results from the presented examples, overinterpretation of the effectiveness of local government expenditures in stimulating the development of local systems can result in diametrically opposed effects (Primo, 2010).

Given that both tax and expenditure policies can have negative effects on the establishment of new firms, the question whether there are certain formulas in the structure of the instruments used that are appropriate for specific categories of local government units is justified. So far, only single attempts at cross-sectional studies showing the use of financial instruments to support entrepreneurship have been

made in literature. As a result, there is no complete and reliable diagnosis concerning the financial instruments used in particular types of LGUs, especially in the CEE countries, including Poland. This study, due to the range of instruments covered by the study, their addressing all types of LGUs and a large research sample, significantly contributes to filling the gap in the knowledge about the examined issue.

As a result of the presented approaches to research in the literature, there is still a lack of knowledge on determinants explaining the use of financial instruments by LGUs. The literature review allowed to assume the following research hypotheses:

H1: The use of financial instruments varies according to the category type of a commune.

H2: Communes do not analyse the budgetary consequences of the implementation of financial support instruments.

RESEARCH METHODOLOGY

The selection of units for the research sample was two-stage. In the first stage, purposeful selection was used – it involved communes that participated in the research carried out in 2015 by the scientific team as part of the project "Supporting entrepreneurship by local government at the commune level". In 2015, 735 communes participating in the Polish edition of the Global Entrepreneurship Monitor research project were surveyed. The idea was to combine data on attitudes and determinants of entrepreneurship in Poland (GEM) with research carried out by the scientific team.

In this study, 735 communes were examined using the CAWI method and about 383 correctly completed questionnaires were received. The contact details of the communes that had not responded were forwarded to the CATI studio altogether with 347 communes added from the database of all communes in Poland, so as to ensure a sample with the same structure as the actual structure of communes in Poland by type. After analysing the situation and the possibility of effective application, proportional stratified sampling was selected. This choice was determined mainly by the fact that it ensures high efficiency of the sample selection. In addition, dependent randomisation was used, i.e. without return.

The CATI research database consisted of 699 communes (352 with GEM and 347 randomly selected), of which 513 questionnaires were completed, 84 refusals were noted, and no contact was possible with 102 units. As a consequence, the study was conducted among 896 local government units, which resulted in the study of over 36% of the entire population, additionally, the structure of the units accepted for the study was consistent with the structure of the general population (by commune type). Despite the fact that some of the units accepted for research came from deliberate selection, by adding an appropriate number of communes of each type, the appropriate structure and size of the sample was ensured, and thus it can be considered that the research was representative.

This study on the use of entrepreneurship support instruments was carried out in the period of June – October 2019. The exact structure of the research sample of communes is presented below (Figure 1).

This part of the article analyses the differences between the type of commune and financial instruments of entrepreneurship support. To capture the diversity of support instruments, the chi-square factor and Cramer's V were calculated.

The following formula was used to calculate the variable chi-square.

$$\mathrm{X}^2 = \sum_{i=1}^{r} \frac{(n_i - np_i)^2}{np_i} \tag{1}$$

where:

X^2 - chi-square factor;

I_{ki} - sample size;

I_{vi} - number in the i-th class, n_i (i=1,…,r);

p_i - probability that a given random variable will take values from the i-th class.

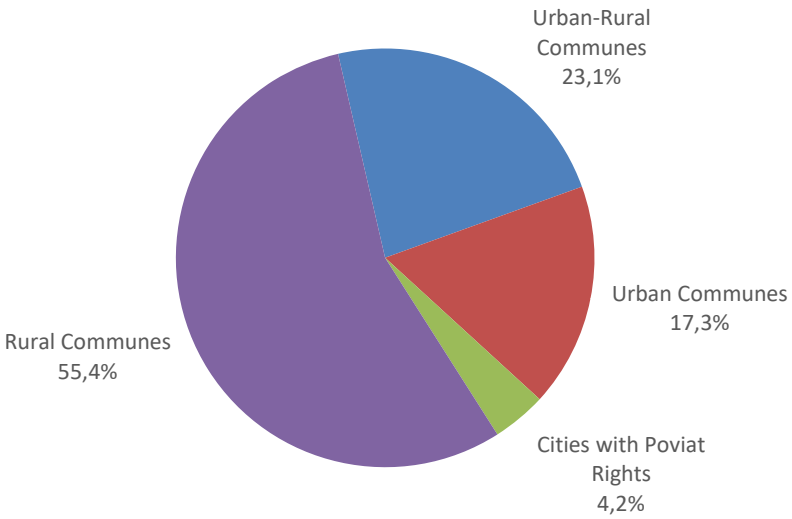

Figure 1. Structure of a sample according to the type of the local government unit
Source: own elaboration based on the results of the conducted research.

Cramer's V coefficient was calculated according to the formula.

$$V = \sqrt{\frac{X^2}{n \cdot min(l-1, k-1)}} \tag{2}$$

where:

V - Kramer's V coefficient;
X^2 - chi-square factor;
n - sample size;
l - number of levels of one variable;
$min(l-1, k-1)$ - smaller than values $(l-1)$ or $(k-1)$.

The determinant of the choice of the latter factor was the fact that the presence of support instruments and the type of local government units are variables presented on nominal scales, and this measure is used for such analysis. The chi-square test studies the independence of variables. If p <0.05, there is a relationship between variables, the difference is statistically significant (we reject the null hypothesis). If p> 0.05, then there can be no relationship between the variables studied, the difference is not statistically significant (there are no grounds to reject the null hypothesis). Therefore, the chi-square factor informs if the relationship exists, while the Cramer's V factor states the strength of the relationship between variables. When rejecting the null hypothesis, one should first pay attention to approximate significance. The value of the Cramer's V coefficient takes values from 0 to 1, the higher its value, the greater the strength of the relationship between the features. If the strength of the relationship is in the range:

- V <0.3 – the relationship should be defined as weak;
- 0.3 <V <0.5 – there is a moderate relationship;
- V> 0.5 – the relationship must be considered strong.

The collected source material was analysed with the use of PS IMAGO 5.1 PRO software.

RESULTS AND DISCUSSION

The first question in the questionnaire regarding financial instruments of entrepreneurship support to which respondents replied concerned the commune's involvement in financial support for entrepreneurs in the form of sureties, guarantees or loans. It turned out that fewer than 11% of communes use such tools (Table 2).

Table 2. Is the LGU involved in financial support for entrepreneurs (sureties, guarantees, loans)?

Variant of answer	Altogether	Urban commune	Urban-rural commune	Rural commune	City with poviat rights
Yes	10.9	20.0	12.6	5.8	31.6
No	81.1	71.0	77.3	88.5	47.4
I do not know	7.9	9.0	10.1	5.6	21.1
Altogether	100.0	100.0	100.0	100.0	100.0
chi-square tests					
Statistics		**Value**	**df**	**Asymptotic significance (2-sided)**	
Pearson's chi-square		62.751a	6	0.000	
Likelihood ratio		56.381	6	0.000	
[a] 16.7% of cells (2) has an expected number below 5. The minimum expected number is 3.01.					
Symmetrical measures					
Statistics			**Value**	**Approximate significance**	
Cramer's V			0.187	0.000	
N of significant observations			896	.	

Source: own elaboration based on the results of the conducted research.

Analysing the involvement of communes supporting entrepreneurship by individual types, it should be stated that these instruments are most often used by cities with poviat rights and urban communes. There is a relationship between two variables, i.e. the commune's involvement in financial support for entrepreneurs (sureties, guarantees, loans) and the type of commune, as evidenced by the chi-square analysis, however, the Cramer's V ratio of 0.187 indicates the weak strength of the relationship. The above analysis results should be considered to be in line with the expectations. Financial instruments such as sureties, guarantees or loans can be successfully used by entities with a sufficiently large budget and at the same time having appropriately sized economic entities interested in this type of support. Certainly, it is definitely easier to meet the above-mentioned conditions in the case of cities with poviat rights and urban communes than small LGUs with limited financial potential that prevents them from becoming involved in this type of support for economic activity.

In the next question, respondents were asked whether facilitations have been introduced in their communes for enterprises conducting business activity, i.e. in the form of preferential tax rates on means of transport and real estate (Table 3). Overall, over twenty percent of communes have introduced preferential tax rates on transport, and over twenty seven percent have preferential tax rates on real estate.

Table 3. Has the commune introduced facilities for enterprises conducting economic activity?

Variant of answer	Altogether	Urban commune	Urban-rural commune	Rural commune	City with poviat rights	Pearson's chi-square	Asymptotic significance (2-sided)	Cramer's V
1	20.6	27.7	19.8	18.8	21.1	21.018	0.002	0.108
2	27.1	40.6	31.9	19.6	44.7	58.563	0.000	0.181

Note: (1) preferential tax rates on means of transport, (2) preferential tax rates on real estate.
Source: own elaboration based on the results of the conducted research.

The analysis by the type of commune showed that when preferential rates on means of transport are used, the differences between the communes are not so immense. Fewer than twenty percent of communes are the highest share, while the worst situation is among rural communes - fewer than nineteen percent of these units use this instrument. On the other hand, preferential tax rates on real estate are used by almost forty-five percent of cities with poviat rights and only fewer than twenty percent of rural communes with an average of slightly higher than twenty-seven percent. Analysis by the chi-square test and symmetrical measures showed that there is a relationship between the character of the commune and preferential tax rates on means of transport and real estate. This relationship can be classified as weak, and thus, once again, research has proven that it is not the commune category that is the stimulus for using the above-mentioned forms of entrepreneurship support.

The relatively rare application of preferential tax rates on means of transport by communes may indicate that communes do not want to lose financial resources by lowering this tax rate, for many of them a serious source of budget revenues. The frequent use of preferential rates in real estate tax by urbanised communes rather than by rural communes may, in turn, prove that they are interested in attracting and locating corporate headquarters in their areas.

The idea of placing the next question in the questionnaire was to obtain information on tax breaks granted to new entrepreneurs (Table 4). The respondents had to choose "Yes", "No" or "I do not know".

Table 4. Does the commune grant tax breaks to new private enterprises?

Variant of answer	Altogether	Urban commune	Urban-rural commune	Rural commune	City with poviat rights
Yes	33.0%	45.8%	40.6%	24.2%	55.3%
No	46.0%	29.0%	38.6%	56.3%	21.1%
I do not know	13.1%	14.8%	15.5%	11.5%	13.2%
Altogether	100.0%	100.0%	100.0%	100.0%	100.0%
chi-square tests					
Statistics		**Value**	**df**	**Asymptotic significance (2-sided)**	
Pearson's chi-square		62.719 a	9	0.000	
Likelihood ratio		64.133	9	0.000	
a 12.5% of cells (2) has an expected number below 5. The minimum expected number is 3.01.					
Symmetrical measures					
Statistics			**Value**	**Approximate significance**	
Cramer's V			0.153	0.000	
N of significant observations			896	.	

Source: own elaboration based on the results of the conducted research.

One third of communes grant tax breaks to new private enterprises. Most often this instrument of supporting entrepreneurship is used by cities with poviat rights, urban communes and urban-rural communes. Chi-square analysis showed that there was a weak relationship between the variables tested. This situation confirms that factors other than the type of commune decide about the application or non-use of entrepreneurship support. It can be assumed that, while cities with poviat status and urban communes are predisposed to use this type of instruments, as there is a concentration of entities conducting economic activity on their territory, it does not preclude their use by smaller local governments, including rural communes.

The next stage of the analysis was to check whether communes provide / sell communal property to private entrepreneurs (Table 5).

Almost half of the communes share or sell communal property to private enterprises. A very small difference in this area is shown in the cross-section of the commune by category. Most often this instrument is used in urban and urban-rural communes. The Chi-square analysis showed that there is a low correlation between the variables, so the commune category of commune is not a sufficient explanation for using the instrument of sharing or selling communal property to private enterprises.

In the next stage of the research, respondents were asked which economic and financial tools are used by the commune (Table 6).

Out of the eleven economic and financial tools listed, the communes surveyed most often use two: the distribution of instalments for tax payment or tax arrears and the deferral of tax payment deadlines. The use of these instruments was indicated by more than half of all the surveyed communes. More than a third of communes use: preferential (lower than maximum) tax rates, tax breaks for entrepreneurs and the cancellation of tax arrears. Every fifth commune supports entrepreneurship through tax exemptions for entrepreneurs. The other tools are used much less frequently.

The chi-square analysis showed that there is a relationship between all the entrepreneurship support instruments and types of communes, however, the analysis using Cramer's coefficient requires that it is assessed at a low level. A relatively strong relationship was observed between the type of

commune variable: activities involving the inclusion of investment areas in the Special Economic Zone. There is a large variation among communes, as half of the cities with poviat status and one-third of urban communes have chosen this instrument. In the case of rural communes, only every twelfth commune have decided to do so.

Table 5. Does the commune provide/sell communal property to private companies?

Variant of answer	Altogether	Urban commune	Urban-rural commune	Rural commune	City with poviat rights
Yes	49.7%	63.9%	55.6%	42.3%	55.3%
No	19.2%	9.7%	16.4%	24.0%	10.5%
No, because there is no such property beyond the immediate needs of the administration	13.3%	12.9%	13.0%	13.7%	10.5%
I do not know	6.8%	1.9%	4.8%	9.5%	2.6%
No answer	11.0%	11.6%	10.1%	10.5%	21.1%
Altogether	100.0%	100.0%	100.0%	100.0%	100.0%
chi-square tests					
Statistics	**Value**	**df**	**Asymptotic significance (2-sided)**		
Pearson's chi-square	45.766a	12	0.000		
Likelihood ratio	48.314	12	0.000		
a. 10.0% of cells (2) has an expected number below 5. The minimum expected number is 2.59.					
Symmetrical measures					
Statistics	**Value**	**Approximate significance**			
Cramer's V	0.130	0.000			
N of significant observations	896	.			

Source: own elaboration based on the results of the conducted research.

Table 6. Which economic and financial tools are used by the commune?

Variant of answer	Altogether	Urban commune	Urban-rural commune	Rural commune	City with poviat rights	Pearson's chi-square	Asymptotic significance (2-sided)	Cramer's V
1	35.2	47.1	37.2	29.8	44.7	46.807	0.000	0.132
2	33.8	47.7	41.1	25.0	52.6	67.807	0.000	0.159
3	21.4	25.8	27.5	15.1	52.6	59.931	0.000	0.149
4	34.2	26.5	40.6	33.7	36.8	30.903	0.000	0.107
5	56.1	58.1	59.9	53.2	65.8	23.112	0.006	0.093
6	50.2	54.2	54.6	45.8	68.4	35.793	0.000	0.115
7	10.7	18.1	14.0	6.5	18.4	40.065	0.000	0.122
8	6.8	12.9	10.6	3.0	10.5	42.317	0.000	0.125
9	4.5	9.0	4.8	2.4	10.5	32.469	0.000	0.110
10	17.7	34.8	21.3	8.5	50.0	121.766	0.000	0.213
11	10.4	18.7	9.7	7.5	18.4	65.079	0.000	0.156

Note: (1) preferential (lower than maximum) tax rates, (2) tax breaks for entrepreneurs, (3) tax exemptions for entrepreneurs, (4) cancellation of tax arrears, (5) distribution of instalments for tax payment or tax arrears, (6) deferral of tax payment deadlines, (7) preferences regarding the determination of fees paid by entrepreneurs to the communal budget, (8) financial support in the form of sureties and guarantees, (9) financial support in the form of loans, (10) activities involving the inclusion of investment areas in the SEZ, (11) pricing policy instruments related to services.
Source: own elaboration based on the conducted research.

The next stage of the research was to find an answer to the question on which tools of a commune's economy are used in the process of supporting entrepreneurship (Table 7).

The tool most commonly used by the examined communes are fees for the use of areas, facilities and equipment owned by the commune, as well as sales (perpetual usufruct) and exchange of real estate of the commune. About nine out of twenty respondents chose these responses. Seven out of twenty

indicated the answers: detailed rules for the use of the commune property and pricing systems for the use of land and facilities owned by the commune. Adjacent fees are the least used. A relationship was observed between the answers to this question and the type of commune, although it was weak.

Table 7. Indicate which of the commune property management policy tools listed below are used in the process of supporting entrepreneurship

Variant of answer	Overall	Urban commune	Urban-rural commune	Rural commune	City with poviat rights	Pearson's chi-square	Asymptotic significance (2-sided)	Cramer's V
1	46.0	56.8	47.8	40.5	63.2	31.332	0.000	0.108
2	35.6	51.6	35.3	30.0	44.7	37.884	0.000	0.119
3	16.0	22.6	20.3	10.9	31.6	47.505	0.000	0.133
4	37.2	48.4	38.6	32.3	47.4	34.609	0.000	0.113
5	43.8	46.5	46.9	40.5	57.9	17.236	0.045	0.080

Note: where: (1) fees for the use of land, facilities and equipment owned by the commune, (2) price fixing systems for the use of land and facilities owned by the commune, (3) adjacency fees, (4) detailed rules for the use of commune property, (5) sale (perpetual usufruct) and exchange of real estate in the commune.
Source: own elaboration based on the conducted research.

A very important issue showing the awareness of the consequences of using entrepreneurship support instruments is whether the commune analyses the financial implications of its entrepreneurship support policy for the budget. This issue is presented in the Table 8.

Table 8. Does the commune analyse the financial consequences of the entrepreneurship support policy for the budget?

Variant of answer	Overall	Urban commune	Urban-rural commune	Rural commune	City with poviat rights
Yes	43.2	53.5	42.0	38.9	63.2
No	26.1	17.4	25.1	30.8	5.3
I do not know	16.7	11.0	20.8	17.3	10.5
No answer	14.0	18.1	12.1	12.9	21.1
Overall	100.0	100.0	100.0	100.0	100.0

chi-square tests			
Statistics	**Value**	**df**	**Asymptotic significance (2-sided)**
Pearson's chi-square	34.914a	9	0.000
Likelihood ratio	37.860	9	0.000
[a] 0.0% of cells (0) has an expected number below 5. The minimum expected number is 5.30			

Symmetric measures		
Statistics	**Value**	**Approximate significance**
Cramer's V	0.114	0.000
N of significant observations	896	.

Source: own elaboration based on the conducted research.

The research results indicate that only slightly more than forty-three percent of communes analyse the financial implications of their entrepreneurship support policy. If we extend the analysis to individual types of communes, it should be noted that such analysis is much more often carried out by cities with poviat rights and urban communes. The analysis also showed that there is a relationship between the studied variables, however, this relationship is at a low level.

CONCLUSIONS

In the literature focusing on the subject, research on the use of financial instruments to support entrepreneurship is fairly widely presented. Most often, however, the authors do not analyse a broad range of support instruments, their manner and effectiveness of use, but focus on the individual financial

instruments that stimulate entrepreneurship and analyse the effects of their use by local government units. The literature on the subject usually presents specific instruments supporting entrepreneurship and their consequences in relation to individual types of communes, which naturally narrows the view on the obtained research results and their applicability.

Local governments in Bulgaria can use the following financial instruments to support entrepreneurship: lowering local fees, investing in infrastructure, joint investments with the private sector and financial aid (providing guarantees, encouraging credit unions, etc.) (Damianova *et al.,* 2005). The Supreme Audit Office (NIK, 2018) presented in its report comprehensive research results concerning the supporting entrepreneurship policies conducted by Polish communes. This study covered 1 617 communes to which a questionnaire was sent and which was supplemented by the results of direct controls carried out among 48 communes located in 8 out of 16 Polish voivodeships. The NIK research showed that 81% of LGUs, when regulating the principles of property management, do not introduce concessions and reliefs for entrepreneurs, including fee discounts for renting and leasing real estate, while 65% of communes apply lower than maximum rates of property tax and tax on means of transport or introduce reliefs in these expenses. These analyses gave comparable results to those presented in this study. It is enough to recall that 20.6% of the communes surveyed by the authors use preferential rates of tax on means of transport and 27.1% of LGUs apply preferential rates on real estate tax. On the other hand, the results of research on offers of financial support for entrepreneurs in the form of sureties, guarantees and loans are in contradiction to the NIK's research. NIK reported that the communes did not prepare such solutions. In turn, the research presented in the following article indicates that about 11% of the surveyed communes use this form of support.

Research carried out in Macedonia (Zarezankova-Potevska, 2018) shows that around 30% of new enterprises have problems with access to sources of financing, as private financial institutions, i.e. banks, are not interested in providing such assistance. About 15% of entrepreneurs cannot find investors. It seems necessary to involve local governments to help in this field.

Many authors write about fiscal preferences consisting in reducing the rate of tax on means of transport and the rate of real estate tax. Swianiewicz *et al.* (2013) indicate that the property tax is closely related to the issues of entrepreneurship, because about 85% of revenues resulting from this tax are paid by entities conducting business activity (Swianiewicz *et al.,* 2013). Therefore, it is a tool strongly associated with enterprises and, much more importantly, numerous studies show that this instrument itself is not a decisive factor in initiating the activity or affecting its location. The predictability of the fiscal policy of LGUs, its stability, as well as the combination with other instruments stimulating local economic development have a much stronger impact. In the latter model, taxes are a complementary element and not the only one in the structure of business development stimulants.

The results of research carried out by Dziuba (2016), regarding the effects of introducing reduced rates in both of the above-mentioned taxes indicate that the most fiscally efficient local tax is real estate tax. It constitutes on average almost 12.5% of total communal revenues. However, the greatest effects of applying reduced rates were visible in the tax on means of transport, the revenues on which could be as much as 53% higher if this tool was not used (Dziuba, 2016). This finding draws attention to one more important issue - budgetary consequences of applying fiscal preferences. Their improper selection or their use as the only instruments to stimulate entrepreneurship on the one hand has no stimulus effect, and on the other hand it drains the budget by depleting the ability to effectively conduct entrepreneurship development policy. This fact is certainly one of the factors causing that the majority of local government units examined by Poniatowicz (2015) decide to apply maximum rates of real estate tax or rates close to the level of maximum rates. As demonstrated by her research, maintaining rates at a level definitely lower than the maximum does not significantly affect an increase in local investment activity (Poniatowicz, 2015).

