a scientific quarterly

EBER

Entrepreneurial Business and Economics Review

ISSN 2353-883X eISSN 2353-8821 2020, Vol. 8, No. 4

CRACOW UNIVERSITY OF ECONOMICS
Department of International Trade
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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)

Publisher

Cracow University of Economics
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Mrs. Anna Marcinek-Markowska
Building U, Room 300, phone +48 12 293 5929

Abstracting/Indexing

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

ESCI Web of Science ™ 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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Table of Contents

Dependencies and systemic risk in the European insurance sector: New evidence based on Copula-DCC-GARCH model and selected clustering methods 7
Anna Denkowska, Stanisław Wanat

The influence of personal characteristics on entrepreneurial intentions: International comparison 29
Alice Reissová, Jana Šimsová, Ralph Sonntag, Kristýna Kučerová

Innovation strategies of manufacturing companies during expansions and slowdowns 47
Jagoda Kaszowska-Mojsa

Entrepreneurial orientation and small firm performance: The moderating role of environmental hostility 67
Chukwuemeka Christian Onwe, Anastasia Ogbo, Abu Amodu Ameh

Organizational capabilities mediates between organizational culture, entrepreneurial orientation, and organizational performance of SMEs in Pakistan 85
Anam Bhatti, Shafique Ur Rehman, Jumana Basheer Abu Rumman

The effect of knowledge management on competitive advantage and business performance: A study of silver craft SMEs 105
Putu Yudy Wijaya, Ni Nyoman Reni Suasih

Individual determinants of entrepreneurship in Visegrád countries: Reflection on GEM data from the Czech Republic, Hungary, Poland, and Slovakia 123
Ondřej Dvouletý, Marko Orel

Does entrepreneurial knowledge influence vocational students' intention? Lessons from Indonesia 138
Rr Ponco Dewi Karyaningsih, Agus Wibowo, Ari Saptono, Bagus Shandy Narmaditya

Entrepreneurial orientation dimension affects firm performance: A perspective from the Malaysian furniture industry 157
Fazal Akbar, Rao Aamir Khan, Fazli Wadood, Abdul Talib Bin Bon

Entrepreneurial nascent behaviour: The role of causation process in opportunity discovery and creation 183
Cai Li, Majid Murad, Sheikh Farhan Ashraf, Nausheen Syed, Madiha Riaz

Social entrepreneurship innovation: A study from Mexico **201**
María Teresa de la Garza Carranza, Eugenio Guzmán-Soria,
Jorge Armando López-Lemus, Ana Cristina Sierra Martínez

The COVID-19 pandemic impact upon housing brokers' workflow and their clients' attitude: Real estate market in Krakow **221**
Bartłomiej Marona, Mateusz Tomal

Entrepreneurial Business and Economics Review

2020, Vol. 8, No. 4

10.15678/EBER.2020.080401

Dependencies and systemic risk in the European insurance sector: New evidence based on Copula-DCC-GARCH model and selected clustering methods

Anna Denkowska, Stanisław Wanat

ABSTRACT

Objective: The objective of this article is to study the correlations between the most important European insurers and their participation in systemic risk in the insurance sector. We compare systemic risk in different market regimes.

Research Design & Methods: We use statistical clustering methods for time units (weeks) to which we assign conditional variances obtained from the estimated Copula-Dynamic Conditional Correlations-Generalised Auto-Regressive Conditional Heteroskedasticity model (C-DCC-GARCH). In each of the identified market regimes we determine the Conditional Value at Risk *CoVaR* systemic risk measure.

Findings: In this article we show a positive correlation of all the insurance companies under consideration. During global market crises the correlation appears stronger than in 'normal times.' This confirms that the insurance sector generates systemic risk in the presence of turbulences on financial markets, since the value level of the compared index CoVar is much higher in these conditions.

Implications & Recommendations: Our research confirms the insurance sector's contribution to Systemic Risk. Thus, it is important to develop an analysis of systemic risk with a particular attention to the evolution of risk in time and the institutions' interconnectedness in the context of contagion using also some new modelling tools.

Contribution & Value Added: A novel approach of this article is the analysis of dependencies in the insurance sector using the C-DCC-GARCH model with taxonomic methods.

Article type: research article

Keywords: systemic risk; insurance market; Copula-DCC-GARCH(C-DCC-GARCH)

JEL codes: G22, C38, C32

Received: 13 November 2019 Revised: 15 June 2020 Accepted: 20 August 2020

Suggested citation:

Denkowska, A., & Wanat, S. (2020). Dependencies and systemic risk in the European insurance sector. New evidence-based on Copula-DCC-GARCH model and selected clustering methods. *Entrepreneurial Business and Economics Review,* 8(4), 7-27. https://doi.org/10.15678/EBER.2020.080401

INTRODUCTION

This article is an answer to the 2017 European Insurance and Occupational Pensions Authority (EIOPA 2017) report that recommends the analysis of systemic risk in the insurance sector; i.e. undesirable financial occurrence with systemic cause and negative global effect in real economy (Eling and Pankoke, 2014 provide 43 definitions of systemic risk). The report pays special attention to two aspects: firstly, the evolution of risk over time and, secondly, dependencies among institutions. In an era of economic globalisation, one of the most important questions is the possibility of financial risk contagion. The higher the level of correlation among insurers, the greater the risk.

Therefore, we aim (i) to analyse systemic risk dynamics for the years 2005-2018, and (ii) to show precisely the interconnectedness among insurers and confirm their impact on systemic risk. The second point comes to the fore through the identified market regime during the largest turbulences on financial markets due to the financial crisis of 2007-2009.

Following the financial crisis of 2007-2009 and the European public debt crisis in 2010-2012, interest in systemic risk has been significantly growing. Among other things, this resulted in the literature proposing many new methods for the study of financial institutions' influence on systemic risk. Moreover, both the academic community and financial regulatory authorities began to pay more attention to the role played by non-bank financial institutions, in particular insurance companies, in creating systemic risk. Before the crisis, most scholars generally accepted that the insurance market has a negligible impact on systemic risk. However – although many a study still supported the latter point of view – the recent literature offers several articles suggesting the possibility of the insurance market itself creating systemic risk. Let us quote here from a few articles whose authors claim that insurance companies:

- generate systemic risk (Billio, Getmansky, Lo, & Pelizzon, 2012; Weiß & Mühlnickel, 2014),
- can be systemically important when they conduct investment activities outside of their normal insurance busines (Baluch, Mutenga, & Parsons, 2011; Cummins & Weiss, 2014), while in general the systemic significance of the insurance sector as a whole is still subordinated to the banking sector (Chen *et al*., 2013; Czerwińska, 2014),
- are systemically unimportant due to the low level of interconnections and the lack of strong dependence on external funding (Harrington, 2009; Bell, 2009; Keller, 2009; Geneva Association, 2010).

On the other hand, after studying a very large sample of insurers in a long-term horizon, Bierth, Irresberger and Weis (2015) claim that the level of generating systemic risk by the insurance sector is rather low, its peak having been reached during the financial crisis of 2007-2009. Moreover, these authors indicate the four L's – linkages, leverage, losses, liquidity – as the crucial factors influencing the exposure of insurers to systemic risk.

The present article belongs to the mainstream of studies in the linkages among large insurance companies and their participation in systemic risk in the insurance sector. Our main aim is to check whether the strength of existing connections among the eight largest insurers depend on the insurance market regime. These eight companies come from the list of the most important insurance companies in the world with respect to total assets – five from Europe, one from the USA, Canada, and China – together with their participation

in systemic risk in the European insurance sector. The market regimes are identified by analysing the weekly rates of return of the insurers in question during the period between January 2005 and December 2018. They are assessed using statistical clustering methods of time units (weeks) to which we assigned conditional variances obtained from the estimated C-DCC-GARCH model. Indeed, we assume that the change (increase) of the risk (variance) is a good and classical index of the financial market tension. Such an approach has the advantage that there is no need to assume a priori a number of market regimes, because this number is identified by the clustering quality assessment. Next, in each of the identified regimes we establish the CoVaR systemic risk measure, commonly used today (see e.g. Acharya, Pedersen, Philippon, & Richardson 2010; Bierth *et al*., 2015; Jobst, 2014). We assume that the European insurance market is represented by the weekly rates of return from the STOXX 600 Europe Insurance index. The CoVaR measure, indicating the participation of each of the insurers to systemic risk, is assessed using the conditional distributions obtained from eight bivariate C-DCC-GARCH models. In each of these models one boundary distribution represents the European insurance market – on the logarithmic return from the stock market index STOXX 600 Europe Insurance index – while the other one represents the insurer, on the appropriate logarithmic rate of return. To the best of our knowledge, such an approach has not been used in systemic risk analysis ever before.

The paper consists of five chapters. The second one overviews the literature devoted to systemic risk in the insurance sector, the third chapter presents the methodology together with empirical results, the fourth one shows the data and describes our findings, whereas the fifth and last one proposes conclusions.

LITERATURE REVIEW

Let us begin with recalling the natural definition of systemic risk as 'any set of circumstances that threatens the stability of or public confidence in the financial system' (Billio *et al.*, 2012).

Usually, systemic risk is endogenous, i.e. coming from the financial system itself, which amplifies its exogenous version. Systemic risk can be viewed as a coordination failure. The specific sources of systemic crisis are contagion, bank run, or liquidity crisis. Up to now, insurance has virtually been immune to systemic risk, which is partly explained by pyramidal risk sharing – which removes a lot of contagion risk – and less room for coordination failure than in other financial institutions. However, as insurance companies become increasingly involved in other financial activities or – rather – as insurance is increasingly often conducted by financial institutions that do not specialise only in this sector, the situation may well change. Of course, there are other causes that may lead to this, such as e.g. more pervasive liquidity insurance offer by the companies. In particular, these conclusions can be found in the special report by the Geneva Association (2010), 'Systemic risk in insurance: An analysis of insurance and financial stability'. Furthermore, Billio *et al.* (2010) already mention the growing interrelations between the insurance, banking, and hedge funds sectors as one of the causes of increasing systemic risk.

Another question is how to measure systemic risk, as several approaches are possible. Leaving this question aside for the moment – as the matter is raised in many of the articles mentioned below (e.g. Bernardi & Catania, 2015) – let us quick overview at recent approaches to systemic risk in insurance. The general and most widespread view is that, for various reasons, the added value of insurance sector to systemic risk – whatever

its definition and measurement tools – is very low but this recently undergoes a change, as the insurance market keeps evolving (also cf. the 2015 'Report on systemic risks in the EU insurance sector' by ESRB, 2015).

Indeed, Kanno (2016) observes that – contrary to the interbank market – the insurance market does not contain feedback mechanisms that would make it fully interconnected. However, Kanno indicates that interconnectedness in the insurance sector has not been explored yet with network theory or contagious default approach. As a conclusion, Kanno upholds the opinion of International Association of Insurance Supervisors (IAIS, 2011) that the degree of interconnectedness within the (re)insurance sector is small, which adds to its immunity to systemic risk. However, an earlier study (Dungey, Luciani, & Veredas, 2014) notes that insurance companies display substantial systemic risk via interconnectedness with the financial sector and the real economy. Similarly, Bierth, Irresberger, and Weiß (2015) studied the contribution of 253 international life and non-life insurers to global systemic risk in 2000-2012, and they observe that systemic risk in the international insurance sector is small in comparison to that of banks. Still, during the financial crisis, insurers significantly contributed to the instability of the financial sector. In conclusion, the various factors determining the systemic risk of insurers are interconnectedness, leverage, loss ratios, and the insurer's funding fragility. Bierth, Irresberger, and Weiß (2015) furthermore conclude that there is no big difference in the contribution to global systemic risk between life insurers and non-life insurers. In particular, there seems to be no relationships between an insurer's size and its contribution. The authors support the viewpoint that unlike the banking sector, the insurance one predominantly suffers from exposition to systemic risk, rather than from the financial system's fragility. Moreover, another study (Mühlnickel & Weiß, 2015) indicates a strong positive relationship between consolidation in the insurance industry and moderate systemic risk in the insurance sector, but definitely no extreme systemic risk. Similar conclusions are drawn by Berdin and Sottocornola (2015), who use three measurements to infer that the insurance industry has a persistent systemic relevance over time but far from the role of banks in causing systemic risk compared to banks. An interesting contrast between the Eurozone and the USA is observed by Bernal, Gnabo, and Guilmin (2014), who surmise that in 2004-2012, the other financial services sector and the banking sector in the Eurozone contribute relatively more to systemic risk in periods of distress than the insurance sector, while in the USA the insurance industry is systemically the riskiest financial sector.

These recent results were preceded by several articles – many of them triggered by the AIG's collapse in the recent crisis – in the years 2009-2013 (as listed in the excellent survey by Eling and Pankoke, 2014). Harrington (2009) claims that traditional insurance products make no contribution to systemic risk. Radice (2010) comes to a two-fold conclusion. He identified those phenomena that do not contribute to generating SR; According to him, these are the unavailability of insurance, life insurance, insolvency of CDS and the use of credit ratings. He indicated those that may be systemically risky, i.e. contagion with assets, limited fungibility of the available liquidity of the group, difficulties in unregulated / uninsured activity within the insurance group.

Baluch, Mutenga, and Parsons (2011) noted that the increase in systemic risk in the insurance sector has been caused in recent years by an increased share in capital markets and the introduction of banking services.

The same year, van Lelyveld, Liedorp, Kampman van Lelyveld, Liedorp and Kampman (2011) studied contagion and the contribution of linkages among insurers and reinsurers to systemic failure, which leads them to conclude that the collapse of several reinsurers would result in the bankruptcy of only a few primary insurers.

That is, these authors suggest that the potential failure of one or more (re)insurers is not a systemic risk. Still, in 2011, a study of the US insurance sector was performed by Cummins and Weiss (2014a), which shows that the largest contributors to SR are non-traditional and non-insurance activities such as derivatives trading and financial guarantees.

Grace (2011) states that the situation in the insurance sector is different from that in the banking sector; the duration of assets and liabilities are more closely matched.

Similarly, Kessler (2013) asserts that reinsurance does not contribute to systemic risk, while Baur, Enz, and Zanetti (2003) come to the same conclusion. On the other hand, Mühlnickel and Weiß (2014) claim that the insurance sector is sensitive to the financial system's deterioration and contributes to systemic risk.

Schwarcz and Schwarcz (2014) concentrate on systemic risk in insurance as resulting from correlations among firms.

Our work responds to the problems still open in literature (Brechmann *et al.*, 2013; Reboredo & Ugolini, 2015; Di Bernardino *et al.*, 2015) regarding the analysis of the insurance sector in the context of interrelationships and systemic risk along with SR measures (Barrieu *et al.*, 2014; Tang & Yang, 2012). We undertake research both in the context of searching for a model and assessing whether and at what level SR is generated during the normal state of the market and during turbulences. We analyse eight insurance companies from the list of the most important insurance companies in the world ranked by total assets, five of which are the largest in Europe, two in North America, and one in Asia. Thus, we propose the following research hypotheses:

1. All analysed insurers generate systemic risk in the European insurance sector regardless of the country, currency, and the size of insurer measured by the size of assets.
2. The systemic importance of the European insurance market is the same for all insurers, except for the Chinese, for whom it is less important (CoVaR is higher). During turbulences, the SR generation level is much higher than in the normal state.
3. The existence of strong relationships between insurers and the European insurance sector results in a higher SR level.

In order to verify the hypotheses, an innovative hybrid approach has been used, which combines machine learning cluster analysis with the C-CDD-GARCH model. We used the C-DCC-GARCH model (Di Clemente, 2018; Karimalis & Nomikos, 2018; Oh & Patton, 2018; Gaizner, 2019) in three different contexts:

- in combination with cluster analysis methods to determine market states which – as far as we know – has not been described in literature up to now,
- to determine conditional correlations between insurers,
- to calculate the CoVaR risk measure.

RESEARCH METHODOLOGY

The empirical strategy we use in this article to analyse the dependences and assess systemic risk on the European insurance market consists of two basic steps:

1. Market regime identification;
2. Analysis of identified market regimes:
   - dependences among the studied insurance companies,
   - correlations between a given insurance company and the European insurance market as represented by the STOXX 600 Europe Insurance index,
   - systemic risk.

It is assumed in the first step that market regimes are identified using statistical methods of grouping weekly periods *t* according to the assigned conditional variances of rates of return of all the instruments under analysis. The conditional variances that are essential in this approach are obtained through the multivariate C-DDC-GARCH model. In this model, the distribution of the rates of return vector $r_t = (r_{1,t}, \dots, r_{1,t})'$ – conditional with respect to the set Ω_{t-1} of information available up to the moment $t-1$ – is modelled using the conditional copula proposed by Patton (2006). The copula assumes the following form:

$$r_{1,t}|\Omega_{t-1} \sim F_{1,t}(\cdot\,|\Omega_{t-1}), \dots, r_{k,t}|\Omega_{t-1} \sim F_{k,t}(\cdot\,|\Omega_{t-1}) \tag{1}$$

$$r_t|\Omega_{t-1} \sim F_t(\cdot\,|\Omega_{t-1}) \tag{2}$$

$$F_t(r_t|\Omega_{t-1}) = C_t\left(F_{1,t}(r_{1,t}|\Omega_{t-1}), \dots, F_{k,t}(r_{k,t}|\Omega_{t-1})\right) \tag{3}$$

in which C_t denotes the copula, whereas F_t and $F_{i,t}$ are the multivariate CDF and the CDFs of the marginal distributions at time *t*. In general, the univariate rates of return $r_{i,t}$ can be modelled by various specifications of the mean model, e.g. the ARMA process (Box & Jenkins, 1970) and various specifications of the variance model e.g. sGARCH, fGARCH, eGARCH, gjrGARCH, apARCH, iGARCH, csGARCH (Fiszeder, 2009).

In our study, the following ARMA process is applied to all the series of returns for the mean:

$$r_{i,t} = \mu_{i,t} + y_{i,t}, \tag{4}$$

$$\mu_{i,t} = E(r_{i,t}|\Omega_{t-1}),\ \mu_{i,t} = \mu_{i,0} + \sum_{j=1}^{P_i} \varphi_{ij} r_{i,t-j} + \sum_{j=1}^{Q_i} \theta_{ij} y_{i,t-j}, \tag{5}$$

$$y_{i,t} = \sqrt{h_{i,t}}\varepsilon_{i,t}, \tag{6}$$

While for the variance we use the eGARCH model (Nelson, 1991):

$$\log(h_{i,t}) = \omega_i + \sum_{j=1}^{p_i}(\alpha_{ij}\varepsilon_{i,t-j} + \gamma_{ij}(|\varepsilon_{i,t-j}| - E|\varepsilon_{i,t-j}|) + \sum_{j=1}^{q_i}\beta_{ij}\log(h_{i,t}), \tag{7}$$

In which $\varepsilon_{i,t} = y_{i,t}/\sqrt{h_{i,t}}$, are independent random variables with the same distribution. In the empirical analysis we considered the following distributions: normal, skew-normal, t-Student, skew-t-Student and GED.

The structure of the dependences between the rates of return is modelled using elliptic copulae with conditional correlations R_t as parameters, the dynamics of which is described by the DCC(*m*, *n*) model:

$$H_t = D_t R_t D_t \tag{8}$$

$$D_t = diag(\sqrt{h_{1,t}}, \dots, \sqrt{h_{k,t}}), \tag{9}$$

$$R_t = (diag(Q_t))^{-\frac{1}{2}} Q_t (diag(Q_t))^{-\frac{1}{2}}, \tag{10}$$

$$Q_t = (1 - \sum_{j=1}^{m} c_j - \sum_{j=1}^{n} d_j)\bar{Q} + \sum_{j=1}^{m} c_j\left(\varepsilon_{t-j}\varepsilon'_{t-j}\right) + \sum_{j=1}^{n} d_j Q_{t-j}, \tag{11}$$

in which the conditional variances $h_{i,t}$ are modelled using univariate GARCH(*p*,*q*) processes of the form (7), $\varepsilon_t = D_t^{-1} y_t$, $y_t = (y_{1,t}, \dots, y_{k,t})'$ and $\bar{Q}$ is the unconditional covariance matrix of standardised residuals ε_t. In the specification (11) c_j $(j = 1, \dots, m)$, d_j $(j = 1, \dots, n)$ are scalars describing the influence on the current correlations of the respective previous shocks and previous conditional correlations.

The parameters of the C-DCC-GARCH model above are estimated using the *inference function for margins – IFM*. This method is presented in detail e.g. in Joe (1997). The computations were done in the R environment using the 'rmgarch' package developed by Ghalanos (2019).

We used statistical methods of unsupervised classification in order to identify market regimes. We assumed that the groups obtained from periods *t* have similar levels of risk, i.e. have a similar conditional variance. The clustering was performed by means of hierarchical methods in which groups are created recursively by connecting the most similar objects (Ward's method). We also used two division methods, i.e. the classical k-means method and the partitioning around medoids method (PAM) proposed by Kaufman and Rousseeuw (1990). The optimal number of groups – and thus the market regimes – were assessed under the following measures of cluster validity: the *Calinski-Harabasz index* (Calinski & Harabasz, 1974), the *silhouette index-SI* (Kaufman & Rousseeuw, 1990), the *Dunn index* (Dunn, 1974), and the *Xie-Beni separation measure* (Xie & Beni, 1991).

In the second stage of analysis, in each of the identified market regimes we assessed the *CoVaR*. The systemic risk measure $CoVaR_{\beta,t}^{i|j}$ was defined to be the value at risk (*VaR*) of the institution (market index) *i* under the condition that another institution (market index) *j* is subject to distress, i.e. its rate of return is smaller than its value at risk, meaning that:

$$P\left(r_{i,t} \leq CoVaR_{\beta,t}^{i|j} | r_{j,t} \leq VaR_{\alpha,t}^{j}\right) = \beta, \tag{12}$$

Using the conditional probability formula we received:

$$\frac{P\left(r_{i,t} \leq CoVaR_{\beta,t}^{i|j}, r_{j,t} \leq VaR_{\alpha,t}^{j}\right)}{P\left(r_{j,t} \leq VaR_{\alpha,t}^{j}\right)} = \beta, \tag{13}$$

The definition of the value at risk for the institution *j*, i.e. $VaR_{\alpha,t}^{j}$ yielded $P\left(r_{j,t} \leq VaR_{\alpha,t}^{j}\right) = \alpha$, that is:

$$P\left(r_{i,t} \leq CoVaR_{\beta,t}^{i|j}, r_{j,t} \leq VaR_{\alpha,t}^{j}\right) = \alpha\beta. \tag{14}$$

Therefore, the assessment of $CoVaR_{\beta,t}^{i|j}$ required the knowledge of bivariate distribution F_t of the vector $\left(r_{i,t}, r_{j,t}\right)$. Due to the Sklar Theorem, this distribution can be represented using the copula in the following way:

$$F_t\left(r_{i,t}, r_{j,t}\right) = C_t\left(F_i\left(r_{i,t}\right), F_j\left(r_{j,t}\right)\right). \tag{15}$$

Invoking (15), $CoVaR_{\beta,t}^{i|j}$ can be determined by (numerically) solving the equation:

$$C_t\left(F_i\left(CoVaR_{\beta,t}^{i|j}\right), \alpha\right) = \alpha\beta. \tag{16}$$

In the empirical analysis, we studied the influence on the European insurance market's systemic risk of the five largest insurance companies from Europe and the biggest

insurers from the USA, Canada, and China. We assumed that $r_{i,t}$ represents the European insurance market (we made use of the weekly rates of return from STOXX 600 Europe Insurance), while $r_{j,t}$ describes the insurers (we made use of the weekly logarithmic returns on shares). For each of the eight pairs – the rate of return from the STOXX 600 index $r_{i,t}$, logarithmic return of the insurer $r_{j,t}$ – we assessed parameters of the bivariate C-DCC-GARCH model described by the formulae (1)-(7). Then, using these parameters together with the conditional correlations obtained by these models, we determined the copula C_t and the distributions F_t. The values $CoVaR_{\beta,t}^{i|j}$ for the analysed period were obtained by solving numerically the equation (16).

RESULTS AND DISCUSSION

From the literature analysis, we conclude that much was already written about the generation of SR in the insurance sector, and the conclusions are divided. Baluch, Mutenga, and Parsons (2011) and Schwarcz and Schwarcz (2014) confirm the thesis that the insurance sector generates SR, especially in the recent period, when insurers have expanded non-insurance activities. From our case study of the eight largest insurers, we conclude that each insurance company generates SR. In addition, the SR level increases during turbulences on financial markets. Many works (e.g. Barrieu *et al.*, 2014; Tang & Yang, 2012; Jobst, 2014) state that tools for measuring SR have not been developed yet, the universal definition of the SR measure has not yet been established. Oh and Patton (2018) and Reboredo and Ugolini (2015) show that the C-DCC-GARCH model enables the study of SR in the banking sector, considering turbulences on financial markets. In our work, we confirm that the model also works in the insurance sector. The novelty of our article lies in the creation of a model that combines taxonomic methods with the econometric C-CDD-GARCH model. As the basis for our study, we took stock prices of the five largest insurers from Europe and the biggest insurers from the USA, Canada, and China (cf. Table 1 and Figure 1), along with the STOXX 600 Europe Insurance index representing the European insurance market (cf. Figure 2). Data were obtained from the Thomson Reuters in January 2019. We analysed the weekly log returns for the period between January 2005 and December 2018.

Table 1. Insurance companies considered in the study with their acronyms used in the presentation of results

No.	Insurer	Acronym	Country	Total assets (in bln USD)
1	AXA	AXA	France	944.145
2	Allianz	Allianz	Germany	934.654
3	Prudential plc	Prud	United Kingdom	578.149
4	Legal & General	Legal	United Kingdom	574.901
5	Aviva	Aviva	United Kingdom	541.188
6	Metlife	Metlife	USA	898.764
7	Manulife Financial	Manu	Canada	534.705
8	Ping An Insurance	Ping	China	802.975

Source: own elaboration based on of data from http://www.relbanks.com/top-insurance-companies/world (15 January 2019).

All insurers besides Legal & General and Manulife Financial are listed by G-SII according to the principles suggested by the Association of Insurance Supervisors (IAIS) in Basel in 2013, which established how to evaluate financial institutions as far as systemic importance is concerned.

In the first stage of our study, we identified the regimes of insurance market on the basis of the conditional variances of rates of return of the insurance companies under scrutiny. We assessed these conditional variances using the eight-variate C-DCC-GARCH model. During the analysis, we considered various ARMA-GARCH specifications of univariate models. Finally, on the grounds of information criteria and model appropriateness tests (result available upon request to the authors), we opted for all the instruments, i.e. for the ARMA(1, 1)-eGARCH(2, 2) model with the skew Student distribution (with skewness ξ and shape υ); the eGARCH meaning exponential GARCH model put forward by Nelson. During the analysis of the dynamics of dependences between the rates of return, we considered the Gauss and Student copula together with various specifications of the DCC model. As earlier, on the basis of information criteria, we chose the Student copula with conditional correlation coefficients obtained from the DCC(1, 1) model and a constant shape parameter η. The assessment results are presented in Table 2, while the conditional variances obtained are shown in Figure 3.

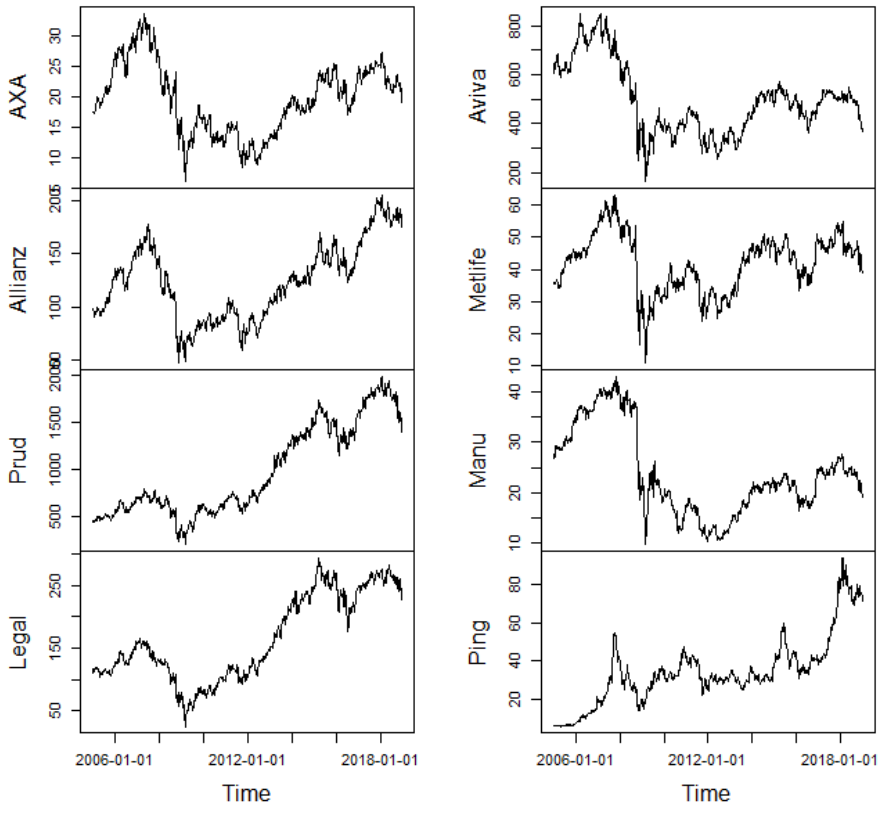

Figure 1. Quotations of insurance companies studied for the period 07.01.2005-21.12.2018
Source: own elaboration.

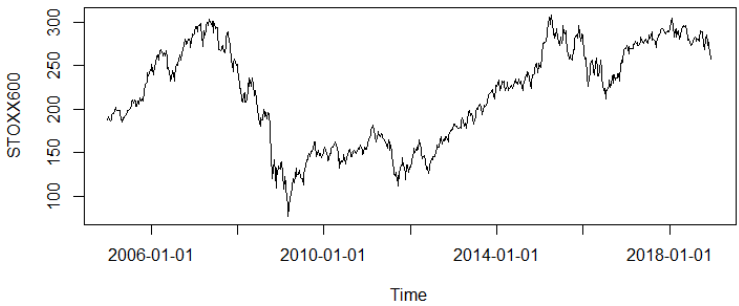

Figure 2. STOXX 600 Europe Insurance index during the period 07.01.2005-21.12.2018
Source: own elaboration.

Table 2. C-DCC–GARCH model estimation results

Param.	AXA	Allianz	Prud	Legal	Aviva	Metlife	Manu	Ping
M	0.0010	0.0011	0.0009	0.0011	-0.0006	0.0009	0.0003	0.0039
	0.3569	*0.3294*	*0.2815*	*0.0604*	*0.5609*	*0.0930*	*0.8047*	*0.0198*
φ_1	0.8445	0.2844	0.6072	0.7425	0.7211	0.7876	-0.8687	-0.9367
	0.0000	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0005*	*0.0000*
ϑ_1	-0.8897	-0.3397	-0.7336	-0.8123	-0.7797	-0.8440	0.8056	0.9118
	0.0000	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0073*	*0.0000*
Ω	-0.1891	-0.2024	-0.1287	-0.1854	-0.2492	-0.1608	-0.2018	-0.2718
	0.0000	*0.0001*	*0.0011*	*0.0282*	*0.0040*	*0.0041*	*0.0123*	*0.0848*
α_1	-0.3000	-0.2597	-0.1974	-0.2058	-0.1721	-0.1963	-0.1868	-0.0396
	0.0000	*0.0000*	*0.0003*	*0.0191*	*0.0003*	*0.0000*	*0.0097*	*0.3617*
α_2	0.2021	0.1564	0.0907	0.1036	-0.0184	0.0810	0.0225	0.0356
	0.0002	*0.0125*	*0.1053*	*0.3209*	*0.7349*	*0.0084*	*0.7240*	*0.4804*
β_1	1.0000	1.0000	1.0000	1.0000	0.1931	1.0000	0.5951	0.2430
	0.0000	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*
β_2	-0.0299	-0.0300	-0.0205	-0.0284	0.7682	-0.0252	0.3751	0.7113
	0.0000	*0.0001*	*0.0009*	*0.0376*	*0.0000*	*0.0044*	*0.0000*	*0.0000*
γ_1	-0.0366	0.0532	-0.0929	0.1295	0.0277	0.1169	0.1414	0.2838
	0.6340	*0.6021*	*0.2804*	*0.2064*	*0.7292*	*0.2584*	*0.1533*	*0.0000*
γ_2	0.1790	0.0507	0.2159	0.0764	0.3062	0.0103	0.0824	0.0932
	0.0334	*0.6303*	*0.0186*	*0.4639*	*0.0001*	*0.9199*	*0.3380*	*0.2080*
ξ (skew.)	0.8519	0.8332	0.8022	0.8906	0.8152	0.8709	0.9219	1.1321
	0.0000	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*
υ (shape)	11.7322	10.1324	6.0408	5.4374	6.0600	4.5168	5.0649	5.4819
	0.0118	*0.0079*	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*

C-DCC parameters	
Distribution	Octovariate t-Student
DCC order	DCC(1, 1)
	Parameters
c_1	0.01063 (*0.00012*)
d_1	0.94801 (*0.00000*)
η (shape)	9.96436 (*0.00000*)

The numbers in parentheses are probability values (p-values).
Source: own study.

Market regimes were identified by means of clustering weekly periods with respect to the conditional variances in insurance companies' rates of return. In this crucial step – from the viewpoint of the whole study – we considered various combinations of distance measures, clustering methods, and a number of classes. Eventually, following criteria of clustering quality (cf. Table 3), we chose a division into two classes obtained using the method of k-means with the Euclidean distance (cf. Figure 4). In this case, the silhouette index is 0.8683 (clustering quality is pictured in Figure 5). We assumed that different market regimes correspond to different classes. The variance distribution in different regimes is shown in Figure 6. We can infer from Figure 6 that the first regime is characterised by low volatility (low risk level), while the second one – occurring during the period 17.10.2008-05.06.2009 – by high volatility (high risk level).

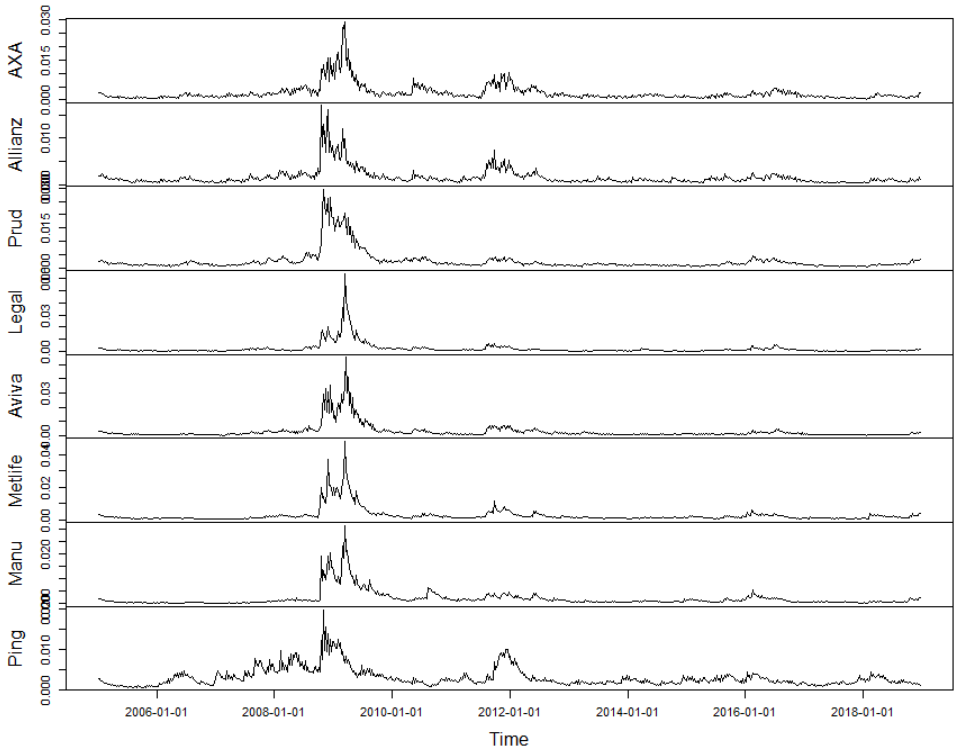

Figure 3. Conditional variances
Source: own elaboration.

In the second step of our study, we analysed dependences between the studied insurance companies based on the conditional correlations from the previously assessed octovariate c-DCC-GARCH model. Their distribution for the respective pairs in the identified market regimes is shown in Figure 7.

On the other hand, the analysis of dependences between the insurer and the European insurance market – but also the analysis of systemic risk in the first and second market regime – was conducted on the basis of the estimated eight-bivariate C-DCC-GARCH

models for the following pairs: the rate of return on the European market index and the individual rate of return for a given insurance company. The models were evaluated on the basis of the whole history of occurrences. In the case of insurers, we employed the earlier estimated ARMA(1, 1)-eGARCH(2, 2) models with the skew Student distribution. On the grounds of information criteria and model appropriateness tests, we considered the same specification for the STOXX 600 Europe Insurance index rate of return. The parameters of the estimated model are given in Table 4. During the analysis of the

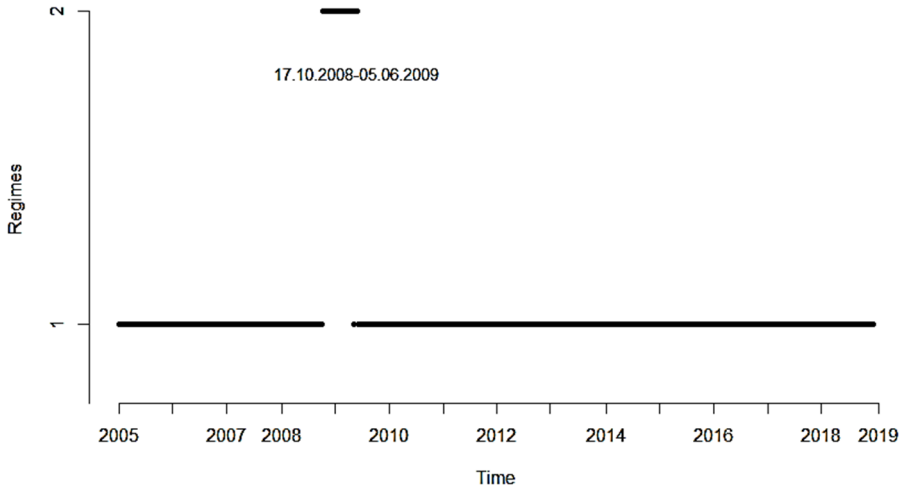

Figure 4. Identified market regimes
Source: own elaboration.

Table 3. Validation indices for data partitions

Validation criterion	Number of clusters				
	2	3	4	5	6
	Ward's method				
Silhouette	**0.8683**	0.4202	0.3958	0.3987	0.3986
Calinski Harabasz index	**1545.1570**	1006.8530	771.5901	963.3596	814.7552
Dunn index	**0.0552**	0.0080	0.0080	0.0110	0.0110
Xie-Beni index	**1.9208**	76.1650	68.5520	45.4610	43.3223
	PAM				
Silhouette	**0.8623**	0.4788	0.4153	0.4181	0.1549
Calinski Harabasz index	**1501.2950**	1036.3830	791.2769	990.6590	809.8822
Dunn index	**0.0353**	0.0082	0.0077	0.0104	0.0053
Xie-Beni index	**4.1444**	66.2503	72.2987	47.7384	177.4645
	k-means				
Silhouette	**0.8683**	0.5238	0.5177	0.4713	0.4394
Calinski Harabasz index	**1545.1570**	1063.6570	1170.1440	1047.2740	915.3568
Dunn index	**0.0552**	0.0071	0.0106	0.0146	0.0127
Xie-Beni index	**1.9208**	92.8171	62.4426	28.7042	34.8416

Note: numbers in bold indicate the optimal number of groups with reference to a given criterion.
Source: own study.