Capkova (2005) argues that most taxes applied by local authorities are not a heavy burden for businesses. She believes that the use of preferential rates may not be economically viable. According to the author, companies are not guided by the issues of tax relief in their location decisions (Capkova, 2005).

The research results presented in this study indicate that one in five of the surveyed communes is exposed to negative budgetary effects and thus the weakening of real opportunities to stimulate economic development in the future, as regards the tax on means of transport, and more than every fourth

one in relation to the real estate tax. The obtained research results clearly show that LGU finances are crucial in stimulating local economy, but even more important is how limited financial resources are used by them. The results of the research show that not all of the local government units studied understand the problem that has been well presented in the article and, as a result, they take actions considered by them as "stimulus", whose effects will not be strongly associated with the dynamics of entrepreneurship. In order to understand this problem, it is required to examine the budget consequences of the actions taken, and unfortunately, these tasks are not implemented by communes (NIK, 2018).

The use of instruments supporting entrepreneurship by the local government units other than those presented in the study is relatively poorly described in the literature. The authors mention their existence and use, but do not undertake in-depth analyses of this issue. This opens up space for further research dedicated to the above-mentioned topics, recognizing this phenomenon and expanding knowledge on non-financial forms of entrepreneurship support.

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Acknowledgements and Financial Disclosure

The article is a result of research project entitled "Instrumentalization and effectiveness of local government policies supporting entrepreneurship in Poland and Latvia", financed by the University of Information Technology and Management in Rzeszow, Poland as part of its statutory activity.

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Published by Cracow University of Economics – Krakow, Poland

Entrepreneurial Business and Economics Review

2021, Vol. 9, No. 3

10.15678/EBER.2021.090310

Governance of special economic zones and their performance: Evidence from Poland

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ABSTRACT

Objective: The objective of the article is to assess why some zone managing companies (ZMCs) are more successful in developing their special economic zones (SEZs) than others. In almost every part of Poland, there are winners and losers among SEZs. It suggests that the advantage of having a better zone location is relative, and other factors may play a role. The specific research question addressed in this article is whether the individual zone administrations matter.

Research Design & Methods: We used cluster and correlation analysis and estimated regression models at the level of ZMCs to explain the relative performance of SEZs in Poland over the period 2004-2018. The set of explanatory variables, treated as a proxy for ZMC's efforts, were regressed on investment outlays and jobs created.

Findings: (1) location is the principal determinant of SEZs performance; (2) zone governance also makes a difference; (3) among ZMCs' efforts promotional activities and infrastructural outlays impact SEZs performance to the greatest extent.

Implications & Recommendations: Zone performance depends predominantly on its location but effective governance exercised by the operator matters, too. Both conclusions advocate opting for a zone policy that limits the centralising of decision-making powers. First, regional/local authorities must be more engaged. Second, and more importantly, additional powers and resources should be delegated to zone operators.

Contribution & Value Added: The use of a regression model to explain the role played by zone operators in zones' performance is very scarce in economic literature. There is no such a study for Poland. Our research tries to fill this gap. We check (1) whether good administration is important for the success of a SEZ and (2) why it is important: due to the resources ZMC has or rather due to the services it provides for investors.

Article type: research article

Keywords: special economic zones; zone managing companies; investment policy; Poland

JEL codes: C19, F23, H25, H71, O25, P48, R58

Received: 24 November 2020 Revised: 26 April 2021 Accepted: 29 April 2021

Suggested citation:
Dorożyński, T., Świerkocki, J., & Dobrowolska, B. (2021). Governance of special economic zones and their performance: Evidence from Poland. *Entrepreneurial Business and Economics Review,* 9(3), 149-167. https://doi.org/10.15678/EBER.2021.090310

INTRODUCTION

Special economic zones (SEZs) have become a popular investment policy tool especially in emerging economies. According to UNCTAD (WIR, 2019), back in 1975 there were 79 zones operating in 29 countries, while in 2018 as many as 5 400 zones could be found in 147 countries. Recently, special economic zones have been spreading rapidly – over five years their population grew by one thousand and further five hundred are expected to be established in near future. Growing popularity of zones among the governments seems to confirm the effectiveness and efficiency of the instrument. More sceptical assessments can be heard from researchers aware that we are dealing with the *second best* solution (Rodrik, 2008), i.e., the one which may, but does not have to, be beneficial to the economy and may also generate loses (Baissac, 2011; AfDB, 2015; ADB, 2015). For instance, according to Ag-

garwal (2019), in only three countries (Korea, Taiwan, and China), representing only 2% of all economies in which special economic zones operate, the policy has been fully successful, and in further 25 countries (17%), including Poland, the policy has been moderately successful.

The main objective of comparative empirical studies is to identify circumstances and factors decisive for the performance of zones in individual countries. Such determinants stem from programme-based solutions (incentives and requirements addressed to investors), zone characteristics (location, infrastructure), and the environment in which they operate (institutional quality, economic development level). These factors are highlighted by neoclassical economics and political economics (World Bank, 2017; Farole & Moberg, 2014). Their wide range includes, among others, the role of zone operators, that is entities which administer SEZs. Yet, in most instances, their assessment usually boils down to labelling them as 'private' or 'public' in character and does not even provide clear-cut answers as to which solution is better (World Bank, 2017).

In addition to cross-country comparisons, more detailed case studies are carried out for zones based in one country (see e.g., Kuznetsow & Kuznetsowa, 2019; Aggarwal, 2005), where the regulatory, institutional, and macroeconomic context is the same for all operators. The case of Poland shows that also in such circumstances zones differ when it comes to their performance (e.g. Ambroziak, 2016; Ambroziak & Hartwell, 2018; Ciżkowicz *et al.,* 2017).

Hence, a question can be asked to what extent these differences can be attributed to the professionalism of zone operators. The issue is far from obvious if we consider the fact that the latter operate within the framework of competences entrusted to them by the central government and under its strict surveillance. On the one hand, we could say that they simply administer SEZs like in a fully centralised decision-making system. On the other hand, however, there are strong reasons to believe that they enjoy a wide margin of discretion and manage the zones as if they operated in a system of indirect government intervention. For instance, Dorożyński *et al.* (2016) suggests there is a correlation between the performance of zones and actions undertaken by their operators (officially referred to as managing companies). To put some light on this relationship we have applied a more advanced quantitative method, i.e., the cluster analysis and regression analysis that covers all the zone managing companies (ZMCs) in Poland over the period 2004-2018.

The objective of the article is to find out whether and why some ZMCs are more successful in developing their SEZs than others. Specifically, we would like to address the following research questions: Do individual zone administrations matter? And, if so, how exactly do they make a difference? Do they matter because of the resources they have, or is it due to the services they provide and institution-building efforts? In the literature on special economic zones, only a handful of studies have tackled the issue (e.g. Aggarwal, 2005), partly due to the limitations of data concerning variables relevant for comparing zone administrations with each other.

Our study was motivated by the fact that in every part of Poland we can find the best and the worst performing ZMCs in terms of investment outlays and the number of jobs created. The results of our empirical study suggest that the location advantage (in terms of physical location, infrastructure, available resources, and cultural and historical contexts) is very important, but other factors may play a role, too. The quality of governance (administration) could be one of them, and our analysis demonstrates that this presumption may be correct.

We have divided our article into six main parts. In the next section, there is a short literature review. Section 3 explains how the Polish SEZs are managed. In section 4 we present sources of data and briefly discuss statistical methods used in the empirical part of the study. In section 5 we analyse the data with a view to answering the research questions and discuss the results. The final section concludes and delineates directions for further studies. A detailed description of variables can be found in the Appendix.

LITERATURE REVIEW

Economists who investigate SEZs often highlight the absence of credible indicators that might give us a full picture of the effects of their operations (Frick & Rodriguez-Pose, 2019). Absolute and relative

measures (e.g. number of jobs created, value of investments, volume of exports), estimated spillover effects, expert opinions about how SEZs have contributed to the growth of the economy, or night-time lights data as a proxy measure for investors' economic activity (World Bank, 2017) relate to various goals of zone policies. Hence, assessments based on them are often incomparable. Researchers also face problems with identifying credible counterfactuals and with accessing reliable data (Gibbon *et al*., 2008). Studies on the effects of SEZs have been conducted for developed economies (for an overview see Mayneris & Py, 2013), but predominantly for developing and transition economies (e.g. Farole, 2011; Aggarwal, 2012; ADB, 2015; Zeng, 2015; Frick *et al.*, 2018), which, according to UNCTAD, host 93% of all zones.[1]

However, independently of how we measure the performance of SEZs, what matters much more to politicians are factors that are decisive for the zones' success or failure. Surveys in this field usually take the form of case studies (Madani, 1999; Engman *et al*., 2007; FIAS, 2008; ADB, 2015; Zeng, 2015; Kuznetsow & Kuznetsowa, 2019; WIR, 2019), which are not necessarily substantiated with advanced statistical methodologies. For instance, Farole (2011) used correlation coefficients for a sample of 70 countries. Fewer studies use econometric models with panel data, e.g., Aggarwal (2005), World Bank (2017), Frick *et al.* (2018), Frick and Rodriguez-Pose (2019).

There are probably as many reasons why some zones perform better than others as there are SEZs (Moberg, 2015). For analytical purposes, we can rank them by dividing them into three groups (World Bank, 2017; Frick *et al.*, 2018): (1) SEZ operating principles (SEZ scheme); (2) uniqueness of the SEZ; (3) the business environment (national and regional). If we narrow our comparisons to SEZs in one country, which all follow the same operating principles, differences can be sought in the uniqueness of the zone (the investment climate) and its immediate environment, i.e., in the business attractiveness of the host region. Researchers stress that suitable location, a factor independent of the operator (ZMC), is the key to a zone's success. Inevitable mistakes concerning location are made by governments due to inadequate knowledge and destructive rent-seeking behaviour (Moberg, 2015). Establishing a SEZ in relatively remote rural areas (Frick & Rodriguez-Pose, 2019), poorly connected to the rest of the world and with labour shortages (WIR, 2019), with little developed industry (Kuznetsow & Kuznetsowa, 2019), and far from important urban centres (World Bank, 2017) does not bode well for the success of the venture. Aside from location, which is a very wide-ranging concept, the researchers consider more concrete factors like the size and maturity of the zone. In such cases their opinions are less unequivocal. Bigger zones are more attractive to investors but not always develop much better (World Bank, 2017). The growth of the zone is not linear and varies over time (Frick *et al.*, 2018).

The choice of location is made by policymakers. An operator (ZMC) is expected to manage the SEZ effectively, i.e., to ensure smooth administrative services to investors, promote the zone, provide the necessary infrastructure, etc. The role played by ZMC is rarely accounted for by researchers in their analyses and is assessed differently. By using a questionnaire-based interview and a panel model, Aggarwal (2005) demonstrated that governance has a meaningful impact on the performance of zones in India, Sri Lanka, and Bangladesh. Based on panel data and a sample taken from many countries, the World Bank (2017) suggests that private zone operators are no more effective than public ones. Frick *et al.* (2018) draw a similar conclusion. On the other hand, Farole and Moberg (2014) provided evidence that private operators perform better because they have more knowledge about market reality, better managerial skills, and the horizon for their work is not dictated by political agendas. Generalising the experience of many countries, WIR (2019) underlines that effective zone governance, together with good cooperation amongst operators and administration at different levels, are pre-conditions for winning and maintaining investors' trust.

Zones located in Poland are guided by the same rules, which is why discrepancies in their performance can be attributed to the qualities of the zones (investment climate) and the advantages

[1] Numerical data should be approached with a great deal of caution. For instance, according to UNCTAD, there are 21 SEZs in Poland ranking second after the United States amongst developed economies (WIR 2019). The number comes from including 7 duty-free areas. The latter do not offer incentives laid down in the Act on SEZs so researchers usually ignore them. Interestingly, in accordance with the EU law, only duty-free areas are considered to be zones *de jure*. The legal boundaries for SEZs *de facto* can be found in the EU's provisions on regional State aid (Commission Regulation (EU) No 651/2014 of 17 June 2014).

of the host region. The relevance of both factors was confirmed by Dorożyński *et al.* (2018). Hajduga *et al.* (2018) in research based on a questionnaire survey indicated that zone governance is important for investors. These observations justify checking whether differences in zone performance may depend on zone administration. According to Jensen (2018), this is an important and under-researched topic.

Managing the Polish zones experiment

Special economic zones have been active in Poland since 1995. Between 1995 and 1997, the government established 17 zones that were designed to operate until no later than 2017. In 2001, some zones were phased out, other merged, reducing the zone population to 14. The maximum area eligible for public support under the scheme also increased several times, from the first ceiling of 6.3k ha to 25k ha in 2015.

The decision-making process related to SEZs involves many actors motivated not necessarily by the same goals and interests. At the national level, regulations and surveillance over the zones rest in the hands of the Ministry of Economy. However, the Ministry of Economy must consult its decisions with the ministry responsible for regional development, Ministry of Finance, and the Office of Competition and Consumer Protection. These bodies, taking care of different aspects of state operations (territorial cohesion, public finance, and competitive order), are subject to, inter alia, strong pressure exerted by local stakeholders. The latter include public administration, local authorities, Members of Parliament, as well as other stakeholders (e.g., trade unions, universities) who have vested interests in solutions that would attract investors, stimulate the economy, and ensure the creation of new jobs. Thus, the establishment of a zone and its further development are worth formal and informal lobbying at the highest levels of power in the country. In fact, it is believed that most zones were established not out of the initiative of the government but as a result of bottom-up efforts (Siudak & Wątorek, 2011) mostly dictated by political interest of the ruling party (Cieślik, 1995).

Zone operators, i.e., companies with majority holdings of the State Treasury or provincial self-government (one case), execute the policy delineated by the central government. The Ministry of Economy provides them with a zone development plan identifying the goals, resources, duties, rules of procedure, deadlines, and preferred industries. For this reason, the financial result of the company[2] cannot be viewed as a credible indicator of its performance. Much more important are economic effects generated by the zone, such as the number of permits issued to enterprises, their investment outlays, newly created jobs, or the development of the zone area (NIK, 2011). The government may support zone operators by exempting them from CIT and by waiving some zone development related charges but also may entrust them with the issuance of permits and day-to-day monitoring of investors' operations. Thus, a zone managing company is an agent whose performance is monitored by the government represented in the Supervisory Board and encouraged by tax allowances (CIT). On the other hand, a ZMC remains in direct contact with the local self-government which may offer additional support to investors who decide to invest in the zone (e.g., property tax allowances, facilitated formalities involved in applying for different permits, organising training courses for newly recruited workers, improved infrastructure). Co-operation with local authorities often conditions a zone development and thus the assessment of operator's performance by the central government. Support received from local communities and information barrier faced by the central government put ZMCs in an advantageous position. As a result, ZMCs may impact its decisions to take care of the interest of an investor or/and of the local government, e.g., when it comes to changes in zone boundaries, inclusion of a private plot into the zone, or introduction of a new industry, etc.

For the above stated reasons, the national level takes care primarily for having trustworthy people in ZMCs in top management positions. However, unlike in private companies, where professionalism

[2] Financial result is a difference between costs (administration, infrastructure, marketing, services to investors, cost of real estate purchase) and earnings (fees and charges paid to the zone, sales of property, revenue from contracts).

is the key criterion for hiring managers, in ZMCs political affiliation, loyalty and allegiance are fundamental for receiving these well-paid jobs. Thus, people hired by ZMCs are usually recruited from among local activists of the ruling party. Changes in management occur mainly, although not exclusively, after parliamentary elections. The CEOs change rather often which may impact the quality of zone governance and its performance (the subject is discussed further below).

However, zones' functional specificity stems from two other features. Firstly, they are distinguished in a legal rather than purely physical sense. Hence, plots are often dispersed, located in various administrative regions, sometimes several hundred kilometres away from each other, e.g. a sub-zone in north-west belongs to a zone in the south-east of the country. As the zone location is not predetermined, ZMCs can compete for investment plots almost anywhere in the country.

The second distinctive feature of Polish SEZs concerns the conditions of starting up a business. Zone managers do not enjoy any legislative autonomy that would enable them to offer special concessions and better compete for investors with other operators. Each SEZ in Poland has the same package of incentives with similar requirements. As a result, the differences in the maximum value of financial incentives between them are known in advance. They result from EU regulations on State aid ceilings which are regionally diversified. Therefore, differences in the administrative capacity of the zones depend generally on two factors. Firstly, on the availability of larger-sized investment plots (which is an inheritance of the territorial concentration of industry in the command economy) and zone managers' ability to bargain for these with the local authorities. Secondly, on the professionalism and attitude that both the ZMCs and the local authorities show towards investors.

While investments in SEZs come with incentives, such as tax exemptions, fully developed investment plots, advanced technical infrastructure, and the eventual exemption from property tax, there are many requirements attached to these favourable investment conditions. The requirements include extra bureaucracy involved in preparing a permit to operate in the SEZ and minimum requirements regarding employment, investment, and capital stake. Large investors have to operate for at least five years in the SEZ, while for smaller investors, the minimum operation period is three years. Additionally, all investors must pay an annual fee to the ZMC. Investors are liable to pay back the public support with interest if they fail to meet the terms and conditions. Finally, there is a requirement that the investment does not represent a relocation, e.g. investors must prove that their investment is a new activity rather than simply the relocation of an existing business (within the European Economic Area).

The comparative information collected from interviews[3] in the Lodz Province (Table 1) indicates that investing in a zone may be more complicated than outside of SEZs. The extra services are costly in monetary terms as well as in extra red tape, lengthy procedures, less freedom for doing business, and fewer plots to choose from. Figure 1 shows how bureaucratic and complicated zone entry procedures are.

Summing up, the conditions of investing in SEZs constitute an effective selection mechanism for firms: only the strong can afford to get into the club and start working according to its rules (Trzciński *et al*., 2016). Strong firms are usually big and foreign market players. In 2015, in the whole non-financial sector, big companies accounted for only 4.5% of all investors while in the SEZs they represented as much as 53.5%. More than one-third of all firms of that size in Poland were present in the SEZs; 71% of them were firms with foreign capital.[4]

The selection mechanism is reflected in statistics on investment permits. By the end of 2018 less than 60% of granted permits translated into actual economic operations. In the opinion of 44% of the respondents, the costs entailed by investing in SEZs would exceed the benefits (KPMG, 2012).

[3] Own compilation based on 6 partly structured individual interviews with representatives of the local and regional government in the Lodz Province and with the staff of the Lodz special Economic Zone. Interviews were conducted by the authors of the article in 2017 and 2018.

[4] Based on Statistics Poland (2016) and data from the Ministry of Economy.

Table 1. Advantages and disadvantages of investing within and outside of SEZs

Component	SEZ	outside of SEZs
	(+) advantage / (-) disadvantage	
Administrative costs	-	+
Time-consuming and complex procedures	-	+
Requirements to be met by the investment project	-	+
Real estate acquisition costs	-	+
Degree of land/property development	+	-
Real estate legal status	+	-
Variety of potential locations	-	+
Limitations regarding the business profile	-	+
Assistance in recruiting labour	+	-
Advisory services (project manager)	+	-
Average amount of State aid	+	-
Total	**5+**	**6+**

Source: own compilation based on in-depth interviews with representatives of local and regional government units from the Lodz Province and the Lodz Special Economic Zone.

RESEARCH METHODOLOGY

We employed statistical and econometric methods at the level of the ZMCs to explain the relative performance of SEZs in Poland over the period 2004-2018. The set of explanatory variables (x_1-x_6), treated as a proxy for ZMC's efforts (tax allowances for ZMCs, equity of ZMCs, promotional and infrastructural outlays, number and changes in governors), were regressed on investment outlays (Y_1) and jobs created (Y_2).

We created our own database. Numerical data is available in the reports published yearly by the ministry responsible for the economy (Information about…, 2005-2019). We deflated nominal values with the price index for the sector closest to the researched phenomenon (Investment Outlays Price Index, Consumer Price Index). The year 2004 was used as the base one (for detailed description of variables and sources of statistical data see Table A1). The data on the number and changes in governors comes from NIK (2011) and from other sources (SEZs' websites and press articles).

In the first stage of the study we used cluster analysis (k-means algorithm and Ward's linkage method) to distinguish clusters of zones differing with the invested amount and the number of newly created jobs. By using the k-means method we could identify clusters that differ the most between each other. At the same time, standardized variables used in this method helped us to identify cluster centroids and estimate deviation from the mean. The disadvantage of the k-means method is the fact that it may generate strongly non-equipotent clusters. This is what happened in our case. This prompted us to apply hierarchical cluster analysis (James *et al.*, 2014; Lasek, 2002).

In the second stage we used correlation analysis (Pearson's linear correlation coefficients and Spearman's rank correlation coefficients). They let us evaluate the relationship between the performance of SEZs measured with investment outlays and jobs created and the set of explanatory variables. These variables (x_1 - x_4, Table A1) come from the reports of the Minister who supervised the SEZs. In addition, we considered the frequency of changes in the composition of boards as this factor may impact management continuity (and quality). Over the period covered by the study, one and the same person held the position of the CEO of the ZMC in KTW for 13 years and in SLP for 14 years (SEZs symbols see Table 2). On the other hand, in 8 zones CEOs changed at least five times (KRW, LGA, LDZ, MLC, PMR, SWK, TBS, and WMZ). Therefore, we decided to add our original variable (x_5) that reflects changes in the position of the CEO of ZMCs to our analyses.

Because our main goal was to identify the direction and strength of relationships, we built linear regression models (Welfe, 2009; Greene, 2003) in the last stage. Being aware that geography does matter, although it does not prejudge SEZ performance, we added to variables describing governance

quality a location variable which informs to which of the six macro-regions a zone belongs (Table 4). Central macro-region, in which there is only LDZ, was our reference point.