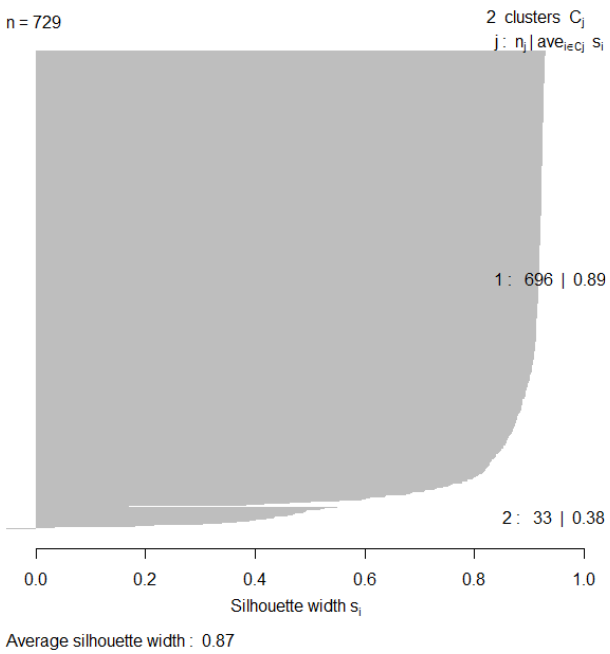

Figure 5. Silhouette plot
Source: own elaboration.

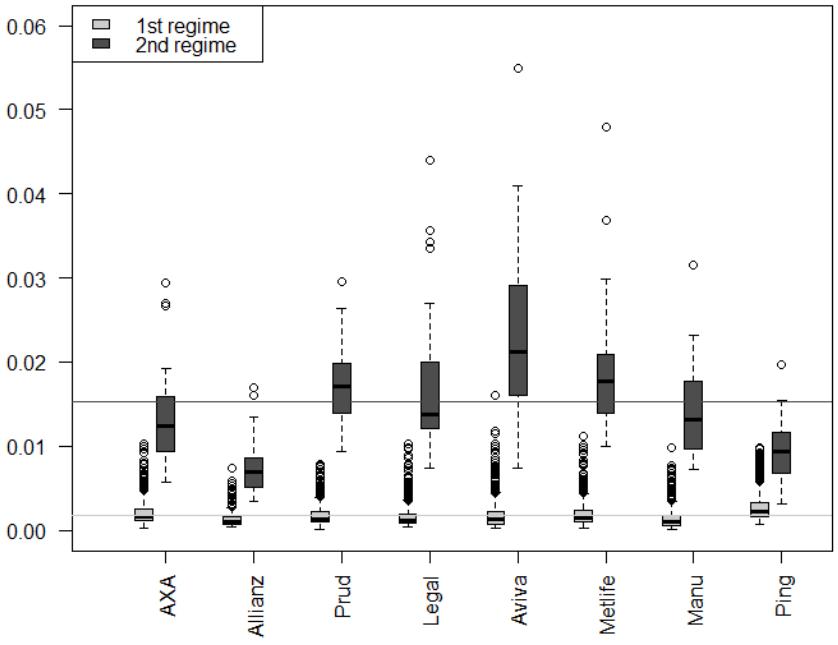

Figure 6. Boxplots for the conditional variance in the identified market regimes
Source: own elaboration.

dynamics between the rate of return on the index representing the European insurance market and the insurers' rates of return, we considered the Gauss and Student copulae, along with various specifications of the DCC model. On the basis of information criteria for each pair, we chose the Student copula with conditional correlations obtained from the DCC(1, 1) model and constant shape parameters. The estimation results are presented in Table 5, while the conditional correlations obtained are shown in Figure 8. Finally, the distribution of the conditional correlations between the domestic and European capital markets in the identified regimes is given in Figure 9.

Systemic risk assessment in identified market regimes was performed using the *CoVaR* measure determined by the method described in the previous section. The *CoVaR* value distribution illustrating the influence of a given insurer on the European insurance market is shown in Figure 10.

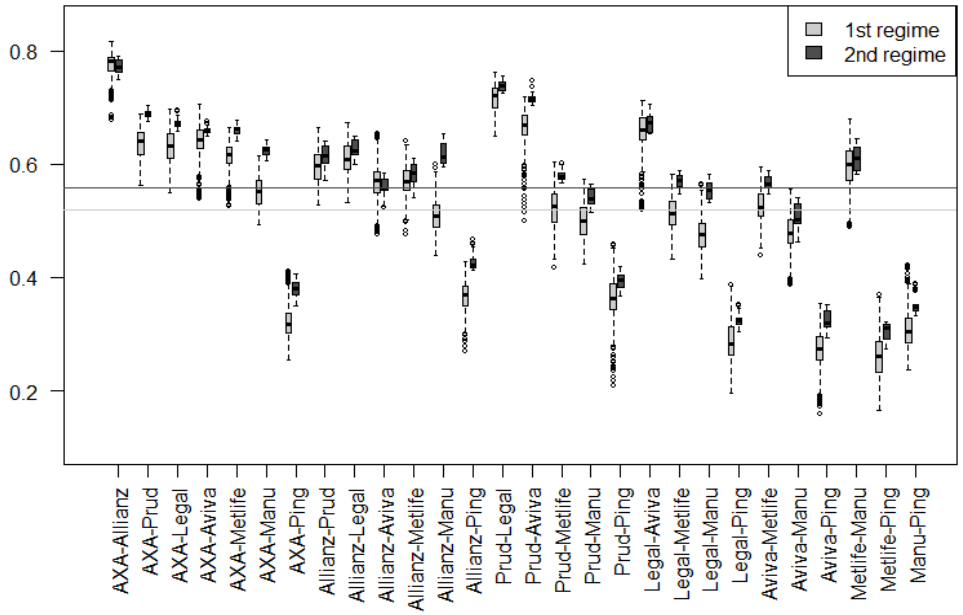

Figure 7. Boxplots for the conditional correlations between analysed markets in the identified regimes

Source: own elaboration.

Market regimes were established to check whether the systemic importance of the surveyed largest insurers from Europe, North America, and Asia is at a similar level during the normal period and during the turbulence in the insurance markets. Such information is important for decision-makers who shape the macro-prudential policy of the European insurance sector; in particular regarding the method of determining insurers of global systemic importance. From the studies conducted upon the eight insurers, a hypothesis follows that the level of SR generation increases in the second state in the period from October 17, 2008 to June 5, 2009 shown in Figure 7. A significantly higher level of SR in the state of turbulence means that during turmoil on financial markets, the strength of the negative impact of individual insurance units upon the whole insurance sector increases.

Table 4. Univariate ARMA(1, 1)- eGARCH(2, 2) model estimations for the STOXX 600 Europe Insurance index

Parameter	M	φ_1	ϑ_1	Ω	α_1	α_2
estimation	0.00086	0.68392	-0.72741	-0.20234	-0.25814	0.16812
p-Value	*0.35844*	*0.00000*	*0.00000*	*0.00221*	*0.00003*	*0.00570*
Parameter	β_1	β_2	γ_1	γ_2	ξ (skew.)	υ (shape)
estimation	1.00000	-0.02848	0.09708	0.05358	0.79261	9.87665
p-Value	*0.00000*	*0.00691*	*0.35870*	*0.60707*	*0.00000*	*0.00438*

Source: own study.

Table 5. Bivariate DCC(1, 1) models estimations for the pairs: STOXX 600 Europe Insurance and a given insurer

Indicator	AXA	Allianz	Prud	Legal	Aviva	Metlife	Manu	Ping
c_1	0.02513	0.02159	0.03199	0.04218	0.02631	0.07105	0.03338	0.00942
	0.04014	*0.01083*	*0.02421*	*0.00990*	*0.00191*	*0.02998*	*0.08039*	*0.73776*
d_1	0.95214	0.96262	0.94015	0.92320	0.96805	0.72663	0.90777	0.85545
	0.00000	*0.00000*	*0.00000*	*0.00000*	*0.00000*	*0.00027*	*0.00000*	*0.32845*
η (shape)	6.85867	11.11860	8.13343	7.99758	6.31898	16.80825	7.86310	15.97758
	0.00026	*0.00241*	*0.00000*	*0.00012*	*0.00000*	*0.10873*	*0.00122*	*0.14136*

Source: own study.

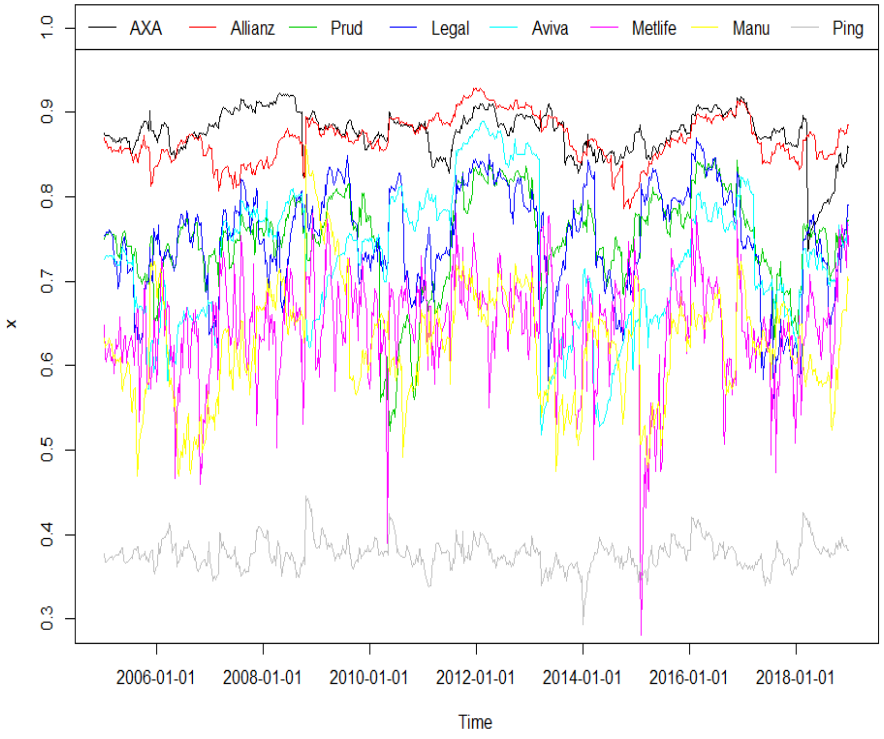

Figure 8. Conditional correlations between the insurer and the European insurance market
Source: own elaboration.

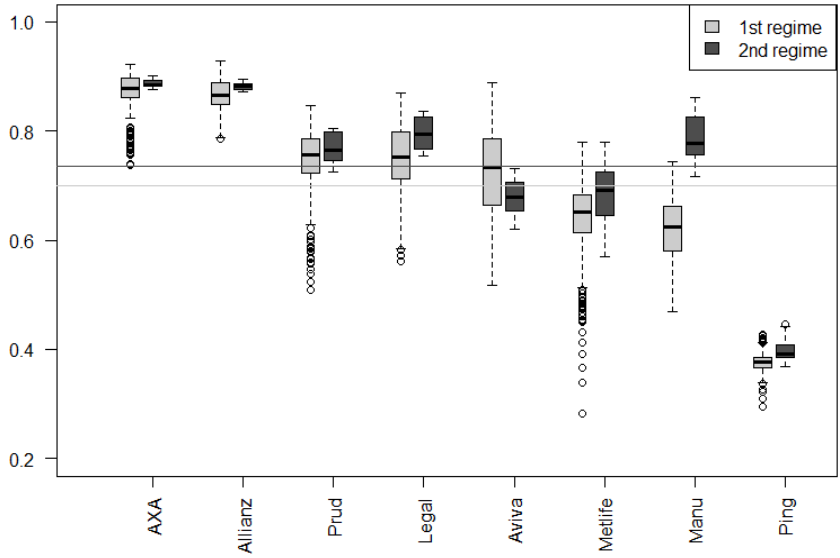

Figure 9. Boxplots for the conditional correlations between the insurer and the European insurance market in the identified regimes
Source: own elaboration.

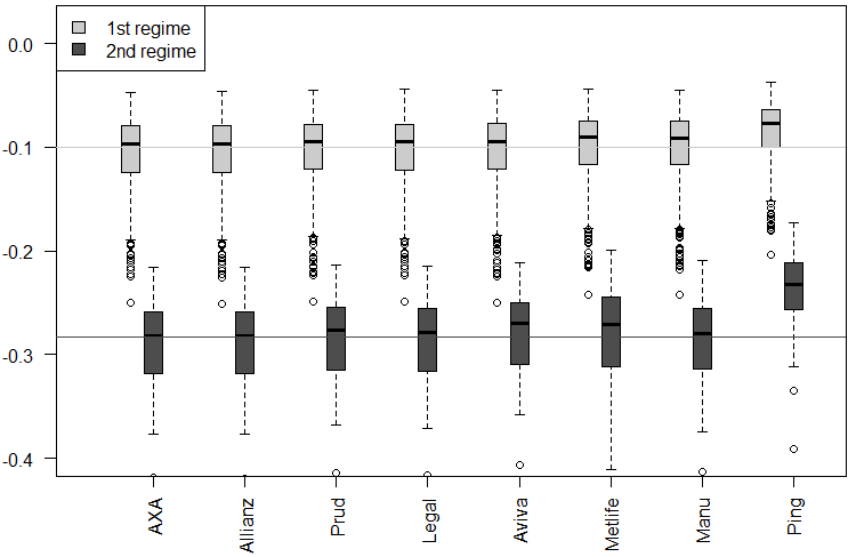

Figure 10. Boxplots for the CoVaR measure in the identified regimes
Source: own elaboration.

Market regimes were established to check whether the systemic importance of the surveyed largest insurers from Europe, North America, and Asia is at a similar level during the normal period and during the turbulence in the insurance markets. Such information

is important for decision-makers who shape the macro-prudential policy of the European insurance sector; in particular regarding the method of determining insurers of global systemic importance. From the studies conducted upon the eight insurers, a hypothesis follows that the level of SR generation increases in the second state in the period from October 17, 2008 to June 5, 2009 shown in Figure 7. A significantly higher level of SR in the state of turbulence means that during turmoil on financial markets, the strength of the negative impact of individual insurance units upon the whole insurance sector increases.

CONCLUSIONS

In this article, we used the C-DCC-GARCH model to analyse dependences in a group formed by the largest five insurance companies from Europe and the biggest insurers from the USA, Canada, and China. Then, availing ourselves of the *CoVaR* measure, we studied the influence of each insurer on the European insurance market systemic risk. The European market was represented by the STOXX 600 Europe Insurance index, while for the insurers, we considered their quotations on domestic markets. The study was performed in two steps. The first one consisted in identifying regimes of European insurance market, while the second one analysed the following items for the identified regimes: correlations among the scrutinised insurance companies (using conditional correlations), dependences between a given insurer and the European insurance market, and the influence of analysed insurance companies on the European insurance market systemic risk. The market regimes were identified by monitoring the insurers' logarithmic returns on shares. To this end, we applied statistical clustering methods for weekly periods to which we assigned the conditional variances obtained from the estimated octovariate c-DCC-GARCH model. Both the clustering quality measures and the possibility of a reasonable economic interpretation exposed two different market regimes in the considered period of time: a regime of low volatility (1st regime, 'normal') and a regime of unstable quotations (2nd regime, 'risky'), which appeared during the time of the strongest turbulences experienced by the global markets.

We may draw the following conclusions from our study:

- The insurance companies from the investigated group are positively correlated. The strongest dependence appears among insurers from Europe – Axa and Allianz are a pair with the strongest tie – a somewhat weaker dependence exists between insurers from Europe and those from North America, while the weakest link shows between the insurer from China and the others. These correlations are clearly stronger in the second identified regime, i.e. during the period of turbulences on global markets (cf. Figure 7). On that basis, we may state that during a global crisis, the exposure to systemic risk on the European insurance market increases, because the stronger the link between insurance companies, the greater the likelihood of the spread of negative effects of financial shocks.
- The European insurance market – as represented by the STOXX 600 Europe Insurance index – is most strongly correlated to the largest insurance companies from Europe, i.e. Axa or Allianz. A weaker correlation exists in the case of insurers from North America and a notably weaker still in the case of the insurer from China (cf. Figure 8). As earlier, these correlations are stronger in the second market regime (cf. Figure 9). Noteworthy, these results may be biased to some extent by the construction of the STOXX 600 Europe Insurance index.

- There is an important difference between the *CoVaR* measures for the first and second regimes of the European insurance market in the case of all the insurers from the studied group. The influence of insurance companies on systemic risk is much stronger during turbulences periods (cf. Figure 10). It is also apparent that in a fixed regime this influence remains more or less at the same level, which in the case of the insurer from China is somewhat lower than average.
- The influence of North American insurance companies on the European insurance market's systemic risk is at a comparative level with the influence of companies from Europe, both in the first and second identified market regimes.

The world entered the twenty-first century, the era of digital economy and the so-called Fourth Industrial Revolution. According to the G20 report, digital economy is defined by economic activity in which digitised information and knowledge are considered to be key production factors, together with the development of a modern information network that accelerates growth and optimises economic structures. The International Monetary Fund (IMF) broadly defines digital economy as digitization in all sectors of the economy.

In the digital age of Fintech, the combination of finance and technology plays an increasingly important role. The financial supervisory and macro-prudential authorities for Systemically Important Financial Institutions (SIFI) now face new challenges, while the prevention of SR is one of the most important elements of globalised policy and economics. Since the reports of the Financial Stability Board (FSB), International Association of Insurance Supervisors (IAIS), and the European Systemic Risk Board (ESRB) keep indicating the lack of tools to describe and measure SR in the insurance sector, further research should concentrate on the search for SR measure. Moreover, scholars should focus on determining the mathematical, statistical, and econometric tools in order to build models that would allow the prediction of adverse phenomena on the insurance market.

The present article uses statistical-econometric tools, a combination of taxonomic methods with the C-DCC-GARCH model, to utilise them in a more widely planned research on SR in the insurance sector when constructing hybrid models using e.g. network theory, as in Denkowska and Wanat (2020).

The article presents several new results, yet it also has some limitations that can be improved in further studies. Based on the presented results in the form of boxplots, we noticed that the overall correlation between companies is higher during turbulence periods. Stronger connections make the whole system more vulnerable to systemic risk, hence the conclusion about the increase in exposure to this risk. However, we did not investigate whether average correlations were significantly different in distinguished states. Nevertheless, this thread of analysis can inspire future studies in which the significance of network connections for systemic risk in the insurance sector is analysed using Minimum Spanning Trees.

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Acknowledgements and Financial Disclosure

This article was financed by the Ministry of Science and Higher Education of the Republic of Poland as part of a research program “Regional Initiative of Excellence” Programme for 2019–2022. Project no.: 021/RID/2018/19. Total financing: 11 897 131.40 PLN.

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Ministry of Science and Higher Education
Republic of Poland

The copyediting and proofreading of articles in English is financed in the framework of contract No. 913/P-DUN/2019 by the Ministry of Science and Higher Education of the Republic of Poland committed to activities aimed at science promotion.

Entrepreneurial Business and Economics Review

2020, Vol. 8, No. 4

10.15678/EBER.2020.080402

The influence of personal characteristics on entrepreneurial intentions: International comparison

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ABSTRACT

Objective: The aim of this study is to establish which factors are the most influential with regard to the development of entrepreneurial intentions (EI) and to establish whether it is the environment (each respondent's country of origin), gender, or personal characteristics the influence of which factor prevails.

Research Design & Methods: The created hypotheses were tested using the classification tree method, following a logistic regression. The research population (*n*=789) comprised students of economic fields from universities in three countries: the Czech Republic, Germany, and the United Kingdom. 'Willingness to run a business' was a dependent variable whereas the countries of respondents' origin, their gender, prior work experience, and personal characteristics (self-reliance, ability to accept risk, creativity, proactivity, and responsibility) were independent variables.

Findings: We found that the most significant factor in the willingness to run a business is the ability to accept risk. Other factors, such as the country of origin or respondents' gender, are also statistically significant. Prior work experience did not prove to be a strong predictor.

Implications & Recommendations: The results show that the willingness to run a business, which forms an integral part of EI, is to a large extent influenced by relatively stable variables (i.e., personal characteristics, gender, and country of origin). Therefore, it is possible that certain measures aimed at starting and developing a business (e.g., education) will be less effective if the monitored variables (e.g., personal characteristics) are not taken into account.

Contribution & Value Added: The added value of this study is the identification and verification of variables influencing business within the international context.

Article type:	research article
Keywords:	entrepreneurship; personality; gender; Czech Republic; Germany; United Kingdom
JEL codes:	M13

Received: 1 February 2020 Revised: 28 August 2020 Accepted: 3 September 2020

Suggested citation:

Reissová, A., Šimsová, J., Sonntag, R., & Kučerová, K. (2020). The Influence of Personal Characteristics on Entrepreneurial Intentions: International Comparison. *Entrepreneurial Business and Economics Review,* 8(4), 29-46. https://doi.org/10.15678/EBER.2020.080402

INTRODUCTION

Entrepreneurship and its development receive extensive attention because of their contribution to economics and the social area. Entrepreneurs can react promptly to current market demands, create new jobs, and introduce innovations.

The area of entrepreneurship receives a lot of attention in the fields of science and education. Dolhey (2019) analyses almost 1400 scientific articles dealing with entrepreneurial intentions published in 2000-2018. The sheer number of studies shows that researchers all over the world pay great attention to entrepreneurship.

It might be difficult to find one's way in such a large number of studies. Accordingly, cross-sectional studies aimed at categorising and systemising such a broad topic are very valuable. One of the most important studies is that by Liñán and Fayolle (2015), who analyse a total of 409 articles dealing with entrepreneurial intention, published in 2004-2013 (inclusive). The criteria for categorisation were quotation and thematic analysis.

One extensive topic is the examination and application of a variety of social psychological theories and their relationship to entrepreneurship or the prediction of future entrepreneurial activities. Although studies may be based on different theories, they usually all want to apply their effects in practice. This brings another large-scale topic concerning entrepreneurship: education and the development of entrepreneurial skills and the ensuing discussion about the potential impacts of entrepreneurial education, methods, and similar matters. A cross-sectional study focusing on the topic was drawn up by Nabi *et al.* (2017). Entrepreneurial intentions of students are influenced by a variety of factors.

The aim of this study is to establish which variables are the most influential with regard to the entrepreneurial intentions of students. The structure of this article is as follows: a brief introduction, an overview of the literature, theoretical anchoring of the discussed topic, and the formulation of hypotheses. Then, a detailed description of the research process (methodology) follows, including a description of the cohort and the methods used. The main part of this article includes results acquired based on statistical methods (classification tree and logistic regression). The conclusion discusses the limits and restrictions, followed by theoretical and actual impacts of the presented research.

LITERATURE REVIEW

Many researchers seek to explain why people start a business. For example, Jafari-Sadeghi (2019) explores whether business venturing is opportunity-driven or necessity-driven as running a business is their only way to earn money. Asante and Affum-Osei (2019) state that the ability of individuals to recognise entrepreneurial opportunities is the crucial factor in the decision-making of business ventures. Another reason why people may start an entrepreneurial career is family tradition, when young people as successors take over the management of family businesses. However, even in this case, the motivation of successors may be influenced by the fact that they perceive business as an opportunity and that they have no choice (Porfírio, Felício, & Carrilho, 2019). If the successors lack high levels of psychological ownership of their business, their innovative production also significantly decreases (Rau, Werner, & Schell, 2019).

Some authors seek to find barriers hindering business. Established barriers differ in various socio-economic characteristics, such as the country, level, and type of education attained, gender, and others (Iskandarini, 2014; Wąsowska, 2016; Oliveira & Rua, 2018; Ng & Fu, 2018; Sitaridis & Kitsios, 2019; and others). Age is also a frequently monitored socio-demographic characteristic. In this respect, research was conducted by Zhang and Acs (2018). Using multilevel logistic regression, they found that the relation between entrepreneurship and age is not provable. Later, Zhang and Acs (2019) also deal with the identification of intergenerational differences (Traditionalists, Boomers, Gen Xers, and Millennials). However, no influences were found. A barrier to business may also be the negative image of businesspeople and entrepreneurship in society. Chmielecki and Sułkowski (2016) explore metaphoric statements to find that most metaphors related to entrepreneurship contain negative images; especially in the cohort of respondents with the lowest level of education.

Entrepreneurial Intentions

Many authors try to find a model to predict the intentions to run a business. Most models are based on social-psychological theories assuming that decisions with long-term consequences – such as the choice of occupation – usually do not arise from immediate decisions and are not mere reactions to individual stimuli, but they rather are premeditated and planned. Obviously, this includes a degree of cognitive processing.

Krueger, Reilly, and Carsrud (2000) state such intentions are typical for entrepreneurship; however, the timing of starting a new business does not necessarily need to be planned (they may occur when an opportunity appears), and to predict a planned behaviour it is useful to observer the intentions of such a behaviour. There are many models dealing with such a prediction. In their study, Krueger, Reilly, and Carsrud (2000) compare two such models using Ajzen's theory of planned behaviour (TPB) and Shapero's model of entrepreneurial event (SEE). Ajzen assumes that intentions generally depend on perceptions of personal attractiveness, social norms, and feasibility. On the contrary, Shapero assumes that entrepreneurial intentions depend on perceptions of personal desire, feasibility, and propensity to act.

The Ajzen concept of planned behaviour assumes that behaviour is always preceded by an intention, usually a behavioural intention. It is defined as a certain subjective probability that an individual will perform a specific behaviour in a specific situation. However, the final behaviour does not always match predictions because human behaviour is influenced by many other factors. Ajzen originally defined two influencing factors: personal attitudes and subjective norms. Personal attitude to particular behaviour can be either positive or negative. If an individual evaluates specific behaviour as desirable, s/he will most probably behave in this way. Attitudes and beliefs change throughout our life as they are not congenital, and they develop. Subjective norms represent some social pressure exerted by our close environment, e.g., family, friends. A new component was later added to the theory: perceived behavioural control. This refers to the perceived difficulty of enacting a specific behaviour. If a person believes s/he can enact specific behaviour, s/he is more likely to enact such a behaviour (Ajzen, 1991).

Both models were tested on students who were making decisions on their future careers at the time of testing. Using regression analysis, it was found that both models have

strong statistical support. The conclusion is that the best predictor of any planned behaviour, including entrepreneurship, are intentions.

Maes, Leroy, and Sels (2014) also use the TPB as their basis. They deeply modify this theory by including its measuring model and subsequently exploring whether there are gender differences in the area of entrepreneurial intentions. They find that the influence of gender on entrepreneurial intentions arises from personal attitudes and the perceived control of behaviour, but not from social standards. Female students are more motivated to follow normative role models.

Another approach based on the TPB appears in a new study by Al-Jubari, Hassan, and Liñán (2019). They integrate the TPB with the organismic theory of motivation from the self-determination theory (SDT). They test the role of basic psychological needs of autonomy, competence, and relatedness in shaping university students' attitudes and intentions towards entrepreneurship. They conclude that internal and external motivations play a role in the formation of entrepreneurial intentions implemented in business activities.

Lee *at al*. (2011) define entrepreneurial intention as a result of the influence of work environment and personality factors. A negative work environment influences low job satisfaction, which may increase entrepreneurial intentions. Among personal characteristics, it is self-reliance which plays the positive role.

Eid *et al.* (2019) criticise theories focusing only on the relationship between the perception of entrepreneurs and their intentions as they ignore cognitive and psychological characteristics, which may play an important role. Therefore, they integrate Ajzen's theory of planned behaviour (TPB) and the model of entrepreneurial event (EEM). The model is extended with personal characteristics of an entrepreneur which could influence perception and intentions. Therefore, it is obvious that there is no respected theory or model explaining or predicting the active approach, i.e., starting a business venture. We may assume that the existing models will be worked on and extended in future researches.

EI and the Influence of the Country

Recent years have seen a significant increase in the interest of scientists in researches comparing entrepreneurial intentions of students in different countries (Franke, 2003; Pittaway & Cope, 2007; Carayannis *et al.*, 2003; Boissin *et al.,* 2009; Lee *et al.*, 2009; Lee *et al.*, 2005; Pruett *et al.,* 2009; Giacomin, 2011), or a few newer studies, such as Khursheed *et al.* (2018), Khursheed *et al.* (2019). The results obviously show that cultural background and social influences may play both a positive and a negative role. In some countries, traditions and values may hinder business venturing. For example, Pruett *et al.* (2009) found that Chinese students would like to take an entrepreneurial career but their family often reject such intentions.

Entrepreneurial Intentions and Prior Work Experience

Zapkou *et al.* (2015) also take from Ajzen's theory of planned behaviour. The main objective of their work is to identify how prior entrepreneurial exposure influences the entrepreneurial intention. They verified whether attitude, subjective standards, and perceived behavioural control contribute to the influence of entrepreneurial role models and work experience on entrepreneurial intention. The authors conclude that different types of prior entrepreneurial exposure and its perceived quality influence the entrepreneurial intention of individuals.

Entrepreneurial Intentions and Personal Characteristics

There is a relatively broad agreement among authors concerning personal characteristics and qualities and their influence on entrepreneurial intentions. There is significantly lower agreement on which characteristics are crucial in this respect. Krueger, Reilly, and Carsrud (2000) state that entrepreneurship is a way of thinking which consists in preferring opportunities to threats. Most often, personal characteristics in relation to entrepreneurial intentions are explored using the Big Five (Yu-Fen & Ming-Chuan, 2010). Their results show that the attitude of students to entrepreneurship was influenced by both environmental factors (family, society, education, and economic environment) and personal characteristics (the Big Five). Except for temperament characteristics developed on the genetic basis, personal characteristics may play an important role. Personal characteristics include, e.g., willingness/aversion to take risk, which may play an important role in relation to entrepreneurial intention (Shinnar *et al.,* 2009).

An interesting research in this area was conducted by Wach and Wojciechowski (2016). They established that apart from the variables of Ajzen theory – attitude to entrepreneurship, subjective norms, and perceived behavioural control – the attitude to risk plays a significant role. Similar conclusions were also made by Zhang *et al.* (2020), too. Accordingly, we will investigate whether personality traits influence students´ entrepreneurial intentions, along with the importance of aversion to risk as one of personality traits. Thus, we defined the following hypotheses:

H1: Out of the monitored variables (i.e., country, gender, prior work experience, and personal characteristics), personal characteristics have the most significant influence on the willingness to run a business.

H2: Out of the monitored variables, the ability to accept risks has the greatest influence on the willingness to start an entrepreneurial career.

Entrepreneurial Intentions and Gender

Many authors deal with gender issues in the area of entrepreneurship, e.g. Wilson, Marlino, and Kickul (2004), Adachi and Hisada (2017), Murnieks, Cardon, and Haynie (2020). Machado *et al.* (2016) endeavour to find the main factors making life difficult for women who are starting their business in industry, commerce, and services. They conclude that women are not a homogeneous group and propose that if a country wants to increase the number of female entrepreneurs, it should provide women with help to resolve their difficulties.

Holienka, Pilková, and Jančovičová (2016), carried out an extensive investigation in the Visegrád group. One of the conclusions made from the analysis of secondary data was that a barrier to starting business is the fear of failure; however, gender plays an important part as well. Female students have a significantly lower chance of becoming entrepreneurs.

Recent research indicates that gender differences are more often seen in the stage of decision-making and considering (intentions) rather than in the stage of action (business activity; Verheul *et al.*, 2012). These results are confirmed with Reissová and Šimsová's research (2019), who explore whether men plan to start an entrepreneurial career more often than women. Gender differences in willingness to run a business were found in a cohort of students who do not have a business, whereas these differences

were not found in a cohort of students who already run a business. We defined our third hypothesis based on these findings:

H3: Gender is the least important variable influencing the willingness to run a business.

Factors Adversely Affecting Entrepreneurial Intentions

Heretofore, we mentioned studies looking into variables that positively affect EI. However, there also is a number of researchers who look into factors that affect EI adversely. This area involves rather frequently discussed factors, such as the absence of role models in the family, which consequently leads to the low level of entrepreneurial intention (Nowiński & Haddoud, 2019). Postigo, Iacobucci, and Tamborini (2006) conclude that the occupation of parents plays an important role and influences students´ EI as well. Consequently, even this study will examine whether students consider the absence of these role models as an important negative obstacle in their entrepreneurship:

H4: The factor that most adversely affects EI is the absence of business role models in the family.

RESEARCH METHODOLOGY

Data Collection and Sample

The main research method was the written questionnaire method. The questionnaire was based on Ajzen's theory of planned behaviour. It contained questions focused on students´ attitudes towards future entrepreneurship (a plan to do business in the future), and it investigated students´ characteristics as well. We assumed that if a student displays characteristics in his/her self-assessment – established early on as important for future entrepreneurship (willingness to accept risk, creativity, initiative, responsibility and independence) – s/he will also feel that entrepreneurship is feasible in reality.

The questionnaire was distributed to full-time students at three universities. The faculty of Social and Economic studies in Ústí nad Labem (the Czech Republic), the University of the West of Scotland (UWS) in Paisley (the UK), and the Faculty of Business Administration at the University of Applied Sciences in Dresden (Germany). The selected cohort included students of economic studies. First-year students were excluded from the survey because they usually do not have a clear picture of their future professional career at the beginning of their studies. From the viewpoint of socio-demographic features (age, education, and the field of study), the cohort was relatively homogeneous. The respondents significantly differed according to their place of residence (i.e., country). The indicated quotes were selected intentionally with regard to the aim of the research, as 'country' and 'gender' represented independent variables.

The selected population comprised 789 respondents (326 men and 463 women). Of the total, 269 respondents came from the Czech Republic, 271 from Germany, and 249 from the UK.

Measures

The dependent variable (willingness/intention to run a business) was explored using the following question: 'What are you planning to do upon completion of your studies (within three to five years of completion of your studies)?' The question was followed

by a choice of possible activities (will be employed in my home country, run a business, work abroad). For each of these activities, respondents were asked to indicate to what extent it is likely they will perform the activity on a four-point Likert scale (from 1 = definitely yes to 4 = definitely not).

The independent variable was personal characteristics, which may be assumed to play a certain role within the choice of entrepreneurship. The respondents were asked, again using the four-point Likert scale, to assess to what extent are the selected personal characteristics typical for them (from 1 = definitely yes to 4 = definitely not). The personal characteristics were selected based on conducted research and included self-reliance, ability to accept risk, creativity, proactivity, and responsibility. The results of self-assessment are given in Table 1 below.

Table 1. Self-assessment by students – in absolute frequencies

Scale	Self-reliance	Accepting risk	Creativity	Proactivity	Responsibility
1	370	240	208	203	494
2	371	393	347	434	246
3	42	150	209	144	39
4	6	6	25	8	10

Source: own elaboration in SPSS.

Within this research, willingness to run a business is a dependent variable and the following are independent variables: gender, country, prior working experience, and personal characteristics (attitude to risk, self-reliance, creativity, proactivity, responsibility). The data were processed using SW SPSS. The statistical method of the classification tree was used. Subsequently, the analysis was amended with logistic regression.

To find the answer to the fourth hypothesis (the absence of entrepreneurial role models on EI), respondents were asked to use the four-point Likert scale to assess how the following situations can adversely affect the entrepreneurship of young people (from 1 = strongly agree to 4 = strongly disagree):

1. No one runs a business in the family;
2. Business idea missing;
3. Concerns about unstable salary.

RESULTS AND DISCUSSION

First of all, data were evaluated using the classification tree. It follows from Picture 1 that the greatest influence on the decision whether the students will start an entrepreneurial career upon completion of their studies is the fact whether they are able to accept the risk. Using this variable, the model split the data into three more homogeneous groups (the first branch of the dendrogram). The first group includes those who state they are *definitely able* to accept risk. Of this group, 57.9% of respondents want to run a business. The second group comprises respondents who are *rather able* to accept risk, whereas most of them do not want to run a business (62.1%). The third group comprises those who are *not willing to accept risk* (rather not and definitely not); in this group, 82.7% of respondents do not want to run a business.

The second level (branch) of the dendogram shows that for those who are definitely or rather willing to accept risk, the strongest predictor is their country of origin. For respondents who are *rather willing to accept risk*, the group is formed by English and Czech students as opposed to German students. The group of Czech and English students willing to accept risk shows one more statistically significant predictor, which is gender.

The fourth of the monitored variables, i.e., prior work experience, was not reflected in the generated dendrogram at all. This means that this variable shows the lowest influence compared to the monitored variables.

Using the dendogram, we can also see which students declare their willingness to run a business more often. These are German students who are *definitely willing to accept risk*. Similarly, most of the German students who are *rather able to accept risk* are also willing to start an entrepreneurial career upon completion of their studies.

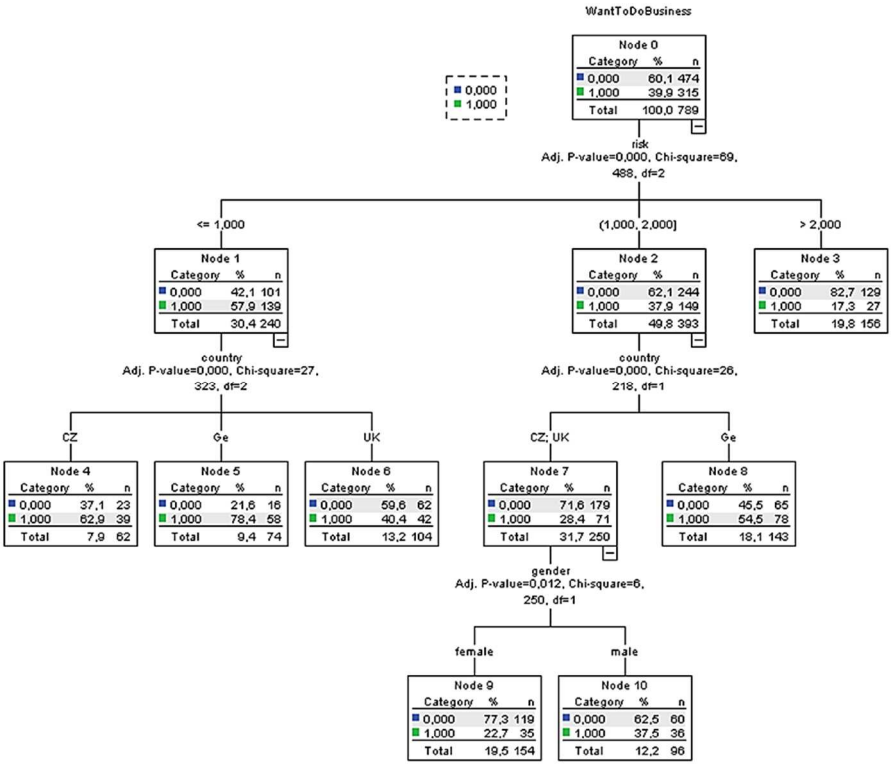

Figure 1. Dendrogram: the identification of variables with the greatest influence on the willingness to run a business

Source: own elaboration in SPSS.

As the model classifies correctly only 69.1% of cases and the risk estimate is 30.9%, we conducted another analysis using forward stepwise logistic regression. Again, willingness to run a business was a dependent variable and the following were independent variables: gender, country of origin, personal characteristics (attitude to risk, self-reliance, creativity, proactivity, and responsibility).

Within four steps, the variables of ability to accept risk, country of origin, creativity, and gender (Table 2) were identified as significant variables influencing the decision to run a business.

Using Wald's statistics (column Wald), we gained levels of significance (column Sign.). It follows from the low values that with the exception of the country variable (CZ vs UK), the hypothesis of zero regression coefficients is rejected.

The values in column exp(B) obviously show that the greatest willingness to run a business is declared by German students (3.918 times greater chance compared to English students.) This decision is also greatly influenced by their ability to accept risk. There is only a 40% chance to run a business in those who are slightly (rather) willing to accept risk compared to those who are definitely able to accept risk. With each lower self-assessment for acceptance of risk, the chance for a positive attitude to entrepreneurship decreases 0.4 times. The success rate of this model is 69.5%.

Table 2. Logistic regression: the identification of variables

Variables in the Equation	B	S.E.	Wald	Sign.	df	Exp(B)
Risk	-0.908	0.127	51.012	0.000	1	0.403
Creativity	-0.342	0.103	11.085	0.001	1	0.710
Gender	-0.437	0.163	7.153	0.007	1	0.646
Country			50.447	0.000	2	
CZ vs.UK	0.366	0.205	3.183	0.074	1	1.442
GE vs. UK	1.366	0.204	44.984	0.000	1	3.918
Constant	1.605	0.299	28.800	0.000	1	4.976

Source: own elaboration in SPSS.

Using the p-values of the Hosmer and Lemeshow test (0.908), the hypothesis of a match between the regression model and data is not rejected. Nagelkerke statistics (R 0.22) show that the model is not the best means to estimate the values of the dependent variable (I want to run a business upon the completion of my studies), but it can be used for a summary analysis.

Both methods validated that variables of the ability to accept risk and the country of origin strongly influence the attitude to entrepreneurship. Especially German students predicted a positive attitude to entrepreneurship, as they are (definitely or rather) able to accept risk. Weaker predictors were gender and self-assessment of creativity. Other monitored personal characteristics (self-reliance, creativity, proactivity, responsibility) have no significant influence on the willingness to run a business. Such findings comply with conclusions of the study, which established upon correlation and regression analysis that people who are entrepreneurship-friendly have standard psychological characteristics. They include a greater inclination toward risk and tolerance of ambiguity (Murugesan, 2010).

The H_1 hypothesis was only partially confirmed. Of personal characteristics, a significant variable influencing willingness to run a business proved to be the ability to accept risk and, within the logistic regression model, also creativity. Proactivity, self-reliance, and responsibility did not prove to be characteristics influencing the decision to start an entrepreneurial career upon the completion of studies. Hence, the H_2 hypothesis was confirmed.

Should institutional measures be considered to support entrepreneurship, it is very important to recognise the influence of individual personality variables. Some of them can be

rather stable dispositions (viz. Wąsowska, 2016), other can result from character traits that can be influenced more effectively. Liñán, Rodríguez-Cohard, and Rueda-Cantuche (2011) identify the most important factors that explain entrepreneurial intentions: personal attitude and perceived behavioural control. They are the most important factors explaining entrepreneurial intentions. Interesting findings were also made by Chmielecki and Sułkowski (2016). The variables represented by creativity, innovation, and risk appear in their research as outputs of students' metaphoric statements, presented by them in connection with entrepreneurship. Nevertheless, this area clearly requires additional research.

Both within the model of logistic regression and dependence using classification trees, gender proved to be a significant variable influencing the willingness to run a business; however, based on the third level of the dendogram and the value of coefficient in the logistic regression, the influence is weaker than the influence of accepting risk and home country. Hence, the H_3 hypothesis was confirmed.

Within this research, gender appears to be a hardly convincing predictor. Zhang *et al.* (2009) conducted research on an extensive sample of thousands of monozygotic and dizygotic twins to explore whether the stronger predictor for entrepreneurship is genetics (temperament characteristics such as extraversion or neuroticism) or influences of the environment. They conclude that there are significant gender differences. Whereas in women there appeared a significant relationship between genetics and the tendency towards entrepreneurship, in men the influence of external environment was stronger.

Ward, Hernández-Sánchez, and Sánchez-García (2019) show that there are no big differences between men and women in entrepreneurial intentions. Kristiansen and Indarti (2004) do not find any differences. They conclude that age, gender, and education do not have a statistically significant impact on the established rate of entrepreneurial intentions.

Our study established that there are divergent attitudes to entrepreneurship between students from different countries (GE, UK, CZ). There are also other studies which deal with the identification of differences between individual countries. For example, Liñán and Chen (2009) compared Taiwanese and Spanish students to also find different attitudes to starting business, which they see in particularly dissimilar cultural differences.

The last part of the test wanted to find out whether students consider the absence of entrepreneurial role models in the family as a factor adversely affecting entrepreneurship of young people. Table 3 specifies the relative frequency of answers to individual questions. The results suggest that respondents evaluate having no one running a business in the family as a factor adversely affecting entrepreneurship of young people. However, such an absence of role models is evaluated as the least adverse compared to other factors. Accordingly, the 'Missing business idea' or 'Concern about unstable salary' are more frequently marked as negative factors.

Table 3. What adversely affects entrepreneurship of young people: relative frequency

Answers	Strongly agree	Agree	Disagree	Strongly disagree
No one runs a business in the family	23.03%	40.08%	28.37%	8.52%
Business idea missing	38.42%	46.44%	12.47%	2.67%
Concern about unstable salary	33.59%	48.6%	16.41%	1.4%

Source: own elaboration in SPSS.

The p-value relative frequency test of positive answers was used to verify whether the established differences are statistically significant. The results are shown in Table 4 below.

Table 4. What adversely affects entrepreneurship of young people: p-value

p-values	1 The family runs no business	2 Missing idea	3 Unstable salary
1. No one runs a business in the family	x		
2. Business idea missing	0	x	
3. Concern about unstable salary	0	0.0786	x

Source: own elaboration in SPSS.

The table shows that the percent of positive answers to question 1 (No-one runs a business in the family) is statistically significantly smaller than the percent of positive answers to question 2 (Business idea missing) and 3 (Concern about unstable salary).

Since we established that the country of origin affects respondents' attitudes to entrepreneurship, we further examined whether the students' answers to these last three questions would differ in different countries. Table 5 shows p-values of the relative frequency test of positive answers to questions 1 to 3 for individual countries. The table clearly shows no differences in the opinions among students in this area. Accordingly, they do not recognise the absence of family role models as a negative factor. However, the other two assessed factors are stronger, regardless of the country of origin. Thus, H4 was rejected.

Table 5. What adversely affects the entrepreneurship of young people: p-values

p-values	No one runs a business in the family			Business idea missing			Concern about unstable salary		
	cz	de	sc	cz	de	sc	cz	de	sc
cz	x			x			x		0.889
de d	0.3571	x		0.1027	x		0.3845	x	
sc	0.3599	0.2283	x	0.0963	0.4734	x	0.2889	0.1994	x

Source: own elaboration in SPSS.

The results following from the conclusions of this article can be helpful in the preparation of educational and training programmes. Many educational programmes aimed at motivating young people and preparing them for entrepreneurship are emerging, as it may be a good alternative for young people to employment in the labour market (Brizek & Poorani, 2006; Gordon, Hamilton, & Jack, 2012; Ghina, 2014; Sondari, 2014; Rustiadi, 2015). Maresch *et al.* (2016) note that education in entrepreneurship increases entrepreneurial intentions but the effect of business education in different fields of study varies.

Gieure *et al.* (2020) states that entrepreneurial intentions can be influenced by perceived skill and sufficient necessary information. Similar conclusions were made earlier by Liñán (2008) as well, who established that value and skills play a significant role in explaining entrepreneurial intention. The conclusions of studies confirm that entrepreneurial education is important.

People who do not have any education usually do not pursue a career in doing business. A similar finding was established for people with a very high level of attained education (Blanchflower, 2000). It is likely that people who become top specialists will not show

any entrepreneurial intentions. A precondition for effective entrepreneurship education is primarily the choice of persons who should be educated. Obviously, not everybody has the personality preconditions to become an entrepreneur. However, women should not be excluded from the process of the development of entrepreneurial skills just because they are women or because some studies show that women do not have such a strong relationship to entrepreneurship as males. Our study established that gender may play a certain role; however, this variable had the lowest influence of all the monitored variables. Moreover, results of other studies show that gender differences are apparent only in the group of students who do not do business, not in the group of students who already do business (Reissová & Šimsová, 2019). Entrepreneurial education should also be verified afterwards. Liñán, Rodríguez-Cohard, and Rueda-Cantuche (2011) propose a standardised EIQ questionnaire that could be used as an instrument to assess entrepreneurial education programmes. The questionnaire was drawn up by Liñán and Fayolle (2015). A positive relationship was established between entrepreneurial education and entrepreneurial intentions (Turker & Selcuk, 2009). Respondents with formal entrepreneurial education show a higher intention to start business (Cera *et al.*, 2020). Entrepreneurial education forms certain attitudes and enhances overall entrepreneurial intention (Souitaris, Zerbinati, & Al-Laham, 2007). Zhang, Duysters, and Cloodt (2014), Zhang *et al.* (2020), and Jena (2020) also refer to the positive relationship between entrepreneurial education and entrepreneurial intentions. Many authors seem to agree on the positive influence of education. The importance of some other variables is then arguable. For example, the study by the last mentioned authors foregrounds interesting findings that previous entrepreneurial exposure negatively influences entrepreneurial intentions. Apparently, despite the extensive number of studies focusing on this topic, there is still a large scope for further examination.

CONCLUSIONS

The aim of this study was to establish which variables are most influential with regard to willingness to run a business. Independent variables included country, gender, prior work experience, and personal characteristics. Using a decision tree, we found that personal characteristics and – in particular – the ability to accept risk play the most significant roles. On the other hand, prior work experience did not prove to be a significant predictor. The aforementioned variables were confirmed using logistic regression. Furthermore, another characteristic – that of creativity – was found as related to starting an entrepreneurial career. Characteristics such as self-reliance, proactivity, or responsibility did not prove to be good predictors. Moreover, we established that the absence of entrepreneurial role-models in the family is not considered the factor which most strongly adversely affects the entrepreneurship of young people. The 'Business idea missing' or 'Concern about unstable salary' were more frequently statistically significantly indicated as negative factors.

The findings may be useful for institutions and organisers of educational programmes aimed at developing entrepreneurial skills. The measured effectiveness of such programmes may not reflect just the quality of offered education but also the rate of entrepreneurial intentions of their participants and all variables influencing such intentions (such as personal characteristics). Consideration should always be given to who the education is specified for. Universities should focus entrepreneurial education in consideration of the field of study.

Although the conclusions of this research bring interesting findings, let us note the possible restrictions and limits that arise from several facts.

We found that the most important variable is the ability to accept risk and – partially – also creativity. Thus, we should consider the fact that it did not include specialised psychological diagnostics of these characteristics but respondents' self-assessment. As the questionnaire was anonymous and there was no advantage or penalty related to respondents' answers, they were not motivated to misrepresent their answers. However, self-assessment definitely has a lower validity than objective diagnostics.

The dependent variable 'willingness to run a business' was also expressed in a declarative way. Thus, it indicates rather the direction of thinking, considering the future, than it guarantees that a student expressing willingness to run a business will actually follow an entrepreneurial career or that a student who is not considering business at the moment will not start doing business later.

Last but not least, we should consider the fact that in each country the research cohort consisted of students from a single university, which to a certain extent can be a limiting factor. However, within the quota selection, criteria were defined and observed. In all cases, these were universities of a regional type and all the students studied economics-related fields. Therefore, individual populations were relatively homogeneous and could be subsequently compared. For further research, it would be suitable to increase the number of universities, but also the number of monitored variables, such as previous work or entrepreneurial exposure, which might affect the perception of the risk rate or the fact whether a close person does business in the student's family background (and how successful s/he is), because even such a factor can influence student attitudes.

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Acknowledgements and Financial Disclosure

This research was supported by the Jan Evangelista Purkyně University in Ústí nad Labem, Czech Republic [grant number UJEP-SGS-2019-45-009-2].

Published by Cracow University of Economics – Krakow, Poland

Ministry of Science and Higher Education
Republic of Poland

The copyediting and proofreading of articles in English is financed in the framework of contract No. 913/P-DUN/2019 by the Ministry of Science and Higher Education of the Republic of Poland committed to activities aimed at science promotion.

Entrepreneurial Business and Economics Review

2020, Vol. 8, No. 4

10.15678/EBER.2020.080403

Innovation strategies of manufacturing companies during expansions and slowdowns

Jagoda Kaszowska-Mojsa

ABSTRACT

Objective: The aim of the article is to analyse the differentiation in the innovation strategies of the manufacturing companies during economic expansions and slowdowns.

Research Design & Methods: The random-effect logistic regression models were used to examine the differentiation of a firm's innovation strategies and the probability of innovating in different phases of the business cycle. I used the proprietary Innovation Survey (PNT-02) data, which overlap with the Community Innovation Survey (CIS).

Findings: The analyses suggest that the likelihood of implementing innovation changes with the deterioration of macroeconomic conditions. There are groups of manufacturing firms in Poland whose innovation activities are procyclical and countercyclical.

Implications & Recommendations: My analyses will help to understand the innovation strategies of the firms. This, in turn, should help to direct public support where it can be used more effectively. The recommendations will be relevant for the National Innovation System in Poland, as they should counterbalance the procyclical impact of a slowdown on a firm's innovation spending and cooperation in innovation activities.

Contribution & Value Added: Previously, the PNT-02 data for 2004-2006 and 2006-2008 were used in the FP6 project on micro determinants of growth (MICRODYN) to identify the barriers to the innovation of the firms and the factors that decreased the probability of firms' innovativeness. This study indicated a differentiation of the competences between firms that implemented innovation in two periods compared to those that only did so in one period. However, the previous study did not cover a period of an economic slowdown. Therefore, this study will contribute to the state-of-the-art literature by extending the analyses to this period.

Article type: research article

Keywords: innovation strategies; manufacturing sector; CIS survey; slowdown; procyclicality; countercyclicality

JEL codes: O31, O32

Received: 7 February 2020 Revised: 24 June 2020 Accepted: 10 August 2020

Suggested citation:

Kaszowska-Mojsa, J. (2020). Innovation strategies of manufacturing companies during expansions and slowdowns. *Entrepreneurial Business and Economics Review,* 8(4), 47-66. https://doi.org/10.15678/EBER.2020.080403

INTRODUCTION

The aim of this study is to analyse the innovation activities and differentiation in the strategies of Polish manufacturing companies in the period between 2004 and 2014. For this one decade, we attempt to answer the question of whether the innovation activities and strategies were affected by the changes in the macroeconomic conditions in different phases of the business and financial cycles or whether they were affected only by the supply side factors. The purpose of the article is not to identify the properties of the business cycle nor to study its synchronization with the financial cycle. The information about phases of business and financial cycles in Poland was described in previous publications (Lenart & Pipień, 2013a; Pipień, Wdowiński, & Kaszowska, 2018). We assume that the period of 2004-2008 corresponds to economic prosperity in Poland, 2008-2010 to slowdown, while 2010-2012 corresponds to the recovery, and 2012-2014 to the expansionary phase of the business cycle. This article attempts to show what conclusions about changes in the innovation activity and strategies of the companies for specific periods can be drawn based on the CIS ('PNT-02') survey. I would also like to indicate which studies based on the Statistics Poland data could be conducted in the future.

The term 'innovation', as defined in the OECD Oslo Manual (2005), covers a wide range of phenomena. As in both the economics and management traditions, we assume that the accumulation of knowledge – its sources, factors and forms, i.e. supply factors – play a key role in a firm's innovation activities and strategies. However, because we intend to analyse the impact of changes in the macro environment on the innovation strategies of firms, we have to consider the role of the demand factors as well. Those factors influence the innovation activities and the use of innovation resources. Changes in the macroeconomic environment have an impact on the changes in the competition and innovative strategies, the demography of innovative firms and their typology, as well as on the differentiation of their innovation strategies. We also show that the phase of the business cycle influences the sources, factors, and forms in which knowledge is accumulated and hence the probability of introducing innovation.

In the analyses, I used disaggregated data from the Statistics Poland survey. The PNT-02 survey contains information on the innovation activities of the firms that participate in the Community of Innovation Survey (CIS). The analysis of the extensive database required the use of statistical and econometric methods, including the estimation of logistic regression models. During the estimation of the models, among other things, I tested the impact of crises and changes in internal funds and external financing on the probability of implementing innovation. The availability of external financing, including loans, is one of the main factors that influenced the innovation activity of enterprises in Poland and the differentiation of their strategies during the global crisis of 2008.

Previously, the PNT-02 data for 2004-2006 and 2006-2008 – along with a questionnaire for two groups of the firms from four sectors in Poland, the Czech Republic, and Hungary – were used in the EU FP6 project MICRODYN to identify the barriers to a firm's innovation and factors that decreased the probability of it being innovative. This previous study indicated a differentiation of the competences between the firms that implemented innovation in two periods compared to those firms that did so in only one period. However, this study did not cover the period of an economic slowdown. We contribute to the state-of-the-art

literature by providing information on the differentiation of firms' innovation strategies and activities throughout the business cycle. Another value added of the study is the identification of the barriers to innovation in the different phases of the business cycle.

Firstly, I present a literature review and discuss hypotheses. The next section explains how the composite indicator of a firm's strategy was constructed and presents the results of computation based on a sample of firms. Specific results of innovation from the CIS survey (PNT-02) appear in the appendix (available in external repository). The following section explains the details of random-effect logistic regression models on short panel data, along with the results of estimation of two models. The last section concludes.

LITERATURE REVIEW

The Differentiation of a Firm's Innovation Strategies

The problem of the differentiation of innovation strategies is a key element of the discussion between mainstream researchers and those that represent an evolutionary tradition. Evolutionary approaches, strategic management, and the Austrian business cycle theory focus on the differentiation of sources, factors, and the forms in which knowledge is accumulated among firms and over time, which shape the innovation strategies of the firms and their behaviour on the market (Mintzberg, 1988). In light of this tradition, we aim to identify the relationship between the features of the knowledge accumulation mechanism, its use (innovation strategy), and the innovation activity of the firms in an upswing and in a slowdown.

The evolutionary perspective primarily focuses on the supply side of innovation. However, this study not only adopted the supply-side approach but also the demand one. I assumed that an external shock – such as a decrease in market demand during an economic slowdown – can make the introduction of innovation harder, even when accounting for a greater knowledge accumulation of a firm. Therefore, an external shock may cause a change in a firm's innovation strategy. The impact of the changes in demand has been neglected in the literature. The objective of this study is to fill the gap in the literature and to provide insights on the differentiation of a firm's innovation strategies during different phases of the business cycle, which far exceeds the current state-of-the-art literature.

Although the diversity of a firm's innovation strategy constitutes one of the three pillars of the evolutionary perspective, an empirical analysis of this problem has only recently been undertaken. Its main directions reflect two approaches: a sectoral or a micro-economic approach. Within the sectoral approach, two streams of research emerged. Both of these posit that the innovation strategy of a firm is determined by the characteristics of its sector. Pavitt's (1984) taxonomy of industries paves the way for the first stream (Peneder, 2003; de Jong & Marsili, 2006; Leiponen & Drejer, 2007; Castellaci, 2008). In the second one, the OECD classifies industries according to their technological intensity.

Subsequent studies (e.g. Srholec & Verspagen, 2008) undermine the conclusion that the differences in the innovation strategies among the sectors exceed those among firms. A subsequent micro-economic research shows the differentiation of a firm's innovation strategies in some EU countries (Wziątek-Kubiak, Balcerowicz, & Pęczkowski, 2013a). In the empirical literature, there are two main approaches that deal with this issue. Both are extensions of the evolutionary approaches. The first one (Llerena & Oltra, 2002;

Damanpour & Wischnevsky, 2006; Jensen, Johnson, Lorenz, & Lundvall, 2007) focuses on the internal and external sources of innovation. While the second one (Leiponen & Dreijer, 2007; Srholec & Verspagen, 2008; Peneder, 2003; Som, Dreher, & Maloca, 2010; for an overview of some studies on innovation modes, see Frentz and Lambert, 2010) uses a cluster analysis to select different innovation strategies. Most of them are based on the data from the Community Innovation Survey (CIS). This pool of research differs with respect to the period of the analysis, a company's activities (manufacturing and/or services), and the variables that are used. These analyses raised the issue of innovation persistence, which was analysed in certain countries. The non-availability of the micro-data for Polish firms implied that the issue of innovation persistence could not be studied for Polish firms.

The literature on the impact of a crisis or economic slowdown on the innovation behaviour of the firms is surprisingly scarce. Despite the Schumpeterian origin of the evolutionary perspective, the above-mentioned topic was rarely undertaken (Antonioli, Bianchi, Mazzanti, Montresor, & Pini, 2011). To date, research on the relationship between the innovation behaviour of the firms and changes in the business cycle has shown a very strong sensitivity of the innovation activities of the firms in the EU New Member States to an external shock such as an economic slowdown (Archibugi & Filippetti, 2011, 2012; Archibugi, Filippetti, & Fenz 2012, 2013, 2013a, 2013b; Correa & Lootty 2010; Wziątek-Kubiak, & Pęczkowski, 2013; Holl & Roma, 2016; Hardy & Sever, 2020, Giebel & Kraft 2017). This suggests that the level of knowledge accumulation influences the sensitivity of the innovation activities of the firms to changes in the business cycle.

In order to explain the impact of changes in macroeconomic conditions on the mechanisms of knowledge accumulation and its different use among companies, I formed four main hypotheses:

H1: Changes in the macroeconomic conditions in respective phases of business cycle affect the demographics of innovative firms; their composition, characteristics, and number within the total number of companies.

H2: Companies use different factors and forms of knowledge accumulation and sources of funding during economic expansions and slowdowns.

H3: The macroeconomic conditions affect external funding, cooperation, the research and development process and they enhance the role of obstacles to innovations, which translates into a lower probability of introducing innovations during a slowdown.

H4: Changes in the macroeconomic conditions contribute to the differentiation of the innovation strategies between and within groups of companies, which is indicated by the typology of the firms that is based on the continuity of innovation activity.

Because we assume that firms are heterogeneous in their innovation resources, they can also differ in the continuity of their innovation activities and the strategies that they introduce. Some of them – *persistent innovators* – innovate continuously, while others – *occasional innovators* – from time to time, only during an economic upswing. However, it is also possible that some firms that were previously not innovators begin their innovation activities irrespective of a slowdown. They are considered to be *challengers*. Therefore, I

introduce *a new typology* of innovative firms (persistent innovators, occasional innovators, and challengers) and compare their innovation strategies, i.e. factors, sources, and the types of innovation that they use in different phases of the business cycle.

RESEARCH METHODOLOGY

Results of the CIS (PNT-02) Innovation Survey and the Oslo Manual

In the study, the third edition of OECD Oslo Manual was used as the international reference guide for collecting and using data on innovation. According to the Manual, an innovation is the implementation of a new or significantly improved product (good or service), process, marketing method, or organizational method in business practices, workplace organizations, or external relations. Hence, the Oslo Manual distinguishes four areas of innovation: product, process, marketing, and organizational innovations; and so does the CIS (PNT-02) survey. A common feature of an innovation is that it must have been *implemented*, i.e. a new or improved product must have been *introduced on the market*. New processes, marketing methods, or organizational methods are implemented when they are brought into actual use in a firm's operations.

The Statistics Poland survey was focused on the manufacturing sector. In this study, an innovative company was assumed to be one that had implemented an innovation during the period under review. The aim of the Statistics Poland survey was to identify and describe firms' innovation activities, i.e. all of the scientific, technological, organizational, financial, and commercial steps that actually lead to (or are intended to) implementing the innovations. This includes research and development that is not directly related to the development of a specific innovation (Oslo Manual 2005).

The PNT-02 survey overlaps with the cyclically performed Community of Innovation Survey (CIS). We used the databases of disaggregated data for both an upswing and slowdown in Poland during the decade between 2004 and 2014. The PNT-02 databases consist of a voluntary survey of the entire population of large and medium-sized enterprises and a random sample survey of small enterprises. The surveys are conducted every two years for a period of three consecutive years.

Firstly, I performed statistical analysis on the entire sample for each period. Secondly, I determined how these data can be used to develop a complex algorithm that translates the information that is provided in the data into an indicator of innovation strategy, which is much easier to interpret. The values of an indicator suggest whether the firm is more likely to develop innovations on their own or whether it is more prone to purchase a product, process, or technology that is developed externally in order to improve their own product or simply to imitate it in the future. Thirdly, I performed an econometric analysis to identify the supply-side and demand-side factors that affect the likelihood of innovation. In order to perform this analysis, I constructed a balanced panel of 3 691 enterprises that had reported in all five surveys in 2004-2014. Using the panel data, I estimated the random-effect logistic regression. Then, I determined how the values of our indicator were related to the probability of innovation. Finally, I attempted to determine which companies were persistent innovators, which were challengers, and which firms were occasional innovators.

Composite Indicator of a Firms' Strategy

The PNT-02 data can be used to analyse a firm's innovation strategy on the market. I present a composite indicator of the innovation and commercialization strategy of the firms on the market (1).

$$I_j = \frac{\sum_{j=1}^{N} S_j \times \omega_j}{\sum_{j=1}^{N} \omega_j} \quad (1)$$

where:

S_j - subindicator for category j of the questions from the PNT-02 survey;
N - number of categories of questions from the PNT-02 survey that were considered;
ω - significance of the specific component in the question.

The values of the indicator I_j ranged from minus one to one. A value equal to minus one should be interpreted as a willingness to purchase solutions that have already been developed from other enterprises and institutions, including research centres. On the other hand, a value of one should be understood as the interest of company in creating new solutions on their own and in commercialising these innovations on the market. Values close to zero should be interpreted as indicating a neutral attitude towards innovation, i.e. that a given firm is not particularly interested in implementing an innovation in a given period.

When constructing the indicators, the answers to 56 questions from the PNT-02 survey were taken into account. The questions were divided into the following categories:

1. Product and process innovations in the past (innovation persistence):
   Data on introducing new or significantly improved products, services, production methods, supply and distribution methods, or systems to support the processes by an enterprise in previous period.
2. Sales of new or significantly improved products and processes:
   - Share of revenues from selling new or significantly improved goods and services in the total sales revenues in the previous period;
   - Share of revenues from selling new or significantly improved export goods in the total sales revenues in the previous period.
3. Perception of the improvements and modifications used by the company:
   Data on whether a product or process was new or significantly improved from the perspective of the enterprise or in general on the market in which it operates.
4. Information regarding the institution that developed the product or process innovation and cooperation between institutions:
   Data regarding the type of institutions that developed the product or process innovation: enterprise or group of enterprises, enterprise in cooperation with other national scientific enterprises or institutions, enterprise in cooperation with foreign enterprises and scientific institutions, mainly foreign or mainly domestic enterprises.
5. Prematurely terminated or unfinished projects:
   Binary data on whether a company was involved in a product or process innovation projects that were prematurely terminated or unfinished.

6. Expenditures:
   Data on expenditures on the R&D that had been conducted in the entity (internally) or externally on an occasional or continuous basis, acquisition of machinery and technical equipment, expenditures on transporting tools, instruments, movables, software, purchase of technology in the form of documentation and rights, staff training directly related to the introduction of an innovation, marketing related to the introduction of new or significantly improved products.
7. Funding and financial support:
   Data on financial support for the innovation activities, including R&D, from local and central government and from EU funds.
8. Effects of the innovation activities:
   Data on the positive and negative effects of the innovation activities in a given period, i.e. increasing the range, entering new markets or increasing the share in existing markets, improving product quality, increasing production flexibility, increasing production capacity, reducing labour costs per product unit, reducing material consumption per product unit, reducing harmfulness to the environment, improving occupational health and safety, and compliance with regulations, norms, and standards.
9. Commercialisation:
   Data on the purchase and sale of licences, R&D, automation measures, and consulting services.

Firstly, an algorithm was developed that used logic formulas to read the non-unified data from the databases and to calculate specific values based on them. For each category described above, questions were specified. For instance, if a company provided a positive answer to the question 'Did your company purchase R&D from external sources?', the value of the subindicator was decreased by one. Alternatively, if a positive answer was given to the answer stating that the company had sold R&D, then the value of the subindicator was increased by one. A subindicator is the sum of the values that had been reported for all of the questions in the category, but this sum can only be computed after applying an algorithm that teaches the machine how to interpret a specific piece of data. The value of an indicator is the weighted average of the values of the subindicators. The weights enable the values of the subindicators to be normalised, so that each question has the same importance. The weights can easily be modified to assign a different importance of the categories (questions). The indicator values can be calculated for all of the companies and periods (Figures 1-2).

The values of the indicators for 2004-2006 were concentrated in the range(-0.05,0), i.e. 61.19% of the companies were more willing to buy ready-made innovative solutions from other enterprises and scientific institutions or to suspend their innovation activity in the current period than to create new solutions and commercialise them on the market. The indicator values for 1.93% of the companies were lower than -0.05, which means that these companies were even more willing to buy ready-made solutions. In total, 36.88% of the companies declared values ranging from 0.05 to 0.79; see Figure 1.

In 2006-2008, we observed that the values of the indicator for 66.69% of the companies ranged from (-0.10,-0.05). For 0.67% of the firms, the values of the indicator were below -0.10. Therefore, these companies were relatively more prone to buy ready-made solutions than in the previous period. The empirical distribution was asymmetrically right-

sided. The indicator values for 32.29% of the companies were positive, with the maximum observed indicator value being higher than the one in the previous period (0.82%). In the period preceding the crisis, companies were more likely to create new solutions and commercialise them than in the first period under study.

During the crisis, the number of companies that became neutral towards innovative activities increased. The percentage of companies that purchased innovative products decreased. The indicator values for 3.01% of the companies were below -0.05, of which only 0.48% of the companies were below -0.1, which indicates that – during the crisis – companies largely stopped purchasing innovative products from external sources. The indicator values for 27.82% of the firms were positive, of which the values ranged from 0.1 to 0.79 for 19.40% of companies; see Figure 1.

In 2010-2012, values of the indicators below -0.1 were observed for 0.74% of the companies. The situation in 2012 was similar to that of 2008-2010. For 64.09% of the companies, the indicator values fluctuated between (-0.10,-0.05). For 3.82% of the companies, the values was in the range of (-0.05,0.05) and, for 31.35%, they fluctuated in the range of (0.05,0.79); see Figure 1.

In 2012-2014, values in the range from -0.10 to -0.05 were observed for 63.91% of the companies. Values below -0.1 were reported for 0.61% of the companies; 3.09% of the companies were practically neutral towards innovation activities, while 32.39% of the firms were more likely to create new solutions and to commercialise them (values of indicator in the range between 0.05 and 0.78).

To summarise, the analysis of the values of an indicator shows the full impact of the 2008-2010 crisis on the behaviour of the enterprises and their strategies. Enterprises that once bought ready-made innovative solutions on the market were more likely to remain neutral towards innovative activities or to move to developing new products and processes on their own (values of the indicators up to 0.2). A similar situation was observed in 2004-2006. However, enterprises that had already been active in implementing innovations (values of the indicators above 0.2) were less likely to introduce innovations during the crisis.

The Random-Effect Logistic Regression Models

In this section, I will present which individual factors influenced the probability of introducing an innovation the most. Then, I will determine what the relationship between the values of composite indicator of innovation strategy and the probability of implementing innovation could be.

I constructed a balanced panel of 3 691 firms that had reported values in all five editions of the PNT-02 survey over the decade (2004-2014). The dependent variable is a binary variable ($Innov_{it}$), which is equal to one if the innovations occurred and zero if otherwise. In the panel, 55.44% of the observations were equal to zero, and 44.56% of the observations were equal to one. There was considerable persistence from period to period for the firms under study; 85.65% of those who did not innovate in one year (one period) also did not innovate in the next year (the next reporting period), while 78.04% of those who did innovate in one year also innovated in the next one. However, I also observed that 21.96% of the firms in the panel who had innovated in the first period did not do so in the following period. Moreover, 14.35% of the firms that did not innovate in one year were able to innovate in the following period; see Table 1.

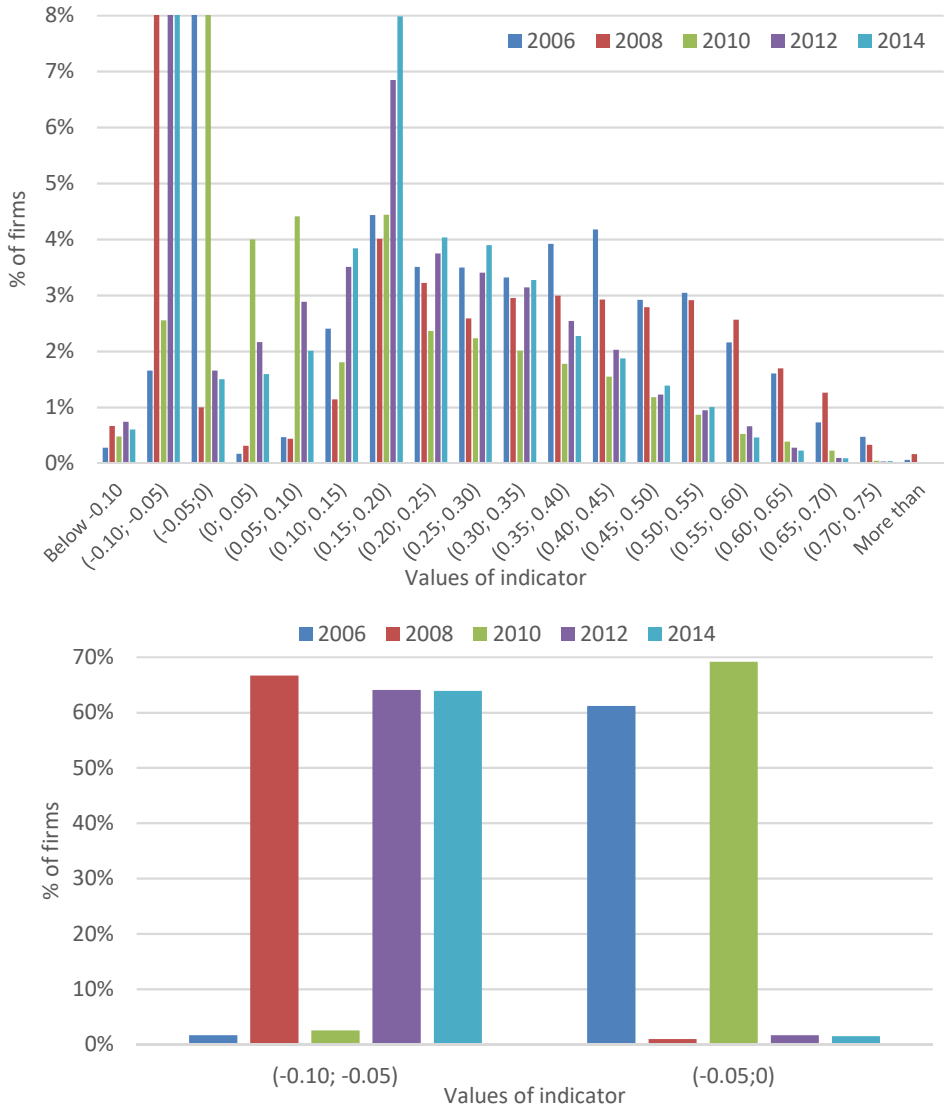

Figure 1. Values of the indicator computed for the five PNT-02 samples (histogram)
Source: own elaboration based on the PNT-02 survey data.

Table 1. Period-to-period transitions in implementing innovations

Variable		$Innov_{it}$		
		0	**1**	**Total**
$Innov_{it}$	0	85.65	14.35	100.00
	1	21.96	78.04	100.00
	Total	57.00	43.00	100.00

Innov_it – binary variable. The value 1 – firm *i* introduced innovation at time, 0 – otherwise.
Source: own elaboration based on the PNT-02 data in STATA.

The number of variables were tested in order to determine whether they were significant when estimating the random-effect logistic regression model; the list is available in the external repository where the results of the project were described in detail. Finally, the most significant explanatory power had the following variables: the group (based on Statistical Classification of Economic Activities in the European Community NACE) which the firm belongs to ($NACEGR$), external R&D ($RDEXT$), internal R&D ($RDINT$), size of the company ($SIZE$), external funding received in the determined period ($FUND$), and binary variable describing the occurrence of the crisis or the slowdown (both models were tested) ($CRISIS$).

I focused on short panels in which a consistent estimation of fixed effects models is not possible in some standard nonlinear models such as binary logit. I considered a nonlinear panel model for the scalar dependent variable y_{it}, with the regressors x_{it}, in which i denotes the individual firm and t denotes time (for more details, see Cameron and Trivedi, 2009).

RESULTS AND DISCUSSION

Results of Estimating the Models and Marginal Effects

The results of estimating the logistic regression models with random effects clearly showed that the probability of implementing innovations was affected by both supply side and demand side factors. Estimating the first model proved that the probability of introducing an innovation depended on internal and external research and development, access to additional funds to conduct the innovation activities, the size of the enterprise measured by the number of employees, and the industry (NACE class) in which the firm operated; see Table 2.

Table 2. Estimation results of the logistic regression model with random effects

Variable	Coef.	Std. Err.	P > |z|	[95% Conf. Interval]	
nacegr	-	-	-	-	-
2	-0.87944	0.18866	0.000	-1.2492	-0.5097
3	-0.12595	0.15814	0.426	-0.4359	0.1840
4	1.03702	0.26006	0.000	0.5273	1.5467
5	0.29720	0.13274	0.025	0.0370	0.5574
6	0.88473	0.20618	0.000	0.4806	1.2888
7	0.38072	0.14385	0.008	0.0988	0.6630
size	-	-	-	-	-
2	0.99292	0.16890	0.000	0.6619	1.3240
3	2.03812	0.18485	0.000	1.6758	2.4004
1.rdint	4.73410	0.15511	0.000	4.4300	5.0381
1.rdext	2.70223	0.17635	0.000	2.4466	3.1379
1.fund	4.76985	0.18267	0.000	4.4118	5.1279
crisis	-0.13483	0.06384	0.035	-0.2599	-0.0097
_cons	-2.86071	0.19870	0.000	-3.2502	-2.4713
/lnsig2u	1.47224	0.05766	-	1.3593	1.5853
sigma_u	2.08782	0.06019	-	1.9731	2.2092
rho	0.56989	-	-	0.4520	0.5973
-	-	-	-	Prob>=chibar2 = 0.000	

Random effects $u_i \sim$ Gaussian Prob. > chi2 = 0.0000; n=3691; Integration method: mvaghermite Integr. pts. 12.
Source: own study.

Table 3. NACE codes and the groups of sectors

Group number	NACE codes	Sector
1	10, 11, 12	Food, beverage, tobacco
2	13, 14, 15	Textile products, clothing, manufacture and production of leather
3	16, 17, 18, 31	Wood, cork, paper, printing, information media, furniture
4	20, 21	Chemicals, pharmaceutical substances, medicines and others
5	19, 22, 23, 24, 25	Coke and petroleum refining products, rubber and plastic, mineral raw materials, ready-made metal products
6	26, 27	Computers, electronic and optical products, electrical equipment
7	28, 29, 30, 32, 33	Machines, equipment, motor vehicles, trailers, transport equipment, repair, maintenance and installation of machinery and equipment

Source: own elaboration based on the Statistics Poland publication on NACE codes.

Table 4. Conditional marginal effects

Model VCE: OIM No of obs: 18,455; Expression: Pr(innov=1), predict(pr); dy/dx w.r.t.: 2.nacegr 3.nacegr 4.nacegr 5.nacegr 6.nacegr 7.nacegr 2.size 3.size 1.rdint 1.rdext 1.fund crisis at:					
1.nacegr = 0.1750203 (mean) 5.nacegr = 0.2851260 (mean)					
2.nacegr = 0.0878895 (mean) 6.nacegr = 0.6654020 (mean)					
3.nacegr = 0.1368735 (mean) 7.nacegr = 0.2023842 (mean)					
4.nacegr = 0.0461664 (mean)					
1.size = 0.0602547 (mean) 2.size = 0.6937957 (mean)					
3.size = 0.2459496 (mean)					
0.rdint = 0.7962612 (mean)					
1.rdint = 0.2037388 (mean)					
0.rdext = 0.87521 (mean)					
1.rdext = 0.12479 (mean)					
0.fund = 0.8833378 (mean)					
1.fund = 0.1166622 (mean)					
crisis = 0.2 (mean)					
Variable	**dx/dy**	**Delta-method Std. Err.**	**P > |z|**	**[95% Conf. Interval]**	
nacegr	-	-	-	-	-
2	-0.1282672	0.0270784	0.000	-0.181340	-0.075194
3	-0.0185077	0.0232328	0.426	-0.064043	0.0270278
4	0.1471202	0.3524320	0.000	0.0780449	0.2161956
5	0.0434168	0.0194034	0.025	0.0053869	0.0811447
6	0.1265472	0.0287068	0.000	0.0702829	0.1828116
7	0.0555089	0.0209462	0.008	0.0144551	0.0965627
size	-	-	-	-	-
2	0.1442111	0.0238723	0.000	0.0974222	0.191
3	0.2927306	0.0259158	0.000	0.2419366	0.3435246
1.rdint	0.5233466	0.0094349	0.000	0.5048545	0.5418387
1.rdext	0.3474864	0.0160376	0.000	0.3160533	0.3789195
1.fund	0.4819280	0.0091009	0.000	0.4640906	0.4997655
crisis	-0.196870	0.0093206	0.035	-0.037955	-0.001419

* Note: dy/dx for factor levels is the discrete change from the base level.