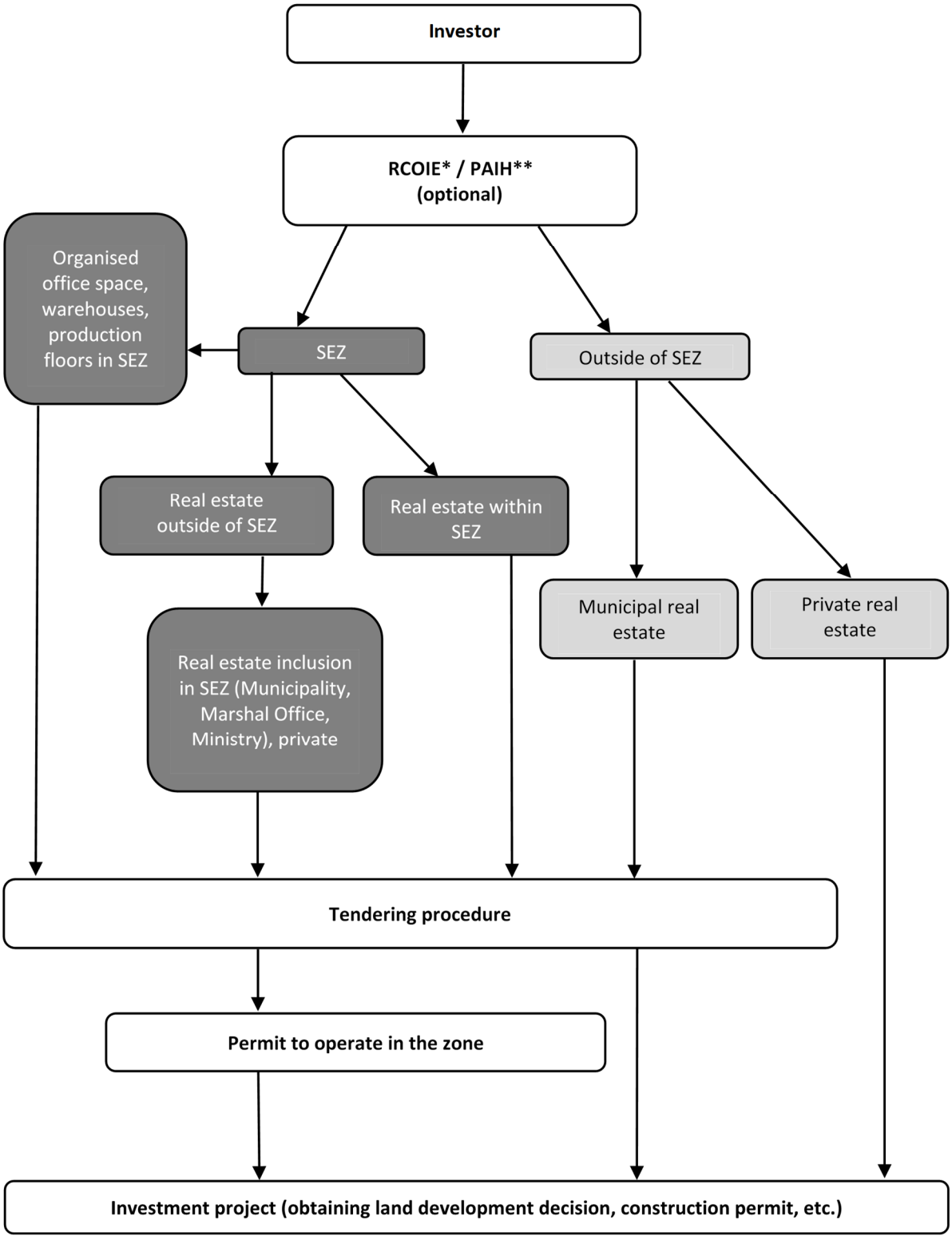

Figure 1. Investor's path to get a project started

* RCOIE – Regional Service Centre for Investors and Exporters

** PAIH – Polish Investment and Trade Agency

Source: own elaboration.

RESULTS AND DISUSSION

Location and SEZ performance: cluster analysis

Our starting point aimed at investigating how geographic location correlates with a zone's performance. To this end, each zone was assigned to one of six macro-regions in accordance with NUTS 1 classification[5] (Table 4). Based on that and using the k-means algorithm[6] we identified three clusters (Table 2). Each cluster brings together zones in which the value of real investment (Y_1) and the number of newly created jobs (Y_2) per hectare are the closest.

Table 2. Membership in clusters based on the k-means algorithm for 14 SEZs in 2004-2018

No. of observations	Special Economic Zone	Symbol	Cluster	Distance from cluster centre
1	Kamiennogórska	KMG	2	0.255
2	Katowicka	KTW	3	2.076
3	Kostrzyńsko-Słubicka	KTS	2	1.842
4	Krakowski Park Technologiczny	KRW	3	5.306
5	Legnicka	LGA	2	2.216
6	Łódzka	LDZ	2	6.383
7	Euro Park Mielec	MLC	3	3.603
8	Pomorska	PMR	2	1.665
9	Słupska	SLP	1	0.000
10	Starachowicka	STW	2	3.257
11	Suwalska	SWK	2	0.936
12	Euro-Park Wisłosan	TBS	2	1.443
13	Wałbrzyska	WBS	2	1.730
14	Warmińsko-Mazurska	WMZ	2	2.481

Source: own elaboration (calculations were performed in PS IMAGO).

Table 3. Standardised average invested amount and the number of jobs created in clusters

Item	Cluster		
	1	2	3
No. of observations in a cluster	1	10	3
Y_1	2.16	4.74	5.65
Y_2	4.33	14.01	26.62

Note: For detailed description of variables, see Table A1.
Source: as in Table 2

In the first cluster, there is only the SLP zone, for which standardised results are the lowest (Table 3). The third cluster brings together three best performing zones in which an average invested amount (Y_1) was more than twice as high as in the first cluster, while the number of newly created jobs (Y_2) was more than six times higher. The second cluster consists of as many as 10 zones. This uneven distribution did not allow to unambiguously assess the importance of the location for zones' performance.

By using Ward's method (James *et al.*, 2014; Lasek, 2002) we obtained a dendrogram, which reveals a hierarchical structure in the order of decreasing similarity in a set (Figure 2). This, in turn, allowed us to distinguish three clusters of zones differing with the invested amount and the number of newly created jobs (Figure 3):

a) group 1: KTS, WMZ, STW, and SLP,
b) group 2: LGA, TBS, SWK, KMG, and PMR,
c) group 3: KTW, MLC, LDZ, WBS, and KRW.

[5] The division was binding between 2004 and the end of 2017 (Regulation (EC) No. 1888/2005 of the European Parliament and of the Council of 26 October 2005). Having more than 50% of the total invested amount in the subzones of a specific macro-region was the criterion for assigning zones to macro-regions. We used unpublished data of the Ministry of Development.
[6] https://www.naftaliharris.com/blog/visualing-k-means-clustering.

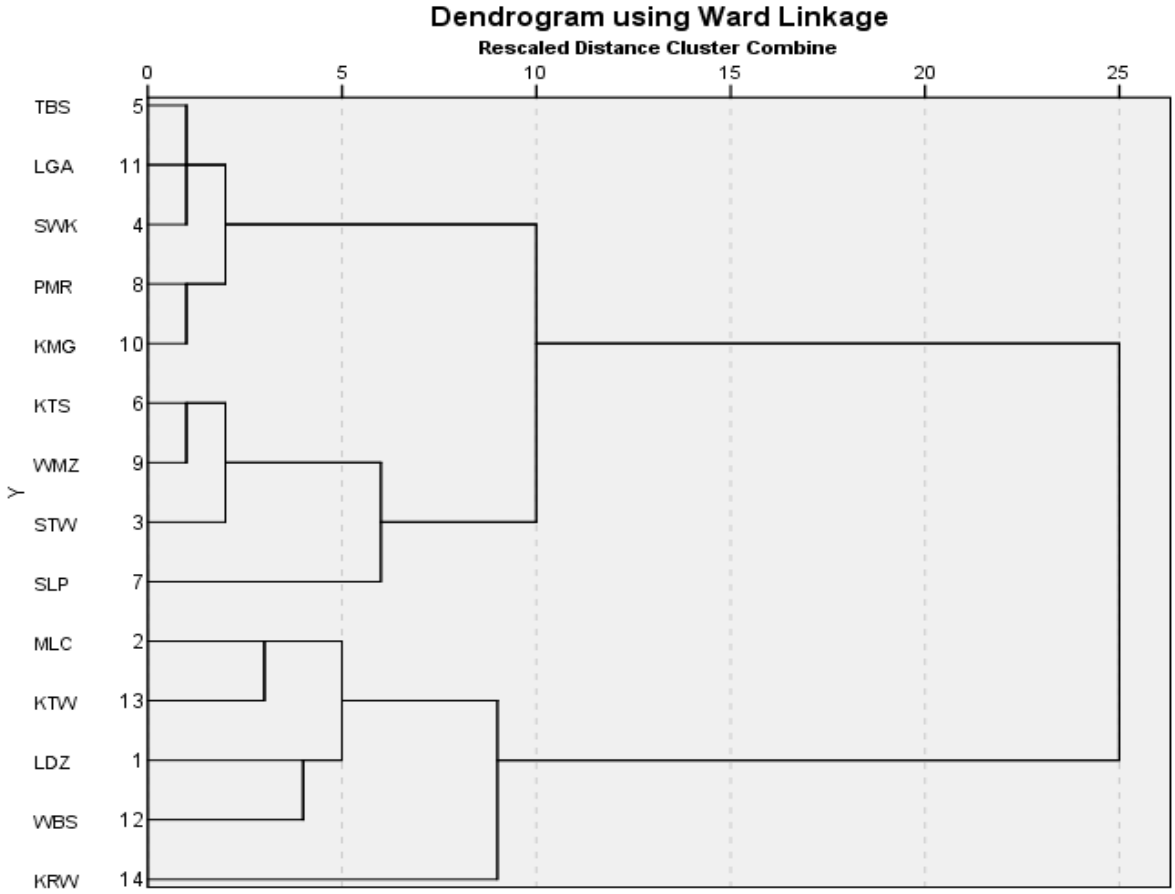

Figure 2. Dendrogram obtained using Ward's linkage method for 14 SEZs
Source: own elaboration.

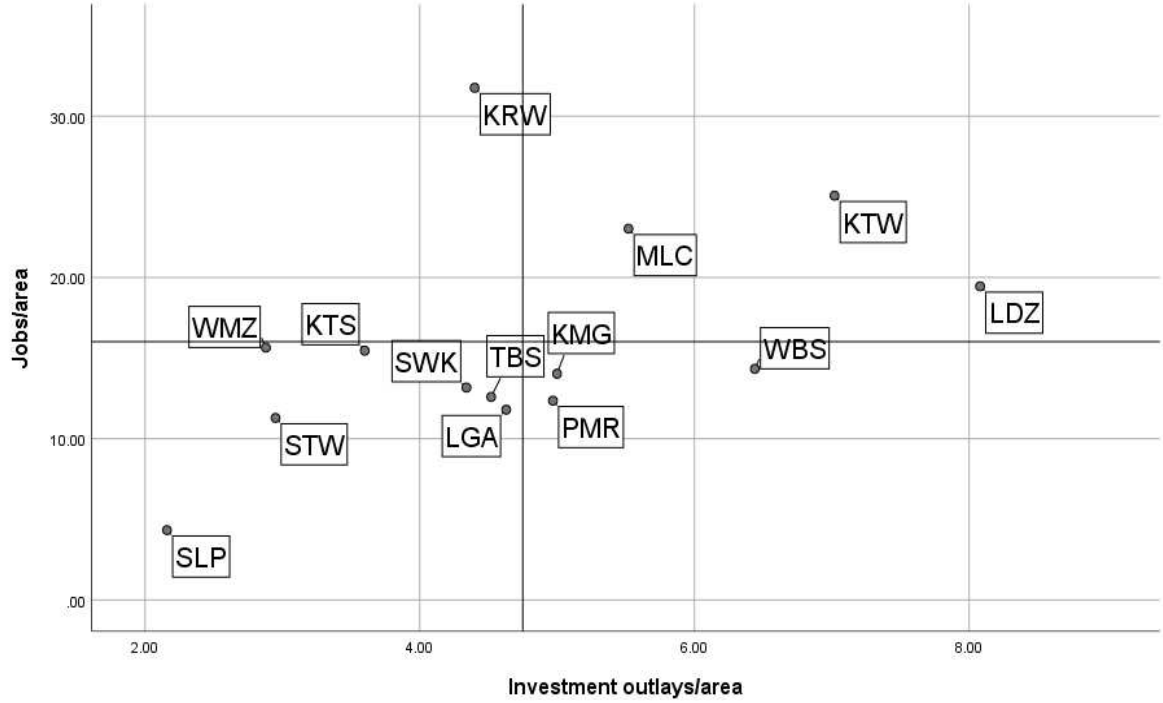

Figure 3. Investment outlays per ha (Y1) and the number of jobs created per ha (Y2) in SEZs
Source: own elaboration.

Based on the above, we can conclude that there is no unambiguous relationship between the membership in a particular cluster and zone location. Zones from groups 1 (worst performing) and 2 (mid) are distributed across three, and from group 3 (the best) across as many as four, macro-regions. Importantly, zones in the eastern macro-region represent all clusters while the northern and south-western macro-regions host zones from two clusters (Table 4). This can be used as evidence substantiating the assertion that the location does not prejudge the attractiveness of a SEZ, as other factors, such as, e.g., the efforts of ZMCs may be important to investors[7].

Table 4. Membership in clusters and zones in macro-regions

Cluster	Zone	Macro-region
GROUP 1	KTS	Northwestern
	WMZ	Northern
	STW	Eastern
	SLP	Northwestern
GROUP 2	LGA	Southwestern
	TBS	Eastern
	SWK	Eastern
	KMG	Southwestern
	PMR	Northern
GROUP 3	KTW	Southern
	MLC	Eastern
	LDZ	Central
	WBS	Southwestern
	KRW	Southern

Source: own study.

Zone governance and its performance: correlation analysis

With data we had, zone operator's efforts to attract and retain new investors could be assessed only indirectly. We used a group of variables which can be controlled by operators and are used as instruments when competing with other zones. Table 5 shows correlation between the inflow of investment (Y_1) and the number of jobs (Y_2) in the zones and our variables reflecting the quality of performance of their operators. Our calculations were made for macro-regions, in accordance with geographic designation of zones.

Table 5. Correlation coefficients for 14 SEZs grouped in 6 macro-regions

Macro-region	Y_1					Y_2				
	x_{1t}	x_{2t}	x_{3it-1}	x_{4it-1}	x_{5it}	x_{1t}	x_{2t}	x_{3it-1}	x_{4it-1}	x_{5it}
Northern		0.645	0.782	0.741				0.476	0.473	
Southern	0.588				-0.642		0.561		0.696	
Eastern				0.626	0.721		0.516		0.466	0.326
Northwestern			0.822	0.817	0.803		0.459	0.882	0.891	0.730
Central	-0.587*	-0.646	0.638	0.797	0.706		-0.709		0.728	0.783
Southwestern	0.465	0.494	0.530	0.344						-0.423

Note: For detailed description of variables, see Table A1. The Table shows statistically significant ($p<0.05$) Pearson's linear correlation coefficients. * Statistically significant ($p<0.05$) Spearman's rank correlation coefficient.
Source: own study.

The values of Pearson's linear correlation coefficients and Spearman's rank correlation coefficient reveal a statistically significant, positive, and at least moderate relationship between the performance

[7] The size and age of a zone may impact its performance. The first one was indirectly accounted for by calculating the amount invested and jobs created per 1 hectare. The second factor seems little relevant to Poland. Zones were established between 1995 (MLC) and 2001 (PMR) and initially they grew very slowly. Investors' interest (especially from other countries) skyrocketed when Poland joined the EU in 2004. Our study begins in 2004, meaning the zones were more or less at the same level of maturity.

of zones grouped in macro-regions, measured with Y_1 and Y_2, and promotion outlays in the preceding period (x_{3it-1}), as well as the equity of ZMCs (x_{2t}). Central macro-region was the only exception where we observed a negative relationship between variable x_{2t} and values Y_1 and Y_2.

We can also observe a statistically significant, positive, and strong correlation relationship between SEZ performance and infrastructural outlays in the preceding period (x_{4it-1}). In southern, southwestern, and central macro-regions invested amounts (Y_1) moderately correlate with tax allowances for ZMCs (x_{1t}). Remarkably, no statistically significant relationships have been found between Y_2 and tax allowances for ZMCs (x_{1t}).

Correlation analysis shows that in most macro-regions the relationship between the frequency of changes in the position of CEO in ZMCs (x_{5it}) and zone performance is statistically significant. Changes in the CEO position positively correlated with invested amounts in northwestern, eastern, and central macro-regions and negatively correlated in the southern macro-region. For Y_2 (newly created jobs) a negative relationship was obtained only for the southwestern macro-region, while northwestern, central, and eastern macro-regions reported positive correlation. It means that analysis conducted at the level of regions does not allow to unambiguously assess the importance of the stability of the composition of the Management Board of a ZMC for the inflow of investment or the number of newly created jobs, although such a relationship is usually statistically significant. This ambiguity of results encouraged us to examine the correlation for individual zones (Table 6).

Table 6. Correlation coefficients for variables Y1 and Y2 and explanatory variables for zones

Zone	Y_1					Y_2				
	x_{1t}	x_{2t}	x_{3it-1}	x_{4it-1}	x_{5it}	x_{1t}	x_{2t}	x_{3it-1}	x_{4it-1}	x_{5it}
KMG		-0.757	0.707	0.750	0.727		-0.583		0.635*	0.567
KRW	0.703	0.587		0.790	0.670	-0.819*	0.678		0.719*	0.824
KTS	-0.924	-0.924		0.943	0.890		-0.801		0.879	0.797
KTW		0.673								
LDZ	-0.587	-0.646	0.638	0.797	0.706		-0.709		0.728	0.783
LGA				0.669	-0.595			0.682*	0.542	
MLC				0.585	0.603				0.575	
PMR		0.539		0.638			-0.869		0.832	-0.557
SLP					0.512	-0.578*	-0.713*	0.738*	0.875	0.512
STW		-0.789		0.785	0.787				0.605	
SWK		-0.693	0.661	0.690*	0.726	-0.756		0.655*	0.572	
TBS	0.848			0.850	0.831					
WBS							-0.613		0.631	-0.742
WMZ				0.572						0.638

The Table shows statistically significant ($p<0.05$) Pearson's linear correlation coefficients. * Statistically significant ($p<0.05$) Spearman's rank correlation coefficients.
Source: own study.

For most SEZs coefficients suggest a statistically significant, positive, and at least moderate correlation between the performance measured with Y_1 and Y_2 and infrastructural outlays from the previous period (x_{4it-1}). In most zones Y_1 and Y_2 significantly correlate with the equity of ZMCs (x_{2t}), while in some with promotional outlays from the previous period (x_{3it-1}) and with tax allowances available to ZMCs (x_{1t}). Besides, there is a clear, usually positive, relationship between the changes in the top management of ZMCs and zone performance. In this case, positive signs are connected with the fact that variable x_5 is a cumulated value.[8] We need to mention three zones, i.e., LGA, PMR, and WBS where changes in the composition of the Board negatively correlated with SEZ performance.

[8] Replacing x_5 with a zero-one variable x_6 in the analysis did not produce any statistically significant relationships (Table A1).

Zone governance and its performance: regression analysis

So far we have learned that the governance quality of ZMCs may contribute to the success or failure of a SEZ. To assess this impact, we built regression models. Searching for the best analytical form, we tested non-linear and linear models. Ultimately, we selected two linear models complying with Markov assumptions[9] and taking account of potential explanatory variables:[10]

$$\mathrm{Y}_{1it} = \beta_0 + \cdots + \beta_1 \cdot \mathrm{X}_{1it} + \beta_2 \cdot \mathrm{X}_{2it} + \beta_3 \cdot \mathrm{X}_{3it} + \beta_4 \cdot \mathrm{X}_{4it} + \beta_5 \cdot \mathrm{X}_{5it} + \beta_6 \cdot D_{1it} + \\ + \beta_7 \cdot D_{2it} + \beta_8 \cdot D_{3it} + \beta_9 \cdot D_{4it} + \beta_{10} \cdot D_{5it} + \varepsilon_{it} \quad (1)$$

$$\mathrm{Y}_{2it} = \beta_0 + \cdots + \beta_1 \cdot \mathrm{X}_{1it} + \beta_2 \cdot \mathrm{X}_{2it} + \beta_3 \cdot \mathrm{X}_{3it-1} + \beta_4 \cdot \mathrm{X}_{4it-1} + \beta_5 \cdot \mathrm{X}_{5it} + \beta_6 \cdot D_{1it} + \\ + \beta_7 \cdot D_{2it} + \beta_8 \cdot D_{3it} + \beta_9 \cdot D_{4it} + \beta_{10} \cdot D_{5it} + \varepsilon_{it} \quad (2)$$

where:

Y_{1it} - is *investment outlays/area* in PLN million/ha for the *i*-th SEZ in the period *t*;
Y_{2it} - is j*obs/area* number of/ha for the *i*-th SEZ in the period *t*;
X_{1it} - is *tax allowances for ZMCs t* in PLN million for the *i*-th SEZ in the period;
X_{2it} - is *equity of ZMCs* in PLN for the *i*-th SEZ in the period *t*;
X_{3it-1} - is *promotion outlays* in PLN million for the *i*-th SEZ in the period *t*-1;
X_{4it-1} - is *infrastructure outlays* in PLN million for the *i*-th SEZ in the period *t*-1;
X_{5it} - is *number of governors* cumulated for the *i*-th SEZ in the period *t*;
D_{1it} - northern macro-region in the period *t*;
D_{2it} - southern macro-region in the period *t*;
D_{3it} - eastern macro-region in the period *t*;
D_{4it} - northwestern macro-region in the period *t*;
D_{5it} - southwestern macro-region in the period *t*.

Table 7 presents the optimum form of model 1 (for Y_1) obtained in a step-wise method. The value of a revised determination coefficient is statistically significant and is close to 0.6, meaning the model fits the sample well.