Source: own elaboration based on the PNT-02 data in STATA.

Table 5. Average marginal effects

Model VCE: OIM No of obs. = 18,455; Expression: Pr(innov=1), predict(pr); dy/dx w.r.t.: 2.nacegr 3.nacegr 4.nacegr 5.nacegr 6.nacegr 7.nacegr 2.size 3.size 1.rdint 1.rdext 1.fund crisis					
Variable	**dx/dy**	**Delta-method Std. Err.**	**P > |z|**	**[95% Conf. Interval]**	
nacegr	-	-	-	-	-
2	-0.079723	0.0165971	0.000	-0.112253	-0.047193
3	-0.01219	0.0152871	0.425	-0.042152	0.0177721
4	0.1080959	0.0278646	0.000	0.053483	0.1627094
5	0.0296879	0.0131828	0.024	0.003850	0.0555257
6	0.0915586	0.0217168	0.000	0.048995	0.1341227
7	0.382507	0.0144159	0.008	0.009996	0.0665053
size	-	-	-	-	-
2	0.0889518	0.0139105	0.000	0.061687	0.1162159
3	0.1982353	0.0162788	0.000	0.1663294	0.2301411
1.rdint	0.4981822	0.010487	0.000	0.477628	0.518737
1.rdext	0.3006198	0.0178872	0.000	0.265562	0.335678
1.fund	0.4714814	0.0112194	0.000	0.449492	0.493471
crisis	-0.0131918	0.0062442	0.035	-0.025430	-0.000953

* Note: dy/dx for the factor levels is the discrete change from the base level.
Source: own elaboration based on the PNT-02 data in STATA.

Unlike other studies, my analysis captured the occurrence of the negative demand shock in 2008-2010. The results of the model estimation show that the variable $Crisis_t$ was significant. Therefore, the likelihood of introducing an innovation by an enterprise is also influenced by the demand factor, i.e. a negative external shock decreases the likelihood of introducing an innovation. This effect is visible for all of the enterprises that operated in the manufacturing sector. The likelihood of introducing innovations increased with the size of the company, a higher expenditure on research and development inside the institution, and higher external funds to conduct research and development.

The analysis of marginal effects enabled me to quantify how likely it was for firms with given characteristics to innovate. Marginal effects can be evaluated either at a specified point for all of the covariates in a model (conditional marginal effects) or at the observed values of the covariates in a dataset and then averaged (average marginal effects). To compute the average marginal effects, the marginal effect is first computed for each observation in the dataset and then averaged. If the sample over which we compute the average marginal effect represents a population, then we estimate the marginal effect for the population. The average marginal effect can be – but will not necessarily always be – close to the marginal effect at the mean that was computed earlier. The differences depend on the distribution of the other covariates. The results also tell us the distribution's effect on the average for populations like the one from which our sample was drawn.

Firstly, I focused on the conditional marginal effects; see Table 4. The mean of all of the covariates is often used as a fixed point, which is sometimes called the marginal effect at the means. Using this approach, we can ask, e.g., how much it increases probability of implementing an innovation by evaluating the marginal effect of being a large company; rather than the first (base) group. At the means of all of the covariates, a large company is

29.27 percentage points more likely to innovate than a small one. This change in the response supports the discrete change from being a small company (1) to a large company (3). The header of the margins table tells us where the marginal effect was estimated (at the mean). We can also evaluate the marginal effect at the median of the variables.

I grouped the enterprises into seven groups according to their main economic activity indicated by the NACE codes ('PKD class'); see Table 3. At the means of all of the covariates, the companies from the second group were 12 percentage points less likely to innovate than the companies from the first group. Similarly, companies from the third group were 1.85 percentage point less likely to implement a product or process innovation. At the same time, companies grouped into groups four to seven were relatively more likely to introduce an innovation. For enterprises from groups five and seven, the observed effect was moderate. Enterprises in the fifth group were 4.34 percentage points more likely to introduce an innovation, while companies in the seventh group were approximately 5.5 percentage points more likely to do so. The companies in groups four and six had the greatest chances of being innovative. In group four, the companies were 14.7 percentage points more likely to implement an innovation. At the same time, firms from group six were 12.65 percentage points more likely to do so than the firms from the first (base) group.

Grouping the enterprises enabled me to distinguish enterprises with a higher innovation potential from those with a moderate and low innovation potential. Enterprises with the greatest possibilities of implementing innovations were mainly the enterprises from groups four and six. The firms from groups of industries one, three, five, and seven had a moderate chance of being innovative. The lowest chances of introducing innovations had enterprises from group there.

The conditional marginal effect was also computed for expenditures on R&D internally. The enterprises that had such expenditures were 52.33 percentage points more likely to introduce an innovation. At the same time, companies that purchased R&D from external sources were 34.74 percentage points more likely to implement an innovation. At the means of all of the covariates, enterprises that allocated additional financial resources for innovation activities were also 48.18 percentage points more likely to innovate.

Although the demand effect was visible, the decrease in the likelihood of innovating was limited. The economic slowdown decreased the possibility of introducing innovation by 1.96 percentage points compared to that of the upswing. However, changes in the business cycle phase also translated into changes in access to external financing, which is crucial from the point of view of implementing innovations.

The results of the average marginal effects analysis provided additional information on the average effects for populations such as the one from which our sample was drawn; see Table 5. On average, the probability of innovating decreased 7.97 percentage points for the enterprises from group two. Enterprises from group three were, on average, 1.22 percentage points less likely to innovate. At the same time, enterprises from groups five and seven were, on average, 2.96 and 3.83 percentage points more likely to introduce innovations, respectively. Companies that operated in the industries which were grouped in groups four and six were, on average, 10.81 and 9.26 percentage points more likely to implement innovations.

The average marginal effects also provided me with information on the impact of the size of the company on the probability of its introducing innovation. The probability of

innovation for large companies was 19.82 percentage points higher than for a small company and 8.89 percentage points higher for a medium-sized company compared to a small one. On average, spending internally on R&D increased the likelihood of introducing an innovation by 49.82 percentage points, while the acquisition of R&D from external sources increased it by 30.06 percentage points. Enterprises that increased funding for innovation activities in a given period were, on average, 47.15 percentage points more likely to introduce an innovation. Meanwhile, the average occurrence of a negative external shock led to a decrease in the probability of innovation of 1.3 percentage point.

Results of the Estimation of Second Model

The regressors in the logistic regression model did not take into account all of the information provided by the PNT-02 study regarding the current and past innovation activity of enterprises, the anticipated effects of this activity, or the factors hindering it. The impact of the crisis – especially on the cooperation, strategy, or the attitude towards uncertainty – was not captured in the first model.

The composed indicator that was presented in the previous sections can be used as a regressor in the second model. When calculating the indicator, all of the dimensions in the nine categories were included. However, for the first two categories, we should emphasise that only the history of introducing innovations by a given company was taken into account in order to capture the persistence of innovations.

Table 6. Estimation results of the second logistic regression model with random effects

Random effects $u_i \sim$ Gaussian Prob. > chi2 = 0.0000; n=3691; Integration method: mvaghermite Integr. pts. 12					
Variable	**Coef.**	**Std. Err.**	**P > |z|**	**[95% Conf. Interval]**	
indic	28.3128	0.6957012	0.000	26.94925	29.67635
1.crisis	-0.926047	0.1025085	0.000	-1.12696	-0.725134
_cons	-1.76539	0.0705064	0.000	-1.90358	-1.62720
/lnsig2u	-0.2606403	0.2405641	-	-0.732137	0.210856
sigma_u	0.8778144	0.1055853	-	0.693455	1.111186
rho	0.1897727	0.0369889	-	0.127529	0.272894
-	-	-	-	Prob>=chibar2 = 0.000	

Source: own elaboration based on the PNT-02 data in STATA.

Table 7. Average marginal effects

Model VCE: OIM No of obs. = 18,455; Expression: Pr(innov=1), predict(pr); dy/dx w.r.t.: indic 1.crisis					
Variable	**dx/dy**	**Delta-method Std. Err.**	**P > |z|**	**[95% Conf. Interval]**	
Indic	0.8717665	0.0110072	0.000	0.8501928	0.893340
1.crisis	-0.0284984	0.0030379	0.000	-0.034452	-0.022544

* Note: dy/dx for the factor levels is a discrete change from the base level.
Source: own elaboration based on the PNT-02 data in STATA.

I estimated the model using random-effect logistic regression on the panel of 3691 firms in the five periods; see Table 6. Then, I computed the average marginal effects as was explained above; see Table 7. On average, the effects of a negative shock in 2008-2010 was

higher than was estimated in the first model. On average, when affected by a negative demand shock, the enterprises were 2.85 percentage points less likely to innovate. The higher the value of the indicator, the more likely the enterprise was, on average, to innovate. This can be interpreted as evidence that companies that conduct innovation activities internally and cooperate with other companies in innovation development are more likely to implement innovations. Firms that had already implemented innovations in the past are also more likely to innovate. The lower the number of prematurely terminated and unfinished projects, the more efficient the companies were and the more likely they would succeed in the future. The values of an indicator also capture the expenditures on R&D, machinery, technical equipment, staff training, and marketing related to the introduction of new or significantly improved products. The firms that had higher expenditures, external funding, and public financial support had a greater chance of implementing innovations. Indirectly, the probability of innovation also depended on the previous experience in commercialization, obstacles to innovations, and the probability of generating the desired effects.

The indicator values were calculated for the 3 691 companies that had reported in all five editions of the PNT-02 survey. The values of indicators were reported for seven groups of firms; see the appendix in the repository. I computed the predicted probabilities for each company. I was particularly interested in the predicted probabilities of the innovations of the firms in the seven NACE groups in relevant periods.

For the first group the percentage of enterprises that purchased innovations from other enterprises and institutions on the market during the crisis decreased. Moreover, there was a decrease in the percentage of companies that were focused on introducing an innovation on their own; for which product or process development and commercialization were conducted within the enterprise. During the economic recovery, there was a higher mobilization of funds both among the companies that had purchased and conducted an innovation activity within the enterprise, which translated into a higher probability of success, i.e. the introduction of an innovation.

In 2004-2006, on average, the firms in the first NACE group had a 0.4841 probability of introducing an innovation. In 2006-2008 it was 0.4881, during the crisis of 2008-2010 it was 0.4053, while in 2008-2010 the number was 0.4629. In the last period, this probability was lower than was expected, taking into account the expansionary phase of the business cycle, i.e. 0.4025. In the latter group, innovation activity is largely procyclical. In the last period under study, I observed the effect of approaching end of the business cycle's expansionary phase.

For the second group, the percentage of enterprises that had focused on purchasing from other enterprises and institutions on the market was significantly higher than in the first group in each of the periods. During the economic slowdown, a higher percentage of firms were neutral towards innovation. The situation was similar for enterprises that carried out innovation activities internally. However, for the latter, the percentage of the type of company whose attitude changed to neutral was lower than for companies that had been purchasing ready solutions from other entities. The probability of the successful introduction of an innovation by the companies conducting innovation activity significantly decreased during economic slowdown of 2008-2010 and in 2012-2014. On average, in 2004-2006, the firms that conducted innovation activities had a probability of introducing an innovation of 0.4567. In 2006-2008, it was 0.4315, while during the crisis, it was only

0.4175. During the recovery, it was 0.4407, while in 2012-2014, the probability of introducing an innovation reached the low of 0.4003. The innovation activity of these companies was procyclical for the firms from the first group. However, the worse position of the companies from the second group compared to the first group was due to a higher percentage of companies that ceased their innovation activity; i.e., they had switched to being neutral towards innovation activity during the crisis.

We should mostly pay attention to the occurrence of the structural problems in the above group of enterprises, which negatively affected their performance and the development of innovations. Economic policy whose aim is to support this type of enterprises should be designed to correct these structural problems and not only to counteract the effects of negative demand shocks. For the companies from the third group, there was a decrease in innovation activity and cooperation among the companies that conducted this type of activity internally. The percentage of companies that were buying innovations externally also slightly decreased during the crisis, which was largely connected with the reduction of funding in 2008-2010. On average, the probability of introducing innovations by enterprises decreased in 2004-2012 and increased slightly in 2012-2014. For this group, the innovation activity of the companies was mostly acyclic.

The firms in the fourth group had on average a 0.4985 probability of introducing an innovation in 2004-2006. In 2006-2008 it was 0.4883, in 2008-2010 it was 0.4404, in 2010-2012-0.4665, while in 2012-2014 the number was 0.3503. In this group, the percentage of companies that were interested in purchasing ready-made solutions was smaller. During the crisis, the percentage of buyers from other enterprises and institutions slightly dropped. From the beginning of the crisis until 2014, the percentage of companies that were interested in partially conducting innovation within companies grew (a moderate degree of innovation activity). In the fourth group, on average, the probability of introducing innovations decreased from period to period. The percentage of companies that were strongly focused on internal innovation activity steadily decreased (firms with indicator values above 0.5). Being in this group could explain the higher probability of introducing innovations in the whole sample.

In the fifth group, on average, a firm had a probability of introducing innovation of 0.4613 in 2004-2006 and 0.4925 in 2006-2008. The probability of implementing an innovation began to decrease at the beginning of the crisis: it was 0.4423 in 2008-2010, 0.4337 in 2010-2012, and 0.4151 in 2012-2014. The innovation activity of the firms in the fifth group was similar to that of the firms in the first group; however, the percentage of firms that conducted innovation activity internally was, on average, higher among the former compared to the latter.

In the sixth group, there was an intensification of the internal innovative activity of the companies despite the crisis (*challengers*). There was a slight decrease in the activity of the companies during the crisis, but only among those for whom the indicator values were the highest; i.e. above 0.6. Most of these types of companies were involved in countercyclical innovation activities. Lower percentages of the companies operating internally – with an indicator value below 0.6 – and purchasing externally were observed in the period preceding the crisis (2006-2008). In group six, on average, a company had a 0.4493 probability of introducing an innovation in 2004-2006 and 0.4091 in 2006-2008. The probability of introducing an innovation by firms in this group during the crisis was the highest

in all of the groups (0.4806). The probability of introducing innovations after the crisis was relatively lower; it was 0.3944 in 2010-2012 and 0.3823 in 2012-2014, respectively. The innovation activity of these companies was mostly countercyclical.

For the last group of enterprises, the companies that were most focused on innovation activity internally – with indicator values above 0.5 – were the most active in the period preceding the crisis (2006-2008). The role of the internally active innovation companies increased during the crisis (up to 0.45), while the percentage of external buyers dropped. On average, the probability of introducing an innovation by a company in this sector was 0.4610 in 2004-2006. It decreased in the period preceding the crisis and during the crisis to 0.4291 and 0.4081, respectively. However, innovation activity increased during the recovery. The probability of introducing an innovation by a medium-sized firm in 2010-2012 was, respectively, 0.4766 and 0.4228 in the 2012-2014.

CONCLUSIONS

The aim of this study was to analyse the differentiation of the innovation activities and strategies of Polish manufacturing companies between 2004-2014. The study focused on both the supply-side and demand-side factors that influence the decisions of firms to innovate.

I used the proprietary disaggregated data from the PNT-02 surveys, which were obtained from the Statistics Poland, which overlap with the Community of Innovation Survey (CIS). In the study, I analysed all of the information that had been provided by the entire population of large and medium-sized enterprises, along with samples of small companies in Poland. I studied how the economic slowdown in Poland in 2008 affected the innovation activities and commercialization of the firms. Thus, I performed a detailed statistical analysis of the changes in the linkages in the innovation processes, the sources of information that were used by the companies in a specific phase of the business cycle, the forms of cooperation between the entities on the market, along with funding and human resources. Moreover, I commented on the objectives, obstacles, and outcomes of innovation.

Then, I used the information in the survey to develop indicators of the innovation strategies. To compute the values of indicator, I developed a complex algorithm that teaches a machine how to interpret the data that had been provided by the firms in the respective editions of the survey. The analysis of the values of the indicators revealed that – irrespective of the period under study – a high percentage of the firms were characterised by a neutrality towards innovations. The impact of the crisis was greater on companies that were more willing to purchase a ready-made solution on the market or to imitate than on the firms that were developing product and process innovations internally.

Next, I presented the results of the econometric analysis that had been performed on a panel of 3 691 firms that had reported in all five of the surveys. I used random-effect logistic regression to uncover the factors behind the higher probability of a firm innovating. The analysis suggested that both supply-side factors and the occurrence of a negative shock have an impact on the probability of innovating. The likelihood of introducing innovations increased with the size of the company, a higher expenditure on research and development internally and externally, and an increase in internal and external funds for innovation activities. The probability of innovation also depended on a firm's NACE group.

A joint analysis of the indicators for innovation strategy and the probability of innovation enabled us to determine the groups of firms whose innovation activity was procyclical,

countercyclical and acyclic, respectively. Our analysis is of particular relevance for the Polish National Innovation System (NIS). Although in most cases the innovation activity of the firms was procyclical, there also appeared groups of firms that were *challengers*, i.e. such that introduced innovations and dynamically conducted innovation activities during an economic slowdown or even a crisis. Those firms should be targeted differently than companies that require structural adjustments.

The main research limitation is related to the restricted access to data after 2014. Future research should focus on testing the procyclicality and countercyclicality of innovation activities and strategies of manufacturing firms in the long period, i.e. up to 2019. In the parallel study, I focused on the problem of aggregation bias that may affect the results and incorrectly suggest procyclicality of innovation activity of companies in aggregates.

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Acknowledgements and Financial Disclosure

The article came into being within project no. 2015/17/B/HS4/02742 entitled "The Differentiation of Innovation Strategies of Polish Manufacturing Firms as an Effect of Changes in Macroeconomic Environment," which was financed by the National Science Centre. This article was presented as an academic paper at 16th International Conference "Developments in Economic Theory and Policy," which was organised in Bilbao on 27-28 June 2019. The PNT-02 data was provided by the Statistics Poland office in Szczecin, which is not responsible for the conclusions contained in the publication. The specific data and values of indicators for specific groups are available in the external repository on ResearchGate.

I would also like to thank the anonymous referees for their useful comments, which permitted her to increase the value of this article.

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Ministry of Science and Higher Education
Republic of Poland

The copyediting and proofreading of articles in English is financed in the framework of contract No. 913/P-DUN/2019 by the Ministry of Science and Higher Education of the Republic of Poland committed to activities aimed at science promotion.

Entrepreneurial Business and Economics Review

2020, Vol. 8, No. 4

10.15678/EBER.2020.080404

Entrepreneurial orientation and small firm performance: The moderating role of environmental hostility

Chukwuemeka Christian Onwe, Anastasia Ogbo, Abu Amodu Ameh

ABSTRACT

Objective: The objective of the study is to investigate the relationship between Entrepreneurial Orientation and the performance of small firms in Nigeria to determine the effect of environmental hostility towards this relationship.

Research Design & Methods: A survey was conducted on small firms. The gathered data were analysed with Andrew Hayes' Simultaneous Entry on SPSS 23.0 and PROCESS 3.

Findings: We discovered that there is no significant relationship between Entrepreneurial Orientation and firm performance, while environmental hostility moderates this relationship positively. We concluded that a hostile environment motivates firms to adopt Entrepreneurial Orientation, and ultimately improve their performance.

Implications & Recommendations: Environmental hostility is a crucial element in determining how Entrepreneurial Orientation relates to small firm performance. Therefore, owners/managers must identify and strengthen these factors that will enable them to improve on their Entrepreneurial Orientation to survive hostile business environments.

Contribution & Value Added: Concerning the Resource-Based Theory (RBT) and contingency theories, this study advances the field of Entrepreneurial Orientation by showing how the two combine to explain the Entrepreneurial Orientation–performance relationship in a developing economy.

Article type:	research article
Keywords:	entrepreneurial orientation; small firms performance; environmental hostility; interaction effects; developing economies
JEL codes:	M10, M19

Received: 17 April 2020 Revised: 18 September 2020 Accepted: 22 September 2020

Suggested citation:

Onwe, C.C., Ogbo, A., & Ameh, A.A. (2020). Entrepreneurial orientation and small firm performance: The moderating role of environmental hostility. *Entrepreneurial Business and Economics Review,* 8(4), 67-84. https://doi.org/10.15678/EBER.2020.080404

INTRODUCTION

High returns on assets, investments, and margins of net profits are key indicators of a successful firm (Poudel, Carter, & Lonial, 2018). The simplest form of accessing a successful firm is through its performance indices. Firms that score high in these indices usually enjoy growth and longevity and are easily regarded as performing well (Isichei, Agbaeze, & Odiba, 2020). Performance is vital in an organization's lifecycle as it signifies progress (Kallmuenzer, Strobl, & Peters, 2018). Organizations need unique nonreplicable resources to help them continuously pursue new opportunities to keep performing (Real, Roldán, & Leal, 2014; Rydehell, Isaksson, & Loften, 2018). Wiklund and Shepherd (2005) suggest Entrepreneurial Orientation (EO) as one of such unique resources.

EO involves those rare and non-replicable resources of a firm that comprises their willingness to take risks that involve trying out products that have not been tested, willingness to innovate, and proclivity to be proactive against competitors (Covin & Slevin, 1991; Covin & Wales, 2012). Scholars expect that firms with an EO would often outperform firms without EO (Chakrabarti & Mondal, 2018; Jogaratnam, 2002; Rydehell *et al.,* 2018; Tajeddini & Mueller, 2018; Vij & Bedi, 2012). This expectation appears to be revolving around the basic assumptions underlying Barney's Resource-Based Theory (RBT), that the resources at an individual's disposal would determine their success in the entrepreneurial process. We view EO as such a resource that could help firms to sustain their operations and survive challenges. Numerous studies have confirmed this expectation that EO enhances firms performance (Adomako, 2018; Anderson & Eshima, 2013; Alvarez-Torres, Lopez-Torres, & Schiuma, 2019; Gupta & Batra, 2015; Kallmuenzer *et al.,* 2018; Kreiser, Anderson, Kuratko, & Marino, 2019; Poudel *et al.,* 2018; Wiklund & Shepard, 2005; Yoon & Solomon, 2017). Although, exceptions still exist, as some studies observed contrary findings (Frank, Kessler, & Fink, 2010) that EO does not necessarily translate into firms' high performance. This meaning that certain factors within the environment (internal, external, or both) in which these businesses operate may be influencing this relationship.

The relationship between EO and performance is complex (Lumpkin & Dess, 1996) and moderated by factors within and without the business environment. Firms that operate in a munificent environment with a lot of support would have an increased in EO's effect on performance than those operating in an environment of hostility with a lot of lack and stress (Gupta & Batra, 2015; Martin & Rialp, 2013; Tajeddini & Mueller, 2018; Tsai & Yang, 2012; Zahra & Garvis, 2000). This paradigm follows the tenets of contingency theory, which suggests that less rigid structures better promote entrepreneurial processes than more rigid structures (Miller, 1988). Therefore, by integrating the contingency theory we follow the line of argumentation according to which simple main-effects relationship between EO and performance is insufficient for generalisation, and that it is dependent on the effects of factors within and without the business environment; particularly for small firms in developing economies like Nigeria.

According to the Small and Medium Enterprises Development Agency of Nigeria and National Bureau of Statistics report (SMEDAN & NBS, 2013, p. 3), small firms are business ventures that have total assets (land and building excluded) above 10 million naira, but not more than 100 million naira, and whose total workforce is between 10 and 49 em-

ployees. They have global recognition as engines of socio-economic transformation, because they provide jobs and wealth-creation opportunities and assist in income redistribution in both developing and developed economies (Atherton, 2005; OECD, 2017). However, small firms in Nigeria are bedevilled with an immeasurable number of challenges including the lack of financial access, dilapidated infrastructures, irregularities in government laws, the lack of support for business development services, insufficient access to markets, multiple taxations, and obsolete technology (SMEDAN & NBS, 2013). These challenges often mete out dire consequences, including the loss of market shares, redundancy, and extinction for most small businesses in Nigeria that are unable to cope with them (Babalobi, 2020; Oluwabunmi, 2020).

The above challenges of small businesses in Nigeria describe a hostile business environment. Nevertheless, some businesses operating in this same environment are still recording successes, growth, and survival with high performance. It is so probably because of their strategic decisions to introduce new business techniques, be proactive in recognising and pursuing new areas ahead of competitors, and take risks that sometimes provide favourable outcomes (i.e. EO) – or sheer luck. Therefore, our questions are: what form of relationship exists between EO and small firm performance in South East Nigeria? Does environmental hostility significantly affect the EO performance relationship of small firms in South East Nigeria?

Notwithstanding the abundance of studies investigating the relationship that exists between EO and performance from North America, Europe, Asia, and Africa (Adomako, 2018; Adomako, Narteh, Danquah, & Analoui, 2016; Amankwah-Amoah, Danso, & Adomako, 2018; Boso, Story, & Cadogan, 2013; Chen & Hsu, 2013; Engelen, Kube, Schmidt, & Christina, 2014; Gupta & Batra, 2015; Kallmuenzer, *et al.,* 2018; Palmer, Stöckmann, Kraus, & Kailer, 2019; Real et *al.,* 2014; Tajeddini & Mueller, 2018), we know of only one such study for Nigeria (Isichei *et al.,* 2020). The latter study investigated the intervening roles of structural infrastructure capability on the EO-performance relationship of SMEs but not the moderation effect of environmental hostility on firms. Moreover, although the study was conducted on the entire six geopolitical zones of Nigeria, the findings cannot be generalised because it investigated only 377 SMEs out of the total number of 73,081 SMEs in Nigeria (SMEDAN & NBS, 2017). Meanwhile, these geopolitical zones differ regarding the ease of doing business (Obisi & Gbadamosi, 2016). For instance, the South East region of Nigeria operates in a very hostile environment (Esien, 2014; Ojukwu, 2008), and no known study has investigated how this hostile environment affects the EO-performance relationship of small firms within these areas, hence our research question. Furthermore, the hierarchical regression approach – often utilised in testing contingency hypotheses – appears to be faulty. Hayes (2018) considers this approach to be essential for testing a moderation hypothesis, because it does not necessarily produce change in R square, nor does it produce the amount of difference in the dependent variable that is uniquely accounted for by the moderation of the independent variable's effect by the moderator. Furthermore, instead of the simple slope approach to visualising interaction effects adopted in previous studies, the Johnson-Newman (JN) technique appears to be better as it enables both the visualization and probing of interaction effects (Hayes, 2018; Hayes & Matthes, 2009).

This study contributes to the EO literature in several ways. Firstly, the small firm perspective from South East Nigeria appears to have been neglected in the EO-performance

relationship discourse, so this case would open new areas for both researchers and policymakers. This study also makes contribution about the interaction effects of environmental hostilities on the EO and small firm performance relationship in Nigeria. This contribution is significant because it can redirect the resources allocation strategies of owners/managers and policymakers towards enhancing the survival and performance of small firms. Finally, this study makes methodological contributions by showing that the simultaneous entry approach to testing moderation hypotheses gives a clearer picture than the hierarchical regression. And that the JN technique for visualising and probing the interaction effect is better than the simple slope technique. Hayes (2018) argues that the hierarchical entry method does not give the proportion of variance in a dependent variable (*Y*) that is uniquely catered for by the change of the independent variables (*X*) effect with moderators (*W*). To address this matter, we propose a simultaneity approach of Hayes's (2018) Simultaneous Entry on PROCESS, with the moderated variable being environmental hostility.

This article proceeds by reviewing studies on EO-performance relationships. The study discusses the likely moderation effects of environmental hostility on this relationship. Then we test our hypotheses on a sample of small firms and discuss the implications of our findings.

LITERATURE REVIEW

EO and Performance

According to Covin and Slevin (1989), EO means top managers' disposition towards taking business-related risks and favouring innovations that garner competitive advantages for the firm to compete with its competitors. Prior research reveals that EO consists of a firm's top management strategies involving innovativeness, proactiveness, and risk-taking (Covin & Slevin, 1989; Hughes & Morgan, 2007; Tang & Hull, 2012). However Lumpkin and Dess (1996) believe that competitive aggressiveness and autonomy should make this list, there is an argument that competitive aggressiveness and proactiveness are highly related, while autonomy is an environment that must exist for entrepreneurial processes to take place. Therefore, there is no need to perceive these elements as different constructs (Wiklund & Shepard, 2005). In this study, we employ EO as involving innovativeness, proactiveness, and risk-taking, in line with Covin and Slevin (1989).

According to the RBT (Barney, 1991), the degree of the divergence and immobility of firms' resources would determine the value, rarity, uniqueness, and sustainability of such resources, which would ultimately translate into higher firm performance. In other word, when the resources of a firm are similar to the resources of other firms, they become less valuable, rampant, and imitable, thereby eroding the firm's advantages easily, (Adomako, 2018; Anderson & Eshima, 2013; Arshad, Rasli, Arshad, & Zain, 2014; Bhattacharyya & Jha, 2015; Kljucnikov, Civelek, Cech, & Kloudova, 2019; Teece, Pisano, & Shuen, 1997). In other words, firms can attain sustainable supernormal returns when they possess superior and protected resources. By implication, this study considers EO as those superior resources: the ability to innovate by creating new products markets and processes as valuable, rare, unique, and sustainable resources for firms that possess them, as EO allows firms to reach higher returns. Moreover, the ability to be proactive – i.e. reading the market and catching opportunities of becoming first movers against other firms – is expected to create room

for higher performance in such kind of firms. The propensity to engage in highly risky ventures with uncertain outcomes can also be considered resources, such that risk-averse firms may easily become passive and side-lined by other companies. With these assumptions in mind, we hypothesised that:

H1: Entrepreneurial Orientation has a significant effect on firm performance.

EO, Hostility, and Performance

Prior research indicates that the business environment is an important ground for firms' growth and development (Adomako *et al.,* 2016; Amankwah-Amoah *et al.,* 2018; Calanton, Schmidt, & Benedetto, 1997; Chen & Hsu, 2013; Doorn, Jansen, Van den Bosch, & Volberda, 2013; Emoke-Szidonia, 2015; Engelen *et al.,* 2014; Gupta & Batra, 2015; Martin & Javalgi, 2015; Masa'deh, Alhenzab, & Obeidat, 2017; Rydehell *et al*., 2018; Shehu & Mahmood, 2014; Tajeddini & Mueller, 2018; Tang & Hull, 2012; Tsai & Yang, 2012). Usually, the environment in which a firm operates would shape its attitude and behaviours concerning competition, structures, and decisions. Firms that operate in an environment with resources, infrastructure, and support can prosper in comparison to firms that operate in environments with deficiencies. However, this argument is true only to the extent that firms that operate in an environment with hostilities do not adjust their operations by strategically positioning themselves to suit their present situation. This synchronises with the basic assumptions of contingency theory. That is, firms operating in an uncertain and volatile environment will exhibit diverse attitudes, behaviours, approaches, and competencies, including adjusting their styles of management to suit the various situations in the environment (Ayman, Chemers, & Fiedler, 1995). By implication, firms that find themselves in hostile business environments have to display valuable, rare, and sustainable resources that include innovativeness, proactive prowess, and risk-taking abilities to succeed. They would easily do this by making adjustments in their management styles. Having rare, valuable, and sustainable resources is indicative of the fact that the firms' resource base is a factor in its success story, whereas uncertainty and volatility in the business environment are factors that could increase the acquisition of these resources.

Hostility in the environment could result in firms performing poorly, as firms that are unable to absorb such shocks may soon exit the environment. However, some firms could develop their resources and adjust their processes to absorb such shocks. Such firms will easily pass as entrepreneurial, but it does not necessarily make them high performers. Hostility in the environment could be in numerous forms such as changes in demands, technology, products, government laws, and policies and forces in the market (Covin & Slevin, 1989). However, numerous studies show that environmental hostilities can promote or mitigate firms' survival (Calantone *et al.,* 1997; Lindelof & Lofsten, 2006; Tajeddini & Mueller, 2018). We envisage that the environment interacts with the EO-performance relationship, and the former could provoke either a positive or a negative effect on small businesses in Nigeria. Therefore, we hypothesise that:

H2: Environmental hostility will likely have a statistically significant moderating influence on the EO-performance relationship of small businesses in Nigeria.

A Conceptual Model

The conceptual model in this study explains the universal EO-performance relationship. This is represented by the path labelled as H1 here. We propose that EO will have a statistically significant relationship with performance. The path labelled H2 in this model represents environmental hostility's contingent effects on EO and performance. This path suggests that the EO-performance relationship is dependent on environmental factors like government interferences, competitors, lacking or deficient infrastructure, and the inadequate supply of materials. Our model predicts that environmental hostility will have a statistically significant effect on the relationship between EO and small firm performance.

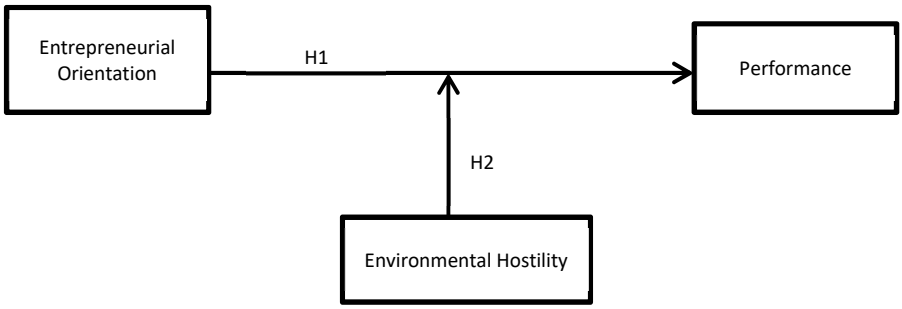

Figure 1. A conceptual model
Source: own elaboration.

RESEARCH METHODOLOGY

This study adopted an exploratory research design to determine the effects of predicting and moderating variables on the outcome variable of the study. The design according to Kothori and Garg (2014) is suitable when the study aims to discover ideas or new insights. The design enabled us to find the type of relationship that exists between EO and performance, but also the effect of hostility on this relationship. Small firms are not necessarily under statutory obligations by regulatory bodies like the Corporate Affairs Commission (CAC) to prepare, present, and publish their financial or business records; and their operations are usually reflected their owners/managers quality. This constrained us to gather primary data directly from owners/managers through questionnaires. The population of the study comprised registered small businesses operating in South East Nigeria. South East Nigeria comprises five states with people of the same culture, language, and religion (Okwo, Ezenwakwelu, Igwe, & Imhanrenialena, 2019). South East Nigeria has a large number of small businesses that greatly contribute to the country's GDP (SMEDAN & NBS, 2013). The total study population includes 6,663 small firms in the South East Nigeria given by the SMEDAN and NBS report (2013). These various firms fall in different economic sectors, including trading, manufacturing, service providers like transport and storage, education, health, social work, art, entertainment and recreation, and construction. A simple random sampling technique (Taro Yamane) was utilised to draw the sample, i.e. 377 small firms from this population. This sample size meets the Kaiser-Meyer-Olkin (KMO) sample size adequacy test criteria, according to which the lower proportion of a sample compared

to its main population makes a data suitable for factor analysis. These firms were proportionately distributed according to their percentages per state: (Abia = 27%, i.e. 102; Anambra = 18%, i.e. 68; Ebonyi = 24%, i.e. 90; Enugu = 12%, i.e. 45, and Imo = 19%, i.e. 72).

The criteria for selection into this study were strictly based on consent, as we approached owners/managers of small firms on site. We clarified to them the aim of the research, highlighting that the study was strictly for academic purposes, their responses would be treated anonymously, and they would not receive any rewards for the survey. Only those that agreed to the above conditions were offered questionnaires. After this process, we discovered that only 267 questionnaires were returned complete. Out of this number, only 221 (58.6%) were properly completed and were utilised for the analysis of this study.

Measurements and Scale Development

All the scales utilised in this study were all adapted from previous researches: the Performance scale from Poudel *et al.* (2018), the EO scale by Covin and Slevin (1989), and the Environmental Hostility scale from Miller and Friesen (1982). However, in recognition of the differences in context, slight adjustments were made in the statements of questions in some scales to suit the context of this study. Every scale utilised in the study – except for the control variable – was anchored in the five-point Likert scale, in which 1 = Strongly Disagree and 5 = Strongly Agree. To ensure that the owners/managers of these firms are familiar with the items of these instruments, we did a pilot study on a few firms in this area. The results from the pilot study indicated convergent and divergent validity, along with high reliabilities of 0.82 for performance, 0.78 for EO, and 0.86 for Environmental Hostility. These results were achieved by checking internal consistency tests on SPSS. The same tests were utilised to access the original data of the study's scales and the minimum alphas pegged at 0.70.

Firm Performance

For our study, we adapted and adopted the reflective performance scale – as created by Poudel *et al.* (2018) – which consists of four (4) regular financial performance indices: Return on Assets (ROA), Return on Investments (ROI), net profits, and profits to revenue ratio. The scale assessed executives' perceptions of their firm's performance against the performance of their key competitors in industry. Small firms are under no strict laws to present their financial records and – since we investigated firms from different industries – it could have been difficult to find a uniform measure of objective performance. Therefore, we opted for subjective measures of small firm performance. The approach of using subjective measures to access firm performance appears to be a common and well-received practice in organizational research (Alvarez-Torres *et al.,* 2019; Poon, Ainuddin, & Junit, 2006; Poudel *et al.,* 2018; Stam & Elfring, 2008; Tajeddini & Mueller, 2018; Wiklund & Shepard, 2005). The performance of owners/managers of small firms was assessed by asking them to rank their perceived growth in ROA, ROI, net profits, and profits revenue ratio over five years on a five-point Likert scale ranging from (1) extremely low to (5) extremely high. We adopted a time lag of five years because this period – according to Boyte-White (2019) – suffices for a firm to calculate its ROA, ROI, net profits, and profits revenue ratio. Moreover, according to Oluwabunmi (2020), one out of every three firms in Nigeria becomes extinct in the first 18 months of operation because of the hostile nature of business environment. This implies that it would have taken most firms some time to break-even

before they could begin to earn some profits beyond their investments. Therefore, we estimate such time to be around five years.

Entrepreneurial Orientation (EO)

Covin and Slevin's (1989) scale was adopted and modified for this study. The EO scale comprised of items that measured a firm's disposition towards innovation, risk-taking, and proactiveness. The scale contained nine items, three from each of the various constructs. Preliminary diagnostics on the data gathered from the scale indicated that four out of the nine items were below the benchmark score of 0.5 and were excluded from further analysis. The remaining five items loaded appropriately, one question had the lowest factor loading of 0.52 while the highest loading of a question was 0.76. The latter measured the extent to which firm owners/managers agree that their firms favour the more tried approach than Research and Development (R&D), technological development, and innovation. The extent to which they agreed that they respond to competitors initiative against initiating processes for competitors to follow, and how much did they agree that they possessed a strong proclivity towards lower risky ventures as against higher proclivity towards risky ventures. The composite reliability (CR) was 0.781.

Environmental Hostility

To measure environmental hostility, we adopted Miller and Friesen's (1982) scale with six question items to quantify the perception of firm owners/managers with regards to their environment. For example, respondents were asked whether 'the environment that characterises this business poses a big threat to its survival.' After preliminary diagnostics, the factor loadings indicated that two out of the six question items failed to meet the set score of 0.5 and were subsequently discarded. The scale also measured the extent to which firm owners/managers agreed that tough price competition serves as a threat to their operations, how much they agree that government interference threatens their business operations, how much they agree that scarcity in raw materials and facilities severely threatens their business operations. Out of the four questions that loaded appropriately, one question had the lowest factor loading of 0.91 while another had the highest loading of 0.95. The composite reliability (CR) was 0.952.

Control Variables

We controlled for firm age. This was gauged by a firm's years of operation. Thus, we ensured that only firms that have operated for five years and more were involved in this study. This was basically because these firms could pass through the initial stage of business, in which fixed costs are usually above variable costs and when businesses can hardly break even. Moreover, we involved these firms because at this stage – according to Boyte-White (2019) – they would be able to ascertain performance indices like ROA, ROI, net profits, and profits revenue ratio.

RESULTS AND DISCUSSION

Confirmatory Factor Analysis (CFA) was executed on the data set of this study before proper analysis. 18 items were assessed under three variables (EO, environmental hostility, and performance). The CFA established the fitness of the overall model, after eliminating items that

could have been covered by other variables. This model fitness was ascertained by accessing the proportion of the chi-square to its degrees of freedom (χ2/df), the Comparative Fit Index (CFI), the Goodness-of-Fit Index (GFI), and the Normed Fit Index (NFI), which all emerged within the stipulated range for acceptance (e.g. Poon *et al.*, 2006). Our hypotheses were tested using the correlation analysis and simultaneous entry analysis (Hayes, 2018). The internal consistency tests were used to obtain Cronbach's alphas for various items; only alpha scores from 0.7 and above are utilised in this study, as suggested in Poon *et al.* (2006).

The χ2/df is lesser than five, i.e. 1.79; CFI = 0.982; GFI = 0.942; IFI = 0.982 and NFI = 0.961, all above the 0.90 cut off suggested by Poon *et al.* (2006). Factor loadings were fine, an indication that the respondents recognised the items of the instruments. Multicollinearity was not an issue in this model, and there was also discriminant and convergent validity between and among the observed variables of the study. The CFA suggested that the elimination of some items would improve the final results and make the analysis less complex. For instance, four items from EO, two from performance, and two from environmental hostility were identified to be major issues in the model and were dropped from further analysis. Compared to a study by Boso *et al.* (2013), this is not out of place because such items may have been covered by other items that are loaded high. Moreover, we pegged our Extraction Absolute Value (ABV) at 0.5, which is higher than the values of some previous studies (Florin, Karri, & Rossiter, 2007). The reason behind pegging it this high was that the scale had never been tested on our study area and population; we intended to confirm that the respondents recognised the items.

Table 1. Descriptive statistics and correlations

Variables	Mean	SD	1	2	3	4
1: Age	1.99	1.014	1			
2: Entrepreneurial Orientation	16.32	4.318	0.416**	**(0.781)**		
3: Environmental Hostility	7.62	1.592	-0.286**	-0.447**	**(0.982)**	
4: Small firm Performance	11.20	7.144	0.234**	0.496**	-0.351**	**(0.734)**

Notes: Alpha reliabilities are shown in parentheses on the diagonal.
** p < 0.001. N = 221.
Source: own elaboration in the SPSS program.

Table 1 shows the Means, Standard Deviations, and the Correlations between variables of this study: firms' age, EO, hostility, and performance. The table shows a positive and significant relationship between EO and performance (r= 0.496, p<0.001), which means that higher EO leads to higher firm performance. Hostility showed a negative and significant relationship with firm performance (r= -0.351, p<0.001), which signifies that higher levels of uncertainties in the business environment reduce firm performance. Firm age indicated a positive and significant relationship with firm performance (r= 0.234, p<0.001), meaning that garnered experiences help businesses to perform better. Finally, hostility showed a negative and significant relationship with EO (r= -0.447, p<0.001), meaning that higher levels of hostility in the environment kill the EO of firms.

To assess the interaction effects of environmental hostility on the EO-performance effect, a simultaneous entry analysis was conducted on SPSS with Andrew Hayes PROCESS.

Table 2. Test of hostility on Entrepreneurial Orientation–performance effect

Variables	*Paths*	*Coeff.*	*SE*	*T*	*p*
Constant	*iy*	7.2413	0.8088	8.9537	< 0.001
Entrepreneurial Orientation *(X)*	b_1	0.0382	0.0473	0.8079	0.420
Hostility*(W)*	b_2	-0.1898	0.0546	-3.4774	< 0.001
Entrepreneurial Orientation X Hostility*(XW)*	b_3	0.0103	0.0034	3.0595	< 0.01
Firm age*(C)*	b_4	0.0631	0.0999	0.6322	0.528
R^2 = 0.2910, *MSE* = 1.8310					
F (9.3605) = 22.1641, p < 0.001					

* p < 0.05; ** p < 0.01; *** p < 0.001.
Source: own elaboration: PROCESS Output.

Table 2 shows the results of the hypotheses. Hypothesis 1 proposed that EO will have a statistically significant relationship with small firm performance, which was not supported (β= 0.0382, *p*>0.05). This is a deviation from previous studies (Amankwah-Amoah *et al.,* 2018; Al-awlaqi, Mohamed, & Habtoor, 2018; Chen & Hsu, 2013; Dess, Lumpkin, & Covin, 1997; Dess & Lumpkin, 2005; Real *et al.,* 2014). By implication, this means that firm performance is not completely predicted by the extent to which firms are innovative, proactive, or prone to taking a risk. In other words, other variables may be moderating this effect. However, suffice it to note that this contrast may be peculiar to the type of firms under study. Hypothesis 2 proposed that environmental hostility will likely have a statistically significant effect on the EO-performance relationship, which was supported (β= 0.0103, *p*<0.001), confirming findings from previous research (Alvarez-Torres *et al.,* 2019; Emőke–Szidónia, 2015; Engelen *et al.,* 2014; Frank *et al.,* 2010; Goll & Rasheed, 2004; Gupta & Batra, 2015; Hasan, Hakim, Yulius, & Naim, 2015; Lindelöf & Löfsten, 2006; Tajeddini & Mueller, 2018). Firms would improve their performance through EO when the environment is highly uncertain.

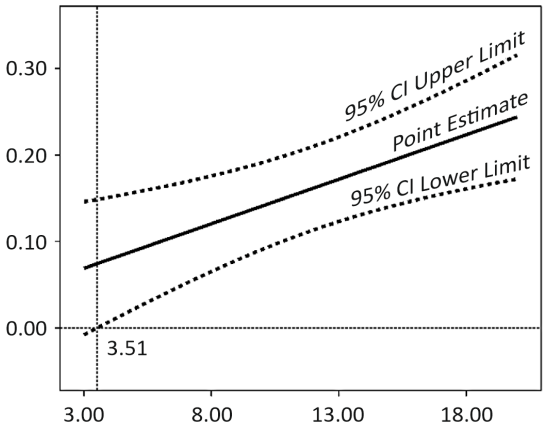

Figure 2. Interaction effect between EO, environmental hostility, and performance
Source: Johnson-Neyman's interaction, PROCESS 3.

Discussion

This study results from previous works that state EO enhances firm performance (Amankwah-Amoah *et al.,* 2018; Al-awlaqi *et al.,* 2018; Poudel *et al.,* 2018; Dess & Lumpkin, 2005; Real *et al.,* 2014; Wiklund & Shepherd, 2005; Yoon *et al.,* 2016). The article also effects from suggestions of previous works to link the EO-performance relationships with theories and methodologically advance the field (Miller, 2011). Moreover, this study is significant because it provides the Nigerian perspective on the EO-performance debate to the already existing body of knowledge. Furthermore, the study confirms the RBT in predicting the EO-performance relationship and extends the methodological approach from the usual hierarchical regression analysis often used by researchers to the simultaneous entry approach suggested by Hayes (2018). This study used the JN technique in probing and visualising interaction effects against the simple slope method.

As a result, the study found that small business enterprises in the South East Nigeria recognised the elements of EO and environmental hostility and that these elements affect their performance. Firms in South East Nigeria are entrepreneurially oriented, i.e. they innovate, act proactively, and engage in risky ventures. A significant positive relationship exists between firm age, EO, and performance as well. This means that the older a firm gets, the more inclined it is towards entrepreneurship and the better its performance. This finding negates the results of previous works (Palmer *et al.,* 2019; Poudel *et al.,* 2018) that found aged firms become more rigid and formalised with time. This divergence could be contextual, i.e. small firms in South East Nigeria may have learned that the only way to stay afloat is to have EO. However, firm age showed a negative relationship with environmental hostility in our study, which means that uncertainties in the environment negatively impact firm operations. Hostilities like high taxes and the lack of basic amenities like securities and power supply affect older and younger firms. Younger firms suffer while still striving for survival, due to the extra costs for providing their securities and control.

However, our major findings (i.e. results from the simultaneous entry) showed that EO is not related to small firm performance, which contradicts previous studies. This finding negates the assumptions of the RBT that the resources at an individual's disposal would determine their success in the entrepreneurial process. Although some studies discovered the negative EO influence on firm performance, our study found a positive yet insignificant result. By implication, EO is beneficial to the activities of small firms in this region, but it is not particularly important as firms without these postures can still perform well. This result could have possibly arisen from the context in which this study was conducted. The majority of firms in the region imitates other products and hardly innovates or engages in less proactive and risky ventures. Therefore, we conclude that EO does not necessarily have a significant relationship with firm performance in this case.

In the same vein, we discovered that environmental hostility has a significantly negative effect on small firm performance. This agrees with the findings of previous works (e.g. Adomako, 2018; Calantone *et al.,* 1997; Hasan *et al.,* 2015; Lindelof & Lofsten, 2006; Zahra & Garvis, 2000). What this implies is that turbulences like harsh government policies and unhealthy competitions tend to dampen the performance of small firms in our region.

Finally, the interaction effect that environmental hostility creates between EO and performance was positive and significant. The finding confirms the tenets of contingency

theory, that firms operating in uncertain and volatile environments will exhibit different attitudes, behaviours, processes, and competencies, including adjusting their management styles to suit the various situations in the environment. The insignificant EO–performance effect could have been orchestrated by environmental hostility. However, this hostility could have necessitated firms to exhibit different attitudes, behaviours, processes, and competencies, including innovating, acting proactively, and taking calculated risks that resulted in an increase in their performance even in a hostile environment. What this finding means is that as the environment gets hostile, firms are bound to seek survival strategies that involve innovativeness, proactivity, and willingness to engage in risky ventures, which would invariably enhance their performance.

CONCLUSIONS

This study addresses three major gaps: providing the Nigerian perspective in the EO-performance literature, linking EO to a theory, i.e. the RBT and – then – adopting a new methodology of testing for an interaction effect in the EO-performance effect. EO involves a firm's proclivity towards innovating, proactivity against competitors, and willingness to engage in risky ventures to maximise profitability and – ultimately – performance. Firms with such a high proclivity perform better than firms that have low proclivity or none. We believed that this obtains among small business enterprises in South East Nigeria and that the environment in which these businesses operate influences how EO affects their performance.

In line with the aims and framework set for this study, several theoretical contributions have been realised from the findings. The study aimed at determining the relationship of EO on the performance of small firms in Nigeria and to enquire how a hostile environment will likely moderate this EO-performance relationship in small firms in South East Nigeria. These arguments were built on theories like the RBT and the contingency theory. The RBV explains that distinctive resources like EO give a firm a competitive edge against its competition. From this argument, we followed previous studies to predict that firm resources (EO) would significantly and positively increase its performance. However, contrary to a priori expectations, this theory did not support the hypothesis that EO necessarily increases firm performance. The contingency theory on the other hand, suggests that certain normative, political and cognitive factors within the business environment would influence a firm's entrepreneurial dispositions, and such influences could increase firms' performance. We discovered that these factors further increased the EO-performance relationship. This means that environmental hostility strengthens firm EO prowess, which in turn increases their performance. Therefore, environmental hostility positively moderates EO and performance.

Our findings have implications for the management of small firms. Firstly, since the EO-performance relationship was not supported, it means that other factors like imitation, reactiveness, or social-cultural issues play underlying motivations that help firms maintain or improve their performance. Therefore, it lies on the owners/managers of these small firms to identify and strengthen the firms as they will help them to maintain or improve their performance. Moreover, since our findings indicated that certain environmental factors improve the EO-performance relationship, owners/managers will

have to devise a means to improve on their EO dispositions as this will help them to survive hostilities within their business environments.

The scope of this study serves as a limitation to the study, given that the study was only conducted on small firms in South East Nigeria. Hence, it may be difficult to generalise the findings of this study because they are the only representative of five out of 36 states in Nigeria. Furthermore, the findings represent a section of the four different categories of businesses in Nigeria. With these limitations in mind, we suggest that future studies should engage in enlarging this scope to include medium-sized and large scale business firms within this region and even beyond.

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Acknowledgements and Financial Disclosure

We thank the reviewers and the editorial team for their work. We also acknowledge Dr Okwo Henry Uchenna, Dr Ofoegbu Grace Nyereugwu, and Okolie Ugochukwu Chinonso, for their suggestions and advice during our work. We did not receive any financial support for this study.

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Ministry of Science and Higher Education
Republic of Poland

The copyediting and proofreading of articles in English is financed in the framework of contract No. 913/P-DUN/2019 by the Ministry of Science and Higher Education of the Republic of Poland committed to activities aimed at science promotion.

Entrepreneurial Business and Economics Review

2020, Vol. 8, No. 4

10.15678/EBER.2020.080405

Organizational capabilities mediates between organizational culture, entrepreneurial orientation, and organizational performance of SMEs in Pakistan

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ABSTRACT

Objective: Our purpose was to determine the mediating role of organizational capabilities between organizational culture, entrepreneurial orientation, and organizational performance of small and medium-sized enterprises (SMEs) in Pakistan.

Research Design & Methods: A total of 384 questionnaires were used for analysis using SmartPLS 3.0. Partial least square structural equation modelling was used for hypotheses testing. The area cluster sampling technique was used for data collection.

Findings: Organizational culture and entrepreneurial orientation are positively associated with organizational capabilities that lead to organizational performance. Organizational capabilities significantly mediate between organizational culture, entrepreneurial orientation, and organizational performance.

Implications & Recommendations: Future researchers can use business strategy, market orientation, leadership, and knowledge management to determine organizational performance. Corporate governance and market orientation can use the mediating or moderating effect between entrepreneurial orientation, organizational culture, knowledge management, and organizational performance.

Contribution & Value Added: We used organizational capabilities with entrepreneurial orientation and organizational culture to measure organizational performance using resource-based view (RVB).

Article type: research article

Keywords: organizational culture; entrepreneurial orientation; organizational capabilities; organizational performance; small and medium enterprises

JEL codes: L26

Received: 19 March 2020 | Revised: 9 August 2020 | Accepted: 20 August 2020

Suggested citation:

Bhatt, A., Rehman, S.U., & Rumman, J.B.A. (2020). Organizational Capabilities Mediates between Organizational Culture, Entrepreneurial Orientation, and Organizational Performance of SMEs in Pakistan. *Entrepreneurial Business and Economics Review,* 8(4), 85-103. https://doi.org/10.15678/EBER.2020.080405

INTRODUCTION

The textile sector faces issues regarding entrepreneurial orientation (EO), organizational culture, and organizational capabilities that influence business performance. In a previous study, researchers found that small and medium-sized enterprises' (SMEs') long-range endurance depends on their capability to deliberately plan business operations (Lyon, Lumpkin, & Dess, 2000) and this process involves a long-range plan regarding their products, competitors, operations, and employees. Prior literature refers to this as entrepreneurial orientation. Researchers have paid considerable attention to entrepreneurial orientation over the last few years (Boukis, Gounaris, & Lings, 2017) to increase the performance of SMEs. To respond to this research question, some critical factors for the performance of SMEs have been identified. Entrepreneurial orientation is a significant factor for measuring business performance (Real, Roldán, & Leal, 2014). A recent study concluded that entrepreneurial orientation and organizational capabilities play an important role in examining business performance (Monteiro, Soares, & Rua, 2017). Prior literature regarding entrepreneurial orientation demonstrated that entrepreneurial orientation is significant for the survival and performance of organizations (Hughes & Morgan, 2007; Lumpkin & Dess, 2001). The connection between dimensions of entrepreneurial orientation and business performance is inconclusive and needs to be studied further. For example, entrepreneurial orientation was found to enhance business performance in one study (Covin & Lumpkin, 2011), but reduced business performance in another (Rauch, Wiklund, Lumpkin, & Frese, 2009). Here, we measured entrepreneurial orientation from the following three dimensions: pro-activeness, innovativeness, and risk-taking.

Organizational culture is considered the most significant determinant for any type of organization and a vital determinant of firm success (Rehman, Mohamed, & Ayoup, 2019a). Organizational culture plays an important role in an organization's survival in the market (Rehman *et al.*, 2019). Despite this, organizational culture (hierarchy, clan, adhocracy, market culture, and hierarchy culture) does not predict organizational performance (Yesil & Kaya, 2013). In addition, the relationship between dimensions of organizational culture and performance is inconclusive and needs to be studied further. In this study, we examined organizational culture from three dimensions: supportive culture, innovative culture, and bureaucratic culture. Our aim was to determine the application of organizational culture, entrepreneurial orientation, and organizational capabilities in the Pakistan textile industry. We also provided exposure to general managers to the execution of organizational culture, entrepreneurial orientation, and organizational capabilities in specific organizations. Therefore, the current research was directed by the following objectives:

1. To examine the relationship between entrepreneurial orientation and organizational capabilities;
2. To examine the relationship between organizational culture and organizational capabilities;
3. To determine the mediating role of organizational capabilities between organizational culture, entrepreneurial orientation, and organizational performance; and
4. To examine the relationship between organizational capabilities and organizational performance.

The sector of micro-, small and medium-sized enterprises (SMEs) in Pakistan is considered the backbone of the national economy. Researchers and policymakers have paid considerable attention to SMEs. SMEs provide benefits to the economy in terms of gross domestic product, provide employment opportunities, and enhance the income level of individuals (Bianchi, Glavas, & Mathews, 2017). Research on small-scale businesses is considered a new field, especially in developing countries, despite the significance and dominance of this sector.

This study was conducted in the textile industry of Pakistan for multiple reasons, mainly:

1. The textile industry of Pakistan is the leading exporting and manufacturing industry in Pakistan earning 1446.86 INR or 8.86 billion USD annually (Rehman *et al*., 2019a).
2. This industry is considered the backbone of Pakistan and contributes more than 63% of exports, 8.5% to the gross domestic product, and is the biggest manufacturing industry in Pakistan (Rehman *et al*., 2019a).
3. The textile industry of Pakistan has a market share of less than 1% in the whole world, and there is a large possibility that this industry will grow in the future (Ataullah, Sajid, & Khan, 2014).

In Pakistan, the textile industry faces challenges regarding organizational capabilities (Rehman *et al*., 2019a) and entrepreneurial orientation (Aziz, Hasnain, Awais, Shahzadi, & Afzal, 2017), which influence organizational performance. Hence, we attempted to highlight some factors that influence the organizational performance. Our findings significantly contribute to the research examining the mediating effect of organizational capabilities between entrepreneurial orientation organizational culture and organizational performance. Prior researchers studied organizational capabilities (external stakeholder relations capability, operational capability, and strategic management capability) in large organizations, but is limited in small organizations (Koufteros, Verghese, & Lucianetti, 2014; Rehman *et al*., 2019a); this study covers this gap. In this paper, a resource-based view theoretical model is developed.

LITERATURE REVIEW

Entrepreneurial Orientation and Organizational Capabilities

Entrepreneurial orientation (EO) was initially developed and defined by Miller (1983) as well as Miller and Friesen (1983). Since then, several studies on entrepreneurial orientation across cultures, countries, and industries have been conducted. For instance, entrepreneurial orientation is defined as the process, managerial activity, and practices that are directed to the latest entry (Lumpkin & Dess, 1996). EO is produced from strategy-making choices where latest chances are lucratively employed by determined enactment (Van de Ven & Poole (1995)) and is mainly determined by the vacant chances in the market (Abebe, 2014). Despite this, a new entry can only be accomplished in a situation where some of these indicators are working (Lumpkin & Dess, 1996). Others measured that EO in terms of risk-taking, pro-activeness, and innovativeness (Miller, 1983). Some researchers concluded that entrepreneurial orientation has no dimension and it is a one-dimensional variable (Covin & Wales, 2012). According to Lumpkin and Dess (1996), EO is measured in terms of five dimensions; autonomy, aggressiveness, innovativeness, risk-taking, and pro-

activeness. Other researchers have recommended the same dimensions to measure the construct entrepreneurial orientation (Lee & Lim, 2009; Miller, 1983).

Dimensions of entrepreneurial orientation are interconnected and might differ autonomously (George & Marino, 2011) depending on cultural, environmental, and organizational perspectives in a situation where an organization engages in a new entry (Zhao, Li, Lee, & Bo Chen, 2011). For instance, one study concluded that entrepreneurial orientation is exemplified by cultural variations and the intensity of these variations is very high in the Netherlands and the USA (Kemelgor, 2002). Due to this reason, many researchers use the following three dimensions to measure EO: pro-activeness, risk-taking, and innovativeness (Semrau, Ambos, & Kraus, 2016). In this context, risk-taking refers to the brave move into an unfamiliar business field in the conditions of uncertainty (Lumpkin & Dess, 1996). Innovativeness refers to the level at which an organization encourages fresh thoughts, experiments, originality, and ingenuity that might lead to a new market, process, product, or service (Wang, 2008). Pro-activeness refers to a situation where an organization enters in a new market by taking initiative over their competitor. Hence, EO is considered a significant firm procedure that assists organizations in enhancing business performance (Khalili, Nejadhussein, & Fazel, 2013). Despite this, entrepreneurship does not play a positive role in economic development (Dvoulety *et al*., 2018). The entrepreneurial orientation impact on organizational performance is based on more than national culture and organization size (Rauch *et al*., 2009). Organizational capabilities play a significant role in determining organizational performance (Chang, Liao, & Wu, 2017; Shurafa & Mohamed, 2016). The influence of EO on organizational capabilities could likely enhance business performance. The proposed hypotheses are as follows:

H1: Entrepreneurial orientation significantly influences organizational capabilities.

H2: Organizational capabilities significantly mediate the relationship between entrepreneurial orientation and organizational performance.

There have been various empirical studies on entrepreneurial orientation conducted in various regions of the world. Table 1 highlights how two recent studies measuring entrepreneurial orientation, used in this study.

Table 1. Selected studies related to entrepreneurial orientation (EO)

No.	Authors	Year	Country	Sample	EO Measured
1	Głodowska, Maciejewski, and Wach	2019	Poland	355 businesses	Risk-taking, pro-activeness, innovativeness
2	Teles and Schachtebeck	2019	South Africa	342 respondents	Risk-taking, innovation, pro-activeness, autonomy

Source: own study based on (Głodowska, Maciejewski, & Wach, 2019; Teles & Schachtebeck, 2019).

Organizational Culture and Organizational Capabilities

Organizational culture includes norms, values, and beliefs that are shared between organization employees to help perform their duties as a social collective unit. The literature shows that some researchers measured culture in terms of the personality of an organization (Balkaran, 1995), whereas others measure organizational culture in terms of purpose, spirit, and foundation (Gutknect & Miller, 1990). Organizational culture has various dimen-

sions as well as variations, including innovative culture, bureaucratic culture, and supportive culture (Wallach, 1983). Ernest Chang and Lin (2007) measured organizational culture in terms of effectiveness, cooperativeness, consistency, and innovativeness.

In this research, we adopted three dimensions of organizational culture: innovative, supportive, and bureaucratic, as presented by Wallach (1983). Innovative culture is also known as an exciting and dynamic culture. Entrepreneurial and determined persons succeed in circumstances that provide a stable and creative work place, filled with risks and challenges. Employees compatible in an innovative organization enjoy working in risky and challenging situations. Employees that have creative minds, take risks regularly, and are result-oriented accept this culture. Bureaucratic culture means hierarchical as well as compartmentalized culture. In this culture, employees receive clear tasks and authority is known, and the employees are expected to work in an organized and systematic way. Bureaucratic culture is hierarchical, structured, and suitable for the organization with a higher portion of a stable market. Supportive culture refers to a comfortable place for doing a job. In this culture, the employees are friendly, fair, and helpful to others while working in an open and pleasant setting. Innovative culture, supportive culture, and bureaucratic culture influence organizational performance (Kuo & Tsai, 2017). Predictors other than organizational culture influence organizational performance, e.g., organizational capabilities (Shurafa & Mohamed, 2016). Organizational culture is the most significant factor in examining organizational capabilities and performance (Mania, 2016). We, therefore, hypothesized the following:

H3: Organizational culture significantly influence organizational capabilities.

H4: Organizational capabilities significantly mediate the relationship between organizational culture and organizational performance.

Organizational Capabilities and Organizational Performance

Organizational capabilities refer to an organization's ability to organize its tangible and intangible resources to execute an activity to improve its performance. According to Barney (1991), organizational resources have some characteristics such as being unique, rare, valuable, and non-substitutable, leading to the achievement of competitive advantage. Organizations need distinctive and/or unique capabilities to obtain an advantage over their competitors (Wernerfelt, 1984). Koufteros *et al*. (2014) used organizational capabilities in their studies and measured organizational capabilities in terms of external stakeholder relations capability, strategic management capability, and operational capability. Strategic management capabilities refer to the capacity of the organization to manage its internal and external resources that have been acquired intentionally for the fulfillment of organizational objectives. Operational capabilities refer to the mixture of difficult tasks performed by an enterprise to increase results from using technology efficiently, production capabilities, and the flow of materials (Dutta, Narasimhan, & Rajiv, 1999). External stakeholder relations capabilities refer to the organized relationship with organizations' external stakeholders like suppliers, customers, and government organizations to improve organizational performance. Organizational capabilities are considered a significant indicator in determining organizational performance (Shurafa & Mohamed, 2016). Figure 1 shows the theoretical framework of the study. We, therefore, hypothesized the following:

H5: Organizational capabilities have a positive and significant influence on organizational performance.

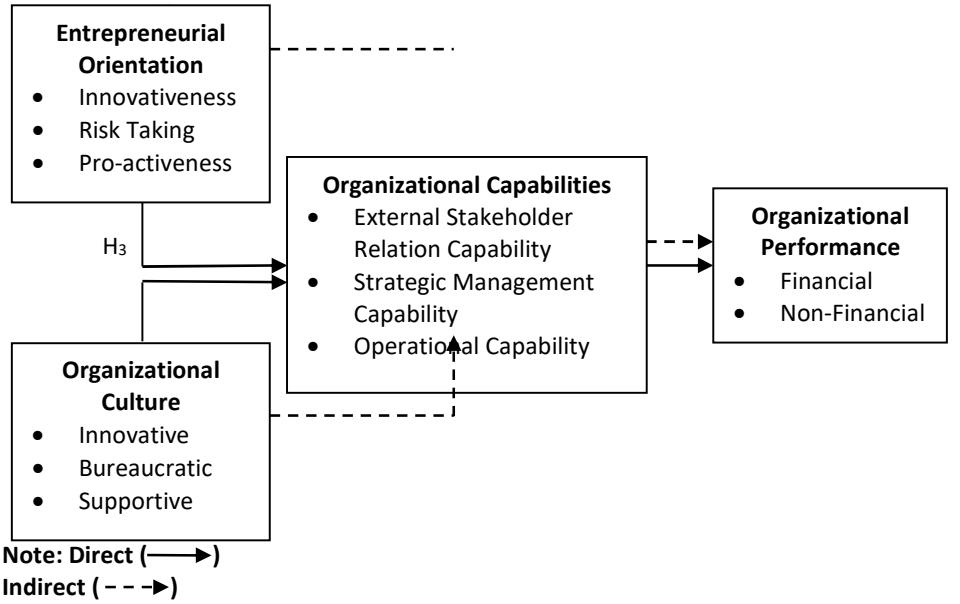

Figure 1. Theoretical framework
Source: own elaboration.

RESEARCH METHODOLOGY

Scales and Items

Entrepreneurial orientation was determined using pro-activeness, risk-taking, and innovativeness, and items were adapted from previous studies (Covin & Slevin, 1989; Chang, Lin, Chang, & Chen, 2007; Hughes & Morgan, 2007). Organizational culture was determined using innovative culture, bureaucratic culture, and supportive culture, and items were adapted from Wallach (1983). Organizational capabilities were determined using external stakeholder relations capability, strategic management capability, and operational capability, and were adapted from Koufteros *et al*. (2014). The organizational performance was determined using financial performance and non-financial performance, and items were adapted from Henri (2006), Teeratansirikool, Siengthai, Badir, and Charoenngam (2013). The questionnaire used in this study (Appendix 1) included two main parts: the first part consisted of 6 questions related to the demographics of respondents; the second part consisted of 66 items of organizational culture, entrepreneurial orientation, organizational capabilities, and organizational performance. Every item was measured using a 5-point Likert scale (1 for strongly disagree, 5 for strongly agree). There are several advantages of the 5-point Likert scale (Rehman, Bhatti, & Chaudhry, 2019b): frustration level among respondents is reduced, respondents fill out the questionnaire with honesty and devotion, and respondents feel more at ease and comfortable using a 5-point Likert scale.

Data Collection

We collected data from a structured questionnaire that was adopted from prior research in the area of organizational culture, entrepreneurial orientation, organizational capabilities, and organizational performance. Questionnaires were distributed personally among textile industry managers/owners of small- and medium-scale textile units. When managers/owners did not want personal visits, data were collected through mail-delivered questionnaires. A common method bias was used because data were collected from a single source. For this purpose, Harman's single factor was used and results revealed that the single factor accounted for 47.023% of the total variance. The value is less than 50%; therefore, there was no issue of a common bias method in the data.

Population and Sampling

These data were collected from small textile industries (weaving, woven, and finishing) performing business in Pakistan. A total of 3500 small units in Pakistan were used (Economic Survey of Pakistan 2017-18). We used area cluster sampling for data collection because textile units are situated in a wide area in Pakistan. Formation of clusters was based on provinces in Pakistan. There are five provinces in Pakistan: Punjab, Baluchistan, Khyber Pakhtunkhwa, Sindh, and Gilgit-Baltistan. Two clusters were chosen for data collection because most of the textile units are located in Punjab and Sindh. After choosing the specific clusters, the next step was to randomly select respondents to fill out questionnaires from each cluster. Area cluster sampling was used as it minimizes data collection cost, is a suitable technique in cases where the population is spread in a wider area, and covers the maximum population (Sekaran & Bougie, 2006). This technique was more appropriate in the current research because the population spread was in a wider area.

Sample Size

Roscoe (1975) stated that as a rule of thumb, there should be a minimum of 30 and a maximum of 500 respondents required for a good sample size and more than this range will give better results. Respondents were managers/owners that had a high rank in the organization and had a knowledge of the study variables. These respondents were well-educated and fill out the questionnaires giving expected results. A total of 346 units were selected (Krejcie & Morgan, 1970). According to Salkind and Rainwater (2003), increasing the sample size by at least 40% is necessary to achieve a better response rate. We increased the sample size by 50% to get a better response rate, and therefore distributed 525 questionnaires. Of the total, 410 were completed and returned, out of which 26 had misleading values; therefore, only 384 questionnaires were used for the final analysis. This study meets the above-mentioned rule of thumb for sample selection. Five major cities were selected for data collection: four in Punjab (Faisalabad, Multan, Lahore, and Gujranwala) and one in Sindh (Karachi). In Sindh, most of the textile units are in located in Karachi. In Punjab, four cities were selected because majority of the textile units are spread out in these cities. All respondents represented the textile industry. The data were collected between June and August 2019. Table 2 represents the organization profile of the respondents. The organizations had 100 to 1000 employees.

Table 2. The profile of respondents

Construct	Category	Number of cases	%age
Position	Managers	129	33.60
	Owners	255	66.40
Qualification	Diploma	11	2.86
	Bachelor Degree	57	14.84
	Master Degree	238	61.97
	M. Phil.	59	15.36
	Others	19	4.95
Field of study	Accounting	89	23.17
	Business Administration	111	28.91
	Finance	119	30.99
	Others	51	13.28
		14	3.65
Experience	Less than 6 years	98	25.52
	6-11 years	149	38.80
	12-16 years	107	27.86
	17-21 years	14	3.64
	More than 21 years	16	6.17
Number of employees	100-300	92	23.96
	301-700	193	50.26
	701-1000	71	18.49
	More than 1000	28	7.29
Average annual revenue	Less or equal to 100	103	26.82
	101-300	184	47.92
	301-600	67	17.44
	More than 600	30	7.81
Location	Multan	26	6.77
	Gujranwala	18	4.68
	Lahore	65	16.92
	Faisalabad	128	33.33
	Karachi	110	28.64
	Others	37	9.64

Source: own study.

Data Analysis

In this study, SmartPLS 3.0 was used to determine the theoretical model because this is one of the recommended growing second-generation techniques. Partial least square structural equation modeling (PLS-SEM) was used to test the hypotheses. To determine the significant values of factor loadings and path coefficients, a bootstrapping of 5000 subsamples was run. SmartPLS has some of benefits over other techniques such as there is no need to conduct a normality test and multicollinearity. This technique is better for estimation as compared to regression, and it is appropriate for both complex and simple theoretical models. In PLS-SEM, researchers estimate two models—measurement and structural models. Here, we used convergent validity and discriminant validity to measure the measurement model.

Three things must be calculated to measure convergent validity: factor loadings, composite reliability (CR), and average variance extracted (AVE). As Table 3 shows, factor loadings, AVE, CR, and Cronbach's α were above the standardized value. Figure 2 shows that we have conceptualized entrepreneurial orientation, organizational culture, and organizational capabilities as second-order variables. We used the repeated indicator approach, as recommended in the literature, in the PLS to model the second-order indicators during analysis (Hair, Hult, Ringle, & Sarstedt, 2013). Factor loadings and AVE values should be above the standardized value (0.50) and CR value should be at least 0.70 (Hair *et al*., 2013). As suggested by Bhatti and Rehman (2019), there is a need to delete all items that have factor loadings below 0.50 to obtain better results of AVE and CR. Table 3 shows items that had factor loadings more than 0.50. This action helped to establish a sound theoretical model. Cronbach's α must be at least 0.60, as suggested by (Nunnally, 1978). Table 3 highlights that the Cronbach's α of all variables was more than the standardized value.

Discriminant validity is determined by comparing the diagonal above values with the below values as mentioned in Table 4 (Fornell & Larcker, 1981). It refers to the level that items are distinguished amongst variables. Discriminant validity is found by comparing AVE square root values with the correlations or by AVE with squared correlation. In this study, we first compared the AVE square root with correlation, as shown in Table 4. According to Fornell and Larcker (1981), AVE square root values in the diagonals must be higher than other values in the same column and row of that specific variable. Table 4 shows these calculations met the discriminant validity criterion.

Table 3. Convergent validity

First-Order Constructs	Second-Order Construct	Items	Factor Loading	AVE	CR	α
Innovativeness		INV1 INV2	0.900 0.852	0.768	0.869	0.700
Risk Taking		RT1 RT2 RT4	0.887 0.898 0.638	0.667	0.854	0.734
Pro-activeness		PRA2 PRA4	0.913 0.885	0.809	0.894	0.764
	Entrepreneurial Orientation	Innovativeness Risk Taking Pro-activeness	0.852 0.917 0.765	0.717	0.883	0.852
Innovative Culture		INVCUL1 INVCUL3 INVCUL4 INVCUL5 INVCUL6	0.701 0.783 0.782 0.752 0.703	0.555	0.862	0.800
Bureaucratic Culture		BURCUL1 BURCUL2 BURCUL3 BURCUL4 BURCUL5	0.706 0.829 0.800 0.758 0.763	0.596	0.880	0.830

First-Order Constructs	Second-Order Construct	Items	Factor Loading	AVE	CR	α
Supportive Culture		SUPCUL1 SUPCUL2 SUPCUL3 SUPCUL4	0.882 0.877 0.787 0.868	0.730	0.915	0.759
	Organizational Culture	Innovative Culture Bureaucratic Culture Supportive Culture	0.901 0.922 0.933	0.844	0.942	0.906
External Stakeholder Relations Capability		ESCR1 ESCR2 ESCR3 ESCR4	0.830 0.855 0.710 0.695	0.602	0.857	0.790
Strategic Management Capability		SMC1 SMC2 SMC3	0.873 0.884 0.830	0.744	0.897	0.827
Operational Capability		OPC1 OPC3 OPC4	0.881 0.924 0.889	0.807	0.926	0.880
	Organizational capabilities	External Stakeholder Relations Capability Strategic Management Capability Operational Capability	0.798 0.798 0.871	0.677	0.862	0.870
Organizational Performance		OP2 OP4 OP5 OP6 OP7	0.712 0.823 0.714 0.803 0.720	0.572	0.869	0.816

Notes: CR – composite reliability, AVE –average variance extracted
Source: own study.

Table 4. Discriminant validity

Variables	EO	OCUL	OCAP	OP
EO	**0.847**			
OCUL	0.278	**0.919**		
OCAP	0.198	0.521	**0.822**	
OP	0.242	0.122	0.316	**0.756**

Notes: EO – entrepreneurial orientation; OCUL – organizational culture; OCAP – organizational capabilities; OP – organizational performance
Source: own elaboration.

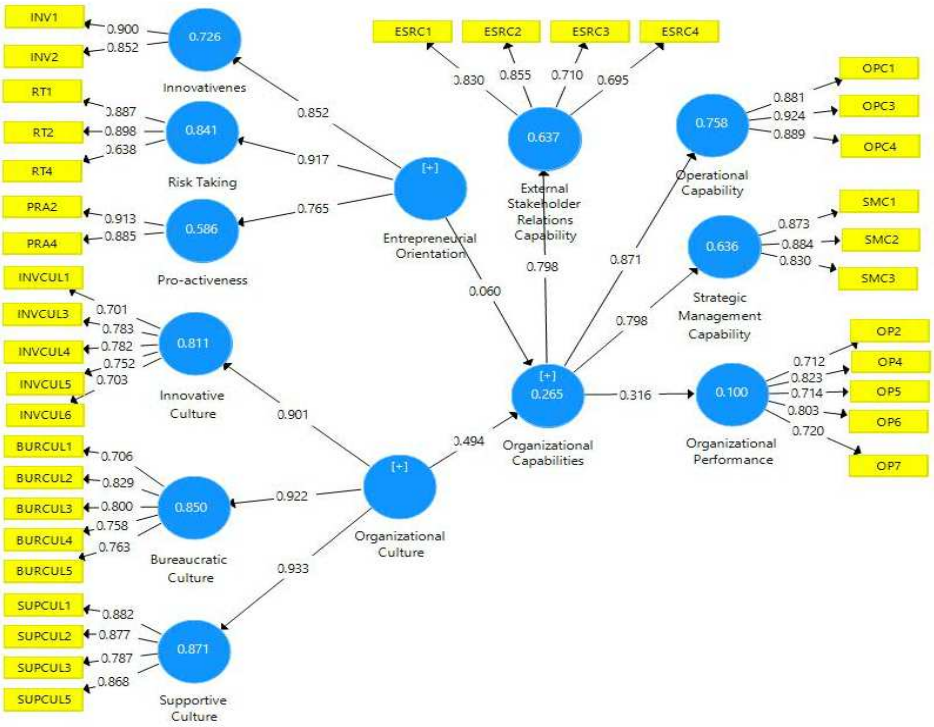

Figure 2. Measurement model
Source: own elaboration.

RESULTS AND DISCUSSION

We used a PLS algorithm and bootstrapping technique to run a structural model. Table 5 demonstrates that entrepreneurial orientation has a positive and significant influence on organizational capabilities (β = 0.060, *t*-value = 1.416, and *p*-value < 0.10), which supports H1. Entrepreneurial orientation is therefore considered a good predictor of organizational capabilities and enhances organizational capabilities. In addition, organizational culture significantly influences organizational capabilities (β = 0.494, t-value = 9.657, and *p*-value < 0.01), which supports H3. Organizational culture is deemed a significant predictor of organizational capabilities and strongly enhances organizational capabilities. Organizational capabilities are significantly related to organizational performance (β = 0.316, t-value = 6.576, and *p*-value < 0.01), which supports H5. Next, we determined the mediating influence of organizational capabilities between organizational culture, entrepreneurial orientation, and organizational performance. In this study, a bootstrapping technique was used to test the mediating effect, as recommended in the literature, and findings revealed that organizational capabilities significantly mediate between entrepreneurial orientation and organizational performance (β

= 0.053, t-value = 1.460, and *p*-value < 0.10), which supports H2. Organizational capabilities significantly mediate between organizational culture and organizational performance (β = 0.156, t-value = 5.817, and *p*-value < 0.01), which supports H4.