Table 7. Estimated parameters of an optimum regression model of variable Y_1

Variable	*Unstandardised coefficients*		*Standardised coefficients*	*p*-value
	Parameter estimate B	Standard error B	β	
x_{1it}	0.150	0.071	0.128	0.036
x_{3it-1}	1.791	0.320	0,358	0.000
x_{5it}	-0.178	0.085	-0,131	0.039
D_{1it}	-1.275	0.344	-0.231	0.000
D_{3it}	-1.610	0.369	-0.292	0.000
D_{4it}	-3.851	0.342	-0.698	0.000
Constant	5.191	0.367	X	0.000
R^2	0.597	F(6;125)=30.8411		
Within R-squared	0.577	(*p*<0.0001)		

Note: For detailed description of variables, see Table A1.
Source: own study.

Estimates have demonstrated that increases in tax allowances for ZMCs (x_{1it}) and in promotional outlays from the previous year (x_{3it-1}) exerted positive impact upon amounts invested in SEZs (Y_1) while frequent changes in the position of CEO had detrimental effect (x_{5it}). Other variables turned out to be

[9] Collinearity of explanatory variables was tested using the VIF coefficient; linearity of the relationship was tested using the non-linearity test; Shapiro-Wilk test was used to test the normality of the distribution of the random factor; for heteroskedasticity of the random factor we used the Breusch-Pagan test; autocorrelation of the random factor of the 1st order -AR(1) was tested with Durbin-Watson test, time series stationarity was tested with the ADF test, and the stability of parameters over time with the Chow test (Welfe, 2009, pp. 60-61).
[10] For detailed description of variables, see Table A1.

statistically insignificant. β coefficients show that investment inflow depended mostly on promotional outlays, changes in the composition of ZMCs boards, and tax allowances.

Surprisingly, in light of earlier correlation analyses, variable x_{5it} came with a 'minus'. When testing simple correlation relationships for zones and macro-regions, dependencies between Y_1 and x_{5it} which were statistically significant had opposite signs (plus and minus).

Nevertheless, we need to bear in mind that in the regression model, unlike in the case of correlation, the dependence is not a simple relationship between two variables but an indicator of the direction and strength of the relationship measured under the assumption that other factors remain constant.

Statistically significant parameters were obtained for three qualitative variables ($D1_{it}$, D_{3it}, and D_{4it}) that identify geographic designation of SEZs. It confirms that the location matters for investor decision. Negative signs at these parameters suggest that its impact on amounts invested in northwestern, eastern, and northern macro-regions is smaller than in central and southwestern macro-regions.

Table 8 presents the optimum format of model 2 (for Y_2). The value of revised determination coefficient from the sample (0.7) is statistically significant. β coefficients show that promotional outlays (x_{3it-1}) were crucial for creating new jobs in the zones, ZMCs' equity (x_{2t}) also played a relatively important role. More frequent changes in the composition of Boards of ZMCs turned out to be a positive factor as they contributed to increased employment in the SEZs. Other explanatory variables, including tax allowances for ZMCs, are statistically insignificant. Parameters for qualitative variables D_{3it} and D_{4it} were negative, while the one for D_{2it} was positive. Being part of the southern macro-region exerted a relatively more positive impact upon the number of newly created jobs. On the other hand, like in model 1, zones from the eastern and northwestern macro-regions underperformed in this area.

Table 8. Estimates of parameters of an optimum regression model for variable Y_2

Variable	*Unstandardised coefficients*		*Standardised coefficients*	*p*- value
	Parameter estimate B	Standard error B	β	
x_{2t}	1.287E-8	0.000	0.177	0.002
x_{3it-1}	5.566	0.804	0.377	0.000
x_{5it}	0.548	0.220	0.138	0.014
D_{2it}	8.323	0.953	0.512	0.000
D_{3it}	-1.894	0.899	-0.116	0.037
D_{4it}	-6.653	0.960	-0.409	0.000
Constant	11.664	1.006	X	0.000
R^2	0.707	F(6;125)=50.346		
Within R-squared	0.693	(p<0.0001)		

Source: own study.

It is difficult to confront our findings with those of other authors as we did not come across similar studies. As far as Poland is concerned, Jensen (2018, p. 887) observed that "*the exact role of the zones' administrations in creating the policy outcome is an important topic to be addressed in future research*". The only econometric study known to us that assesses the impact of governance on the zone performance (measured by investments and exports) is the one carried out by Aggarwal (2005). But unlike in our study, *governance* was an aggregated variable whose numerical value was obtained in a primary survey conducted among investors in zones in India, Bangladesh, and Sri Lanka. They agreed that it is an important determinant of the attractiveness of zones. However, after estimating models' parameters governance turned out to be relevant for investment but not for export performance.

CONCLUSIONS

The objective of the article was to assess why some ZMCs are more successful at attracting more investment and jobs. Our starting point was to check whether we can find the best and worst-performing ZMCs in every region of Poland. In the south and south-west, we can find both the best performing SEZs, such as WBS, KWT or KRW, and one of the worst – KMG and LGA. In the north, the

successful PMR coexists with the poorly performing WMZ and SLP (north-west). In the east, we have one of the least successful STW, while MLC is doing quite well. These examples suggest that the advantage of having a better zone location (in terms of geography, infrastructure, resources, and cultural or even historical contexts) is relative, and other factors may be at play too. The quality of governance (administration) could be one of them.

Our analysis has demonstrated that this presumption may be correct. We have shown that although location is decisive (making zones in the south & central more successful relative to the rest, see Figure A1 in Appendix) the zone management style also impacts SEZs' performance.

ZMC promotional activity is the most important factor. Tax allowances granted to a ZMC are crucial for total amounts invested in SEZ, while ZMC's equity is important for the number of newly created jobs. Apparently, financial and operational autonomy of the ZMC translates into better performance of a zone in these two fields and not very attractive location does not preclude growth opportunities of a SEZ as long as it is managed in a professional way. Changes in the SEZ's top management have a dubious impact – positive in the case of extra jobs and negative in the case of investment inflows.

Summing up, our findings on the relative importance of individual ZMCs in the overall design suggest that: (1) zone administration does matter; (2) competition between ZMCs may be an important aspect, especially as they can open subzones in different macro-regions; (3) zone location determines the ZMC performance in the first place.

Following these conclusions, we recommend limiting the centralisation of decision-making powers in zone policy. On the one hand, it would mean strengthening the role of regional authorities, who have much better knowledge about available plots, their location, and what industries they would like to host in their territories. There is also the more important issue of delegating more powers and resources to the managing companies; being in direct contact with investors surely impacts zone performance. Equipped with additional prerogatives, they could, e.g., more effectively assist in removing infrastructural barriers, help with organising vocational trainings, and facilitate contacts with local businesses.[11]

The results of our study should be approached with caution. First, the explanatory variables only indirectly indicate governance quality, but no better data were available. Second, zones are usually dispersed across more than one region, meaning they are subject to different State aid ceilings.

Third, another simplification stems from our criterion for assigning a zone to a specific macro-region. We used a threshold of more than 50% of the total invested amount in the subzones located there.[12]

Further research could examine the quality of zone governance from investors' perspective through questionnaire-based analysis. Another point worth considering is geography.

Macro-regions cover big areas which are not homogenous as far as economic situation is concerned. Zones in different parts of e.g., the southern macro-region do not offer the same location advantages to investors, as assumed for our study. Therefore, by disaggregating macro-regions into smaller territorial units we could shed more light on the role of zones' governance in Poland.

[11] The results of a study carried out by KPMG suggest that in all zones (except one) investors assessed "the quality of cooperation with SEZ managing authority" clearly better than infrastructure and human resources. Sometimes the rating was higher by even 1 point (on a 5-point scale) and for ten zones it exceeded 4 (with 5 being the maximum score). The sample included 234 enterprises, with at least 10% of investors from each zone. The study was conducted as a computer assisted telephone interview (CATI) with top managers (KPMG, 2014).

[12] The problem has been reduced since 2018. The territorial competencies of ZMCs were specified in the Act of 10 May 2018 on support for new investments (Dz.U. [Journal of Laws] of 2018, item 1162) entered into force on 30 June 2018).

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Appendix:

Table 1. Explained and explanatory variables

No	Variable	Measurement unit (as at 31.12)	Symbol	Explanatory notes
Explained variables				
1.	Investment outlays/area*	million, PLN/ha	Y_1	Cumulated, by companies with valid permits/area**
2.	Jobs/area	number of/ha	Y_2	Cumulated, existing and new/area.
Explanatory variables				
3.	Tax allow-ances for ZMCs	million, PLN	X_1	Yearly, calculated as percentage of the revenue earmarked for the development of the zone, e.g. infrastructure and promotion outlays**
4.	Equity of ZMCs	PLN	X_2	Including State Treasury and other shareholders** Data for 2 SEZs have been skipped. MLC and TBS equity be-long to the same ZMC – Industry Development Agency. There is no information about the shares of the two in total.
5.	Promotional outlays	million, PLN	X_3	Cumulated, by ZMCs***
6.	Infrastructural outlays	million, PLN	X_4	Cumulated, by ZMCs, excluding infrastructure outlays spent in SEZs by gminas, poviats, suppliers of gas, water, electric-ity, sewage and General Directorate for National Roads and Motorways. Those "external" (to ZMCs) outlays were usu-ally much higher****
7.	Number of gover-nors/CEOs	number of	X_5	Cumulated
8.	Change in gov-ernors/CEO position	dummy var.	X_6	Governor = President of ZMC

* The areas of the zones are affected by both land inclusion (more often) and exclusion (less often). There are four main reasons for land exclusion:
1) the loss/termination of a permit by an investor operating in the area;
2) zone area has been earmarked for public infrastructure projects (e.g. motorway);
3) a plot sale for non-zone investment projects;
4) no investment projects in the area.
The last one was the most frequently observed. ZMCs are obliged to make a review of undeveloped areas. If there are no investors for approx. ten years (there is no strong regulation about it) they can remove them from the zone. No statistics are available but the phenomenon is not very common as it covers probably less than 5% of the zone area.
** Variable deflated with the Investment Outlays Price Index (Statistics Poland). The first year of the analysis was taken as a base for comparisons.
*** Variable deflated with the Consumer Price Index (CPI) (Statistics Poland). The first year of the analysis was taken as a base for comparisons.
**** Variable deflated with the Investment Outlays Price Index (sub-category: Buildings and Structures) (Statistics Poland). The first year of the analysis was taken as a base for comparisons.
Variables 1-6: all data come from the Information about the Implementation of the Act on Special Economic Zones, Ministry of Economy and Labour, Ministry of the Economy, Ministry of Economic Development, Ministry of Entrepreneurship and Technology, (2005-2019).
Variables 7&8: authors' own elaboration based on NIK (2011) and other sources (SEZs' websites and press articles).
Source: own study.

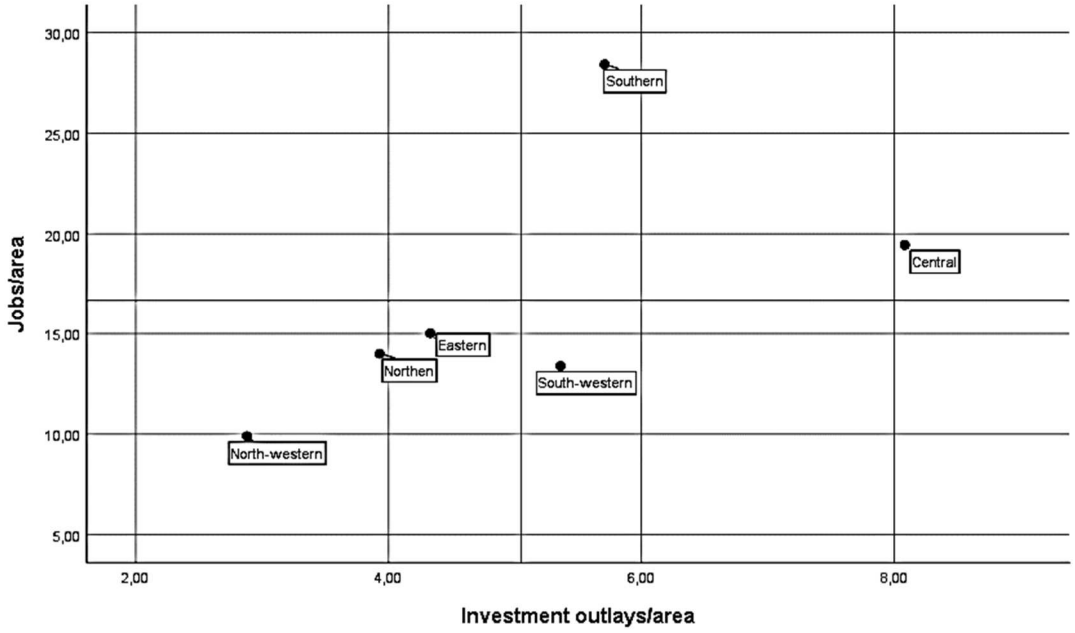

Figure A1. Investment outlays per ha (Y1) and the number of jobs created per ha (Y2) in 14 SEZs grouped in 6 macro-regions

Source: own elaboration.

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

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Acknowledgements and Financial Disclosure

The authors would like to thank the anonymous referees for their useful comments, which allowed to increase the value of this article.

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Entrepreneurial Business and Economics Review

2021, Vol. 9, No. 3

10.15678/EBER.2021.090311

Links between the economy competitiveness and logistics performance in the Visegrád Group countries: Empirical evidence for the years 2007-2018

Botond Kálmán, Arnold Tóth

ABSTRACT

Objective: The objective of the article is to examine the relationship of competitiveness and logistics performance and – on the basis of this relationship – inspect which of the 12 pillars of the Global Competitiveness Index (GCI) reveal developments in the logistics performance of Visegrád Group (V4) countries. Next, we analyse the possibility of creating a common indicator number, by which the index formulated based on the GCI pillars and the Logistics Performance Index (LPI) values can simultaneously express competitiveness and logistics development level.

Research Design & Methods: For our research, we used the time series from the Logistic Performance Index published every three years by the World Bank and the Global Competitiveness Index annually published by the World Economic Forum. We analysed the correlation between the pillars of the GCI and the index components of the LPI and then chose pillars that make it apparent how competitiveness determines the development level of logistics. To that end, we first used the Pearson correlation coefficient and, later, structural equation modelling. We performed the examination of the logistics development level of V4 countries based on the competitiveness pillars by objective index values, but also by comparison to countries that are on top of the LPI ranking.

Findings: Institutions, adoption of information and communication technology (ICT), and Innovation have the most defining effect on logistics performance in V4. The countries of V4 were successful in improving the performance level of their logistics sector, but the performance of Poland and the Czech Republic exceeds the performance of Slovakia and Hungary in practically all of the studied areas.

Implications & Recommendations: The present study primarily highlights the fact that further efficient development can only be realised by appropriately harmonising the activities of economic policymakers and actors. The examined V4 countries showed similar development levels, so we also gave them similar suggestions, which mainly include the development of the info-communication sector and the improvement in the effectiveness of the Institutions competitiveness pillar.

Contribution & Value Added: The last time V4 countries logistics capabilities were scrutinised was in 2015. Since then, the pillar structure of the World Economic Forum underwent a significant change. This study examines the group's logistics performance by using more up-to-date data and highlighting the way for further research activities by searching for comparative advantages, which may allow V4 countries to further increase their competitiveness and logistics performance.

Article type: research article

Keywords: competitiveness; logistics; performance; the Visegrád Group; development

JEL codes: F63, P25, P27, R11

Received: 1 November 2020 Revised: 24 April 2021 Accepted: 26 April 2021

Suggested citation:

Kálmán, B., & Tóth, A. (2021). Links between the economy competitiveness and logistics performance in the Visegrád Group countries: Empirical evidence for the years 2007-2018. *Entrepreneurial Business and Economics Review,* 9(3), 169-190. https://doi.org/10.15678/EBER.2021.090311

INTRODUCTION

The country competitiveness and logistics performance are in close relationship. The implementation of a well-organised production-transport-storage chain is necessary for competitiveness in the era of Industry 4.0, as is appropriate digital equipment and competences (Rymarczyk, 2020; 2021; Sieja & Wach, 2019). The country that implements all this successfully will gain a significant competitive advantage over other countries. At the same time, the information technology (IT) or wider information and communication technology (ICT) sector is also an important pillar of the Global Competitiveness Index (GCI) used by the World Economic Forum (WEF). This means that improvement in competitiveness pillars could also improve logistics performance. The role of the logistics sector in the whole economy is increasing. The share of the logistics and transport sectors in the EU economy is 5% and 10% respectively (European Commission, 2016). These data clearly indicate the significance of economic performance. In satisfying the ever-increasing market demand – which results from the progress of globalization – a great role is played by organised transport, distribution, product monitoring, and warehousing. Development increases constantly, primarily thanks to digitization. IT that is applied in more and more areas of life is essential in modern logistics as well. IT primarily plays a key role in the organization of supply chains, stock management, and transport processes (Magill *et al*., 2020, Zhiwen *et al*., 2020). In the future, the importance of digital awareness will be clear in every area of the economy, from management through workplace environment design to logistics. Likewise, as a result of accelerating development and on top of the characteristics of supply chains, new areas will become the focus of scientific research (Agyabeng-Mensah *et al*., 2020, Ren *et al*., 2020) because of increasing environmental awareness and the rapid shortening of deadlines. Sufficient logistics performance is essential for economic growth. Although, these types of services are generally provided by firms, national governments with regional and international organizations also play a decisive role by establishing regulations. The importance of logistics was recognised in recent decades. Logistics activity is determined by strategic-business approach, which means that on top of examining costs, even in the case of the potential increase of costs (Duran & Alfonso, 2020), the primary objectives remain better performance and higher customer satisfaction (Wang *et al*., 2021). For nations in pursuit of further development, the effective harmonization of logistics strategy and regulations will become necessary, which is an important element of government policy. Besides this, cooperation between countries is also important, which is a competitiveness increasing factor.

Although, the share of logistics in a country's gross domestic product (GDP) is not necessarily as large as the share of other competitive sectors, we must not disregard its role played in supporting all other economic activities. Under appropriate conditions, the known connection between transport-logistics and national development brings numerous other favourable economic and social results. The sector enables companies to be efficient with regards to products and services, along with related transactions. Inadequately efficient logistics increase the costs of commerce and reduce integration potentials. However, not just infrastructure requires development but also new factors of competitiveness such as the efficiency of information flow, telecommunication systems, innovation systems, and the practical application of new knowledge. Thus, the role of logistics increases in improving the economic competitiveness of the region.

The elements of efficient and competitive product transport contribute to the growth of the European economy. Logistics is one of the main drivers and pillars of European competitiveness, by creating routes for the movement of goods and cooperation among firms. For further development, it would be expedient to harmonise related national strategies.

The objective of the article is to examine the relationship of competitiveness and logistics performance and – on the basis of this relationship – inspect which of the 12 pillars of the Global Competitiveness Index reveal developments in the Logistics Performance Index (LPI) of Visegrád Group (V4) countries. Our research question sought which pillars should be modified to enhance logistical performance most effectively. To that end, we first examined the relationship between competitiveness pillars and logistics performance and then examined the effect of relevant pillars on this performance.

During our work, we paid special attention to the Visegrád Group (V4) countries. The relevance of our investigation derives from the fact that the Global Competitiveness Index – published from year to year by the World Economic Forum – changed prior to our research. This change resulted in a research gap in the literature, which we decided to begin filling. Accordingly, old (till 2017) and new (since 2018) pillars of competitiveness had been reconciled with each other before statistical treatment in order to ensure the proper application of the GCI in the future. The novelty of this article lies in the fact that the augmentation of the political influence and the co-operation of the V4 countries will soon produce tangible results, namely in the field of logistics, the V4 railway project abating the duration of Warszawa-Budapest distances under six hours or the Via Carpathia public road development programme.

The structure of the work is the following. Based on comprehensive prior literature review, we formulate our hypothesis, followed by the description of the research method. During the review of the results and discussion, we first show the model we used and then its application for V4 countries. In the closing chapter, we conclude and demonstrate the results.

LITERATURE REVIEW

Theoretical relationships between competitiveness and logistics performance

Modern competitiveness is one of the most often used terms in the literature on economics. However, the notion lacks a generally accepted definition. One of the reasons for this is that modern competitiveness is interpreted on multiple levels – corporate, regional, and national – which are described by various indices (Siudek & Zawojska, 2014). Of course, competitive behaviour and its components may also be evaluated with other methods. In the present work, we chose logistics as area of analysis, whose one of the most accepted condition indicators today is the Logistics Performance Index (LPI), generally published biannually by the World Bank since 2007 (Arvis *et al*., 2007). Since logistics is a component of the GCI, a correlation can be assumed between the two indicators, which has been proven by several authors (Tongzon, 2007; Kasarda, 2016).

Puertas *et al*. (2014) studied the role of logistics performance in the bilateral international commerce processes of European Union member states. By fitting the LPI into the two-step Heckman-model – widespread in economics – they conclude that in balanced two-way commerce, the GDP of the importing country, the distance between the two countries, and the LPI are the three determining factors. Their further significant conclusion is that logistics is a key factor from the perspective of exporting countries. In the trend of the LPI value, the role of interstate commerce processes has appreciated because the local market is rather a hindrance than a driver of increasing logistics performance, even in countries more developed economically. The efficiency of a product transport firm or a department store delivery company can follow increasing market demand only to a limited extent, but in small countries these actors probably dominate in supplying the local market. However, only the companies that explicitly specialise in logistics can keep up with the requirements of the market growth caused by international cooperation. Consequently, the significant expansion in the range of consumers makes it necessary for manufacturers and distributers to use such companies for transport. These international service providers are in competition with each other, which ensures their constant development. With regards to the role played by local markets and their effect on logistics performance Kiisler (2008) demonstrated that on local markets the role of manufacturers is more significant in delivering products than the role of logistics service providers. On the one hand, this entails a considerable increase of manufacturers' costs. On the other hand, in companies specialised in production, neither sufficient knowledge nor adequate resources are available to provide professional logistics services. In turn, this causes a considerable performance disadvantage for a country.

Innovation is also of key importance in logistics (Cieślik *et al*., 2018; Roscoe *et al*., 2016). Björklund and Forslund (2018) analyse the role played by innovation, in connection with a study of international supply chains. They highlight the characteristics of the innovation process, emphasising that its cost reducing and performance increasing effect can be maximised if we study the possibilities of development of all the participants of logistics. Among manufacturers, this could be realised by improving the efficiency of production, while on the side of consumers, assessing needs and

adapting to them would represent the greatest progress. Among transport companies, what is important is the role of committed managers who can determine the most efficient sequence of activities while viewing the process of product delivery in its entirety. One of these innovative processes is the just-in-time (JIT) system developed by Toyota for its production process as early as in 1938, whose logistics application offer significant opportunities even today (Lai & Cheng, 2016). At the same time, air cargo transport plays a leading role in the delivery of high value, quickly perishing foods, medications, flowers, and similar products, generates important innovative solutions, coupled with the requirement of sustainable development (Kasarda, 2016).

Ghoumrassi and Tigu (2018) studied the role of ICT in logistics processes among Pakistani retail stores. Based on their results, according to a majority of transport companies, emphasis on increasing delivery performance volume per time and simultaneously reducing delivery time improves customer satisfaction, which originates from the customer always receiving the right amount of product at the right time and for the lowest price. Today, the significant growth of online purchases makes fast and convenient solutions increasingly important from the perspective of clients. Thus, we must keep this in mind when considering the development of firms that perform products delivery. Delfmann *et al*. (2002) analysed the effect of e-commerce on logistics and indicated that with the increasing popularity of e-shops, the elements of a traditional supply chain also transform. It is a frequent opinion that suppliers and subcontractors should use the same information technology. Primarily, the point is not which type of system they use but that all participants have an identical system. Bates *et al*. (2018) analyse the modern ICT use method. This means that special opportunities of IT systems can be used in the area of 'last mile' logistics. In this case, the point primarily is not what system they use, rather for the system to be the latest and most modern possible version. This facilitates delivering the package from the last distribution point to its destination – mostly the customer's home – in the fastest and most environmentally friendly manner. The concept of smart cities plays a great role in this, along with the 5G information system, currently in its initial phase but developing at an increasing speed. The continuous development of information systems plays an important role not only for countries that lag behind in logistics development as in the absence of adequate technology, there doubtlessly is no realistic chance of increasing performance and catching up to more developed countries. Jhawar and Garg (2016) studied the effect of investments in IT development on competitiveness. Based on the examination of several models, they demonstrated that investment in IT development has little effect on increasing a company's profit (< 0.1%). Despite this, investments in business management systems have an outstanding role since with them, the company's time and performance efficiency can be greatly increased, which in the longer term, certainly increases the logistics performance and competitiveness of businesses.

The subject of logistics and competitiveness has been studied by multiple authors and following various viewpoints. One of the most common goals is to make suggestions for increasing logistics performance (Beysenbaev & Dus, 2020; Roekel, 2013). Primiana *et al*. (2016) scrutinise the performance of the logistics sector primarily with a cost level approach. They use the classic division of logistics costs as a framework to conclude that the logistics costs of the studied companies comprise only 0.2% of their sales revenue. However, they also discover significant differences between specific cost categories: half of the logistics costs comprise costs related to warehousing, while fuel costs are in the second place. Thus, reducing both expenses may result in the possibility of spending considerable financial resources on other tasks. Another research team (Civelek *et al*., 2015) employ the hierarchic regression method to study how the LPI, the GCI, and GDP affect each other. Their results show that improvement achieved in the GCI value directly increases GDP, while a similar effect is observed in an indirect way by improving the LPI values. Another team observes the effect of the GCI on the LPI trends (Çemberci *et al*., 2015). They consider the effect of the GCI on the six indices that comprise the LPI, with the hierarchic regression method presuming a correlation separately in the case of every index. According to their conclusion, the GCI has affects logistics competence, product monitoring, international shipments, and timeliness, while a change in competitiveness failed to affect customs administration and infrastructure. Other authors study what differences can be detected in the effect of logistics performance on competitiveness pillars in countries with various incomes. Their new method is the ARAS-G method, used to evaluate the logistics performance of OECD countries in 2010-2018 (Yildirim & Adiguzel Mercangoz, 2020).

Moreover, clustering is also a popular study method, sometimes employed for a grouping of logistical characteristics (Carlan *et al*., 2017). However, country-based grouping is more frequent due to the large number of countries (C4L, 2017). The income classification of countries was conducted based on the World Bank's 2016 ranking. Among others, the study connects infrastructure, health condition, higher education, and market size more closely to logistics performance. At the same time, the study shows that a country's place in an income category is closely related to its chances of competitiveness development. For the logistically most developed countries of Asia, Chung (2016) applies Porter's Diamond Model by using the GCI and LPI data, along with the model applied in multiple criteria decision-making and the analytic hierarchy process (AHP) for multi-attribute decision-making, also described by Rapcsák (2007). Chung (2016) demonstrates that even though the scrutinised countries all have high positions on the LPI ranking, they comprise two separate groups from the viewpoint of logistics development level. Hwang *et al*. (2017) study the correlations between the competitive and logistics features of the most dynamically developing countries to find that proper industry policy, infrastructure development, market expansion, and appropriately selected IT background are the most important logistics performance stimulants.

Hypotheses development

As it was mentioned, one of the most popular macro-level indices is the GCI, developed and annually published by the World Economic Forum, which may be described by its twelve pillars (Schwab, 2007). As evident from the above overview, several studies examine the correlation between the GCI and the LPI. The future prospects of output values and usability are significantly changed by the fact that in 2017 the World Economic Forum modified the structural composition of the 12 GCI pillars. In consideration of the changes, the present work sets the goal of examining the effects of the new GCI pillars on logistics performance. Our intention was also to create an index which – based on the elements of the GCI and the LPI – can be used for the comprehensive and joint characterization of competitiveness and logistics. Using our own results, we planned the creation of country groups, for which we can make specific recommendations to their governments.

In our study, we particularly focused on the group of V4 countries (Czech Republic, Hungary, Poland, and Slovakia as the members). Although Handfield and Withers (1993) nearly 30 years ago compared Hungary to the logistics of Korea, China, and Japan, we regarded a regional comparison more expedient, thus we made the comparison with the V4 members. These countries are tied together by the heritage of their shared socialist past, which forestalled their economic development for many years, and they have been unable to completely eliminate their disadvantage to this day. The V4 countries were logistically presented in 2015 with a summary work edited by Veres (2015). Ricci (2019) highlights two competitive strategies in the manufacturing industry in Central Eastern European countries. The research team of Dorożyński and Kuna-Marszałek (2015) studied only selective subfields, similarly other researchers focusing especially on themes of intermodal transportation (Białobłocka, 2019), road transport logistics (Włodarczyk & Mesjasz-Lech, 2019), and railway development (Tóth, 2019). We will join these series of studies on V4 countries with our current research, primarily to re-evaluate the old data from previous studies and the results of the literature on the topic.

The empirical results from previous studies allowed us to assume the following research hypotheses, which seem in the literature to be worth verifying (Hwang *et al*., 2017; Arvis *et al*., 2018; Ahmad & Mehmood, 2016):

- **H1:** It is primarily Institutions (Pillar 1), Infrastructure (Pillar 2), and ICT adoption (Pillar 3) that have the most defining effect on logistics performance.
- **H2:** Countries can be grouped into clusters based on their logistics performance for which the development of different competitiveness pillars can be recommended, depending on their specific cluster.
- **H3:** In the studied period, the V4 countries took similar development paths, and they managed to make progress in the area of logistics development.

RESEARCH METHODOLOGY

Data and period

We based our study on two publicly available data sources. First, we mean the competitiveness report entitled "Global Competitiveness Report" that conveys the GCI, which is annually published by the World Economic Forum. From these reports we compiled the data for the period of 2007-2018 (Schwab, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018). As we mentioned above, the index structure of the GCI changed in 2017, thus eliminating its issues that had received criticism (Table 1). The main reason for the change was the need to adapt to Industry 4.0. The change had numerous favourable effects on the index, since the number of indicators based on statistical data increased, and the weighting of the elements that produce the value of specific pillars was simplified. The content's relevance was modernised as well, e.g., the role of specific pillars in competitiveness is now measured by the WEF with statistical data rather than subjective questionnaire surveys.

Table 1. Adaptation of the old and new competitiveness pillars of GCI by WEF

GCI till 2017	GCI from 2018
1. Institutions	1. Institutions
2. Infrastructure	2. Infrastructure
3. Macroeconomic Environment	4. Macroeconomic Stability
4. Health and Primary Education	5. Health
5. Higher Education and Training	6. Skills (all education is included here)
6. Goods Market Efficiency	7. Product Market
7. Labour Market Efficiency	8. Labour Market
8. Financial Market Development	9. Financial System
9. Technological Readiness	3. ICT Adoption
10. Market Size	10. Market Size
11. Business Sophistication	11. Business Dynamism
12. Innovation	12. Innovative Capability

Source: Schwab (2016) and Schwab (2018).

Our second source was the LPI developed by the World Bank, which publishes the report since 2007, usually every two years. The LPI numerically evaluates and ranks logistics performance, thus assisting government leaders, key policymakers, and the private sector in understanding the challenges that they and their trading partners face. The LPI enables government and business leaders to better recognise the competitive advantage provided by efficient logistics and understand the significance of policy factors related to the economy that affect logistics. The LPI measures the logistics performance of countries with six components, which we mentioned in the introduction. Of this data series, we also used the values published in the period of 2007-2018 (Arvis *et al*., 2007, 2010, 2012, 2014, 2016, 2018). Since the World Bank's report was most recently published in 2018, we only studied the GCI up to this year.

Standardization and triangulation of data

In the first step we had to adapt the pre-2018 GCI pillars to the 12 indices applied in 2018. This was necessary to enable the use of a consistent structure for the comparability of our results in the time-series analysis sequence tests. In the case of some of the pillars – e.g., with Institutions or Infrastructure – such an adaptation did not cause any difficulty. Specifically, in cases when a pillar's name clearly indicates that the old and the new pillar measure the same indicator, even if they use different components for their characterization. In cases when the correlation between the pillars was not clearly identifiable based on names, we applied the Pearson correlation to adapt the pillars to each other. The original fourth (Health and Primary Education) and fifth (Higher Education and Training) pillars can be aligned with the new system's fifth (Health) and sixth (Skills) pillars, as proven by the Pearson-correlation analysis, which revealed that the condition of health was the defining factor in the case of Health and Primary Education. This is why we adapted the original fourth pillar to the fifth (Health) pillar of

the new system (Table 2). We found the greatest difference between the old Technological Readiness and the new ICT adoption indicators. Thus, we studied the adaptation with the Pearson correlation in this case as well. The results are shown in Table 3, proving our assumption that the ICT is the component that indeed mostly defines readiness.

Table 2. The role of the health factor and primary education in the old fourth pillar – results of Pearson correlations until 2017

Pillars	Statistics	A. Health	B. Primary education	Fourth pillar Health and Primary Education
A. Health	Correlation coeff.	1	**0.647**	**0.909**
	p-value (2 tailed)		0.000	0.000
	N	1524	1524	1524
B. Primary education	Correlation coeff.	**0.647**	1	**0.906**
	p-value (2 tailed)	0.000		0.000
	N	1524	1524	1524
Fourth pillar Health and Primary Education	Correlation coeff.	**0.909**	**0.906**	1
	p-value (2 tailed)	0.000	0.000	
	N	1524	1524	1524

Source: own elaboration based on Schwab (2017).

Table 3. The role of ICT in the old ninth pillar – results of Person correlations until 2017

Pillars	Statistics	A. Technological adoption	B. ICT use	Ninth Pillar Technological Readiness
A. Technology adoption	Correlation coeff.	1	**0.689**	**0.837**
	p-value (2 tailed)		0.000	0.000
	N	1132	1132	1132
B. ICT use	Correlation coeff.	**0.689**	1	**0.973**
	p-value (2 tailed)	0.000		0.000
	N	1132	1132	1132
Ninth Pillar Technological Readiness	Correlation coeff.	**0.837**	**0.973**	1
	p-value (2 tailed)	0.000	0.000	
	N	1132	1132	1524

Source: own elaboration based on Schwab (2017).

To unify the present study and for its planned future expansion, we decided that from here on, we will use the names and numbering of pillars according to the prevailing valid system from 2018. Further procedures used in the methodology will be discussed in the next chapter to ensure better availability and transparency of the model.

Research methods

We conducted our study with the application of multiple methods. We used Pearson correlation coefficient and structural equation modelling (SEM) method. For calculations we used SPSS Amos software package by IBM. To create our model, we first took account of the extent of correlation between the variables we examined, and we put special emphasis on partial correlations to make model construction more sophisticated. Building from this, we associated the variables based on the closeness of their relationships. Arrows indicate causal connections. Their directions were concluded based on literature review and own experiences attained during previous research of the authors. The actual revelation of causal connections necessitated the application of the Granger test but due to the shortness of the time series of LPI it was not practicable.

Then, we observed the fit indices of the model. We considered the followings for their assessment: an NFI (Normed Fit Index) of 0.95 indicates that the model of interest improves the fit by 95% relative to the null model. The Incremental Fit Index (IF) adjusts the NFI for sample size and degrees of freedom.

Over 0.90 is a good fit but the index can exceed 1. The Relative Fit Index (RFI) is not guaranteed to vary from 0 to 1. However, RFI close to 1 indicates a good fit.

RESULTS AND DISCUSSION

Building and testing the model for 160 countries

The first step in the creation of our model was the study of possible connections of 160 countries. Since the GCI is a composite type of index, its pillars are not independent of each other. Thus, one cannot be selected from among them for a competitiveness increasing purpose because of mutual interactions between all the pillars, which would result in an unexpected result. Therefore, not only the effect of the pillars on the LPI should be analysed but also the complex correlation systems among them. However, analysing all the correlations is unnecessary, so we only focused on the significant correlations. Because of considerable multicollinearities, after normalising the value of the 0-100 pillar-score to values 1-7, we performed partial correlation analyses to select the most significant ones. Then, we followed the same principle in the assessment of interactions between the six components of the LPI (Table 4 and Table 5).

Table 4. GCI partial correlations in the year 2016

Pillars	1. Institutions	2. Infrastructure	3. ICT Adoption	4. Macro-economic Stability	5. Health	6. Skills	7. Product Market	8. Labour Market	9. Financial System	10. Market Size	11. Business Dynamism	12. Innovative Capability
1. Institutions	1											
2. Infrastructure	0.328	1										
3. ICT Adoption	-0.099	0.381	1									
4. Macroeconomic Stability	0.090	0.115	-0.002	1								
5. Health	-0.024	0.085	0.043	0.008	1							
6. Skills	-0.028	0.157	0.413	0.004	0.542	1						
7. Product Market	0.351	-0.039	0.209	-0.016	0.112	-0.117	1					
8. Labour Market	0.120	-0.051	-0.011	0.135	-0.125	0.064	0.202	1				
9. Financial System	0.169	-0.043	-0.048	0.159	-0.014	0.044	0.179	0.169	1			
10. Market Size	-0.420	0.233	-0.159	0.161	0.028	0.035	0.002	-0.196	0.082	1		
11. Business Dynamism	-0.012	0.243	-0.123	-0.052	-0.122	0.166	0.337	-0.085	0.268	0.203	1	
12. Innovation Capability	0.339	-0.210	0.293	-0.086	-0.052	0.046	-0.107	0.209	-0.150	0.309	0.477	1

Notes:
$p < 0.05$
Coefficients > 0.3 <0.2 – 0.3 > <0.1 – 0.2 > In other cases, there is no assessable correlation.
Source: own elaboration based on Schwab (2017).

In consideration of the complex correlations between the pillars, we regarded their extent useable from 0.3. Thus, we created a model with the application of significant correlations with the help of the IBM-SPSS Amos module and with the structural equation modelling method. With explorative factor analyses method, we created the LPI as a latent variable from its six indices. The created model is shown in Figure 1.

Table 5. LPI partial correlations between GCI Pillars and LPI for 2018

GCI Pillars	Correlation coeff.	*p*-value
1. Institutions	0.034	0.356
2. Infrastructure	0.020	0.592
3. ICT Adoption	0.319	0.000
4. Macroeconomic Stability	-0.053	0.148
5. Health	0.046	0.212
6. Skills	-0.099	**0.007**
7. Product Market	0.175	**0.000**
8. Labour Market	-0.077	**0.036**
9. Financial System	0.029	0.426
10. Market Size	0.408	**0.000**
11. Business Dynamism	0.013	0.732
12. Innovation Capability	0.240	**0.000**

Source: own elaboration based on Arvis *et al.* (2018).

While creating the model, we only included the countries for which all annual data in 2007-2017 was completely available to us. Then, we created the LPI, which is included in the model, as a latent variable, with explorative factor analysis (EFA) method. This is a technique used to reveal the elemental structure of a major set of variables. EFA is a statistical method within factor analysis the comprehensive aim of which is to detect the intrinsic links between metrical data (Norris & Lecavalier, 2009). We employed it to evolve a scale being a database of matters used to assess a given area of research. EFA aims to specify a set of potential elements hidden behind a series of measured variables (Fabrigar *et al*., 1999).

We constructed the LPI from its six indices, practically with total correlation. The arrows between the model's elements denote significant correlation. The direction of arrows demonstrates the cause-and-effect relationship between the two endpoints, pointing from the cause toward the result. We determined the direction of the arrow based on our economic knowledge. The effect strength is indicated by the number marking of the arrow, which corresponds to the standardised coefficient from the factor score. The complexity of the GCI pillars' interaction between each other is evident. The two indices that play central roles are Institutions and Infrastructure, which affect practically every other pillar. The received model explains 85% of the LPI. The value of the parameters characterising fitness (NFI, RFI, IF) exceeds 95%. Based on the study of effect strengths, ICT Adoption has the strongest direct effect on logistics performance, the second being Innovative Capability, followed by Market Size and the effect of Product Market. However, Knowledge/Skills and the Labour Market show a direct negative effect, while Institutions do not directly affect logistics performance. In our opinion, the negative effect related to Knowledge/Skills is only apparent. The reason for this is probably that – primarily – physical type indicators are used for the measurement of logistics performance, and these considerably underrepresent the role of the human factor, so better skills and higher knowledge level do not directly appear in logistics performance but, instead, indirectly through ICT Adoption. Regarding the growth of the Labour Market from among the indicator numbers applied by the WEF as statistical data, one of the defining factors is the extent of workforce reduction costs. By their reduction, the position of the labour market improves. However, logistics development may entail that less and less employees can perform a task involving increasingly modern technologies, so we may deem it likely that in this sector the cost of labour has no effect on increasing efficiency. The indicator of ICT Adoption as a stronger direct effect factor is explained in 84% by its two components: knowledge and infrastructure. Based on the analysis of indirect effects, Institutions and Infrastructure affect the LPI the most, while in the third place appears the Knowledge/Skills pillar, but the effect strength of the latter is only about one-third of the former two. The indicators of ICT Adoption and Market Size have a further and weak indirect effect. The third-type effect is the cumulative effect that we receive as the total of direct and indirect effects, which reveal that – in sum – logistics performance is mostly influenced by Institutions.

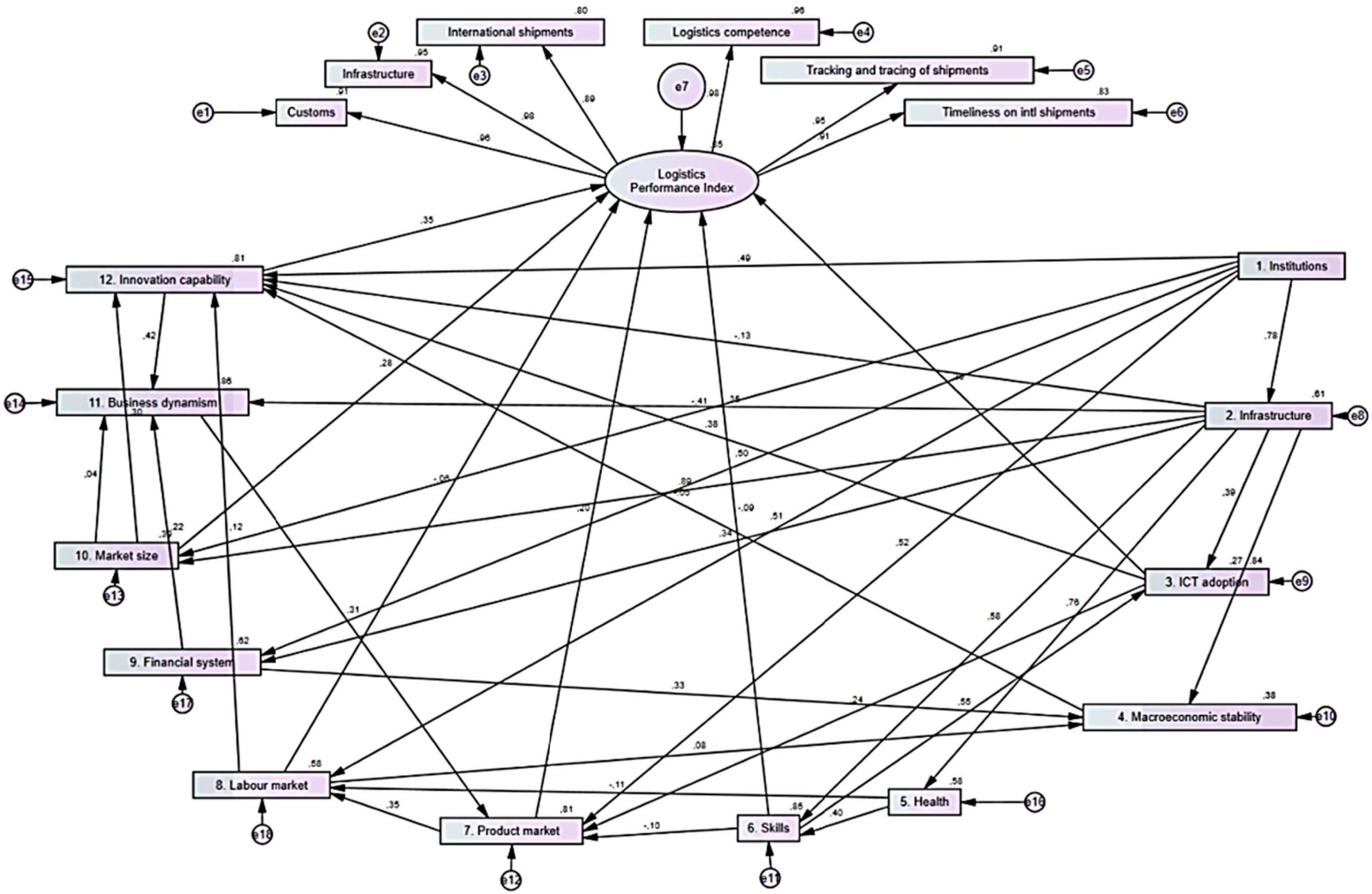


Figure 1. LPI-GCI model
Source: own elaboration.