Entrepreneurial orientation was found to significantly influence organizational capabilities. This significant relationship demonstrates that the textile industry in Pakistan is using entrepreneurial orientation to measure organizational capabilities. The results are similar with the prior studies that reported that entrepreneurial orientation helps to determine dynamic capabilities (Monteiro *et al*., 2017). Organizational culture has a significant influence on organizational capabilities. This significant relationship demonstrates that the textile industry in Pakistan is using innovative culture, bureaucratic culture, and innovative culture in determining organizational capabilities. The outcomes are consistent with the outcomes of prior studies of organizational culture (innovative culture and collaborative culture) and organizational capabilities (product, process, market, and strategic innovation) (Chang, Liao, & Wu, 2017). Organizational capabilities have a significant influence on organizational performance. The findings are similar with the work of Shurafa and Mohamed (2016). Organizational capabilities have a significant mediating effect between entrepreneurial orientation, organizational culture, and organizational performance.

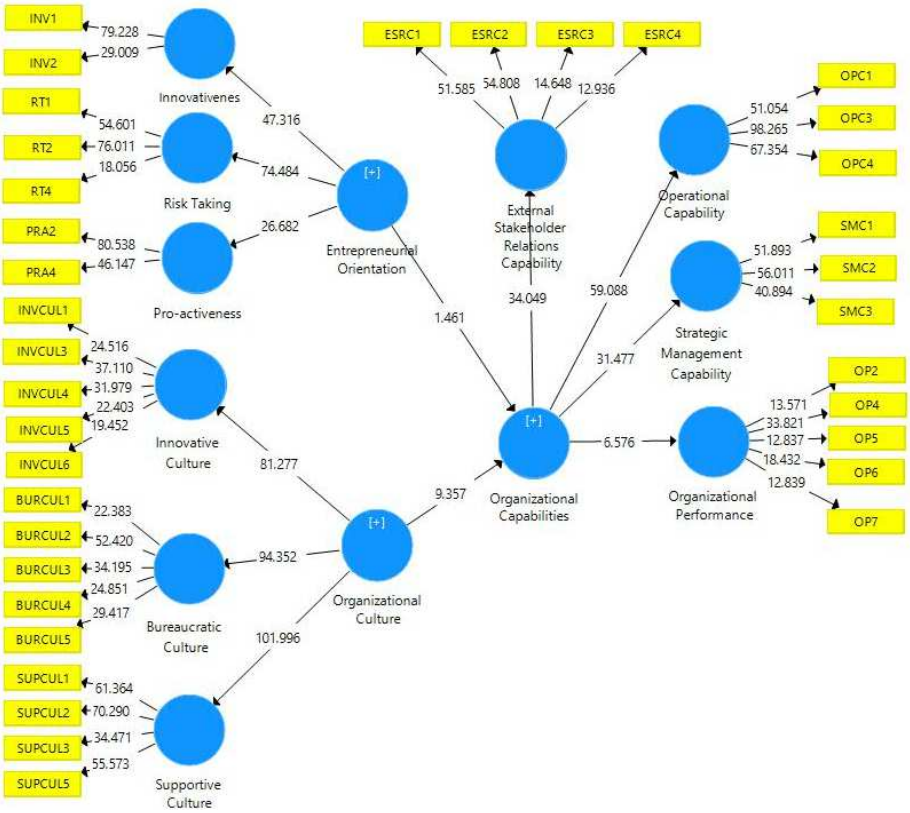

Figure 3. Structural model
Source: own elaboration.

Table 5. Direct relationships

Hypotheses	Paths	B-value	t-value	*p*-value	Results
H1	EO → OCAP	0.060	1.461	0.072	Supported
H2	EO → OCAP → OP	0.053	1.460	0.071	Supported
H3	OCUL → OCAP	0.494	9.357	0.000	Supported
H4	OCUL → OCAP → OP	0.156	5.817	0.000	Supported
H5	OCAP → OP	0.316	6.576	0.000	Supported

Notes: EO – entrepreneurial orientation; OCUL – organizational culture; OCAP – organizational capabilities; OP – organizational performance.
Source: own study.

CONCLUSIONS

The results of this study revealed that resource-based view (RBV) theory supports our theoretical model. In this study, organizational culture and entrepreneurial orientation were used as organizational resources. As RBV theory states, the organizational capabilities explain the relationship between resources and organizational performance. Thus, entrepreneurial orientation, organizational culture, and organizational capabilities enhance organizational performance.

Practical Implications

The outcomes of the current research have numerous practical contributions for managers/owners in the textile industry in Pakistan. The findings revealed that entrepreneurial orientation, organizational culture, and organizational capabilities play a significant role in determining organizational performance. For instance, organizational culture has a significant influence on organizational capabilities (mediator), which enhances organizational performance. This research suggests that managers/owners of the textile industry should focus on organizational culture (innovative culture, bureaucratic culture, and supportive culture) because organizational culture plays a significant role in enhancing organizational capabilities and organizational performance (Chang, Liao, & Wu, 2017; Shurafa & Mohamed, 2016). Cultural issues will result in decreasing if an organization ignores organizational culture. Hence, the findings of this study are useful for management in the Pakistan SMEs. We recommend that managers/owners pay attention to entrepreneurial orientation (innovativeness, risk-taking, and pro-activeness) because it plays a significant role in improving organizational capabilities and organizational performance (Monteiro *et al*., 2017). The findings of current research guide SME owners to work on entrepreneurial orientation because it is a significant factor that enhances organizational performance. Organizations that ignore entrepreneurial orientation face more issues regarding performance than organizations that focus on entrepreneurial orientation. According to the resource-based view (RBV) by Barney (1991), organizational capabilities significantly enhance the relationship between organization resources and organizational performance. In the current research, we used two organizational resources: entrepreneurial orientation and organizational culture.

Limitations and Suggestions

A limitations of the current study is that out of the 525 questionnaires, only 384 questionnaires could be used for analysis. There is a need to increase this sample size. We focused here on the textile industry of Pakistan. Even though the outcomes significantly contribute to the literature, the results of this research cannot be generalized to other areas. Further studies are needed on this theoretical model in the manufacturing sector to generalize the results. Furthermore, this model should be studied in both developed and developing countries despite the RBV theory and some other theories that support the theoretical framework. In addition, we used only entrepreneurial orientation and organizational culture; in future research, we could increase the independent variables to include business strategy, market orientation, leadership, and knowledge management to determine organizational performance. In the future, corporate governance and market orientation can be used as a mediating and moderating effect between entrepreneurial orientation, organizational culture, business strategy, market orientation, leadership, knowledge management, and organizational performance.

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Appendix A: Table Scale Items

Entrepreneurial Orientation (Chang *et al*., 2007; Covin & Slevin, 1989; Hughes & Morgan, 2007)

Innovativeness

1. In my firm, many new product lines or services have been marketed.
2. In my firm, changes in product or service lines have been mostly quite dramatic.
3. In my firm, there is a long-term commitment to invest in new technology, R&D, and continuous improvement.
4. My firm actively introduces improvements and innovations.
5. My firm is creative in its methods of operation.
6. My firm seeks out new ways to do things.

Risk Taking

1. My firm invests in high risk projects (with chances of very high return).
2. My firm adopts bold, wide-ranging acts necessary to achieve the firm's objectives.
3. My firm commits a large portion of its resources in order to grow.
4. My firm invests in major projects through heavy borrowing.
5. In my firm, people in our business are encouraged to take calculated risks with new ideas.
6. My firm emphasizes both exploration and experimentation for opportunities.

Pro-activeness

1. My firm typically initiates action which the competition then responds to.
2. My firm is very often the first business to introduce new products/services, administrative techniques, operating technologies, etc.
3. My firm is closely monitoring technological trends and identifying future needs of customers.
4. My firm excels at identifying opportunities.

Organizational Culture (Wallach, 1983)

My organizations culture is…

Innovative Culture	Bureaucratic Culture	Supportive Culture
1. Challenging	1. Procedural	1. Safe
2. Creative	2. Ordered	2. Trusting
3. Enterprising	3. Regulated	3. Encouraging
4. Stimulating	4. Structured	4. Collaborative
5. Driving	5. Hierarchical	5. Relationship-oriented
6. Risk taking	6. Established, solid	6. Sociable
7. Result-oriented	7. Cautious	7. Personal freedom
8. Pressurized	8. Power-oriented	8. Equitable

Organizational Capabilities (Koufteros *et al*., 2014)

External Stakeholder Relations Capability

The ability to create a good relationship to external stakeholders improves…

1. Overall company leadership in the market.
2. Our relationship with suppliers.
3. Our relationship with customers.
4. Our relationship with regulators or government institutions.

Strategic Management Capability
Top management are capable…
1. To support the achievement of key strategic objectives.
2. To improve the prioritization of actions, projects, and objectives.
3. To give feedback related to company strategy and its strategic direction.
4. To give feedback on operational processes.
5. To improve the alignment of strategy and operations.
6. To enhance negotiation of capital expenditure, budget allocation, and financial support to projects.

Operational Capability
Managers are capable of…
1. Increasing the innovation of working practices.
2. Enhancing the development of integrated solutions.
3. Promoting operational improvements.
4. Increasing productivity.
5. Improving employee performance in their operations.

Organizational Performance
Financial Performance (Henri, 2006)
In my organization…
1. Profits increase.
2. Sales volumes increase.
3. Return on investments increase.

Non-financial performance (Teeratansirikool *et al*., 2013)
In my organization…
1. The number of new products increases.
2. Market share increases significantly.
3. Market development increases significantly.
4. Quality of product/services of organization increases.
5. Employee commitment or loyalty to the organization increases.
6. Employee productivity increases.
7. Personnel development increases.
8. Employee job satisfaction increases.

Ministry of Science and Higher Education
Republic of Poland

The copyediting and proofreading of articles in English is financed in the framework of contract No. 913/P-DUN/2019 by the Ministry of Science and Higher Education of the Republic of Poland committed to activities aimed at science promotion.

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The contribution of the co-authors was equal: Anam Bhatti (33,33%) prepared the literature review and data collection, Shafique Ur Rehman (33,33%) prepared the introduction and statistical calculations. Jumana Basheer Abu Rumman (33,33%) prepared discussion and conclusion, theoretical and practical implication.

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Acknowledgements and Financial Disclosure

Availability of data and material: Primary data were collected from respondents. The dataset used and analyzed during this study is available from the corresponding author upon reasonable request.

Funding: The authors received no funding for the design of the study, data collection, analysis, and interpretation of data or the writing of the manuscript.

Acknowledgements: We would like to thank Associate Professor Dr. Che Zuriana Muhammad Jamil, Associate Professor Dr. Rapiah Mohamed, and Dr. Hazeline Ayoup for their help in ensuring the quality of this research.

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Entrepreneurial Business and Economics Review

2020, Vol. 8, No. 4

10.15678/EBER.2020.080406

The effect of knowledge management on competitive advantage and business performance: A study of silver craft SMEs

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ABSTRACT

Objective: The objective of this article is to analyse the effect of knowledge management on the performance of silver craft SMEs through competitive advantage as a mediator. This study also explores the dimensions and indicators of each latent variable: knowledge management, competitive advantage, and business performance.

Research Design & Methods: This research uses quantitative methods with SEM-PLS analysis techniques. The population in this study is silver craft SMEs in Indonesia, with 146 silver craft SMEs as a sample. Data was collected by questionnaires and FGD.

Findings: This study found that knowledge management has no direct significant effect on business performance but – through competitive advantage – the effect of knowledge management on business performance of silver craft SMEs is positive and significant.

Implications & Recommendations: The outcomes show that knowledge management ought to be connected to form items with competitive points of interest so that it can help to execute silver craft SMEs trade. The expected knowledge management is to incorporate knowledge acquisition, knowledge sharing, and knowledge application.

Contribution & Value Added: This research surveys commerce execution not from a budgetary perspective but from a non-financial perspective. Research on knowledge management within the SMEs division is still uncommon.

Article type: research article

Keywords: business performance; competitive advantage; knowledge management; SEM analysis; SMEs

JEL codes: L25, L26, L61, M21, M31

Received: 13 April 2020 Revised: 23 August 2020 Accepted: 3 September 2020

Suggested citation:

Wijaya, P.Y., & Suasih, N.N.R. (2020). The Effect of Knowledge Management on Competitive Advantage and Business Performance: A Study of Silver Craft SMEs. *Entrepreneurial Business and Economics Review,* 8(4), 105-121. https://doi.org/10.15678/EBER.2020.080406

INTRODUCTION

Small and medium enterprises (SMEs) play an imperative part in supporting a country's financial development, both in developed and developing countries: New Zealand, India, Sri Lanka, China, Malaysia, Indonesia (Apak & Atay, 2014; Darroch, 2005; Ha, Lo, & Wang, 2016; Huang & Li, 2009; Kumarawadu, 2009; Kuncoro & Suriani, 2018; Meutia & Ismail, 2013; Budhi, Lestari, Suasih, & Wijaya, 2020). SMEs have the advantage of being able to absorb large numbers of workers while using relatively large local resources, as a chain for distributing development results and supporting various types of industrial sectors (Tan, Mavondo, & Worthington, 2016). Barriers to the development of SMEs in Indonesia can be grouped into two obstacles, namely external and internal. External barriers include (1) limited access to business financing caused by the high cost of funds and guarantees, (2) high infrastructure costs due to high logistics costs stemming from the poor quality of roads, ports, airports, funding, and legal issues, and (3) inefficient bureaucratic services caused by high levels of corruption and the ratio of civil servants compared to high population. Internal barriers include (1) institutional and human resources, (2) marketing and technology, and (3) intellectual capital (Budhi, Lestari, Suasih, & Wijaya, 2020).

Indonesia is a country with many SMEs which number 64,194 million units of SMEs (Ministry of Cooperation and SMEs of the Republic of Indonesia, 2018). SMEs in creative industries – including crafts – are growing rapidly. Indonesian silver jewellery products are already recognised in the international market putting the country as the world's seventh largest exporter of silver jewellery with a market share of some 5.17%. Most of Indonesian silver jewellery products are exported to Asian and European markets (Directorate General of National Export Development, 2016). The most well-known silver crafting centre in Indonesia is located in Celuk Village, Sukawati District, Gianyar Regency, Bali Province (Directorate General of National Export Development, 2012).

As one of the world tourist destinations Bali can support the existence of SME's crafts. Jewellery craft SME's is one of the five main commodities exported by Bali Province. Most adornments in Bali Province comes from the silver industry. The head of Industry and Trade Office of Bali Province said that the value of Bali silver exports in 2012-2018 experienced a downward trend. The results of initial observations reveal that one of the obstacles is the lack of skills among employees, but also low competitiveness.

As one of the imperative resources of a company organisation, knowledge must be successfully recognised, captured, stored, shared, and connected in the most productive way to attain economical competitive advantage (Kaveh, Bamipur, Far, & Far, 2015; Sarkindaji, 2014). SMEs appear to depend more on the advancement of their inner abilities to bolster advancement (Wijaya, Rahyuda, Yasa, & Sukaatmadja, 2019). Knowledge is seen as the most vital competitive asset. Given the significance of knowledge, business visionaries are motivated to create capacities in overseeing information so that they become more competitive and imaginative (Ha, Lo, & Wang, 2016). Knowledge management is an integrative systematic process used to clearly coordinate organisational activities, identify cognitive needs, transfer, store, share, and apply knowledge related to culture and business strategy (Alrubaiee, Hanandeh, & Ali, 2015; Byukusenge, Munene, & Orobia, 2016). Human resources or knowledge management is a source that can create sustainable competitive advantages (Kamya, Ntayi, & Ahiauzu, 2010; Kaveh Bamipur, Far, & Far, 2015). Experience, intelligence,

and knowledge are intangible factors associated with this source (Madan & Khanka, 2011). Intangible assets in the form of knowledge management owned by business actors are their unique advantages because it is difficult to imitate other business actors. Effective knowledge management enables SMEs to improve their business behaviour.

Knowledge acquisition and sharing impacts competitive advantage. Concern for knowledge plays an important role in increasing competitiveness (Kamya, Ntayi, & Ahiauzu, 2010). Utilising company resource-based expertise and dynamic perspectives are absolutely necessary to create competitiveness (Adams & Lamont, 2003).

A few scholarly investigations state that knowledge management is considered a key figure in business performance since it relates to diverse assets so that it can offer assistance to decision-makers in numerous ways (Alrubaiee, Hanandeh, & Ali, 2015; Carneiro, 2000; Goel & Rich, 1997; Keen, 1991). Knowledge management directly and significantly impacts the performance of both financial and non-financial businesses (Al-Sa'di, Abdallah, & Dahiyat, 2017; Migdadi, Zaid, Yousif, Almestarihi, & Al-Hyari, 2017; Oztekin, Delen, Zaim, Turkyilmaz, & Zaim, 2015; Sarkindaji, Bin Hashim, & Abdullateef, 2014). Knowledge is always needed in business as information to understand the condition of customers, suppliers, employees, competitors, and the entrepreneurial environment in order to achieve competitiveness (Byukusenge, Munene, & Orobia, 2016).

Today, the business faces intense competition among businesspeople and risks easily losing customers. This is because businesspeople do not understand and respond to rapidly changing market trends. The role of knowledge is needed to move to knowledge management practices (Ha, Lo, & Wang, 2016).

Valmohammadi and Ahmadi (2015) found that knowledge management practices did not affect the organisation's business performance, especially seen from the perspective of customers and internal business. Tanriverdi (2005) discovered a frail relationship between a company's monetary execution and its capacity to form, share, coordinate, and utilise knowledge. Byukusenge, Munene, and Orobia (2016) found that knowledge management had a non-significant effect on business performance in business. Knowledge gained from short courses, conferences, exhibitions, qualified staff, and sharing among employees cannot be used directly to generate profits, sales growth, and market share.

The current article places knowledge management as the only exogenous variable, so that its effectiveness on business performance can be known, especially in the creative industries. Creative industries have different characteristics from other industries, in which the former employ creativity that comes from knowledge as the main factor in creating products. Therefore, research on knowledge management is necessary and original.

Research on knowledge management is not very common, but it has recently begun to gain popularity. When compared with previous research, this study tries to map the effects of knowledge management in the creative industry (silver crafts) on competitive advantage and performance. The current study uses financial and non-financial aspects to measure business performance. Abu-Jarad, Yusof, and Nikbin (2010) foreground that an organisation's commerce execution is its capacity to realise its objectives and goals by utilising financial, productive, and viable assets.

The current study aims to explore the factors that influence knowledge management to create competitive advantage and corporate performance in silver industry SMEs in Gianyar Regency, Bali. This study emphasises that the competency development of employers is

good from internal factors, namely knowledge management in enhancing competitive advantage and business performance. By receiving a resource-based view (RBV) as an established hypothesis upheld by Porter Theory (competitive advantage), we propose a system by highlighting key variables that can drive the performance of SMEs. Competitive advantage is the advantage over a competitor by gaining more esteem among customers either at a lower cost or by offering items that give much better benefits.

This research uses quantitative methods with SEM-PLS analysis techniques. The population in this study is silver craft SMEs in Indonesia. We collected data through questionnaire instruments that were tested for validity and reliability through Focus Group Discussion (FGD).

The introduction presented the foundation and targets of our article. The literature review section scrutinises past ideas about the topic of the article. The research method section presents investigation's plan, populace, and tests, but also information collection and methods of analysis. The results and discussion section deliberates the study results, while the conclusion section considers the study limitations and recommendations for future research.

LITERATURE REVIEW

Based on empirical evidence, knowledge management has a positive and significant effect on competitive advantage (Adams & Lamont, 2003; Kamya, Ntayi, & Ahiauzu, 2010; Kaveh, Bamipur, Far, & Far, 2015), while the influence of competitive advantage on business performance is positively and significantly based on research results done by Meutia and Ismail (2013), Mzoughi, Bahri, and Ghachem (2008), and Rahman and Ramli (2014). These empirical results allow us to assume the following research hypotheses:

H1: Knowledge management positively and significantly affects competitive advantage.

Business always needs knowledge as information to understand the condition of customers, suppliers, employees, competitors, and the entrepreneurial environment so that business can remain competitive (Byukusenge, Munene, & Orobia, 2016). Several studies have been conducted on the role of knowledge management on business performance, including those carried out by Al-Sa'di, Abdallah, and Dahiyat (2017), Alrubaiee, Hanandeh, and Ali (2015), and Migdadi, Zaid, Yousif, Almestarihi, and Al-Hyari (2017), who found that knowledge management processes have a positive and significant influence on organisational performance. Previous studies are supported by the discoveries of Sarkindaji, Bin Hashim, and Abdullateef (2014) who clarify that organisations interested in maintaining competitive advantage must create and combine great knowledge management procedures.

These empirical results allow us to assume the following research hypothesis:

H2: Knowledge management positively and significantly affects business performance.

Achieving the position of competitive advantage and improving a company's performance against competitors are the two main objectives of business organisation that the company must try to achieve. Companies that have an advantage in terms of products, price, and quality will certainly be competitive so that their products will be bought by customers. This can increase sales and advertisement, progressing the company's business performance. This condition is supported by several results found by Meutia and Ismail

(2013), Mzoughi, Bahri, and Ghachem (2008), and Rahman and Ramli (2014), who state that competitive advantage can significantly improve business performance.

These empirical results allow us to assume the following research hypothesis:

H3: Competitive advantage positively and significantly affects business performance.

Competitive advantage can explain the mediating relationship of quality on organisational performance (Lakhal, 2009). The use of a quality approach can give organisational competitive advantage in terms of unwavering quality, development, and time-to-market measurements. The higher level of competitive advantage compared to competitors will certainly increase organisational performance. Similar results were stated by Kamboj and Rahman (2017) who explain that competitive advantage can partly mediate between the influence of marketing capabilities on company performance.

These empirical results allow us to assume the following research hypothesis:

H4: Competitive advantage significantly mediates the effect of knowledge management on business performance.

RESEARCH METHODOLOGY

This study uses explanatory research design with a quantitative approach. According to Rahyuda (2016), explanatory research is done by explaining the symptoms caused by the object of research. The research variables studied are quantitative, meaning the types of data are based on quantitative data (Rahyuda, 2016).

This research stage includes the following phases: (1) describing the research gap; (2) setting goals; (3) developing a conceptual framework and hypothesis; (4) determining the research method; (5) arranging and testing the instrument; (6) collecting data; (7) analysing data; (8) interpreting results and test hypotheses; (9) assembling conclusions and recommendations. The process of collecting data uses a perceptual approach to facilitate measurement. In the early stages of the study, we conducted a preliminary study later followed by the distribution of questionnaires based on the literature review. The results of the research were then analysed to test the research hypotheses using quantitative analysis.

Population, Sample, and Data Collection

Gianyar Regency is the centre of silver industry in Bali Province, so this research was conducted on silver craft SMEs in Gianyar Regency. The research subjects were entrepreneurs in small and medium-sized enterprises (SMEs), especially silver handicraftsmen who are currently the leading exporters in Gianyar Regency.

Based on data from the Industry Office of Gianyar Regency, in 2017, there were 235 business units of silver craft SMEs in Indonesia, mostly based in Gianyar Regency. The determination of the number of samples in this study – using the formula of Issac and Michael (the level of significance is 0.05) – allowed us to obtain a total sample of 146 business units of silver craft SMEs in Gianyar Regency. Next, the simple random sampling technique was used, wherein the sample was taken randomly.

Measures

The construction of latent variable constructs of knowledge management, competitive advantage, and business performance is often debated by many researchers. To create a

variable construct, we must study various concepts from previous research and adapt them to the conditions of the research object. This construction is used as the basis for the preparation of a questionnaire which will be the research instrument. Our research instrument has met the validity test criteria with product moment correlation (Pearson corelation) and reliability test with Cronbach's alpha. All of the measures are based on five-point Likert scales. Knowledge management variables are exogenous, while business performance variables are endogenous and competitive advantage variables are mediator variables. In detail, the dimensions and indicators of each variable are presented in Table 1.

Table 1. Operational Definition of Variables

Variable	Dimension	Indicator
Knowledge management (X)	Knowledge acquisition (X1)	– Knowledge from employees (X11) – Training for employees (X12)
	Knowledge sharing (X2)	– Information sharing (X21) – Developing of new ideas (X22)
	Knowledge application (X3)	– Knowledge practical (X31) – Management of knowledge and resources (X32)
(References: Al-Sa'di, Abdallah, & Dahiyat, 2017; Alrubaiee, L, Hanandeh & Ali, 2015; Byukusenge, Munene, & Orobia, 2016; Darroch & Mcnaughton, 2002; Huang & Li, 2009; Kamya, Ntayi, & Ahiauzu, 2010; Kumarawadu, 2008; Migdadi, Zaid, Yousif, Almestarihi, & Al-Hyari, 2017; Obeidat, Al-Suradi, Masa'deh, & Tarhini, 2016; Oztekin, Delen, Zaim, & Turkyilmaz, 2015; Sarkindaji, Bin Hashim, & Abdullateef, 2014; C. L. Wang, Hult, Ketchen, & Ahmed, 2009)		
Competitive advantage (Y)	Efficiency (Y1)	– Cost efficiency (Y11) – Productivity (Y12)
	Product uniqueness (Y2)	– Product shape (Y21) – Product design (Y22)
	Quality (Y3)	– Product quality (Y31) – Product display (Y32)
	Competitive price (Y4)	– Product price (Y41) – Price comparison (Y42)
	Flexibility (Y5)	– Product variants (Y51) – Product adaptation (Y52)
(References: Apak & Atay, 2014; Aziz & Samad, 2016; Chiou, Chan, Lettice, & Chung, 2011; Diab, 2013; Ismail, Rose, Abdullah, Uli, 2010; Kumarawadu, 2009; Kuncoro & Suriani, 2018; Rahman & Ramli, 2014; Sachitra, 2016; Ward, McCreery, Ritzman, & Sharma, 1998; Wijaya, Rahyuda, Yasa, & Sukaatmadja, 2019)		
Business performance (Z)	Financial (Z1)	– Liquidity (Z11) – Rentability (Z12)
	Customer (Z2)	– Number of customers (Z21) – Customer satisfaction (Z22)
	Operational (Z3)	– Product operations (Z31) – Operational management (Z32)
	Learning and growth (Z4)	– Learning for employees (Z41) – Employees satisfaction (Z42)
(References: Al-Sa'di, Abdallah, & Dahiyat, 2017; Alrubaiee, Hanandeh, & Ali, 2015; Byukusenge, Munene, & Orobia, 2016; Ha, Lo, & Wang, 2016; Kamboj & Rahman, 2017; Kipesha, 2013; Kuhl, Cunha, Macaneiro, & Cunha, 2016; Migdadi, Zaid, Yousif, Almestarihi, & Al-Hyari, 2017; Oztekin, Delen, Zaim, Turkyilmaz, & Zaim, 2015; Sarkindaji, Bin Hashim, & Abdullateef, 2014; Tseng & Lee, 2014; Valmohammadi & Ahmadi, 2015; Wang & Wang, 2012; Yousif Al-Hakim & Hassan, 2013; Yusof & Bakar, 2012; Wijaya, Rahyuda, Yasa, Sukaatmadja, 2019)		

Source: own study.

Statistical Methods

Factual investigation in this study comprised of expressive and inferential examination. Graphic investigation was utilised to analyse information by describing collected information (Sugiyono, 2013). Inferential factual examination methods with the examination approach were utilised to test the research hypotheses. Handling information that utilises the way investigation approach with SEM-PLS (Auxiliary Condition Modelling-Partial Slightest Square) arrange corroborative calculate examination (Ghozali, 2012). Agreeing to (Latan & Ghozali, 2012), the assessment of models in PLS was done by evaluating the effects of the estimation, specifically through corroborative calculation of the examination by testing the legitimacy and unwavering quality of idle builds. At that point, we assessed the basic models and tested for centrality to test the impact between builds or factors.

RESULTS AND DISCUSSION

Results of Outer and Inner Model Testing

A demonstration built on a coherent hypothetical premise was created to test the hypotheses. SmartPLS 3.2.8 was utilised for the investigation. The primary step was to survey the unwavering quality and legitimacy of the estimation. Next, a basic demonstration was utilised to test the speculations.

The SEM-PLS investigation procedure was conducted in two stages of investigation, specifically by testing the external demonstration and then by testing the internal demonstration. External testing points to the legitimacy and reliability of pointers in building measurements, but also to measurements in building each variable. Testing the inward demonstrate was to decide the relationship among factors.

Outer model testing

The results of the outer model analysis – as presented in Figure 1 – showed that there are three indicators that were invalid because they had an outer loading smaller than 0.6.

Indicators that did not meet the testing criteria for the outer model were indicators of knowledge and resource management (X32) in the knowledge management variable (X), but also indicators (Z32) and (Z41) in the business performance (Z) variable. Thus, the three indicators were eliminated from the model and the outer model is tested again.

The output of the second phase of the outer model test is shown in Figure 2. Based on the output in Figure 2, we know that all indicators met the validity criteria for the outer model.

Inner Model Testing

The following step is to test the internal demonstration by considering the R-square esteem (R^2) on endogenous factors (trade execution). The effects of information investigation revealed that the R-square esteem was 0.220, which suggests that 22.0% of the variety within the commerce execution of silver craftsmanship SMEs in Gianyar Rule can effect from information administration and competitive advantage. The remaining 78% is clarified by other variables, external to the research model.

Another internal step was to assess the coefficient, as displayed in Figure 3.

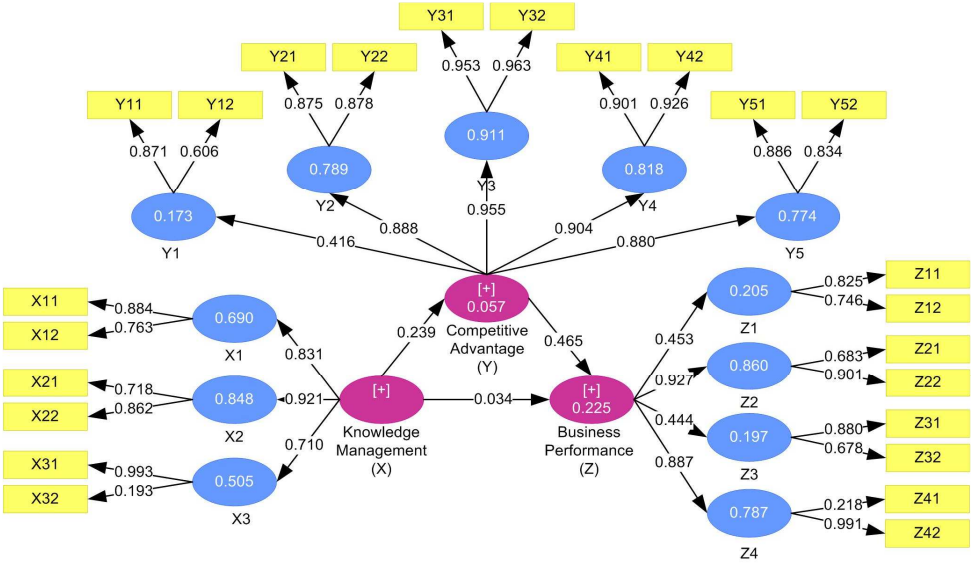

Figure 1. Outer model before elimination the invalid indicators
Source: own elaboration with SmartPLS (2019).

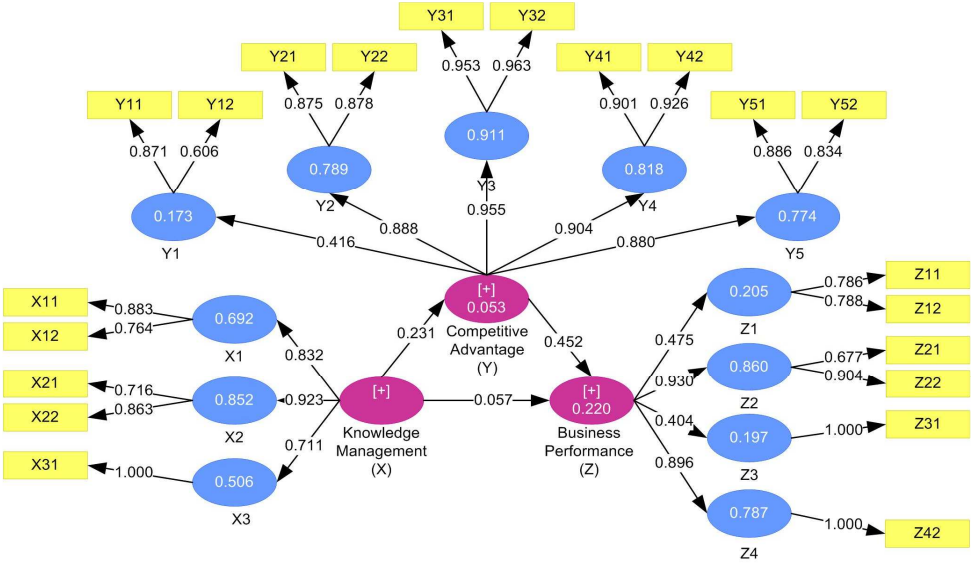

Figure 2. Outer model (after elimination the invalid indicators)
Source: own elaboration with SmartPLS (2019).

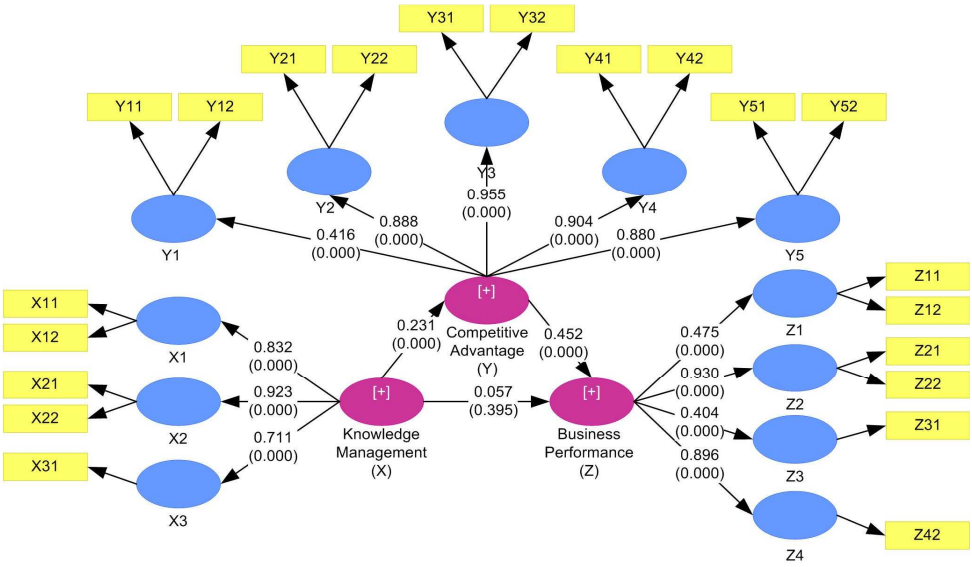

Figure 3. Inner model
Source: own elaboration with SmartPLS (2019).

Table 2. Path coefficient (direct and indirect Effect) and hypotheses results

Path, Direct effects	Path Coefficient	T Statitics	P Values	Hypotheses Result
Knowledge management → competitive advantage	0.231	3.610	0.000	H1 supported
Knowledge management → business performance	0.057	0.852	0.395	H2 not supported
Competitive advantage → business performance	0.452	5.216	0.000	H3 supported
Indirect effects:				
Knowledge management → competitive advantage → business performance	0.104	0.206	0.014	H4 supported
R2	22.0%			

Source: own elaboration with SmartPLS (2018).

Figure 3 and Table 2 show the results of data analysis that knowledge management has a directly positive and significant effect on competitive advantage (*p*-value 0.000 <0.05), while knowledge management turns out to have no direct significant effect on business performance (*p*-value 0.395> 0.05). Competitive advantage has a directly positive and significant effect on business performance (*p*-value 0.000 <0.05). Likewise, the influence of knowledge management indirectly affects business performance positively and significantly through competitive advantage (*p*-value 0.014 <0.05). Given that the direct effect of knowledge management on business performance is not significant, the indirect effect of knowledge management on business performance through competitive advantage is full mediation.

DISCUSSION

In an effort to improve competitiveness, knowledge acquisition is conducted by silver craft SMEs through hiring new employees, along with attending training and seminars as sources of new knowledge. Most silver handicrafts do not rely on a single group of employees to complete product orders from customers. They generally employ several groups of artisans/employees to work on product orders. This aims to minimise production costs and reduce the cost of material inventory, so that companies become efficient. Silver craft SMEs encourage employees/artisans to take part in workshops, seminars, and short courses, such as expert 3D design with computer software. This approach has proven to produce unique products, both in terms of form and design, so that they have competitiveness in the market.

Sharing knowledge and information between business operators in silver handicrafts and partners often happens when receiving product orders. One form of knowledge and information sharing activity is through discussion about the types and variety of silver handicraft products that are in accordance with market tastes. The lack of access to information from business operators in silver handicrafts – compared to their customers – requires them to do knowledge sharing more often. The aim is for business operators in silver craft SMEs to quickly adapt to market tastes.

Knowledge management produces ideas. Based on the results of interviews with several silver craft SMEs, their ideas or knowledge were unable to directly improve business performance. The idea must be able to be realised in the form of quality products and accepted by the market. Some silver craft SMEs rarely do knowledge sharing because they fear that the knowledge they have become known or understood by others, so that the expertise to produce products is copied by others.

The results of this study support previous studies by Carneiro (2000), Kamya, Ntayi, and Ahiauzu (2010), and Kaveh, Bamipur, Far, and Far (2015). Knowledge management must be able to combine advancement endeavours, IT overhauls, and knowledge advancement so as to attain a set of capabilities to make strides in competitiveness. Knowledge management has been considered a key figure in organisational execution, since it is related with distinctive assets that can offer assistance to producers in numerous ways (Carneiro, 2000).

The ability of silver craftsmen (SMEs manager/owner) to produce competitive products (in terms of efficiency, quality, uniqueness, price, and flexibility product) will provide customer satisfaction, increase sales value and market share, also make products competitive in the market.

The results of this study contradict previous studies which have consistently supported significant and positive influence of knowledge management on SMEs business performance. The research results from Alrubaiee, Hanandeh, and Ali (2015), Al-Sa'di, Abdallah, and Dahiyat (2017), and Migdadi, Zaid, Yousif, Almestarihi, and Al-Hyari (2017) found that companies with more knowledge management show higher performance.

The results of this research agree with the investigations of Tanriverdi (2005) and Byukusenge, Munene, and Orobia (2016). Tanriverdi (2005) found an inconsequential relationship between the capacity to form, share, coordinate, and utilise knowledge in a company's commerce. Byukusenge, Munene, and Orobia (2016) argues that knowledge received through brief courses, classes, presentations, or qualified staff is shared with all

employees. Such knowledge cannot straightforwardly cause a noteworthy change in benefits, development, and advertisement of SMEs. The critical relationship between knowledge management and business performance caused by the SMEs managers who anticipate the surge of information and knowledge from the company.

The Resource-Based Value (RBV) theory explains that company resources as a source of sustainable excellence must have four things, namely 1) valuable resources, 2) rare resources, 3) inimitable (imperfectly imitable) resources, and 4) non-equivalent strategic substitutes (non-constitutability; Barney, 1991). Human resources capable of having a sustainable competitive advantage are resources that can provide positive performance for a company. Knowledge management is one of the organisation's internal resources that can produce competitive advantage, so that it has a positive impact on company performance.

The effects of a study conducted by Mzoughi, Bahri, and Ghachem (2008) show that competitive advantage can improve business performance. Ismail, Rose, Abdullah, and Uli (2010) found that competitive advantage had a significant effect on organisational performance in manufacturing companies in Malaysia based on firm age. Moreover, Kamukama, Ahiauzu, and Ntavi (2011) state that competitive advantage can improve business performance in microfinance institutions in Uganda. Competitive advantage can bolster customer retention, relationships, and satisfaction, which results in better company performance (Kamboj & Rahman, 2017).

Therefore, we now known that competitive advantage essentially mediates the impact of knowledge management on the business performance of silver make SMEs in Gianyar Regency. Given that knowledge management has no noteworthy direct impact on business performance, this relationship lies in mediation.

Thus, Kamboj and Rahman (2017) argue that showcasing capabilities are fundamental for the improvement and implementation of promoting procedures, which empower companies to realise client service excellence with respect to client maintenance, relationship building, and fulfilment, which results in a more corporate execution. In turn, Majeed (2011) posits that the knowledge of managers will be able to make a competitive advantage of the company and its execution, as these focal points lead the company to attain high profit.

These results indicate that optimising knowledge will be able to produce products that are competitive. Competitive products can be viewed in terms of efficiency, item uniqueness, item quality, competitive costs, and item adaptability. Full mediation shows the important role of competitive advantage as a mediator. Visionary silver entrepreneurs will certainly orient themselves to produce products that have competitiveness in the market, but they will also strive to produce products quickly and with the ability to adapt according to market expectations. The ability of silver craft SMEs to produce unique products in terms of design and form is inseparable from the role of knowledge possessed by business actors. Companies require routine practice to produce a unique and quality product design. When the product has a competitive advantage, it will certainly improve business performance because it can be accepted by the market.

CONCLUSIONS

Based on the results of our study, we may conclude that knowledge management in silver craft SMEs in Gianyar Regency has a significant positive effect on its innovation. The knowledge sharing dimension is the most dominant predictor that reflects

knowledge management variables. Knowledge sharing that occurs among employees or leaders will certainly facilitate employees in completing ordered products, because they find new ideas about processes and products, following desired product orders. The development of new ideas will certainly engender a good process or product innovation for silver craft SMEs in Gianyar Regency.

Knowledge management in the silver craft SMEs in Gianyar Regency proved to have a significant positive effect on the competitive advantage of the silver craft SMEs in Gianyar Regency. Quality is the dominant dimension that strongly reflects competitive advantage compared to other dimensions. Silver handicraft products are high value products, so excellence in quality in terms of quality, product durability, appearance, and compatibility of design and material are important for the customer. To be able to produce a quality product requires good ideas and knowledge.

Competitive advantage positively and significantly affects business performance in silver craft SMEs in Gianyar Regency. That means silver craft SMEs with superior competitiveness certainly can improve their business performance. Silver craft SMEs capable of creating items at reasonable costs, solid item quality, and aware of client needs will certainly deliver to client expectations, so that these conditions will raise profits.

Competitive advantage significantly mediates the effect of knowledge management on the business performance of silver craft SMEs in Gianyar Regency. It turns out that the competitive advantage possessed by silver craft SMEs in Gianyar Regency can fully mediate the relationship between knowledge management and business performance. The ideal execution of information will be able to create items that are competitive in terms of productivity, item uniqueness, item quality, competitive costs, and item adaptability. When the product has a competitive advantage, it will certainly improve business performance because it can be accepted by the market.

The silver craft SMEs are expected to further enhance knowledge management behaviour, namely by increasing knowledge sharing by participating in exhibition events at the local, national, and international levels. Moreover, silver craft SMEs must improve training for employees or new craftsmen in terms of design, quality, and technology in production process so as to reinvigorate silver craftsmen with superior competitiveness. Regarding the competitive advantage of silver craft SMEs, we expect that they always create products with competitiveness, efficiency, uniqueness, quality, and price. Furthermore, business actors must always pay attention to market tastes. Silver craft SMEs find out and register their intellectual property rights for their products, because that is one of the important forms of protection today for creativity-based products with ever-changing innovations.

This research is limited to but one type of creative industry that has a different character from other types of industries, so the study cannot be generalised to other industries. Furthermore, the assessment of business performance in this study was assessed through perception (measured by Likert Scale), not through financial ratios. This is because the characteristics of silver handicraft SMEs are mostly in the scale of small businesses that do not have detailed records of business performance. This study only captures conditions in a one time period, so it is necessary to consider time periods in a longitudinal manner. This study also did not include the knowledge absorption variable, therefore further research could include the knowledge absorption variable in research models related to knowledge management.

Given the findings of this study – that the role of knowledge management is relatively small in relation to other variables – future research must consider other variables related to SMEs as exogenous variables that influence innovation and competitiveness. Future studies must examine industry classifications based on company size, company age, SME type, process type, technology type, and control variables.

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Acknowledgements and Financial Disclosure

We thank the Bali Provincial Government, Gianyar Regency Government, Indonesian Chamber of Commerce and Industry (Branch in Gianyar) for the support of data and information. We also thank the silver crafts businessmen who have been willing to become research respondents.

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Ministry of Science and Higher Education
Republic of Poland

The copyediting and proofreading of articles in English is financed in the framework of contract No. 913/P-DUN/2019 by the Ministry of Science and Higher Education of the Republic of Poland committed to activities aimed at science promotion.

Entrepreneurial Business and Economics Review

2020, Vol. 8, No. 4

10.15678/EBER.2020.080407

Individual determinants of entrepreneurship in Visegrád countries: Reflection on GEM data from the Czech Republic, Hungary, Poland, and Slovakia

Ondřej Dvouletý, Marko Orel

ABSTRACT

Objective: The article explores the individual determinants driving solo self-employment and employer entrepreneurship in four post-communist economies located in Central Europe (the Czech Republic, Hungary, Poland, and Slovakia).

Research Design & Methods: The article exploits data from the 2013 Adult Population survey, a part of the Global Entrepreneurship Monitor (GEM). Using multivariate logistic regression models, we explore the differences between wage-employed, solo self-employed, and employer entrepreneurs (self-employed with employees), concerning traditional determinants of entrepreneurship, such as gender, age, education, entrepreneurial confidence, and the number of people living in a household.

Findings: The obtained findings show that – regardless of the type of self-employment – there is a strong and positive impact of entrepreneurial confidence on the likelihood of being an established entrepreneur. The impact of remaining variables differed across the type of entrepreneurship.

Implications & Recommendations: This research highlights that self-employed individuals with and without employees should be treated in research and policymaking separately.

Contribution & Value Added: The presented research contributes to the growing body of literature aiming to understand differences between solo self-employed individuals and employer entrepreneurs.

Article type: research article

Keywords: individual determinants of entrepreneurship; self-employment; job creators; solo self-employed individuals; Global Entrepreneurship Monitor; Czech Republic; Hungary; Slovakia; Poland

JEL codes: L26, L53, P42

Received: 13 April 2020 Revised: 25 June 2020 Accepted: 19 August 2020

Suggested citation:

Dvouletý, O. & Orel, M. (2020). Individual Determinants of Entrepreneurship in Visegrád Countries: Reflection on GEM Data from the Czech Republic, Hungary, Poland and Slovakia. *Entrepreneurial Business and Economics Review,* 8(4), 123-137. https://doi.org/10.15678/EBER.2020.080407

INTRODUCTION

The formation of the Socialist Bloc after the end of the Second World War significantly contributed to the mitigation of private ownership and entrepreneurship and resulted in institutional orientation towards the centrally planned economy among its satellite states (Sachs & Woo, 1994; Fischer *et al.*, 1996; Švejnar, 2002). After the break-up of the socialist regime in the 1980s and 1990s, the countries regained their political sovereignty, and they started heading towards an institutional transition from the centrally planned economy to the market-oriented economy (Shama, 1993; Money & Colton, 2000). Decades of Soviet socialist regime and orientation towards central planning have changed the behaviour of people living in the countries and economic agents to the extent that some scholars introduced the term 'homo sovieticus' for the population living under the reign of the former regime (Shiller *et al.*, 1992; Morawska, 1999). The process of economic transition and accompanying reforms was led by experts from abroad who helped to re-establish private ownership that was crucial for the future development of entrepreneurship in post-communist economies (Morwaska, 1999; Dana & Dana, 2003; Ovaska & Sobel, 2005; Wallace & Latcheva, 2006; Cieślik & van Stel, 2014; Dana & Ramadani, 2015; Sauka & Chepurenko, 2017; Kirby & Watson, 2017).

Based on their former historical cooperation, four of these post-communist economies located in Central Europe (the Czech Republic, Hungary, Poland, and Slovakia) have established an international organisation called the Visegrád Group on 15th February 1991 (also the Visegrád Four or V4), which aims to strengthen their mutual collaboration at the cultural, political, and economic level. Among other goals, the V4 sought to join the European Union, which they achieved on 1st May 2004. (Polok *et al.*, 2016, Visegrád Group, 2019). The V4 member states are the object of this empirically-oriented study as examples of countries that experienced the process of economic transition.

According to the data from the Labour Force Survey (LFS), the overall level of entrepreneurial activity in the V4 region was on average 13.7%, specifically in individual countries: 15.2% in the Czech Republic, 10.3% in Hungary, 16.6% in Poland and 12.8% in Slovakia (expressed as a percentage share of 15-64 population) during 2005-2017 (c.f. Dvouletý, 2019, p. 4). The entrepreneurship in the region is considered to be an engine of economic growth (Krasniqi & Desai, 2016; Dvouletý, 2017a; 2017b; Zygmunt, 2018; Šebestová & Sroka, 2020); noteworthy, the previous entrepreneurship research in the region was also driven by the willingness of the countries to participate in the Global Entrepreneurship Monitor (GEM). Hungary and Poland joined the GEM initiative as the first countries from the V4 Group in 2003 (Global Entrepreneurship Monitor, 2013). Since then, national GEM teams and other scholars enriched academia about the specifics of entrepreneurship in post-communist economies.

While looking at the previously published studies, the empirical research in the Visegrad region studied many specific aspects of entrepreneurial behaviour. However, we were unable to find a comparable study on the traditional individual determinants of entrepreneurial behaviour described in the literature (e.g. Parker, 2004; Simoes *et al*., 2016; Muñoz-Bullón *et al*., 2015; van der Zwan *et al*., 2016; Mahto & McDowell, 2018; Laguía *et al*., 2019; Boudreaux *et al*., 2019). Following Davidsson´s (2015) and Delmar´s (2015) call for replication of empirical research in entrepreneurship studies with a focus on regional context, we conduct a comparative study on understanding the differences between wage-employed, solo self-

employed individuals, and employer entrepreneurs in Visegrad countries. As such, the empirical GEM data analysis was not been conducted in the V4 region, so the presented study marks a high contributing factor to the regional body of knowledge. The article also delivers findings to the current debate on the distinction between self-employed individuals with and without employees (see e.g. Cowling *et al.*, 2004; Petrescu, 2016; Coad *et al.,* 2017; Fairlie & Miranda, 2017; Dvouletý, 2018; Grace, 2018; Dvouletý *et al.*, 2019; Cieślik & Dvouletý, 2019) from the perspective of four post-communist economies.

The rest of the article proceeds as follows. We begin by briefly reviewing the existing literature on the determinants of entrepreneurship. The following section introduces the GEM dataset and variables selected for the multivariate logistic regression analysis aiming to capture individual drivers of self-employment with and without employees, which is described in the next section. Then, we summarise the obtained empirical results, and the final part of the paper concludes and provides directions for future research.

LITERATURE REVIEW

Although individual determinants of self-employment have been studied in the literature extensively (e.g. Rees & Shah, 1986; Van Praag & Ophem, 1995; Gerber, 2001; Douglas & Shepherd, 2002; Parker, 2004; Ekelund *et al.,* 2005; Block & Sandner, 2009), the current stream of the literature acknowledges (e.g. Simoes *et al.,* 2016; Bögenhold, 2019; Bögenhold *et al.,* 2019; Burke *et al.,* 2019; Van Stel & Van der Zwan, 2019), that there are different types of self-employed individuals in the economy, which should be differently treated empirically. The most fundamental distinction (i.e. segmentation criteria) we may use is whether self-employed individuals have employees or they remain solo and create work only for themselves (e.g. Cowling *et al.,* 2004; Petrescu, 2016; Coad *et al.*, 2017; Fairlie & Miranda, 2017; Dvouletý, 2018; Grace, 2018; Dvouletý *et al.,* 2019).

When it comes to evidence from the Visegrád region, individual characteristics and drivers of nascent, youth, and established entrepreneurship were explored, for example, by Lukeš *et al.* (2013), and Lukeš and Zouhar (2013; 2016) in the Czech Republic; by Szerb and Imreh (2007) and Márkus and Szerb (2013) in Hungary; by Jakubczak and Rakowska (2014), Wach and Wojciechowski (2016), and Głodowska *et al.* (2019) in Poland; and by Holienka (2014), and Pilkova and Kovacicova (2015) in Slovakia. There also are comparative studies focused on entrepreneurial behaviour in Visegrád countries. Holienka *et al.* (2016) study youth entrepreneurship and, later (2017), student entrepreneurship. Pilková *et al.* (2016) analyse the specifics of senior entrepreneurship in Visegrád countries. Barcik *et al.* (2017) explore the potential of academic entrepreneurship in the V4 region, while Nowiński *et al.* (2019) examine the entrepreneurial intentions of university students. Finally, Dvouletý *et al.* (2019) explore the earnings of V4 entrepreneurs. Nevertheless, according to our best knowledge, there is no study that dives deeper into the differences between solo entrepreneurs and employer entrepreneurs.

Therefore, we this article separately studies determinants of self-employed individuals with employees (job creators) and self-employed individuals without employees (solo self-employed) as this topic was not explored in the Visegrád region yet. Since the previously obtained empirical evidence on this topic is rather insufficient and inconclusive, our study can be treated rather as an exploratory one.

MATERIAL AND METHODS

Data and Sample

The article exploits data from the Adult Population Survey (APS) which is a part of the annual Global Entrepreneurship Monitor (2019). The APS explores the characteristics, motivations, and ambitions of individuals starting a business, and their attitudes towards entrepreneurship (Global Entrepreneurship Monitor, 2019). The V4 member states were also historically conducting the APS. Hungary and Poland joined the GEM initiative as the first countries from the V4 Group in 2003. The Czech Republic and Slovakia conducted their first GEM studies in 2006. Most active today is Hungary, which conducted GEM continuously from 2001 to 2016, except for 2003. Poland did GEM in 2001, 2002, 2004, and then continuously from 2011 to 2018. Slovakia is active within GEM continually from 2011 to 2018, and the Czech Republic conducted GEM study only in 2006, 2011, and 2013 (Global Entrepreneurship Monitor, 2019).

For the purpose of our empirical analysis, we need to select only samples coming from the same years; otherwise, the country micro datasets would not be comparable. The most recent GEM data are available across Visegrád countries for 2013, and this selection is limited by data availability for the Czech Republic that conducted GEM study only three times. Therefore, we only use data for the year 2013 in our analysis, as this is the latest available year for all Visegrád countries (Global Entrepreneurship Monitor, 2013; 2019). We acknowledge that using a relatively old dataset is a limitation of the study; however, since we use it in a novel way – i.e. by differentiating between self-employed with and without employees – we believe that the following analysis has a value for the scholarly community.

In 2013, the GEM data were collected for the Czech Republic by the team from the University of Economics, Prague (see Lukeš *et al.*, 2014 for details); for Hungary by the team of the University of Pécs (see Márkus and Szerb, 2013 for details); for Poland by the team of the University of Economics in Katowice (see Tarnawa *et al*., 2014 for details); and for Slovakia by the team of the Comenius University in Bratislava (see Pilková *et al.*, 2014 for details). Country teams have to collect within the APS individual data for at least 2 000 adults; however, there is no requirement concerning the maximum number of collected responses (Global Entrepreneurship Monitor, 2019). The largest sample in 2013 is for the Czech Republic (N=5 009), and the sample size across Visegrád countries is reported in Table 1.

Table 1. Adult Population Survey in V4 countries in 2013: sample size (N)

Country	**Sample size** (N)	**Country report GEM**
Czech Republic	5 009	Lukeš *et al*. (2014)
Hungary	2 000	Márkus & Szerb (2013)
Poland	2 000	Tarnawa *et al*. (2014)
Slovakia	2 007	Pilková *et al.* (2014)

Source: STATA 14, own calculations based on Global Entrepreneurship Monitor (2013) data.

The APS tracks working status of all kinds of individuals, including part-time workers, retirees, students, unemployed, and other non-economically active individuals. The objective of our study is to better understand individual determinants of self-employment in Visegrád countries and, thus, we restrict our sample only to people economically active, i.e. in

self-employment or paid employment as typical in the previously published studies (e.g. Kolvereid, 1996; Blanchflower, 2000; Millán *et al*., 2012; Hytti *et al.*, 2013; Caliendo *et al*., 2014). Furthermore, we also keep in our sample only established entrepreneurs, who continuously receive income from their business activity, and thus we exclude from the sample all infant business owners (0-3 months) and early-stage (nascent) entrepreneurs (up to 3.5-years-old). The remaining self-employed individuals in the sample managed to survive the first critical years in their business, and they receive regular payments from their economic activity. Global Entrepreneurship Monitor (2013) defines them as owners-managers of established businesses, which means such that operate longer than 3.5 years.

Furthermore, we explore individual determinants of entrepreneurship and self-employment identified in the literature (e.g. Parker, 2004; Simoes *et al*., 2016; van der Zwan *et al.*, 2016; Boudreaux *et al.,* 2019) and check whether they are available in the GEM 2013 dataset. Unfortunately, the GEM focuses mainly on entrepreneurs themselves rather than on collecting a wide range of variables for individuals with different working status; therefore, we are limited by the potentially available variables. The available variables include gender, age, education, entrepreneurial confidence, and the number of people living in a household, which we later use in our empirical analysis. We describe selected variables in Table 2 and provide readership with summary statistics in Table 3. Presented statistics were weighted over the size 18-64 workforce in each of the countries.

Table 2. List of Variables

Variable	Definition
Employment status	Employment status as one of three categories: Self-employed with employees (having at least one employee excluding the owner of the business), self-employed without employees or in paid employment. Self-employed are considered to be owners-managers of an established business for more than 3.5 years.
Age	Respondent's age.
Education	Set of dummy variables according to the United Nation´s educational classification.
Entrepreneurial Confidence	Dummy variable which equals 1 if the respondent answered 'yes' to the following question 'Do you have the knowledge, skill, and experience required to start a new business?'
Number of People in Household	The number of people living permanently in the respondent's household.
Country	Respondent's country of residence.

Source: own elaboration based on Global Entrepreneurship Monitor (2013) data.

Table 3. Sample Descriptive Statistics

Variable	Frequency (%)	N
Self-employed without Employees (=1)	3.8	7244
Self-employed with Employees (=1)	9.4	7244
Pre-primary education or no education (=1)	0.0	7218
Primary education or first stage of basic education (=1)	2.0	7218
Lower secondary or second stage of basic education (=1)	6.4	7218
(Upper) secondary education (=1)	63.2	7218
Post-secondary non-tertiary education (=1)	4.7	7218

Variable	Frequency (%)	N			
First or second stage of tertiary education (=1)	23.7	7218			
Entrepreneurial Confidence (=1)	50.4	7023			
Variable	**Mean**	**SD**	**Min**	**Max**	**N**
Age	41.1	11.1	18	64	7 177
Number of People in Household	3.3	1.4	1	15	7 187

Note: Self-employed and wage-employed individuals only. Post-stratification weights applied.
Source: STATA 14, own calculations based on Global Entrepreneurship Monitor (2013) data.

RESULTS AND DISCUSSION

We follow the methodological approach used in previously published studies on the individual determinants of entrepreneurship (e.g. Djankov *et al.*, 2006; Lukeš *et al.*, 2013; Holienka *et al.*, 2016; Dvouletý, 2018), and we employ multivariate logistic regression analysis to understand the differences between wage-employed, solo, and employer entrepreneurs. Our dependent variables have binary character – i.e. being self-employed with/without employees =1, otherwise =0 – and the presented logistic regression models are estimated on a sample of self-employed and employed individuals. The sample was extracted from the GEM 2013 dataset. All estimates are weighted over 18-64 workforce per census data in each of the countries. The estimated regression models were found to be statistically significant, and they fulfil the standard econometric assumptions (Wooldridge, 2002; Hoetker, 2007).

Two series of econometric models are presented. The first set of regression models aims to capture differences between solo self-employed and wage-employed individuals (Table 4), while the second set (Table 5) shows the differences between employer entrepreneurs (self-employed with employees) and wage-employed. The empirical strategy aims to address the potential of pooled sample bias (Cowling, 2000) by first estimating separate models for the Czech Republic, Hungary, Poland, and Slovakia and, next, by estimating a pooled model for the whole sample of Visegrád countries. The pooled model includes country dummies to address cross-country heterogeneity. Given this empirical approach, we can see how the individual drivers of entrepreneurship differ across Visegrád countries.

Determinants of Solo Entrepreneurship

The first empirical insight we may see from the models – aiming to capture the differences between wage-employed and solo self-employed individuals (Table 4) – is that entrepreneurial confidence is the only strongly significant determinant that is stable across all estimated models. The remaining variables are less conclusive. Women seem to be self-employed less often when compared with men in the Czech Republic, Hungary, and Slovakia, as suggested by the negative regression coefficients. However, the statistically significant coefficient was obtained only in the case of Slovakia. When it comes to age, the obtained results suggest mostly positive association, except for Poland; however, the statistically significant coefficient was found only for the Czech Republic. Moreover, we do not find any empirical support for the inverse u-shaped relationship between age and the likelihood of being solo self-employed. The role of education is also not straightforward. Education seems to be a strong predictor of solo self-employment in the Czech Republic, where we find a positive and statistically significant association with higher levels of education. Nevertheless, results for the remaining countries are very ambiguous. Finally, once we look from the perspective of

household size, we may say that in the Czech Republic and Poland there seems to be a negative relationship, which is statistically significant only in the Czech model, while in Slovakia and Hungary, there appears to be a positive association.

Table 4. Individual determinants of solo entrepreneurship in V4 countries in 2013: solo self-employed vs wage-employed

Model number	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
Country-sample	Czech Republic	Hungary	Poland	Slovakia	Visegrád countries
Independent variables/ Dependent variable (=1)	*Self-employed without employees*				
Female	-0.196	-0.524	0.248	-0.637+	-0.204
	(0.204)	(0.341)	(0.372)	(0.373)	(0.150)
Age	0.120+	0.0677	-0.0850	0.0133	0.0445
	(0.0671)	(0.126)	(0.168)	(0.124)	(0.0555)
Age squared	-0.00115	-0.0000387	0.00109	0.000115	-0.000201
	(0.000797)	(0.00146)	(0.00192)	(0.00141)	(0.000642)
Primary education or first stage of basic education (reference category)	.	.	.	.	.
	(.)	(.)	(.)	(.)	(.)
Lower secondary or second stage of basic education	9.031***	-1.355	.	.	-1.065
	(1.143)	(0.837)	.	.	(0.715)
(Upper) secondary education	8.313***	0.475	-1.392	0.338	-0.488
	(1.052)	(0.738)	(0.944)	(0.393)	(0.678)
Post-secondary non-tertiary education	7.182***	-1.156	-0.616	.	-0.927
	(1.460)	(0.967)	(1.042)	.	(0.751)
First or second stage of tertiary education	8.448***	0.460	-1.151	.	-0.375
	(1.058)	(0.709)	(0.966)	.	(0.675)
Entrepreneurial Confidence	1.171***	1.902***	2.402***	1.854***	1.476***
	(0.226)	(0.363)	(0.568)	(0.491)	(0.172)
Household Size	-0.265***	0.00517	-0.0786	0.0683	-0.119*
	(0.0782)	(0.112)	(0.137)	(0.107)	(0.0556)
Constant	-14.17***	-6.868**	-2.202	-5.492*	-4.307***
	(1.570)	(2.647)	(3.371)	(2.545)	(1.265)
Country dummies	No	No	No	No	Yes
Observations	3,164	990	1,001	995	6,213
Prob > chi2	0.00	0.00	0.00	0.00	0.00
Pseudo R^2	0.062	0.186	0.113	0.091	0.073
AIC	1042.6	317.1	309.2	322.1	2001.3
BIC	1103.2	366.1	353.4	356.4	2088.8

Notes: self-employed are owners-managers of established businesses for more than 3.5 years. Countries included in Model 5 (pooled sample of four Visegrád countries): Czech Republic, Hungary, Poland, Slovakia. Post-stratification weights applied. Robust standard errors are in parentheses, stat. significance is reported as follows: + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

Source: STATA 14, own calculations based on Global Entrepreneurship Monitor (2013) data.

CONCLUSIONS

The presented article chapter aimed to enrich scholarship on individual determinants of solo and employer entrepreneurship in post-communist economies. The study exploited data from the four Visegrád countries, namely the Czech Republic, Hungary, Poland, and Slovakia, from the 2013 Adult Population survey, a part of the GEM. We utilise the available identified determinants of entrepreneurship and self-employment, including gender, age, education, entrepreneurial confidence, and the number of people living in a household, and we estimate multivariate logistic regression analysis with the aim to understand the differences between wage-employed, solo self-employed, and employer entrepreneurs. Compared to the previously published studies, we estimate separate models for each of the Visegrád countries first and, then, we also estimate a pooled model so as to overcome the problem of pooled sample bias.

The obtained findings from all estimated regression models – regardless of the type of self-employment, i.e. with or without employees – show a strong and positive impact of entrepreneurial confidence on the likelihood of being an established entrepreneur. This agrees with previously published studies on the determinants of entrepreneurship showing the importance of entrepreneurial confidence in the decision to pursue an entrepreneurial career pathway (e.g. Koellinger *et al.*, 2007; Dimov, 2010; Simoes *et al.*, 2016). Nevertheless, observations for remaining variables join the increasing volume of knowledge by showing that self-employed individuals are 'different animals' with and without employees (Burke & Cowling, 2015; Dvouletý, 2018).

It was quite surprising for us to observe that we were almost unable to see any statistically significant results for the group of solo self-employed individuals. The exception is the Czech Republic, where we noticed that solo self-employment career pathway is positively associated with age and with higher levels of education. A negative relationship was observed for household size and women. Women are also less likely to be self-employed in Slovakia. On the contrary, for the group of job creators, we may see more harmonised patterns, especially in terms of the obtained level of education. Job creation is positively associated with higher levels of education in the Czech Republic and Poland, which corresponds with the recent observations of Dvouletý (2018) indicating that employer entrepreneurs are usually individuals with more senior profiles, both in terms of education and experience. Women are according to the presented findings also less likely to create new jobs, which was again found to be a statistically significant determinant in the Czech Republic and Slovakia. Quite surprisingly, we were unable to observe an inversed u-shaped relationship between age and job creation, previously documented by several scholars (e.g. Cowling *et al.*, 2004; Millán *et al.*, 2014; Dvouletý, 2018). Such a finding might be linked to the context of the post-communist economies. As entrepreneurship has been emerging after the end of the socialist regime, we propose a hypothesis – which may be further tested in later studies – that most of Visegrád entrepreneurs are relatively younger compared to those doing business in the Western European countries.

Unfortunately, the presented findings are limited by the resources we have. The country-level samples are relatively small, and the findings rely on a dataset from just one year. Having a longitudinal dataset or, at least, data for more years (and cohorts of entrepreneurs) would definitely increase the robustness of the presented findings. A larger sample might

also help in proving statistical significance for the variables that have already been included in the conducted multivariate analysis. Moreover, we need to acknowledge that it would be more proper to have a more recent comparable dataset, which is not currently available. Our research thus also serves as a call for researchers and scholars from those Visegrád countries that have stopped conducting the GEM study, i.e. the Czech Republic and Hungary.

We also need to acknowledge that there are other important individual determinants of entrepreneurship unavailable in the GEM 2013 dataset, which we nevertheless found important in the previous research. These variables should become the subject of future investigation in the context of Visegrád countries. Among other things, scholars should focus on the role of family and partner-entrepreneur relationships and their impact on overall life satisfaction (Shoubaki & Stephan, 2018), the importance of family background and parental influence (Lindquist *et al.*, 2015), and the role of physical and mental disability in pursuing entrepreneurial career (Jones *et al.*, 2011).

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Acknowledgements and Financial Disclosure

This work was supported by the Internal Grant Agency of the Faculty of Business Administration, University of Economics, Prague under no. IP300040.

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Published by Cracow University of Economics – Krakow, Poland

Ministry of Science and Higher Education
Republic of Poland

The copyediting and proofreading of articles in English is financed in the framework of contract No. 913/P-DUN/2019 by the Ministry of Science and Higher Education of the Republic of Poland committed to activities aimed at science promotion.

Entrepreneurial Business and Economics Review

2020, Vol. 8, No. 4

10.15678/EBER.2020.080408

Does entrepreneurial knowledge influence vocational students' intention? Lessons from Indonesia

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ABSTRACT

Objective: The study attempts to extend the current understanding of entrepreneurship education by engaging the entrepreneurial mindset, knowledge, and the intention to be an entrepreneur. The second purpose is to highlight through testing the moderating role of entrepreneurial knowledge on the relationship between entrepreneurial education and students' intention to be entrepreneurs.

Research Design & Methods: The approach utilised in this study was a quantitative research design using a survey model. The participants of this study were recruited from vocational students in Jakarta who enrolled in the entrepreneurial education course. Furthermore, the data were analysed using exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modelling (SEM).

Findings: Entrepreneurship education impacts three variables, including entrepreneurial mind-set, knowledge, and intention. Entrepreneurial knowledge influences students' intention to be entrepreneurs; however, it has an insignificant impact on entrepreneurial mindset.

Implications & Recommendations: Entrepreneurship education in Indonesia should be further developed due to its essential role in education young entrepreneurs, for instance, through curriculum revitalisation.

Contribution & Value Added: Notwithstanding the relatively limited sample, this work offers valuable insights into the important role of entrepreneurship education and vocational students' intention to be entrepreneurs in Indonesia.

Article type:	research article
Keywords:	entrepreneurial education; entrepreneurial knowledge; entrepreneurial mindset; entrepreneurial intention; vocational school
JEL codes:	I25, L26

Received: 8 May 2020 Revised: 20 August 2020 Accepted: 20 August 2020

Suggested citation:

Karyaningsih, R.P.D., Wibowo, A., Saptono, A., & Narmaditya, B.S. (2020). Does entrepreneurial knowledge influences vocational students' intention? Lessons from Indonesia. *Entrepreneurial Business and Economics Review,* 8(4), 138-155. https://doi.org/10.15678/EBER.2020.080408

INTRODUCTION

Over the past decade, the majority of scholars in both developed and developing countries claimed that entrepreneurial education plays a crucial role in motivating entrepreneurs (Jena, 2020; Li & Wu, 2019; Fayolle & Gailly, 2015). Moreover, scholars also agree that entrepreneurial education does not only engage students' knowledge, mindset, attitude, and self-efficacy but also develops students' intention and skills to start a business (Kim & Park, 2019; Barba-Sánchez & Atienza-Sahuquillo, 2018; Souitaris, Zerbinati, & Al-Laham, 2007; Zhang, Duysters, & Cloodt, 2014). Furthermore, some countries propose entrepreneurial education as an effective strategy to enlarge the number of entrepreneurs, particularly through formal education (Nasrullah, Khan & Khan, 2016; do Paco *et al.*, 2013; Fayolle, 2006).

In Indonesia, the government has sought to increase the number of entrepreneurs by amending entrepreneurial education in all level education (Sendouwa, 2019; Hani & Putri, 2012; Utami, 2017; Utomo *et al.*, 2019). In higher education, the policymaker focuses on the revitalisation of vocational school curriculum as an attempt to motivate students to become entrepreneurs (Saptono & Wibowo, 2018; Wibowo, Saptono, & Suparno, 2018). According to the Ministry of National Education (2012), entrepreneurial education in vocational school is intended to motivate students to become young entrepreneurs instead of middle-level skilled workers.

Unfortunately, the reinvigorated curriculum of entrepreneurial education in the vocational school is not adequate yet. In fact, the unemployment rate in Indonesia is dominated by vocational school graduates (BPS, 2019). In more detail, BPS (2019) notes that the unemployment rate in August 2019 amounted to 7.05 million, dominated by vocational school graduates by approximately 10.42%. This is due to vocational school graduates insufficiently creating their own businesses along with enrolling to work in accordance with the demand of the workforce. This readiness shows that the quality of vocational graduates still must be improved, especially their independence and reasoning.

Furthermore, Husnaini (2017) argues that the upward trend in the unemployment rate is affected by the ineffectiveness of entrepreneurial education in vocational schools. Similarly, Jabeen, Faisal, and Katsioloudes (2017) indicate that entrepreneurial education in the school provides inadequate knowledge and mindset to start a business. However, when entrepreneurial education is applied appropriately, it raises students' intention to be entrepreneurs. Several scholars assert that entrepreneurial education promotes creating individual entrepreneurship (Utomo *et al.*, 2019; & Block, 2016; Rauch & Huslink, 2015).

The investigation of entrepreneurial education among Indonesian scholars have rapidly increased (Ana *et al.*, 2016; Eryanto; 2019; Winarno, 2016; Saptono & Wibowo, 2018; Wibowo *et al.*, 2019). However, few researchers have demonstrated the relationship between entrepreneurial mindset and intention of being entrepreneurs. In fact, both variables have a pivotal role incorporate with entrepreneurial intention (Rezaei Zadeh *et al.*, 2017; Farani *et al.*, 2017; Tshikovhi & Shambare, 2015). Entrepreneurial knowledge is closely related to several business activities, such as identification, company creation, marketing, finance, and organisation. Students' knowledge of entrepreneurship could be acquired through school education and training (Bergmann, 2017; Ni & Ye, 2018; Zhao & Seibert, 2006). These findings suggest that entrepreneurial knowledge and mindset obtained from entrepreneurship education positive influences students' intention to be entrepreneurs. Roxas (2014) adds that

entrepreneurial knowledge and entrepreneurial mindset play a crucial role in mediating the impact of entrepreneurial education and entrepreneurial intention.

This study provides three contributions. First, it extends the existing understanding of entrepreneurship education by engaging entrepreneurial intention and knowledge, which is absent in prior studies. Through testing, this article highlights the mediating role of entrepreneurial knowledge on the relationship between entrepreneurial education and students' intention to be entrepreneurs. Second, the focus in Indonesia is unique due to the fact that Indonesia is a densely populated country, but it has an insufficient level of entrepreneurs. Third, this study provides new insight into the debate on the factors affecting entrepreneurial intention in Indonesia, and the debate's influence on the policymakers who decide about education.

LITERATURE REVIEW

The growing body of literature investigating entrepreneurial intention agrees that intention can be formed with some deliberate scenarios (Van Gelderen, Kautonen, & Fink, 2015; Minola, Criaco, & Cassia, 2014). Education becomes one of the effective means of developing entrepreneurial intentions (Passoni & Glavam, 2018; Barba-Sánchez & Atienza-Sahuquillo, 2018; Küttim *et al.*, 2014). Watson (2019) reveals that entrepreneurship education could stimulate ideas and behaviours needed by an entrepreneur. Ahmed *et al.* (2020) conclude that the goals of entrepreneurship education are to foster individual entrepreneurial intentions. An empirical study by Saeed *et al.* (2015) finds that entrepreneurship education and training can strengthen individuals' entrepreneurial intentions and improve their performance.

How does entrepreneurship education improve student entrepreneurial intention? First, entrepreneurial intention in this study covers students' desire to be entrepreneurs and their willingness to set up and run businesses. Wu and Wu (2008) emphasise that entrepreneurship education focuses on increasing students' entrepreneurial knowledge, willingness, and abilities both through theory and entrepreneurship training. Similarly, Souitaris, Zerbinati, and Al-Laham (2007) and Nabi *et al.* (2018) foreground how entrepreneurship education influences students' entrepreneurial intentions through learning, inspiration, and the use of resources. Learning in entrepreneurial education helps individuals to obtain knowledge on how to start a new business.

The entrepreneurial education should be provided more practice instead of theories (George & Bock, 2011). For instance, a social programme allows an individual experience direct application of theory in the field (Dvoulety *et al.*, 2018). This practice model not only stimulates students' interest in studying entrepreneurship but also provides an entrepreneurial attitude (Lackeus, 2014). Some previous studies find a relationship between entrepreneurial education and intentions to be an entrepreneur (Fayolle & Gailly, 2015; Koe, 2016; Sánchez, 2013; Zhang, Duysters, & Cloodt, 2014). Likewise, in Indonesia, several scholars demonstrated the positive impact of entrepreneurial education on entrepreneurial intention (Purwana *et al.*, 2019; Saptono *et al.*, 2019; Wibowo *et al.*, 2019).

Furthermore, Fayolle and Gailly (2015) emphasise that entrepreneurship education impacts individual mindset, which guarantees the capacity to acquire entrepreneurial knowledge by helping an individual to focus on a proper career path. An anticipated long-term investment that results from entrepreneurial knowledge is the production of an entrepreneur who permeates one's personal, social, and professional life (Moberg, 2014). Haynie

et al. (2010) emphasise the strong relationship of entrepreneurial mindset with practical reasoning, entrepreneurial knowledge, and individual competence to obtain valuable resources for business success. Entrepreneurial knowledge covers a proper understanding related of entrepreneurship; e.g. sales, negotiation, product development, and risk assessment.

We believe that entrepreneurial intention and an individual's potential can be increased through entrepreneurship education. In other words, entrepreneurship education can help students to develop entrepreneurial knowledge, skills, mindset, and increase their future success in starting a business. Therefore, we developed the following hypotheses:

H1: Entrepreneurial education positively influences entrepreneurial intention.

H2: Entrepreneurial education positively influences entrepreneurial knowledge.

H3: Entrepreneurial education positively influences entrepreneurial mindset.

Entrepreneurial human capital (EHC) is a specialisation of high-level specific entrepreneurial competencies and knowledge, which is very important, for example, in sales, negotiation, product development, and risk assessment (Ni & Ye, 2018). Based on EHC theory, a person with a high level of education has high probability to become an entrepreneur (Cowling, Liu, & Zhang, 2018). This entrepreneur will potentially combine various types of knowledge and skills in developing good products or services to meet market tastes and demands. This person will also be more observant in exploring opportunities, introducing changes, and utilising resources optimally and effectively.

Some prior studies confirmed that knowledge about entrepreneurship impacts the establishment of start-up and development of new businesses (Ni & Ye, 2018; Farani *et al.*, 2017; Tshikovhi & Shambare, 2015). Furthermore, an entrepreneurial mindset is a feeling and belief in particular abilities to think out of the box (Nabi *et al.*, 2018). Meanwhile, the self-competence of an individual is proposed by Nasrullah, Khan, and Khan (2016), which is a variable that correlates with entrepreneurial mindset. Several scholars of entrepreneurship link entrepreneurial mindset not only with self-competence but also many other factors, namely experience and confidence to act. Moreover, entrepreneurial mindset also covers personality dimension such as values, attitudes, and beliefs (Rajagopal, 2014; Solesvik *et al.*, 2013).

Researchers believe that mindset is a holistic perception to generate new ideas, evaluate opportunities and risks, or start and run a business, which is when an individual assesses own perceptions based on holistic rather than functional attributes (Naumann, 2017; Davis & Hall, 2015; Haynie & Shepherd, 2007). Entrepreneurial mindset is also a way of thinking that sees opportunities not as barriers, instead seeking possibilities in failures and wanting to do something to make a difference rather than sit down and complain about problems (Walter & Block, 2016; Haynie *et al.*, 2010).

In the same way, Fayolle and Liñán (2014); Akmaliah *et al.* (2016) define entrepreneurial mindset as a particular state of mind that orients human behaviour towards entrepreneurial activities and outcomes. This implies that entrepreneurial mindset is closely related to how a person thinks (consciously or subconsciously) or his/her worldview, which influences one's tendency to be entrepreneurial. Solesvik *et al.* (2013) note that entrepreneurship education plays a vital role in developing and even strengthening entrepreneurial mindset. Entrepreneurship education not only provides knowledge, attitudes, and competencies but also increases motivation to develop an entrepreneurial mindset. Indeed, Haynie *et al.* (2010) assert that entrepreneurial mindset offers potential insight into the

various outcomes and situations fundamental to entrepreneurial studies. Therefore, we developed the following hypotheses:

H4: Entrepreneurial knowledge positively influences entrepreneurial intention.

H5: Entrepreneurial knowledge positively influences entrepreneurial mindset.

H6: Entrepreneurial mindset positively influences entrepreneurial intention.