In the next step, we decided to prepare the importance-performance analysis (IPA), which can be calculated from our analysis (O'Leary & Lee, 2015). The IPA quantitatively shows how large is the role of each competitiveness factor in increasing logistics performance (Figure 2).

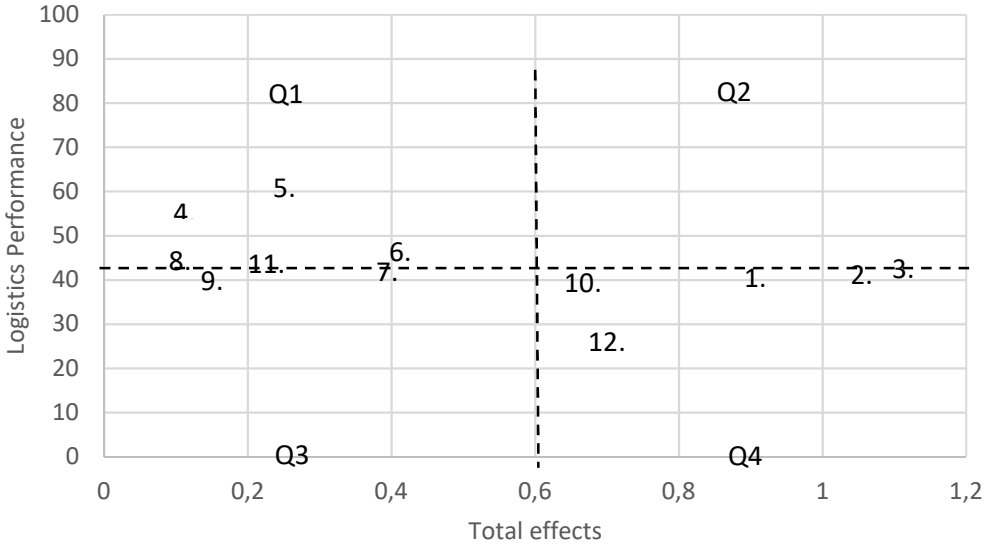


Figure 2. Importance-performance map
Source: own elaboration.

Figure 2 indicates the complete effect of competitiveness pillars on the horizontal axes. The vertical axis represents logistical performance, describing the absolute value of multiplying the pillar value and the total effect. We standardised this value to a one-hundred-degree scale, then we worked out the average pillar by pillar. The numbers shown in each quadrant correspond to the serial numbers of GCI pillars. We sought those competitiveness indicators that currently contribute to logistics performance with low efficiency, meaning that their cumulative effect is considerable but the performance increasing effect is low. These appear in the Q4 quadrant. As most recommended appeared the development of the twelfth pillar, Innovation, followed by Market Size and then ICT Adoption. Since Market size is limited by the geographic characteristics of each country, it is most expedient to focus on innovation, if the goal is to increase logistics performance. Of course, as a result of the abovementioned multicollinearities, this conclusion represents a significant simplification compared to reality. Still, those economic policy developments that increase the efficiency of innovation will expectedly result in increasing logistics performance.

Our next goal was the creation of an index that characterises the relationship between logistics performance and competitiveness with a common indicator. For this, we first made the GPI pillars comparable with the LPI components by normalization, then from these variables we created a factor in the SPSS program through main component analysis. Based on such received index value, we classified countries described by both the WEF and the World Bank into groups with cluster analysis, according to their economic-logistics development level. During the clustering, our goal was to create well-separated country groups. For this purpose, we classified the countries in the clustering that were closest to each other into the same group, based on the values of the 12 pillars, because in this way the cluster centres could have been determined at the largest distance from each other. Based on the dendrogram received as a result of computer analysis, we created three clusters – high, medium, and low development level – then based on the index values of countries in the same group for which we calculated cluster averages. The average values and deviations of the index created by us are shown in Figure 3.

Based on our index values, of the 160 countries included in our study, 48 countries were in the low logistics performance and competitiveness group, 78 were among the medium development level, 34 were in the developed cluster. The cluster averages of each variable are shown in Figure 4.

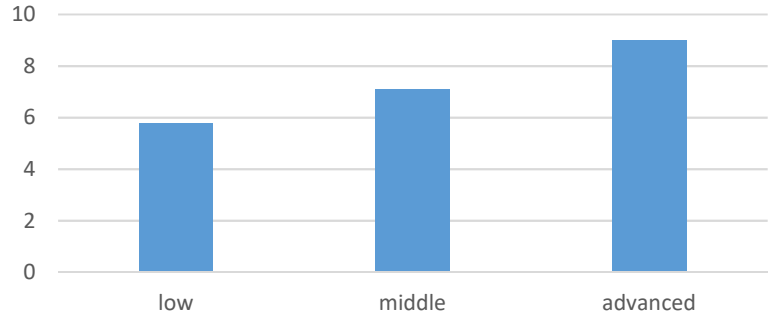


Figure 3. Average values and deviations of the clusters for 160 countries in the years 2007-2018
Source: own elaboration.

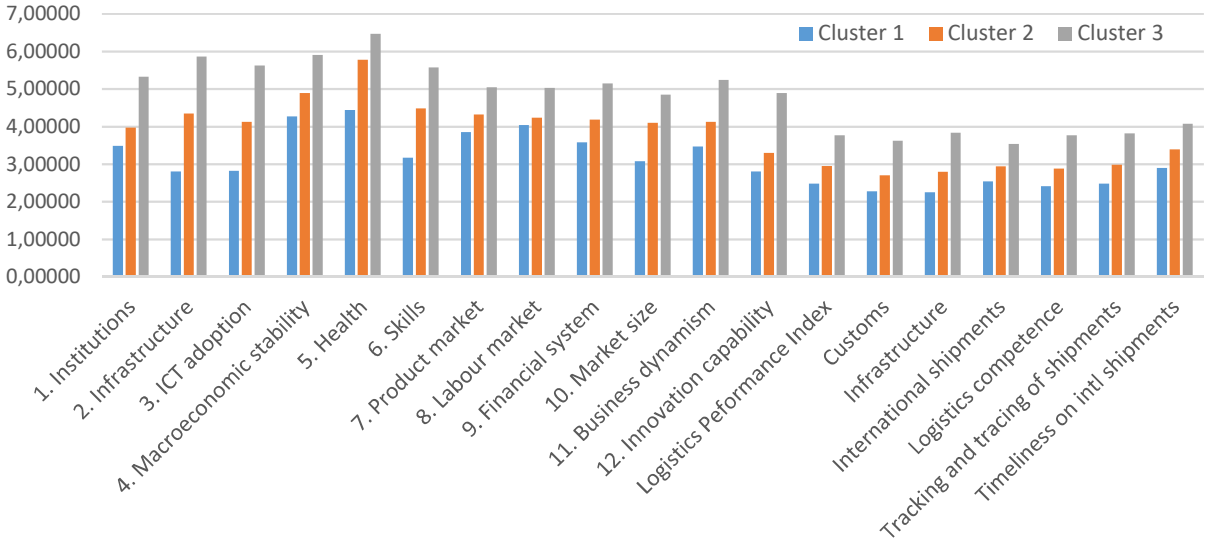


Figure 4. GCI pillar and LPI cluster averages for 160 countries in the years 2007-2018
Source: own elaboration.

We selected the countries located at the limit values of the quantiles from the different clusters. Since the high and low development level clusters include fewer countries then the medium cluster, we divided the former into three groups and selected two countries for further study, each located on the boundaries of the terciles, we divided the medium development-level group into quartiles and selected for three countries further study, each located on the boundaries of the quartiles.

In accordance with the results of the importance-performance study, here it is also evident that irrespective of development level, the relatively low level of Innovation proved to be a general problem, which is further increased by the underdevelopment of the IT sector in less developed countries. An additional problem may be represented by the small size of the market, which makes it difficult to increase performance even in economically and logistically developed countries. Other studies in literature have dealt with these problems in the past few years. Here, we reference the work of Ghoumrassi and Tigu (2018) who analyse the correlation between ICT and logistics, along with the conclusions of Bates *et al*. (2018) regarding the key importance of IT even in logistically developed countries. The results of analyses by Delfmann *et al*. (2002) evaluate the effect of e-commerce on supply chain trends. The key importance of innovation in logistics is highlighted in the works of Roscoe *et al*. (2016) and Björklund and Forslund (2018). Furthermore, we cite the fact that there is potential for development even with such traditional methods as the application of the just-in-time system (Lai & Cheng, 2016). The results of Kiisler (2008) supports our results regarding the performance-limiting effect of the size of local markets.

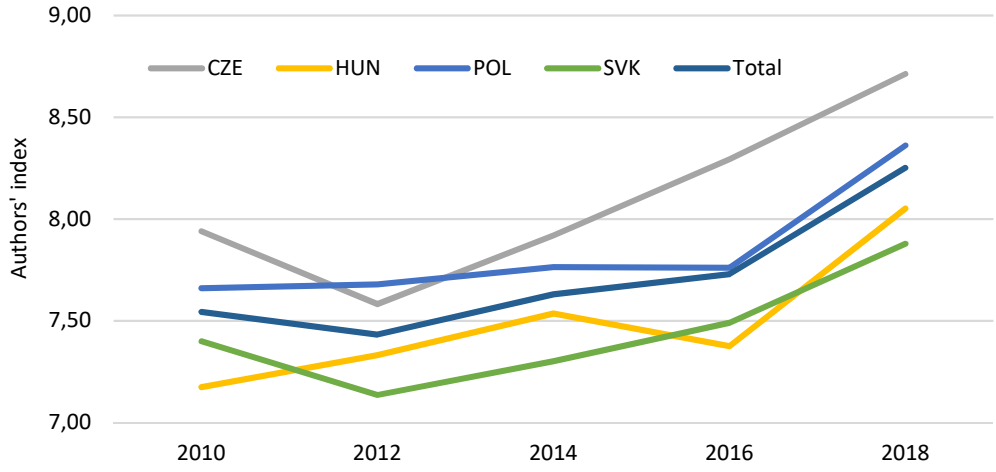
By using our own clusters, we also studied the logistics development levels of European countries. Based on this, we can observe that three European countries – Ireland, the Czech Republic, and Hungary – show the highest development pace, thanks to which these countries in 2010-2018 moved from medium-developed to highly-developed clusters logistics-wise. Thus, in 2018, only three countries, Greece, Croatia, and Cyprus remained in the second cluster.

Our model's application for the V4 countries

By the application of the results received after the creation of our model, we focused our further study on a narrower, regional group of the V4 countries. In the literature section, we have described their similar economic characteristics that originate from shared history. Here, we foreground the fact that based on their geographic location, they play a special role in the East-West commerce, and a portion of the North-South commercial routes toward Southern and Eastern Europe also cross here.

Similarly to the shared historical background, the trends of logistical development are also similar among the V4 countries. Economic underdevelopment originating from their shared socialist past greatly impacted the performance of all of these countries. This is visible from the development classification of our own clusters. All four countries were in the medium logistics development level until 2018, and only moved into the developed cluster in 2018. This also means that during the eight years under scrutiny, these countries experienced dynamic development, overtaking e.g., Greece that has been an EU member since 1981, Cyprus that joined the EU at the same time as the V4 countries, and Croatia that has been an EU member since 2013, which all still showed only medium logistics development level in 2018.

Although clustering and classification based on this provides a good overview, such a picture is not sufficiently differentiated. Therefore, to refine our analysis, we studied our index values for each country and for the V4 countries together (Figure 5).



Notes: CZE – Czechia HUN – Hungary, POL – Poland, SVK – Slovakia, Total – all V4 countries

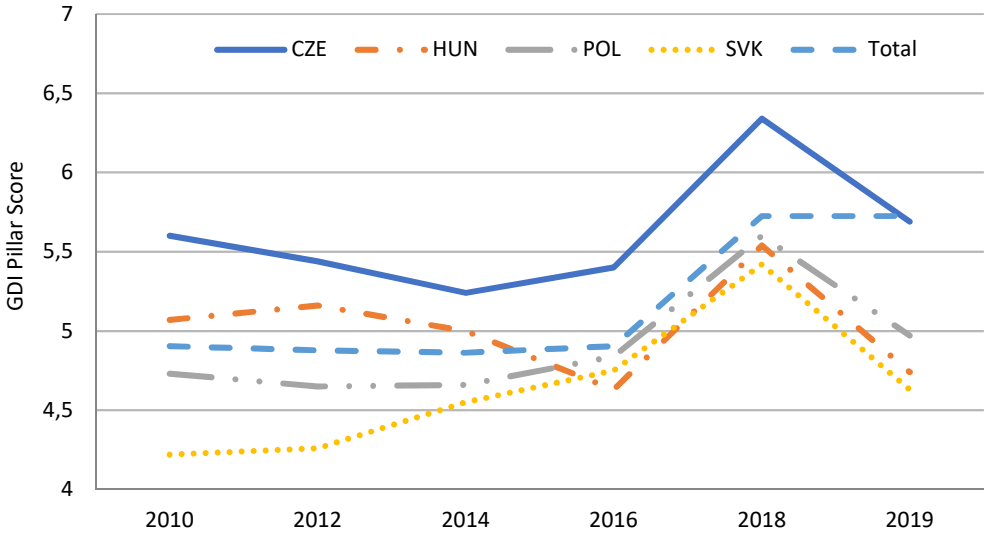
Figure 5. Authors' index values for the V4 countries in the years 2010-2018

Source: own elaboration.

Figure 5 clearly shows that during the studied years, the performance of the Czech Republic and Poland was continuously above the V4 average, while the Hungarian and Slovakian index value continuously remained below the average. However, after 2016, Hungary's development was the most dynamic in the group. From the perspective of the Innovation aspect, the Czech Republic continuously performs well, while Hungary showed performance exceeding the V4 average until 2014. In the area of Innovation only the Czech Republic has shown uninterrupted and above average development (Figure 6).

By 2016, Hungary fell back in this area to the last place among the V4 countries, but by 2018, it approached the average again as a dynamically developing member of the group. Considering that the performance of the Czech Republic significantly exceeds all others, it could mean a major step ahead for the V4 if they were the leader of cooperative developments by sharing their experience. Market

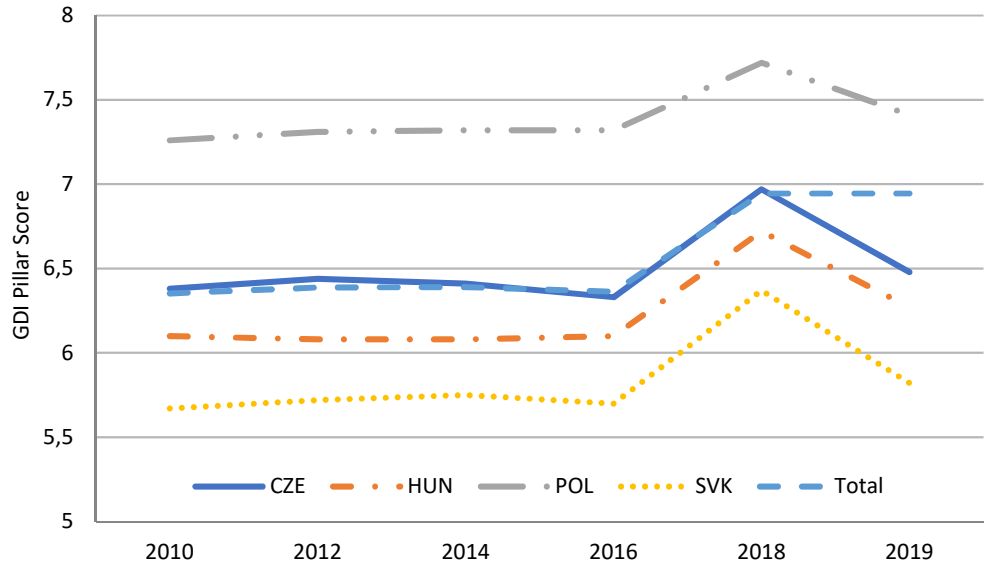
size clearly depends on the geographic and demographic characteristics of these countries; thus, it is not a coincidence that in this area Poland performs the best (Figure 7).



Notes: CZE – Czechia, HUN – Hungary, POL – Poland, SVK – Slovakia, Total – all V4 countries

Figure 6. Innovation capability values for each country and for the V4 countries together in years 2010-2019

Source: own elaboration.



Notes: CZE – Czechia, HUN – Hungary, POL – Poland, SVK – Slovakia, Total – all V4 countries

Figure 7. Market size trends in the V4 countries in years 2010-2019

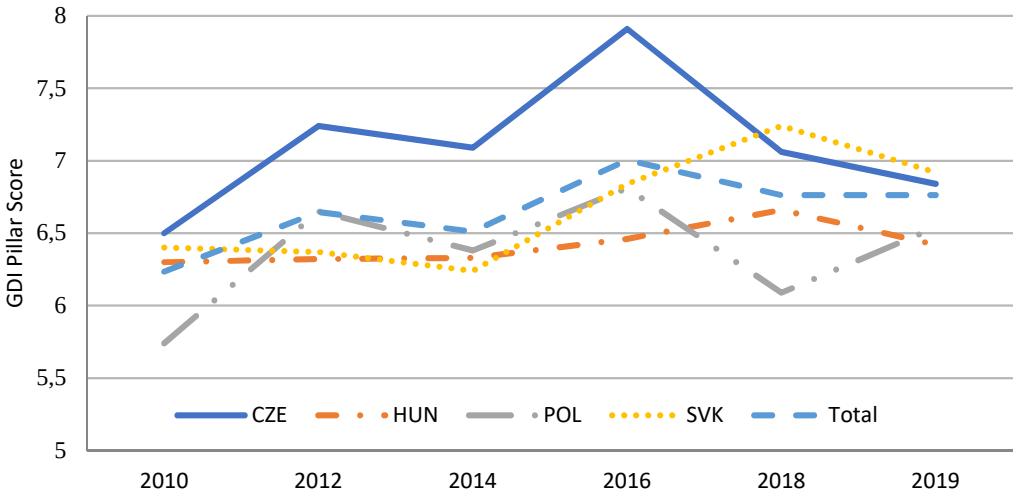
Source: own elaboration.

Thus, in the pillar of Market Size, the only opportunity for development is market growing, the basis for which could be cooperation. However, considering that every V4 country is also an EU member, their markets are not limited to their populations. This is proven by the fact that their development pace shows a completely identical picture and changes with the development of the EU.

The ICT Adoption pillar was the third studied component of the IPA-matrix (Figure 8).

Even though the Czech Republic also continuously performs above average in the ICT Adoption pillar, in 2018 Slovakia exceeded the average as well, and then it showed higher ICT adoption than the Czech Republic. Further detailed investigation of the factors in the background of this performance shows promise that the other countries would soon gain useful experience applicable in the

area of IT development for the purpose of increasing logistics performance. Considering the observed worldwide acceleration in the pace of IT development, this area will probably play a key role in supporting logistics development as well.



Notes: CZE – Czechia, HUN – Hungary, POL – Poland, SVK – Slovakia, Total – all V4 countries

Figure 8. Trends of ICT adoption development in the V4 group in the years 2010-2019

Source: own elaboration.

Figure 9 shows the logistics performance of the V4 countries and significant competitiveness pillar values.

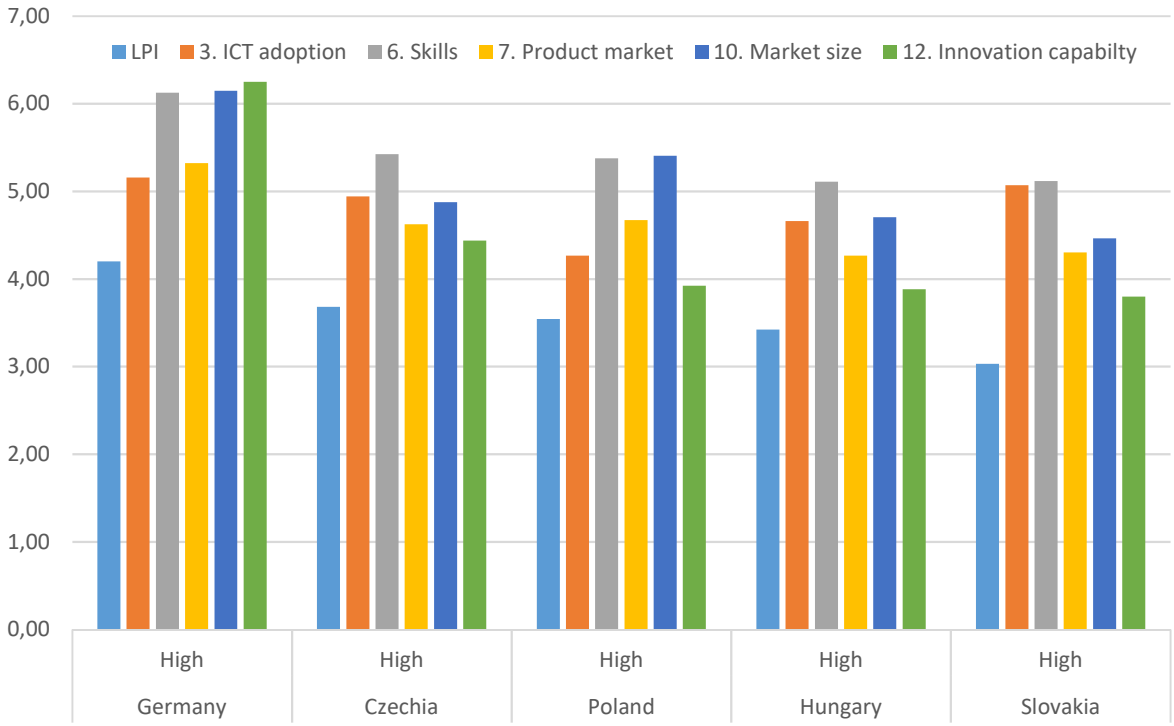


Figure 9. The trend of logistics performance and the competitiveness pillars defining in the V4 countries compared to Germany in the years 2007-2018

Source: own elaboration.

In order to realistically assess the performance of the V4 countries, we used Germany data as a point of reference. We made this decision because of Germany's geographical location and its central role in Europe, Germany is close to the V4 countries and it is among the leading countries in

global logistics performance and competitiveness indices. Since its independence, the Czech Republic has best managed to develop economically, which cumulatively exceeds other V4 countries in the studied indicators. By inspecting specific GCI pillars, we established that Poland's size and population considerably contributes to its development, since the size of its local market is much greater than of any other V4 country. However, we highlight Poland's underdevelopment shown in the area of IT application as an engine for its further development. The reduction of IT underdevelopment in Poland is possible by way of cooperation between the V4 countries, which may have a significant performance increasing effect for Poland. A shared characteristic of the V4 group is the previously generally observed experience that from among the competitiveness pillars that influence the success of logistics, Innovation capability lags behind compared to other pillars. One of the solutions for the improvement of this situation, among other things, may be taking advantage of opportunities inherent to the development of higher education, which has significantly accelerated since 2016. In this area, what may represent a development potential is to make decision-making processes of Institutions more efficient, which has the strongest cumulative effect.

Even though we studied here the V4 countries from the side of economic cooperation, numerous other elements may strengthen V4 countries' relationship, e.g., policy decisions such as the commencement of the Monostor Bridge in Komárom in September 2020 or the Via Carpathia project, which is a 3300-km-long motorway and rapid transit corridor connecting the Baltic Sea with the Aegean Sea and the Black Sea. Foreseeably, the Via Carpathia will be built by 2026 as part of the Trans-European Transport Network (TEN-T). A similar shared project is the construction of the rapid rail connection on the Budapest-Bratislava-Brno-Warszawa line, which the V4 countries decided for in 2018 as a shared policy intent.

Considering that the applied time series concluded in 2018, we also examined how the scores of Pillars 6, 10, and 12 changed until 2020 in the V4 countries. The 2019 Global Competitiveness Report was already available at the time of this article preparation. Thus, we estimated the 2020 data: we projected the average growth of the period 2010-2019 onto the next year (Figures 10-12). In the trend of ICT adoption, Poland develops the fastest, catching up with the other three countries, so that by 2020 in this pillar the four countries are expected to be on the same level. Proportionally, Market Size also trends similarly in the studied countries. Since Market Size strongly depends on the size and population of the country, the differences between the four countries remain, but with the progress of globalization and as a result of the increasingly close integration of the EU, Market Size reduction is expected in all four countries. The path of the future is going to be dedicated to Schumpeter: competitiveness, which is currently based on cheap labour force, shall be transfigured to a knowledge-intensive basis. This transformation requires a considerable amount of time, and the initially fast amendment will slacken. Decrease in innovation capacity indicates this downshift.

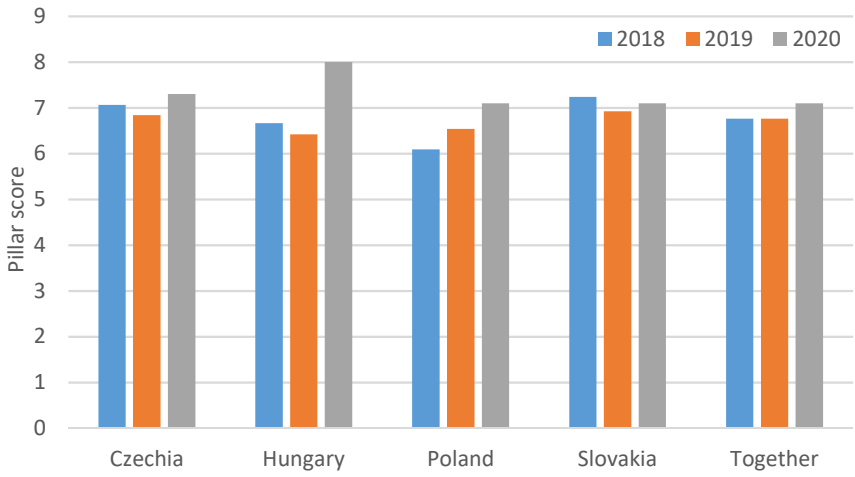


Figure 10. Development of the ICT-pillar in years 2018-2020
Source: own elaboration based on the WEF.

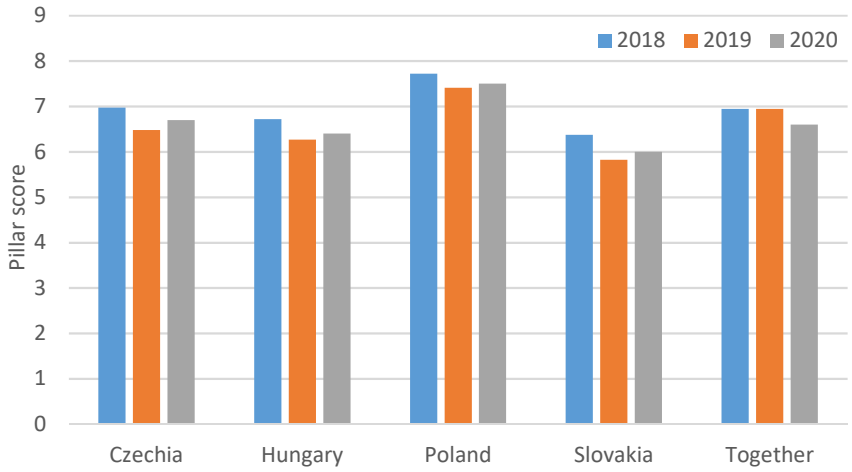


Figure 11. Trend of Market Size in years 2018-2020
Source: own elaboration based on the WEF.

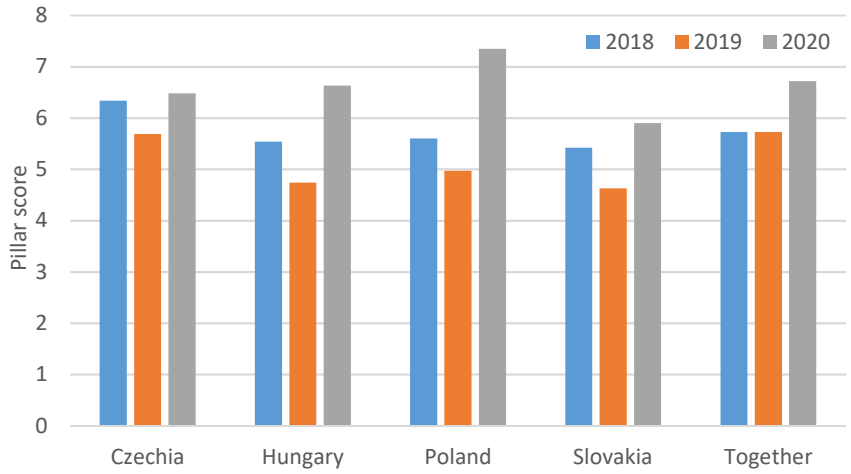


Figure 12. Trend of Innovative Capability in years 2018-2020
Source: own elaboration based on the WEF.

CONCLUSIONS

The goal of our study was to establish what effects GCI pillars have on logistics development, and by the application of which factors can logistics performance be increased. Our knowledge gained by reviewing literature played a significant role in decision on the direction of our study. Specifically, the literature review revealed that the authors who conducted earlier studies were more curious about which components of the LPI are affected by the competitiveness pillars or which only focused on the effect of an individual pillar. Several external factors have also been the subject of research, e.g., to what extent does the income of a country influence competitiveness and logistics efficiency. Considering the fact that neither specific competitiveness pillars nor LPI components can be realistically evaluated in isolation – because of the multicollinearities that exist among them – we decided to include all the GCI pillars in our analysis. Although there is a complex correlation system between the pillars, their effect on logistics performance cannot be equal. Based on information gained from the literature review, when we formulated our first hypothesis H1, we assumed that Institutions, Infrastructural Background, and ICT Adoption have the most defining effect. This hypothesis has been partially proven. Specifically, based on the results of the importance-performance analysis (IPA), Innovation proved to have by far more significant effect than the role of Infrastructure, but we managed to

support the significant role of Institutions in ICT Adoption. The practical relevance of the model is the fact that with the development of the ICT sector, the state can make a significant increase in logistics performance while at the same time improving competitiveness. Therefore, our advice is to provide significant state aid to ensure the ICT modernisation in all V4 countries, while also considering the multicollinearity found among competitiveness pillars.

In our second hypothesis H2, we assumed that the clusters created according to logistics development level emphasise the development of different competitive factors and will mostly increase the performance of the members of specific country groups. This hypothesis was disproved since in every cluster, Innovation development was proven to be the most important factor, and only the countries characterised by the lowest LPI showed a specific factor, which was the lack of IT development.

In the formulation of our third hypothesis H3, we assumed a similar development of the specific group of countries – the V4 countries – in the studied period. This assumption was proven, with the addition that the performance of Poland and the Czech Republic exceeds the performance of Slovakia and Hungary in practically all of the studied areas. Moreover, we managed to show that in 2016-2018, all four countries were successful in improving the performance level of their logistics sectors. Based on our results, one of the mutually beneficial solutions for further development would be cooperation as pooling resources and experience may result in additional qualitative progress of all V4 countries.

Profit-oriented market expansion caused by accelerating globalization only brings expected result with sufficient efficiency and organization. Logistics play a key role in these tasks. As a consequence of the mutually complex correlations between competitiveness and logistics development, competitiveness is just as important for logistics development as efficient logistics for greater competitiveness. The present study primarily intended to raise awareness of this fact, highlighting that further efficient development can only be realised by appropriately harmonising the activities of economic policymakers and actors. Of course, the correlations studied in the present work only represent a portion of the entire picture. An analysis from another aspect, not described in the present study, may refine the assessment more. The assessment may become even more subtle by an analysis not featuring in the framework of the current study, which represents a different viewpoint.

Of course, the correlations studied in the present work only represent a portion of the entire picture. An analysis from another aspect – not described in the present study – may make the assessment more refined. Thus, the outlining of normative conditions required for increased performance may be conducted and their realisation may be studied based on economic-policy measures and the results they bring.

Our research is, on the one hand, limited by the world economy being constrained to shut down by the outbreak of the coronavirus pandemic after the publishing of the last available data. The long-term effects of this cessation are yet to be assessed exactly, as of today. Another not foreseeable factor is the outcome of the EU's economic climate. And a further issue is the scheduled enlargement of the Union, resulting in the inclusion of new actors. For example, the admission of Serbia and the accession of the Western Balkans may accelerate the accomplishment of the V4 countries' intended projects in the region.

Future research should keep the data up-to-date and thus ensure the examination of a longer time series according to the new pillar structure by the WEF. By extending the study to further countries and regions, new viewpoints may arise that can be used to further develop our current study. The actualisation of our study's results is severely limited by the fact that the last publication of the LPI was in 2018 and current data will only be available in 2021. Unfortunately, to prove our assumptions, we will have to wait for the next publication of the LPI, whose data will hopefully support our conclusions derived from our current results.

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Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Entrepreneurial Business and Economics Review

2021, Vol. 9, No. 3

10.15678/EBER.2021.090312

How software robots can facilitate the procurement process? A case study of Siemens in the Czech Republic

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ABSTRACT

Objective: The objective of the article is to evaluate whether technological changes adopted in procurement can support the strategy of the firm and to observe the software robots' implementation phase in procurement.

Research Design & Methods: In order to reach the article objective, a single case study methodology was applied. The analysis focused on the Siemens company.

Findings: Digitalisation strategy in procurement can support the firm's strategy of global leadership and further growth through increased efficiency, focus on value-added activities, increased transparency in processes, easier cooperation between the involved parties, and the worldwide reach of suppliers. The potential for further use of software robots has been identified among repetitive processes with no value-added but securing the smooth and errorless flow of information and documents. For this purpose, we propose a more detailed definition of the procurement cycle.

Implications & Recommendations: Three processes were selected for potential dedication to software robots which can serve as a recommendation to companies to improve the efficiency and competitiveness of their supply chains.

Contribution & Value Added: To identify gaps for digitalisation in the procurement process, the "procurement cycle" was used. We found that the processes must be defined in a more detailed way in order to serve the analysis.

Article type:	research article
Keywords:	supply chain; procurement; digitalisation; information technologies; industry 4.0; software robots; Czech Republic
JEL codes:	F23, 033

Received: 26 September 2020 Revised: 25 March 2021 Accepted: 29 March 2021

Suggested citation:

Křenková, E., Rieser, K., & Sato, A. (2021). How software robots can facilitate the procurement process: A case study of Siemens in the Czech Republic. *Entrepreneurial Business and Economics Review,* 9(3), 191-203. https://doi.org/10.15678/EBER.2021.090312

INTRODUCTION

For companies involved in international supply chains, it is necessary to monitor and actively respond to changes in the production process of the most important trading partners and consider the effects they have in the areas of digitalisation, production automation, and related processes. Implementation of digital solutions under Industry 4.0 technologies supports horizontal integration of supply chains with the potential to increase their competitive advantage (Veile, Kiel, Müller, & Voigt, 2019; Liao, Deschamps, Loures, & Ramos, 2017).

Still, there are companies that postpone the necessary steps towards digitalisation. Based on local research from the Czech Republic from 2019, 32.4% of companies did not have any digital strategy, and 29.5% of companies were in the phase of preparation of a digital strategy (Confederation of Industry of the Czech Republic, 2019).

The conventional approach points to the headquarters of multinationals being in charge of strategic activities such as the adoption of new technologies (Filippov & Duysters, 2014). On the other

hand, Szalavetz (2016), in her research, states that subsidiaries such as shared service centres may be playing an important role within multinationals as they are often initiators of technological changes. Such a subsidiary's initiative can positively stimulate its entrepreneurial efforts and thus the corporate goals (Filippov & Duysters, 2014).

Digital technologies under what is called Industry 4.0 are associated with opportunities that can be exploited when the digital solutions are implemented in targeted and suitable ways (Veile *et al.*, 2019).

Our research is therefore focusing on the implementation phase of advanced information technology solutions in procurement. In our research, we adopt a single case study approach and have selected the Siemens company that is considered to be one of the world leaders in the development and implementation of digital solutions. The literature review is an essential phase of the case study research (Merriam, 1985) and is addressing the research questions, i.e., the implementation of digital technologies and the impact digital technologies have on the organisation. The research methodology is followed by the results and discussion chapter, where we present the research findings. Finally, we conclude with the implications, limitations of our research, and future research suggestions.

LITERATURE REVIEW

Digitalisation has changed the way many companies serve their customers nowadays. This attitude is changing customers' expectations and has an impact on all companies, including those which are still resistant to accepting the change. The president of SAP, Ariba Alex Atzberger, adds that large companies are aware of the change and are not afraid of experiments, even if they could result in unsuccessful outcomes or financial losses (Busch, 2016). Technologies behind automation and value-seeking that directly impact procurement processes are: Internet of Things, IoT, social media, cloud technologies, artificial intelligence, AI, cognitive computing, big data, big data analytics, mobile technologies, augmented reality, Blockchain, and additive manufacturing (Srai & Lorentz, 2019).

Benefits and barriers to new technology adoption in procurement

Procurement will be defined by the processes it usually consists of. Despite technological changes in procurement, there are still steps that are, in most cases, inevitable. Rushton, Croucher, and Baker (2017) described these steps as the "procurement cycle" including 1) the identification of the need to procure a good or service, 2) documentation approval and passing to procurement, 3) a request for quotation, RfQ, sent to suppliers, 4) a response from suppliers (and potential negotiation), 5) a selection of supplier and creation of purchase order, PO, 6) authorisation and sending of the PO to the supplier, 7) the delivery and inspection of goods and services, 8) the invoice sent to the supplier, 9) the invoice approval and payment or pending, 10) post-contract review of the purchase.

The drivers and the speed of the adoption of digital solutions vary among companies. Kosmol, Reimann, and Kaufmann (2019) divide the factors affecting the readiness to adopt digital technologies in procurement into technological, organisational, and environmental factors. Research by Srai and Lorentz (2019) shows that companies that have experience in basic technologies are more likely to employ advanced digital technologies. This research supports the earlier research results by Anaya, Dulaimi, and Abdallah (2015), who brought the evidence that digitalisation expands the potential for innovation. Digitalisation creates data that can be used not only to cut costs but also for value creation, which could result in increased profitability and competitiveness (Bienhaus & Haddud, 2018; Nagy, Oláh, Erdei, Máté, & Popp, 2018; Sieja & Wach, 2019). Bienhaus and Haddud (2018) name increased collaboration, traceability, and transparency among the benefits of procurement 4.0, Neil (2018) describes increased connectivity and real-time integration, and Rushton *et al.* (2017) suggest a partnership-based approach.

Qualitative research into advanced manufacturing technologies employed in Hungarian subsidiaries identified a piece of evidence that supported the technology adoption, which strengthened the competitive position of the firm not only through increased resource efficiency but also through process efficiency, and this led to an upgrading of the environmental performance of the firm (Szalavetz, 2017). Procurement is one of the key activities having the potential to contribute to environmental

sustainability. If companies employ technologies that work with data in terms of waste reduction and energy and emissions saving, they can significantly contribute to this strategic decision. Ghadimi, Wang, Lim, and Heavey (2019) go beyond the one company focus view and suggest incorporating sustainability dimensions in criteria that will be applied in supplier selection and evaluation processes. Software solutions enable regular suppliers' performance monitoring without the need for any human interaction. The information obtained may then support managerial decisions.

Despite the widespread use of computers, the Internet, and wireless communication, there are still barriers described in various sources of literature. Not only in the field of supply chain management have the authors identified factors that slow down the transformation process towards what is in the context of industry 4.0 called a smart factory, advanced manufacturing, smart capabilities in supply chains, and procurement 4.0 (Neil, 2018). Capital constraints represent an apparent barrier to digital transformation. Costs of maintenance, adjustments of systems to individual environments, adaptation, and modification are all to be considered as well.

Serious concerns have been raised concerning the security in the cyber environment and the protection of intellectual property (Geissbauer, Weissbarth, & Weitzstein, 2016; Rymarczyk, 2020).

Bienhaus and Haddud (2018) stress the importance of reaching a strategic decision about digital transformation first. Managers who see digitalisation as more of a threat than an opportunity can be considered as a barrier to introducing changes. Among other cited barriers inside organisations there is a change in organisational culture, existing limits in managing a cross-functional approach (Neil, 2018), existing work positions, capabilities of recent employees, and organisations' need to provide training and to hire new employees (Bienhaus & Haddud, 2018; Rymarczyk, 2021; Veile *et al*., 2019).

There are also technical barriers named by McKinsey (Szozda, 2017), such as the need for uniform standards for data transmission and the connection of all process participants by means of wireless networks and problems occurring during the integration of information technology, IT, systems (Vaidya, Ambad, & Bhosle, 2018).

Digital strategy of procurement

The digital strategy of procurement can be seen as an alternative to a cost-cutting strategy described by Rushton *et al*. (2017), where the number of suppliers was reduced in order to reduce the costs of procurement and supply. The digital strategy of procurement enables the management of supplies on a global scale and benefits from the possibility to address more potential suppliers (Knudsen, 2003). Additionally, there is a potential to increase cooperation and real-time integration among the stakeholders (suppliers, manufacturers, retailers, and customers) (Pearcy, Parker, & Giunipero, 2008). There are numerous research papers focusing on cooperation. However, only several investigated cooperation in the context of purchasing 4.0.

Companies are looking for ways to automate processes, saving costs, and increasing the efficiency of supply chains (Neil, 2018). The statement "procurement function will be a strategic interface to support organizational efficiency, effectiveness, and profitability" has been supported in the Bienhaus and Haddud's (2018, p. 974) research.

In procurement, the potential is seen in the implementation of software robots. Artificial intelligence is often associated with the use of robots. Artificial intelligence, AI, also called machine learning, can be defined as a "broad set of methods, algorithms, and technologies that make software "smart" in a way that may seem human-like to an outside observer" (Noyes, 2016). The ISO standardisation norm distinguishes between industrial and service robots (ISO, 2012). The features that characterise the implementation of software robots are relatively easy configuration and compliance with company safety standards, easy integration with company software, and relatively fast implementation compared to other company software (Kedziora & Kiviranta, 2018; Lacity & Willcocks, 2016).

In procurement, software robots have attracted the attention of various companies. IBM has implemented robotic process automation in order to deal with high-volume repetitive tasks. Deloitte (2019) also suggests robotic process automation in highly repetitive, prone to error, rule-based, time-critical, and seasonal processes. This automation will allow focusing on value-adding activities, service and product development, and individual customer approach (Vollmer, 2017; Murphy, 2017; Kedziora

& Kiviranta, 2018). The future is seen with further integration of machine learning and cognitive technologies in robotic process automation (Schatsky, Muraskin, & Iyengar, 2016). A huge potential is also seen in forecasting and data analytics (Szozda, 2017).

New opportunities for adopting software process automation have been identified among routine and repetitive processes, present in all stages of the procurement process, including purchase request, authorisation, ordering, delivery, payment, and the exchange of documents (including documents used in international business for transportation or customs purposes) (Rushton *et al*., 2017). The employment of digitalisation in procurement has delegated repeated manual processes from employees to computers, reduced time spent by sending emails or by daily submission of data to portals and dedicated platforms. The solution can be especially useful when suppliers are not using electronic data interchange, EDI, as the solution does not require EDI (Vollmer, 2017). The public concern is whether AI can take over human tasks completely. In research by Bienhaus and Haddud (2018), the statement that AI would take over decision-making processes was among less supported statements. On the other hand, we can see a clear shift from routine operational tasks to a supportive role in the decision-making processes. It is evident that under the new conditions, digital transformation creates the key for success, which is the redefinition of business models, concepts, and business practices (Szozda, 2017; Neil, 2018).

Stuart, McCutcheon, Handfield, McLachlin, and Samson (2002) identified gaps in operations management, with a potential for future case study research. Among the topics, they included "understanding procurement" with a proposed research question: "What are the interactions between a firm's supplier management expertise and electronic purchasing?" (Stuart *et al*., 2002, p. 432). This is not a recently asked question, but the researchers' proposal is, nevertheless, rather relevant. Gaps remain in understanding the role of procurement. There are still many questions associated with the role of procurement in the context of technological development regarding the challenges arising from technological and global changes.

The aim of our research is to answer two main research questions:

RQ1: How can digital technologies be employed to support the strategy of the firm through procurement?

RQ2: What steps and challenges are there in the software robots' implementation phase in procurement?

RESEARCH METHODOLOGY

For our research, we selected a case study methodology that is a suitable method when focusing on a contemporary phenomenon. The case study method is especially useful when addressing "how" and "why" questions (Yin, 2018).

In our research, we move from the existing theory in procurement and industry 4.0 adoption theoretical base to the particular implementation of the software in procurement and the interconnection of these fields. This approach, when researchers advance from general to particular, is characterised as deductive (Woiceshyn & Daellenbach, 2018). The case study methodology enables researchers to provide a deep insight into the development of processes, to describe in detail the set of events to consider multiple variables, external and internal environments, changing conditions, and company specifics (Stuart *et al.,* 2002).

To achieve this in-depth and extensive understanding of the single processes in procurement, we opted for a holistic single case study that was enabled by close cooperation with a selected company. This study design is found appropriate in case of studying unusual cases (Yin, 2018). We consider the Siemens company an outstanding example of a company that is recognized as a world leader in industrial digitalisation. The company employs 385 000 staff members worldwide (Siemens, 2019) and the procurement functions are secured by cross-functional multinational teams called Global Business Services centres, GBS. In our research, we addressed the GBS centre in Prague in the Czech Republic. The holistic approach consists of observing the procurement under this GBS centre solely. The procurement team consists of circa 20 team members and provides purchasing services for roughly six customers in Germany.

In the case research, we do not find one strict methodology. The set of methods is flexible and, in the end, adjusted to the particular case (Johansson, 2007). On the other hand, researchers stress the need for credibility, trustworthiness, and replicability (Yin, 2018). To address these challenges, emphasis is put on studying the existing literature sources to address possible explanations (Merriam, 1985; Yin, 2018). The pieces of information from face-to-face in-depth interviews were put into the context of multiple sources or evidence, i.e., triangulation (Yin, 2018), the company representative commented on the draft of the research, and the final manuscript was checked for its accuracy by the team leader to increase its reliability and validity. The observations on-site paid attention to the detailed explanation of existing processes to serve the evaluation of the results of new systems implementation in the context of the particular company (Anaya *et al*., 2015). Five stages of research were followed as suggested by Stuart *et al*. (2002): (1) definition of the research questions, followed by (2) instrument development, (3) data gathering, (4) data analysing and results sharing, and lastly, (5) dissemination phase.

For the purpose of our research, eight interviews were carried out, encompassing the team leader, process expert of the procurement team, and six team members. The interviews and on-site observations were scheduled within one week in March 2019. The applied semi-structured interviews were intended to develop a detailed understanding of the procurement processes and the role of the software used. The inquiries paid attention to the systems and processes already in place and to the introduction of new software solutions. Besides the focus on implemented software solutions, the procurement processes were investigated to elaborate on the role of procurement in the organisation. The main questions were: "Can you describe the procurement process step by step? What are the main IT tools used in procurement? What can be done to make it more efficient? What are the benefits and disadvantages of robotisation of the processes?".

The triangulation was achieved by the study of annual reports and other internal materials, press articles, and company websites.

RESULTS AND DISCUSSION

The company's latest strategy was presented in Vision 2020+, and it includes the accelerated growth of revenue and profit margin of the company's industrial business. The company is regarded as the world leader in industrial digitalisation, and the strategy aims to retain this leading position. The named steps to support the growth strategy are leaner and simplified company's structure, expansion of digital business, and investment in new growth fields (Siemens, 2018).

Firstly, we identify the role of procurement in relation to the company's strategy. We refer to Porter's Value chain theory (Porter, 1985), where procurement is regarded as supporting activity, and the derived virtual value chain theory, in which technologies affect value creation by "spanning over the functional boundaries" and thus affecting the value creation process (Nagy *et al*., 2018, p. 6). Secondly, the implementation phase of new digital solutions is observed to name the challenges in the process with the aim of generalising the findings and implications for the industry. The theoretical base for answering RQ2 is the Rushton's *et al*. (2017) procurement cycle.

The strategic role of procurement services

Siemens' strategy is to do its business as well as the best competitors in the global market. Part of the strategy is the redefinition of the company's structure that includes "operating companies," "strategic companies," and service companies, and that is defined as customer-oriented (Siemens, 2018). Focusing on the service companies, the key concept of GBS centres is to provide service of high quality, and in the best case, finding individualised solutions for customers. This would firstly fulfil the basic function of procurement, and secondly, it would support the company's competitive position through procurement by time and cost savings.

The provided purchase service includes all parts of the procurement process depending on the individual needs of their customers; it mostly concerns requests for quotations, control of purchase orders, or negotiating better purchasing conditions (e.g., price, delivery or payment conditions). Addi-

tionally, the purchase service includes extensive communication with external suppliers as well as customer's employees from logistics, project management, the ability to take over responsibility for the delivery of goods on time and in the right quantity, the control of price, delivery and payment conditions, the acquirement of all necessary export documents from suppliers on time, and the receipt of invoices which includes concise and agreed purchasing conditions.

The performance of Siemens GBS centre employees is measured by hard and soft data, hard data are quantified by Key Performance Indicators, KPIs. KPIs included are total purchase volume order absolutely and relatively, the total number of processed POs/relevant buyer's desk, and savings expressed either in an absolute or a relative figure. Some customers prefer to know the amounts saved in absolute figures, and thus a minimum sum that has to be achieved per month is agreed with them; other customers prefer targets in relative figures.

The current state of the implementation of digital technologies in procurement

The on-site interviews were focused on the existing purchasing processes and the technologies used to support them. The current purchasing functions insured by digitalisation are secured by SAP (enterprise application software) purchase orders processing and an online Siemens strategic procurement platform (the supplier portal). Most recently, software robots have been introduced to take over processes previously insured by the buyers. The current state of the automation of processes in procurement is described in the initial phase of the model of the procurement cycle (Rushton *et al*., 2017). The procurement process starts with the identification to procure a good or service. The buyer's first questions are: "What am I going to buy?", "At which company?" "For what price?". The purchase requisition is converted automatically into a purchase order in SAP.

Another way to send the RfQs, is digitalised. Especially for Siemens, digitalisation takes place with a developed online tool called SCM STAR. Especially in procurement (from the experience of our interviewed team members), this tool is used for RfQs, e-auctions, or for checking frame agreements that Siemens has with its suppliers. There are two parties that have access to SCM STAR: Siemens employees (mostly from supply chain management) and suppliers. Related companies are responsible for keeping their data (mainly contact data) updated in the system. The buyers can create their RfQs directly in SCM STAR, depending on their needs, wishes, and the complexity of the quotation they want to receive. The selected suppliers respond directly with this tool. This process is more challenging than the method of using RfQs sent via EDI or software robots. Subjects to the challenge are not only the buyers but also the suppliers.

If we compare the options that have just been described, we can state that the use of the online Siemens strategic procurement platform brings advantages such as transparency in the RfQ process. This benefit has been proven when a buyer or supplier had to be deputised by a colleague. Additionally, the tool can complexly evaluate received quotations which are essential for the buyer in order to choose the right supplier. The barriers identified are connected with the complexity of the system – the buyers have to provide help to the suppliers when needed, and for the buyers themselves it was not always straightforward to learn all of the functionalities and it requires time to "get into the process."

Particular attention has been paid to price and sales conditions negotiations that follow the supplier's response unless there is a frame agreement in place previously negotiated by the strategic procurement in the headquarters in Germany. This procurement phase is still mainly entrusted to the buyers who negotiate more preferable sales conditions, most often via phone calls, rather than via emails. Successful negotiation increases the personal professional "scores" of the buyers measured by KPIs. It enhances employees' motivation and builds closer relations between companies. Growing motivation and employees' enthusiasm are important elements to consider, alongside hard data collected by KPIs.

To meet the strategic goals, the company has changed its organisational structure. Procurement services are included in the GBS centre's function and are supposed to support the company's strategic growth through increased efficiency. To accelerate the growth of profitability and profit, a company can either reduce costs, add value to its products, find new markets for the products, or sell more on existing markets (Hill & Hult, 2018). The cost-cutting strategy achieved by the digitalisation of procure-

ment was supported by previous research (Bienhaus & Haddud, 2018; Neil, 2018). The customer orientation of service companies increases pressure on the efficiency and productivity of the service centres involved in procurement, i.e., on costs and purchasing results. The greatest benefits described resulted from improved procurement processes and cost savings achieved by closer cooperation with customers, more time dedicated to bargaining, and the minimisation of mistakes. Also, for this statement we find support in the previous studies (Bienhaus & Haddud, 2018; Vollmer, 2017; Neil, 2018). A company strategy of growth in new fields of business is supported by the cooperation with customers on individual solutions. Another factor that has not been as greatly stressed but is of great importance is the reach of customers who are not involved in a dedicated platform or using SAP. For a present-day global multinational, a wide reach of RfQs and automated follow-up processes can be an important factor in the highly competitive global market.

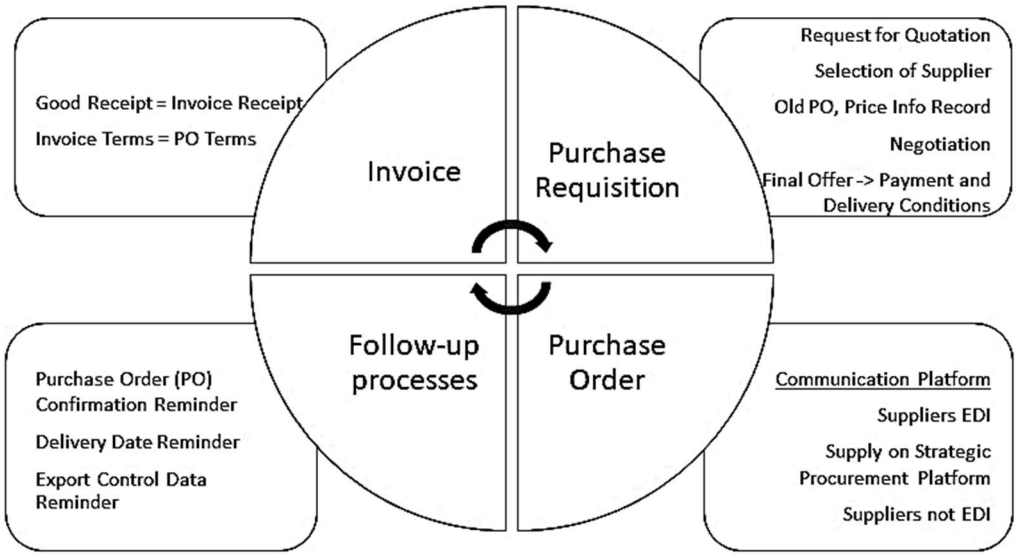

Figure 1. Analysis of current procurement process
Source: own elaboration.

Opportunities for the implementation of software robots in procurement

The observation phase is followed by a discussion about processes that can be further dedicated to robots.

Software robots have already been used to send RfQs in situations when there is no current supplier and no price, or the price is older than one year. A buyer sends an email including an excel file attachment that both meet a strict guideline to a software robot. The robot processes all requests twice a day. The most important accomplishment is that the implementation of software robots has saved time and manual work, which would have to be done by the buyers. The use of software robots in procurement processes under observation indicates the implementation of highly repetitive processes that can be highly standardised. Also, the implementation of this solution was less complex than in the case of the SCM STAR.

The next steps of the procurement cycle (Rushton *et al*., 2017) that follow the supplier's response to the RfQ are: negotiation, the selection of supplier and creation of PO, sending the PO to the supplier, the delivery and inspection of goods and services, sending the invoice to the supplier, invoice approval and payment, and the post-contract review of purchase. These phases were observed in terms of manual work requirements, frequency and repetition, standardisation of processes, time factor, transparency and clarity of the process, and level of difficulty.

To address processes that can be further dedicated to robots to answer our second research question, the procurement cycle by Rushton's *et al*. (2017) has been found insufficiently detailed. There are activities that are important for ensuring smooth faultless processes, including sub-processes that need to be initiated early on when it is discovered that data or a piece of information is

missing. Such tasks are not included in the procurement cycle according to Rushton *et al*. (2017). These are PO confirmation reminding processes, reminder of delivery terms processes, maintenance of export control and customs documents.

Purchase order confirmation reminding that includes PO acceptance check, PO confirmation reminder, and PO confirmation check were identified as the first area requiring improvement of the process with the employment of digital technologies and robots.

In order to process the purchase order, suppliers have to confirm the PO within ten days. Once the PO is sent either via EDI or email, the deadline for the receipt of the order confirmation runs. The GBS centre's buyers used to remind suppliers regularly. This now happens manually through SAP transactions and via email. Firstly, the buyers must identify missing purchase orders, and secondly, they must generate reminders in PDF form from SAP. Lastly, all reminders must be sent via email; it does not matter whether the supplier is connected through EDI or not. Simultaneously, this part of the process has several disadvantages. Once the reminder for the order confirmation is sent, there is no control over whether the document has been received, as it is not generated again during the next reminding period. Moreover, due to high overcrowding of processed POs, the buyer has no chance to check if the PO has been accepted or confirmed by the supplier.

Order confirmations are regarded as essential for buyers. Based on this document, the buyer can check all the conditions (delivery and payment conditions) for the PO, price, correctness of material, and lastly, the delivery date. These reminding documents are still manually sent via email to suppliers who are connected with EDI instead of reminding them directly through SAP, which has been identified as an area of the process requiring improvement. This process was the first to be suggested for the implementation of software robots.

Together with the reminder of PO confirmations, there is another follow-up activity, which is the reminder of delivery dates. Delivery date reminding is done in a very similar way to PO confirmation reminding. Suppliers are reminded regularly and manually by the buyers through SAP transactions and by sending emails of PDF documents. In case the delivery dates are requested by other departments, e.g., logistics or project management, the reminding cannot proceed on a regular basis. Urgent requests are solved by phone calls. If this process could be automated through a robot, the human workforce would be substituted in the process.

The third and final follow-up activity that is significant in the process is the reminding of export control and customs documents, ECC documents. Without these documents, the material that is purchased by the GBS centre cannot be re-exported and can only "lie in stock." This leads to increased costs and, more importantly, can delay projects. The suggestion for the assignment of this process to the software robots would not be through the reminder of ECC documents, but for the automation of the whole process, by sending out blank ECC documents due for completion by suppliers, who are connected to the EDI. As so-called EDI suppliers do not automatically receive blank ECC documents with the purchase order, these have to be sent additionally via email. Suppliers who are not connected to EDI and obtain the PO only via email, also get a blank ECC document together with the PO.

For the team in GBS centre Prague, the sending out of ECC documents represents a minimum of around 8 working hours/week, depending on the exact number of processed POs. The time factor was counted from the average length of the process, which was 4 hours, and it was regularly scheduled twice a week. The process selection criteria are summed up in Table 1.

The selected processes suggested for further dedication to robots are highly repetitive processes with no value-added, which corresponds to the previous literature findings (Rushton *et al*., 2017). On the other hand, securing the smooth flow of information and documents prone to errors processes can significantly increase the quality of the procurement services provided, which can positively impact the other interconnected activities of the Siemens company.

The second research question was designed to examine the steps and challenges in the implementation of software robots in procurement. Challenges in the implementation phase included the need and cooperation of technical experts, cooperation with other departments, and meeting customers to understand their needs. Training of employees and support to users must also be provided in the early stages of the implementation phase.

Training and support to suppliers' employees must also be implemented. Suppliers must often introduce Siemens' designed platforms or applications (e.g., RfQs SCM STAR platform) and invest in automated solutions such as electronic data interchange. The support is provided mostly directly by Siemens' buyers, who must be well-trained and capable of learning by working with new systems. One of the stated problems is the lack of detailed information provided throughout training that encompasses different departments and the organisation units (e.g., strategic buyers, operative buyers, GBS centre buyers, managers, and logistics). Therefore, further support besides the training must also be provided.

Table 1. ECC document maintenance and reminding

Process criteria	Process description
Frequency and repetition	Twice every week
Standardisation of processes	High – the same repeated process
Time factor	4 hours
Transparency and clarity of process	High – easy to track and to communicate to IT technicians
Level of difficulty	Low – downloading documents from SAP, sending out standardised emails, maintaining data

Source: own study.

Regarding the implementation of the automation of the follow-up processes of purchasing, the initiation came from the buyers themselves. The implementation involved the GBS centres' employees. The pre-implementation phase included the analysis and detailed description of the processes and the assessment of propositions by IT experts. The challenges in the implementation phase, together with the benefits seen, are summarised in Table 2.

Table 2. Benefits and challenges of the implementation of software robots

Identified benefits of software robots	Identified challenges of software robots
+ Time saving -> workforce hours (e.g., in the case of the process of ECC documents reminding minimum 8 hours/week)	- Need for technical experts for the training of employees and the introduction of new robotised processes
+ Dedication to value-adding activities which are not replaceable by a robot -> negotiation and building relationships with the suppliers	- Unwillingness of suppliers for the launching of new digitalised tools or platforms (training of supplier's employees, high introduction costs, need of support from Siemens)
+ From the perspective of personal development -> stress on soft skills instead of mechanical work	- Buyers and experts often act as contact persons for suppliers for technical questions
+ Reduction of repeated processes -> increased motivation for employees	- Possible technical outages that need to be deputised by manpower - Need for a back-up plan in the case of a blackout
+ Increased transparency of processes -> better substitutability (e.g., tool SCM Star), ease of control	- Often "learning by doing" (for employees when introducing a new tool/application or robotised process)
+ Easier and faster tracking and tracing of activities	- High costs for the implementation (processes need to be analysed beforehand to determine whether they will pay off)
	- Involvement of buyers as additional workload

Source: own study.

Among the benefits of digitalisation with relation to the strategy of the firm, we identify the workforce time saved, which is invested in other activities that bring higher levels of efficiency. The key activities that were identified to be supported by employees and not dedicated to robots are negotiation, establishing relationships, cooperation (resulting in cost-saving, increased visibility in the supply chain, and improved services for the buyers), and problem-solving.

The robots can be used in procurement processes that involve customers outside the EDI network and enhance the global market strategy providing a wide reach to cover worldwide markets. The number of potential suppliers is not limited when most of the processes are automated and dedicated to robots. This can become an important tool to support the differentiation strategy of the firm.

The increase of the digitalisation and automation of processes suggests that there is a threat of a negative impact on employment and recently defined working positions. This statement was not supported in the case company. Our findings support the findings of Schatsky *et al*. (2016), who concluded that rather than a reduction in the number of employees, the companies would consider the redesign of jobs. Our arguments are based on the finding that although robots and robotised processes save time, there are activities such as negotiating with suppliers and building relationships with companies that are not substitutable by robots.

CONCLUSIONS

This research article dealt with two main research questions: (1) how digital technologies can be employed to support the strategy of the firm through procurement and (2) what the steps and challenges in the implementation phase of the software robots in procurement are. For the role that procurement in the case company has in supporting the company's strategy, we found strong support from previous studies. The innovation of products and processes has become vital for keeping the competitive position of companies. Digital technologies can support the strategy by responding to the innovative needs by global sourcing capabilities development. Companies should consider the options of digitalisation strategies that will enable them to focus on their core business. The proactive approach may be vital also due to supply chain integration.

A new contribution has been brought by answering RQ2, observing the steps and challenges in the software implementation phase. Firstly, such practical examples are still rare among research studies. Secondly, our research contributes to the theory by extending the Rushron *et al*. (2017) procurement cycle. There are three phases identified in the procurement of the case company with the potential for further automation and the employment of software robots. These are: the automation of purchase orders confirmation reminding, the reminder of delivery dates, and the reminder and maintenance of the ECC documents.

To address these challenges, companies need capital and workforce with information technology capabilities (Veile *et al.*, 2019). This is where the state can play a supportive role. The questions of preparedness of the workforce towards the changes in digitalisation and capital constraints were not addressed by our research and need to be further investigated also in regard to the size of the companies and regional differences. Small and medium-sized enterprises, SMEs, might be particularly limited by low innovation motivation, limited human and financial resources. Further research may be focused on a more detailed analysis of the relationship between the multinationals and SMEs, notably measuring SMEs, responding to the requirements of multinationals related to digitalisation.

Given the qualitative nature, the case study methodology is limited in terms of applicability and generalisability. Further research is needed to apply the extended procurement cycle framework in other cases and industry fields. The adoption of technological changes is developing over time, and further research needs to be carried out to evaluate the changes and generalise the findings.

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Acknowledgements and Financial Disclosure

The authors would like to thank the anonymous referees for their useful comments, which allowed to increase the value of this article.

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Entrepreneurial Business and Economics Review

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UNIVERSITY
OF ECONOMICS

Centre for Strategic and International Entrepreneurship

INTERNATIONAL
TRADE
DEPARTMENT

ISSN 2353-883X

eISSN 2353-8821