H7: Entrepreneurial knowledge mediates the impact of entrepreneurial education and entrepreneurial intention.

RESEARCH METHODOLOGY

The approach utilised in this study was a quantitative research design using a survey model. The major advantage of this approach is that it helps to understand how entrepreneurship education, entrepreneurial knowledge, and entrepreneurial mindset affect the intention to be an entrepreneur (Figure 1).

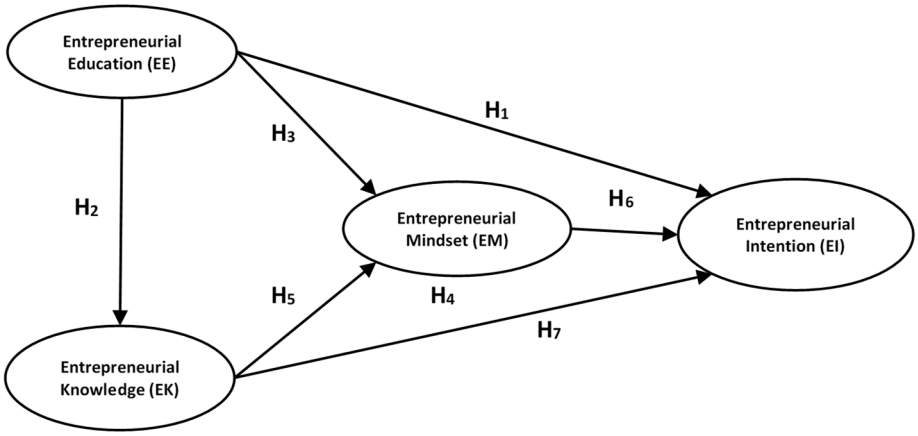

Figure 1. The research framework
Source: own elaboration based on Passoni and Glavam (2018); Barba-Sánchez and Atienza-Sahuquillo (2018); Küttim *et al*. (2014); Watson (2019); Fayolle and Gailly (2015); Koe (2016); Sánchez (2013); Zhang, Duysters, and Cloodt (2014).

Sample and Data Collection

The participants of this study were recruited from vocational students (SMK) in Jakarta who enrolled in the entrepreneurial education course. The focus was reasonable due to the fact that vocational schools in Jakarta are more adequate in terms of educational facilities and infrastructure than other regions of Indonesia. Thus, a convenience sample was used as is frequently done in entrepreneurship research. A total of 378 questionnaires were returned and 351 questionnaires proved useful after validation. The precise demographic of respondents is provided in Table 1.

Table 1 shows the demographic of respondents of the study. Approximately 59% of students majored in business, slightly less than a quarter majored in culinary arts, and about

20% majoring in marketing. Additionally, the lowest percentage of students majored in accounting. Furthermore, there were more women than men among respondents, with a percentage of approximately 56% and 44%, respectively. Moreover, the majority of respondents' parents, more than a quarter was working as an entrepreneur. Accordingly, about 22% and 19% was found in the occupation of laborer and teacher/lecturer. Almost the same percentage of 9% came from government civil servant, police and soldier families.

Table 1. The demographic of respondents

No.	Categories	Number of Participants	Percentage
1.	Age		
	15-years-old	90	25.64
	16-years-old	180	51.28
	17-years-old	81	23.08
2.	Gender		
	Female	198	56.42
	Male	153	43.58
3.	Major		
	Accounting	22	6.26
	Business	207	58.97
	Marketing	71	20.22
	Culinary arts	51	14.55
4.	Parents' Job		
	Laborer	79	22.50
	Teacher/Lecturer	69	19.65
	Civil Servant	35	9.97
	Police	34	9.68
	Soldier	34	9.68
	Entrepreneur	100	28.52

Source: own study.

Instrument Development

The questionnaires which designed to measure entrepreneurial intention (EI) was adapted from Robledo *et al.* (2015); Linan and Chen (2009), while to measure entrepreneurship education (EE), we adapted items from Denanyoh *et al.* (2015); Opoku-Antwi *et al.* (2012). Furthermore, to understand the entrepreneurial knowledge (EK), we adapted prior instruments validated by Al mamun *et al.* (2017); Kumar *et al.* (2018), whilst to measure entrepreneurial mindset (EM), we applied questionnaires from Mathisen and Arnulf (2013). All the items reflecting the independent and dependent variables were responded to along a 7-point Likert scale ranging from 1 indicating 'strongly disagree' to 7 indicating 'strongly agree.'

Data Analysis

We conducted two stages of testing: exploratory factor analysis and confirmatory factor analysis. Exploratory factor analysis was to validate data, explore dimensions, and maintain strong indicators (Allen, Bennett, & King, 2010), followed by a reliability test. Statistical analysis was performed using SPSS 18. According to Hair *et al.* (2012), a construct can be reliable if it has a Cronbach's alpha score equal to or higher than 0.6. Secondly, this

research followed a confirmatory factor analysis performed with AMOS 24. Schermelleh and Müller (2003) note that the model tested must have several criteria and a cut-off value, including p-value (probability) > 0.5, in order to obtain a fit model. Furthermore, the value of CMIN/DF < 2 (Tabachnick, Fidell, & Ullman, 2007), CFI > 0.95, and RMSEA ≤ 0.05 (Hu & Bentler, 1999). Data were analysed using exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modelling (SEM).

RESULTS AND DISCUSSION

Based on the exploratory factor analysis results presented in Table 2, in total, there are 25 factors, including entrepreneurship education (6), entrepreneurial intention (6), entrepreneurial knowledge (6), and entrepreneurial mindset (7). All factors have a Cronbach's alpha ranging from 0.661 to 0.922, which we considered sufficiently reliable to be included in further analysis. Moreover, Table 2 reveals that the value of loading for the entrepreneurial mindset (EM) variable ranged from 0.578 to 0800, with Cronbach's alpha = 0.836. Based on the results, the EM items are considered to be reliable (Hair *et al.*, 2012).

Table 3 provides information about the test result between variables using structural equation modelling (SEM). The SEM calculations is aimed to check the theoretical framework and fitted models. The probability score was 0.129, the CMIN/DF score – 1.241, the CFI score – 0.994, the FMIN score – 0.170, and the RMSEA score – 0.027. From Table 3 we know that H1, H2, H3, and H4 are significant, with each C.R. score being 7.185, 9.849, 6.686 and 2.436, respectively. In contrast, H5 and H6 were not significant due to C.R. being only 1.082 and -0.835. Lastly, we learn that H7 is significant with b-score 2.327 (Hair *et al.*, 2012).

Table 2. The exploratory factor analysis result

Code	Indicator	Loadings
	1. Entrepreneurial Intention **α = 0.661**	
ei3	I have serious doubts about ever starting my own business.	0.900
ei1	I am ready to do anything to be an entrepreneur.	0.858
ei2	I will make every effort to start and run my own business.	0.833
ei4	I am determined to create a business venture in the future.	0.823
ei5	My professional goal is to be an entrepreneur.	0.813
ei6	I have a very low intention of ever starting a business.	0.719
	2. Entrepreneurial Education **α = 0.922**	
ee4	My school teaches students about entrepreneurship and starting a business.	0.892
ee2	My polytechnic provides the necessary knowledge about entrepreneurship.	0.888
ee3	My polytechnic develops my entrepreneurial skills and abilities.	0.848
ee6	I thought entrepreneurship education encourages me to be an entrepreneur.	0.826
ee5	Entrepreneurship can be developed through education.	0.824
ee1	The education in polytechnic encourages me to develop creative ideas for being an entrepreneur.	0.819
ee4	I thought entrepreneurship education encourages me to be an entrepreneur.	0.892
	3. Entrepreneurial Knowledge **α =0.880**	
ek6	I have sufficient knowledge in managing a business.	0.842
ek3	I have sufficient knowledge to organise a business.	0.826
ek5	I have sufficient knowledge in commercialising a business idea.	0.789
ek4	I have sufficient knowledge in marketing a product/service.	0.776

Code	Indicator	Loadings
ek2	I know how to find the resources (e.g. financial) to set up a business.	0.775
ek1	I have sufficient knowledge of the legal requirements to start a business.	0.741
	4. Entrepreneurial Mindset **α =0.836**	
em4	I look for both negative and positive information about becoming engaged in entrepreneurial activities.	0.800
em1	I consider both positive and negative aspects of becoming engaged in entrepreneurial activities.	0.794
em5	I think about possible business ideas and consider becoming engaged in entrepreneurial activities.	0.784
em3	I consider whether I have the opportunity financially to become engaged in entrepreneurial activities.	0.779
em2	I consider whether I have the time to become engaged in entrepreneurial activities.	0.726
em6	I consider whether it is desirable for me to become engaged in entrepreneurial activities.	0.633
em7	When I consider becoming engaged in entrepreneurial activities it sometimes feels right and sometimes wrong.	0.578

Source: own elaboration based on Robledo *et al*. (2015); Linan and Chen (2009); Denanyoh *et al*. (2015); Opoku-Antwi *et al*. (2012); Al Mamun *et al*. (2017); Kumar *et al*. (2018); Mathisen and Arnulf (2013).

Table 3. The summary of testing results

Hypothesis	Impact	*S.E.*	*C.R.*	*P*	Decision
H_1	**EE → EI**	0.101	7.185	***	Significant
H_2	**EE → EK**	0.064	9.849	***	Significant
H_3	**EE → EM**	0.072	6.686	***	Significant
H_4	**EK → EI**	0.063	2.436	0.015	Significant
H_5	**EK → EM**	0.042	1.082	0.079	Insignificant
H_6	**EM → EI**	0.129	-0.835	0.404	Insignificant
H_7	**Indirect EE → EM→ EI b=2.327**				Significant

Note: EE = Entrepreneurial Education; EI = Entrepreneurial Intention;
EK = Entrepreneurial Knowledge; EM = Entrepreneurial Mindset.
Source: own study.

Discussion

The study aimed at examining vocational school students' entrepreneurial intention based on entrepreneurial education courses that trained entrepreneurial education, mindset, and knowledge. Findings of this study confirm five of our hypotheses and reject two. The results indicate a positive correlation between entrepreneurship education and the intention of being an entrepreneur. Moreover, the findings agree with previous studies by Sun, Liang, and Wong (2017), Li and Wu (2019), Ferreira, Fernandes, and Ratten (2017), which reveals that entrepreneurship education promotes an individual's intention to be an entrepreneur. This finding broadly supports the work of other studies in Indonesian context, thus linking entrepreneurial education with intention (Purwana & Suhud, 2018). The results of the study indicate that entrepreneurship education plays a crucial role in forming entrepreneurial intentions. Entrepreneurial education in vocational schools enables students to experience both theoretical and practical entrepreneurship. As the positive effect of entrepreneurship education

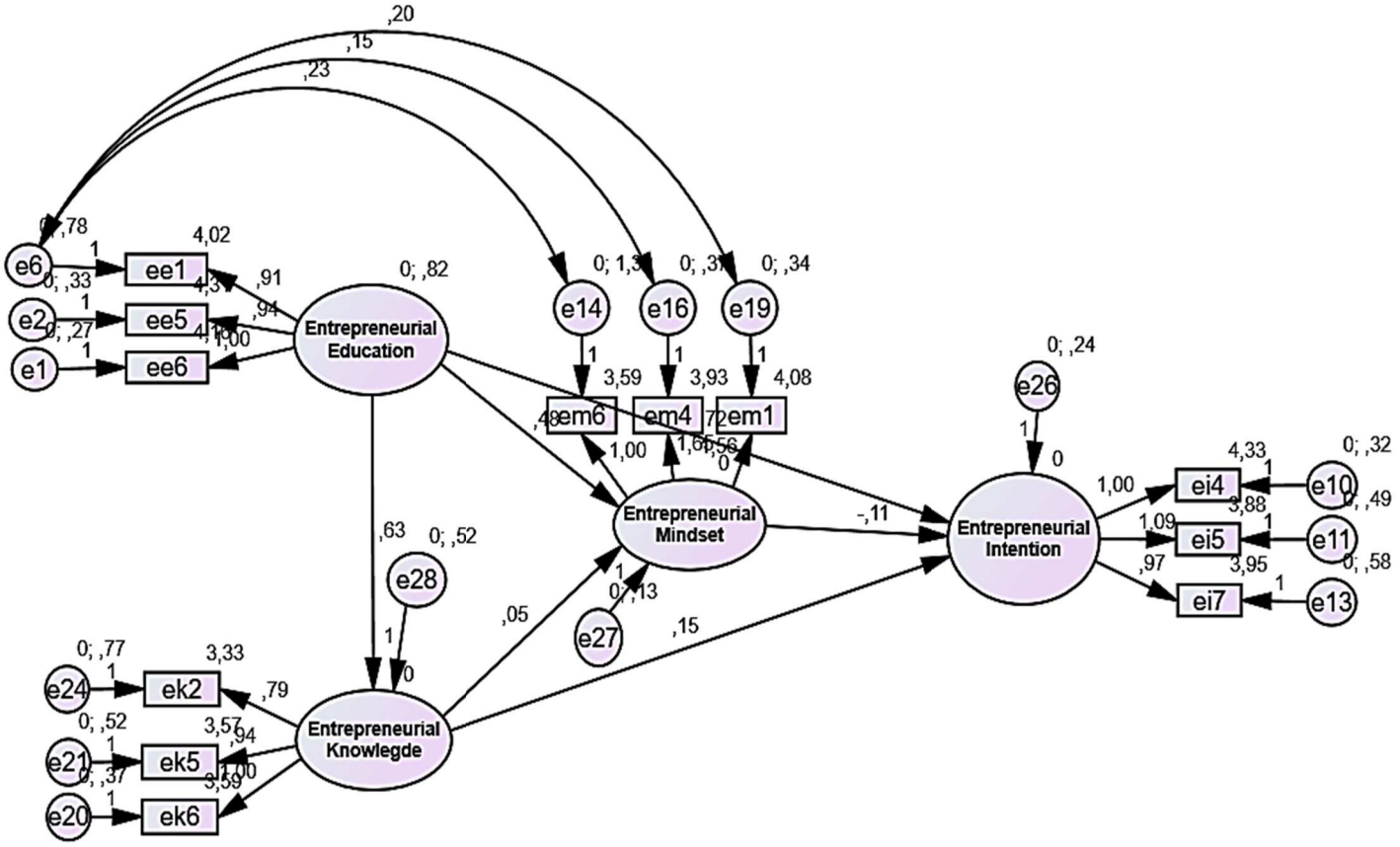

Figure 2. Results of the structural equation research model

Source: own elaboration based on SEM-AMOS Output, 2020.

motivates the Indonesian government to revitalise the curriculum and practice of entrepreneurship education, this step is expected to make effective entrepreneurship education increase young entrepreneurs' abilities through formal education.

The second question of this study sought to determine the relationship between entrepreneurial education and entrepreneurial knowledge. Increased students' knowledge as an impact of entrepreneurship education of students corroborates some earlier works. For instance, Tshikovhi and Shambare (2015), Boldureanu *et al.* (2020) confirm the close relationship between entrepreneurship education and entrepreneurial knowledge. Our finding implies that an individual with high-level education will potentially become an entrepreneur in the future. This entrepreneur will combine various types of knowledge and skills in developing good products or services to meet market tastes and demands. S/he will also be more observant in exploring opportunities, introducing change, and utilising resources optimally and effectively. Similarly, Roxas (2014) argues that entrepreneurs should have the knowledge and skills that are the main capital when running a business. Our finding also supports a prior study by Ni and Ye (2018), who confirmed that entrepreneurial knowledge influenced start-up and new business development. According to Entrepreneurial Human Capital (EHC), education can increase student knowledge related to entrepreneurship. This is because the main role of entrepreneurship education is to provide students with knowledge about entrepreneurship, while its secondary role is to equip students with the skills needed in entrepreneurship.

The third finding of our study shows the significant relationship between entrepreneurship education and entrepreneurial mindset. Consistent with Hussain (2015), Opoku-Antwi *et al.* (2012), Walter and Block (2016), Haynie *et al.* (2010), Zhao and Seibert (2006), we found that entrepreneurship education plays an essential role in developing and even strengthening an entrepreneurial mindset. Entrepreneurship education not only provides knowledge, attitudes, and competencies but also increases motivation to develop an entrepreneurial mindset. Similarly, our finding confirms prior studies by Solesvik *et al.* (2013), Haynie *et al.* (2010), Fayolle and Gailly (2015), who remark that the critical influence of entrepreneurship education on entrepreneurial mindset is to help an individual to focus on the right career path. An anticipated long-term investment that results from entrepreneurial knowledge is the motivation of entrepreneurial worldview which permeates one's personal, social, and professional life (Moberg, 2014).

Furthermore, our study failed in demonstrating the relationship between entrepreneurial mindset and entrepreneurial intention. This outcome is contrary to that of Hussain (2015), Opoku-Antwi *et al.* (2012), Walter and Block (2016), Haynie *et al.* (2010), and Zhao and Seibert (2006) who found a positive correlation between entrepreneurial mindset and the intention to be an entrepreneur. Our contradicting result may stem from the present curricula in entrepreneurship education at Indonesian vocational schools. Our finding could possibly be an entry point for the revitalisation of entrepreneurship education in Indonesia. It implies that even though entrepreneurship education in Indonesia influences entrepreneurial intention, it is not strong enough to encourage the actual entrepreneurial behaviour of vocational students. Thus, entrepreneurship education in the school should not only focuses on cognitive and affective aspects, but it also concerns on psychomotor domain.

The fifth question in this research was to provide the relationship between students' entrepreneurial knowledge and the intention to be an entrepreneur. This finding confirms

hypothesis (H4). Moreover, the finding also accords with earlier observations by Rezaei Zadeh *et al.* (2017), and Farani *et al.* (2017) who showed that entrepreneurship knowledge has a positive effect on entrepreneurship intention. Prospective entrepreneurs with entrepreneurial-related knowledge – such as how to start a business, develop products, or services that can meet customer tastes and market demands – will have a high entrepreneurial intention, compared to those who do not have any at all. Furthermore, Ni and Ye (2018) argue that entrepreneurs with entrepreneurial knowledge and skills, not only witness an increase in entrepreneurial intention but also in principal capital when running their businesses.

The prior literature mentions that entrepreneurship knowledge has a positive effect on entrepreneurial mindset. However, our finding is contrary to previous studies by Rezaei Zadeh *et al.* (2017) and Farani *et al.* (2017) who suggest that entrepreneurship knowledge positively affects not only entrepreneurial intention but also entrepreneurial mindset. The difference in results stems from the inability of respondents to distinguish between entrepreneurial knowledge, entrepreneurial mindset, and entrepreneurial orientation. Moreover, our finding contrasts with the EHC theory, according to which a person with a high level of education simultaneously shows high levels of entrepreneurial mindset and entrepreneurial intention.

Lastly, our study set out with the aim of assessing the importance of entrepreneurial knowledge in mediating influences of entrepreneurship education on students' intention to be entrepreneurs. This study findings confirm the last hypothesis (H7). This result agrees with recent studies by Rezaei Zadeh *et al.* (2017), Farani *et al.* (2017), Hussain (2015), Opoku-Antwi *et al.* (2012), and Walter and Block (2016) who indicate that entrepreneurial education not only affects entrepreneurial knowledge but also entrepreneurial intention, both directly and indirectly. Moreover, from elementary to university levels, entrepreneurial education can play three primary roles related to the entrepreneurial mindset. First, entrepreneurial education aims to create an entrepreneurial culture that permeates all activities; second, the former is to provide special courses during which students can learn more about entrepreneurship itself. Lastly, its final role is through special training courses for individuals who want to start their own businesses (Klofsten, 2000).

CONCLUSIONS

The current article leads us to confirm five and reject two of our initial hypotheses. In more detail, the examination of entrepreneurship education impacts three variables, namely entrepreneurial mindset, entrepreneurial knowledge, and entrepreneurial intention. Moreover, the second major finding is that entrepreneurial knowledge influences students' intention to be entrepreneurs. However, entrepreneurial knowledge has an insignificant impact on entrepreneurial mindset. Lastly, our investigation of the mediating role of entrepreneurial knowledge revealed its positive influence, which implies that entrepreneurial knowledge successfully mediates entrepreneurship education and entrepreneurial intention.

These findings suggest that the Indonesian government should focus on vocational schools curricula, that could be implemented in practice instead of theory. Furthermore, the schools should provide a role model of entrepreneurs and facilitate live experience of entrepreneurship based on the model.

The most important limitation of our study lies in the fact that the data was collected in 15 vocational state schools in Jakarta, which cannot be generalised to represent real

conditions in all vocational schools in the city. Future research should involve all vocational schools in Jakarta that would allow for the generalisation of research results.

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Acknowledgements and Financial Disclosure

The authors would like to thank the anonymous referees for their useful comments, which allowed for the increase of the value of this article. The authors would also thanks to the Faculty of Economics at Universitas Negeri Jakarta for the valuable support of this research through young lecturers scheme in 2020.

Published by Cracow University of Economics – Krakow, Poland

Ministry of Science and Higher Education
Republic of Poland

The copyediting and proofreading of articles in English is financed in the framework of contract No. 913/P-DUN/2019 by the Ministry of Science and Higher Education of the Republic of Poland committed to activities aimed at science promotion.

Entrepreneurial Business and Economics Review

2020, Vol. 8, No. 4

10.15678/EBER.2020.080409

Entrepreneurial orientation dimension affects firm performance: A perspective from the Malaysian furniture industry

Fazal Akbar, Rao Aamir Khan, Fazli Wadood, Abdul Talib Bin Bon

ABSTRACT

Objective: The main objective of this study is to verify the impact of entrepreneurial orientation dimension on firm performance of furniture industry in Malaysia.

Research Design & Methods: In this study, we used a quantitative research method and collected data through a questionnaire from 391 furniture manufacturing company owners and managers, while following purposive sampling approach. The collected data was analysed using structural equation (Partial Least Square). To measure five entrepreneurial orientation dimensions, we adopted specific measuring instruments.

Findings: The study shows that the three dimensions of entrepreneurial orientation – i.e. innovation, risk-taking, and competitive aggressiveness – make unique statistical contributions to the considered model. Findings indicate low levels of autonomy and proactiveness. However, the entrepreneurial orientation and FP models significantly influence the unique contribution of individual entrepreneurial activities in the Malaysian furniture industry.

Implications & Recommendations: This article aims to fill the gaps in entrepreneurial orientation and performance literature within Malaysia's context. This article provides relationship information among performance and entrepreneurial orientation existence, allowing policy-makers and management interventions to improve OE levels.

Contribution & Value Added: This study indicates that there exists a strong entrepreneurial orientation among Malaysian manufacturers, which furthermore establishes and provides basis for future research, as entrepreneurial orientation strongly impacts firm performance. The article is the first one to study complete entrepreneurial orientation dimensions as uni-dimensional in Malaysian manufacturing context.

Article type:	research article
Keywords:	entrepreneurial orientation; furniture industry; Malaysia; firm performance; PLS-SEM
JEL codes:	L20

Received: 1 May 2020 Revised: 8 August 2020 Accepted: 2 September 2020

Suggested citation:

Akbar, F., Khan, R.A., Wadood, F., & Bin Bon, A.T. (2020). Entrepreneurial orientation dimension affects firm performance: A perspective from the Malaysian furniture industry. *Entrepreneurial Business and Economics Review,* 8(4), 157-181. https://doi.org/10.15678/EBER.2020.080409

INTRODUCTION

Entrepreneurial orientation playing a significant contribution towards the success of global entrepreneurs (Akbar, Bon, & Wadood, 2020; Aziz, Mahmood, Tajudin, & Abdullah, 2014). As entrepreneurial orientation got great attention and growing (Aziz *et al.*, 2014; Cámara, 2018; Gartner & Shane, 1995; Thornton, 1999; Żur, 2013). With the establishment of new companies, the world has become an entrepreneurial economy, and entrepreneurs are considers as champions of economic advancement and competition (Entebang, 2011; Sathe, 2004). Now, the ever-changing economic climate, all entrepreneurial strategies ought to be integrated into the strategic management framework (McGrath & MacMillan, 2000). A lot of work on entrepreneurial orientation endorse its important role towards economic and overall development (Ireland, Kyratko, & Morris, 2002). Entrepreneurial orientation applies to decisions concerning companies pursuing innovation, proactivity, risk-taking, autonomy and competitive motivation (Cools & Van den Broeck, 2007; Gartner & Shane, 1995; Lumpkin & Dess, 1996; Thornton, 1999). Appropriate applicability of these dimensions puts the company ahead of its competitors (Cámara, 2018; Quince & Whittaker, 2003). Many authors (such as Moreno & Casillas, 2008; Linton & Kask, 2017; Ebrahimi & Mirbargkar, 2017; Anderson, Kreiser, Kuratko, Hornsby, & Eshima, 2015; Latif, Abdullah, & Jan, 2016) explore entrepreneurial orientation but not the complete five dimensions. EO requires more research despite of its significant consideration (Teles & Schachtebeck, 2019; Głodowska, Maciejewski, & Wach, 2019; Wach, Głodowska, & Maciejewski, 2018). The knowledge, training and skills that somebody can develop their business services are increasingly not known to emerging enterprise entrepreneurs (Joubert, 2007). Entrepreneurial orientation leads to success from business growth and financial results perspective. This situation presents the following challenges: to evaluate the influence of entrepreneurial direction on company outcomes, to validate the study-related past research.

Understanding entrepreneurship and entrepreneurial orientation are the fundamental characteristics of business creation and wider economic growth (Lumpkin & Dess, 1996; Rodriguez-Gutierrez, Fuentes-Fuentes, & Rodriguez-Ariza, 2013), their contribution towards unemployment (Birch, 1979; Birley, 1989; Cámara, 2018; Rambe & Mosweunyane, 2017), and a catalyst for technological innovation creation (Acs & Audretsch, 2005; Fellnhofer, 2018; Hisrich, 1988). Campos, la Parra, and Parellada (2012) work indicate that entrepreneurial environments have been seen as one of the unique fields in which entrepreneurial study has accrued expertise. Agreeing with Rauch, Wiklund, Lumpkin, and Frese (2009) that for several years the literature shows substantial trend towards entrepreneurship and strategic management. Entrepreneurial orientation outlines the decision-making process, strategies, and activities ensuring that entrepreneurs are in charge of setting up new companies (Lumpkin & Dess, 1996). In this case, it is not surprising that there is a good amount of literature studying the relationship among EO and SMEs performance (Avlonitis & Salavou, 2007; Cámara, 2018; Martin & Javalgi, 2016; Rauch *et al.*, 2009; Wang, 2008; Wiklund & Shepherd, 2005). The highly competitive and rapidly changing climate, the integration of entrepreneurial methods into the strategic management foundations is required. Entrepreneurial orientation leads to the results from business growth and financial performance perspective. This situation poses the challenge of deterring the

effect of entrepreneurial orientation on company results, confirming past study-related research and noting the effect, if any, on inadequate market knowledge or management.

Furniture manufacturing is Malaysia's fastest-growing timber subsector industry which contributes 8% towards GDP of Malaysia (Akbar *et al.*, 2017). The industry's socio-economic significance is evident, as it has generated approximately 2.5 billion USD in currency while providing a significant number of participating employees with job opportunities (Akbar, Razak, Wadood, & Al-subari, 2017). The key issues raised were the lack of competitiveness and insufficient technology and innovation (Ratnasingam, Yoon, Mohamed, & Kassim, 2013). However, in recent years, Malaysian furniture manufacturers have been increasingly competing with other cheap furniture manufacturers, notably China and Vietnam (Ratnasingam *et al.*, 2013). Malaysian furniture manufacturers, therefore, need to adopt strategies that can increase productivity, competitiveness and innovation (Akbar *et al.*, 2017). As a result, this situation has led researchers to carry out detailed research on issues, to provide possible solutions to pressing issues, to support innovation and to foster entrepreneurial culture in the furniture manufacturing sector. In this regard, policy makers are advised on the basis of real-world data from the Malaysian furniture industry.

LITERATURE REVIEW

Entrepreneurial orientation is one of the focused areas of corporate entrepreneurship (CE) strategy (Ireland *et al.*, 2009). Furthermore, they emphasise that Entrepreneurial orientation is expressed, by entrepreneurial courses and behaviours, as state or organizational eminence within the business. And various styles and characteristics of many organizations strategies would remain dependent events of EO efficiency (Covin & Slevin, 1991; Lumpkin & Dess, 1996), in addition, entrepreneurial orientation should be regarded as an essential component of a specific and identifiable strategic element, such as the organization's enterprise strategy.

Contingency theory is the basic theory in the field of entrepreneurial orientation, that entrepreneurship must be consistent with the background in order to achieve better results (Wiklund & Shepherd, 2005; Lumpkin & Dess, 1996). Furthermore, Lumpkin and Dess (1996) suggested that entrepreneurial orientation should be consistent to a number of diverse situational factors, such as External (environmental) and internal (organizational) factors. For example, organizational factors may be resources, processes, strategy and structure, while external (environmental) factors can be the marketplace, business, and environmental characteristics. Contingency fit can be viewed as a humble theory: better firm performance would benefit from the relationship between entrepreneurship and contextual factors. Although it appears after reviewing the literature on the entrepreneurial orientation that the contingency function has been theorized in several different forms, which is the core concept of contingency theory, that continuity or 'fit' between the major variables for instance organizational procedures and industrial conditions which is essential to achieve optimum efficiency (Lawrence & Lorsch, 1967). The theory of contingency elucidates the relation among the variables dependent on the level of the third variable.

The inclusion of moderators in bivariate relation facilitated to minimize the risk of unclear consequences and allows for a 'more detailed and accurate interpretation' of con-

tingency relationships (Rosenberg, 1968, p. 100) as cited in (Venkatraman, 1989). Consequently, we analysed the potential strength of the relationship among EO and firm performance with the aim to explain the disparity in results between studies.

Research Assessment Model and Hypotheses Development

The structure and relationship between these will be defined in detail in this section, as displayed in Figure 1 of the study evaluation model. Explanation of the model aims to understand clearly the bind relationship among the constructs of entrepreneurial orientation and firm results. This will enable the design to be operationalized according to the specifics of the current study, and then enable the research hypotheses to be developed.

Relationship Between EO Dimensions and Firm Performance

In past literature, the relations among EO and company performance has become the main concern (Sethi, Iqbal, & Sethi, 2012). Rauch *et al.* (2009), stated that companies adopt EO may execute well than firms that embrace a conservative approach. Primarily, people may question the prominence of EO to business achievement. Therefore, prior research has revealed that EO can significantly advance the company's performance (Wiklund & Shepherd, 2005; Lyon, Lumpkin, & Dess, 2000; Lumpkin & Dess, 1996; Covin & Slevin, 1989). The following Table 1 shows the taxonomy of different studies of EO and firm performance.

Several studies on entrepreneurial orientation and firm performance suggest positive outcomes (Arshi, 2016; Chow, 2006; Coulthard, 2007; Keh, Nguyen, & Ng, 2007; Madsen, 2007; Wolff & Pett, 2006; Wiklund & Shepherd, 2005; Lee, Lee, & Pennings, 2001; Wiklund, 1999; Zahra & Covin, 1995; Zahra, 1991). Nevertheless, there is no doubt that there are studies that show EO has not brought positive results to a company's performance (Naldi *et al.*, 2007; Morgan & Strong, 2003; Matsuno, Mentzer, & Özsomer, 2002; Smart & Conant, 1994). Therefore, very few studies agree that – under different circumstances – EO drives direct and indirect effects of company performance under controlled circumstances (Arshi, 2016; Couppey & Roux, 2007; Kellermanns, Eddleston, Barnett, & Pearson, 2016; Zahra, 2008). Hence, numerous studies show close links between entrepreneurial orientation and firm performance, which emphasises the need for an in-depth study of EO, especially such dimensions as autonomy, innovativeness, proactiveness, competitive aggressiveness, and risk-taking, as identified by Dess and Lumpkin (2005). Therefore, we hypothesise that:

H1: Entrepreneurial orientation affects firm performance.

Innovativeness and Firm Performance

Innovation received much attention from the scholarship because it is the main foundation of entrepreneurial activities (Drucker, 2002). Many researchers find that a company's internal innovation is positively correlated with the total success and impartial measures of company performance, including ROI, ROA, ROS (Calantone, Cavusgil, & Zhao, 2004). Empirical studies of Spanish SME's reveal that a firm's innovation is largely associated with organisation growth, e.g. in term of assets, sales, and job growth (Casillas & Moreno, 2010). Other studies show a significant relationship between process innovation and overall organisation growth (Wadood *et al.*, 2013; Klomp & Van Leeuwen, 2001). Moreover, new product development also shows positive impact on overall firm performance (Li & Calantone, 1998). A research held in Taiwanese small and medium enterprises, similarly establishes that – among

other things – innovative SMEs are high performing (Wang & Yen, 2012). The results of Pakistani companies are similar to those of previous findings (Hameed & Ali, 2011), South Korea (Hong, Song, & Yoo, 2013), and Istanbul (Turkey) (Karacaoglu, Bayrakdaroglu, & San, 2013). A recent Iranian study found that innovation is the most appropriate dimension to positively affect company performance (Cannavale & Nadali, 2019).

Table 1. Taxonomy of conceptual and empirical literature on EO and performance

Names of Authors	Title of Paper	Country of Research	Year
Covin & Slevin,	'A conceptual Model of Entrepreneurship as Firm Behavior'	United States	1991
Zahra	'A Conceptual Model of Entrepreneurship as Firm behavior: A Critique and Extension'	United States	1993
Lumpkin and Dess	'Clarifying the Entrepreneurial Orientation Construct and Linking it to Performance'	United States	1996
Wiklund,	'The Sustainability of Entrepreneurial Orientation-Performance Relationship'	United States	1999
Lumpkin and Dess	'Linking Two Dimensions of Entrepreneurial Orientation to Firm Performance: The Moderating Role of Environment and Industry Life Cycle'	United States	2001
Wiklund and Shepherd	'Knowledge-based Resources, Entrepreneurial Orientation, and Performance of Small and Medium-sized Businesses.'	Sweden	2003
Wiklund and Shepherd	'Entrepreneurial Orientation and Small Business: A Configurational Approach'	Sweden	2005
Harun Kaya and Veysel Ağca	'Entrepreneurial Orientation and Performance of Turkish Manufacturing FDI Firms: An Empirical Study'	Turkey	2009
Rauch, Wiklund, Lumpkin and Frese	'Entrepreneurial Orientation and Business Performance: An Assessment of Past Research and Suggestions for the Future'	----	2009
Khalili, Nejadhussein, and Fazel	'The Influence of Entrepreneurial Orientation on Innovative Performance'	Iran	2013
Aziz *et al.*	'The Relationship Between Entrepreneurial Orientation and Business Performance of SMEs in Malaysia'	Malaysia	2014
Naldi, Nordqvist, Sjöberg, and Wiklund	'Entrepreneurial Orientation, Risk-Taking, and Performance in Family Firms'	Sweden	2007
Wales, Parida, and Patel	'Nonlinear Effects of Entrepreneurial Orientation on Small Firm Performance: The Moderating Role of Resource Orchestration Capabilities'	----	2013
Van Dorn, and Volberda	'Entrepreneurial orientation and firm performance: The role of the senior team'	----	2009
Chiara Cannavale and Iman Zohoorian Nadali	'Entrepreneurial Orientations and Performance: A Problematic Explanatory Approach in the Iranian Knowledge-Based Industry'	Iran	2018
Akbar *et al.*	'Open Innovation Mediates the Relationship between Entrepreneurial Orientation and Firm Performance: A Preliminary Survey'	Malaysia	2020

Source: own study.

Big established companies have always embraced innovation and have been driven by the development of new products, which led to constant changes in their product lines (O'Connor & DeMartino, 2006). Innovation might be new to the world and can construct entirely fresh markets. Companies with the ability to provide multiple product lines and excellent technical support within the organisation will receive greater economic returns (Cannavale & Nadali, 2019; Sorescu, Chandy, & Prabhu, 2003). Therefore, by taking advantage of opportunities in emerging markets, innovative strategic positions are considered to have a positive impact on company performance. Therefore, we hypothesise that:

H1a: Innovativeness affects firm performance.

Proactiveness and Firm Performance

A proactive company will benefit from its position as the driving force because it can take advantage of market opportunities (Ambad & Wahab, 2013). According to Lumpkin and Dess (1996), the introduction of new product or service enhances firm revenue and has the advantage of building brand awareness. Taking the lead in introducing products/services will build customer consistency because of high transaction expenses. The capability to foresee future difficulties, needs, or changes enables companies to form the atmosphere and course of opposition from which they can benefit (Morgan & Strong, 2003). Nevertheless, Coulthard (2007) shows that – compared with companies established in the franchise industry – start-ups are more suitable to employ proactiveness. This may be due to the size of the company, because larger companies have more pronounced bureaucracy and cannot take advantage of being first movers in the market (Meuer & Rupietta, 2015).

Furthermore, Lumpkin and Dess (1996) state that proactive companies not only actively seek opportunities but also actively respond to competitors. This comportment permits the company to face competitors and achieve excellent performance. Proactive companies are closely aware of market gestures, access to unusual means, and a firm commitment to improving products/services, so they can all achieve great performance revenues (Day & Wensley, 1988; Wright, Kroll, Pray, & Lado, 1995). Among Spanish SMEs, the more proactively a company develops to gain new business opportunities, the higher its growth rate (Casillas & Moreno, 2010). Furthermore, proactiveness also shows great impact in sales increase in small businesses in the USA (Becherer & Maure, 1999; another, similar study on Taiwanese SMEs shows similar results; Wang & Yen, 2012). There are also positive results of proactivity from the Iranian technology-based industry, and its stronger impact on firm performance (Cannavale & Nadali, 2019). Therefore, we hypothesise that:

H1b: Proactiveness affects firm performance.

Risk-Taking and Firm Performance

A trend that changes from a predictable situation to an unpredictable trend is a risky behaviour, in which case we may take advantage of the opportunity and invest a lot of resources with little knowledge of the new situation (Wiklund & Shepherd, 2005; Covin & Slevin, 1991). The finding of the study on 167 New Zealand companies suggests that greater risk results in higher financial performance. The most recent study of Cannavale and Nadali (2019) on Iranian technological SMEs supports this arguments and shows positive relationship between risk taking activities with firm performance. A similar relationship appears in the study by Wang and Yen (2012) on SMEs in mainland China, whose risk taking strategy positively im-

pacts overall firm performance. Rauch *et al.*'s (2009) meta-analysis shows that there is a positive correlation between risk-taking behaviour/approach and firm performance.

In a nutshell, risk-taking behaviour strongly impacts overall firm performance. As companies invest their resources in new projects, they take financial risks which may pay back with high returns, thus increasing firm resources. Therefore, we hypothesise that:

H1c: Risk-taking affects firm performance.

Autonomy and Firm Performance

The empirical discoveries associated with autonomy, namely entrepreneurial orientation dimension, result, and conclusion appear to be inconsistent in the study by Yu, Lumpkin, Praveen Parboteeah, and Stambaugh (2019). Chen, Neubaum, Reilly, and Lynn (2014) and Jancenelle, Storrud-Barnes, and Javalgi (2017) show a positive correlation among autonomy and firm performance. However, some studies do not find substantial autonomy performance ratio (Lechner & Gudmundsson, 2014; Hughes & Morgan, 2007). Since EO-autonomy field appears self-contradictory and different studies reveal different and mixed results (Zellweger & Sieger, 2012; Short *et al.*, 2009), we focus on the study of companies based on EO and the relationship among autonomy and firm performance. Numerous scholars – among others, Cogliser and Schneider (2009), Lumpkin and Prottas (2008), and Coulthard (2007) – recommend that permitting autonomy to all participants in an organisation can motivate and encourage action in an entrepreneurial manner, thereby improving company performance. As we discovered, autonomy is an element of entrepreneurial orientation, and it participates in its basic theoretical assumptions that – in an appropriate configuration – what shows positive impact are higher EO levels and other crucial elements such as strategy, environment, and structure (Rauch *et al.*, 2009). Hence, we conclude that there is strong correlation between entrepreneurial orientation and firm performance. Therefore, we hypothesise that:

H1d: Autonomy affects firm performance.

Competitive Aggressiveness and Firm Performance

Competitive aggressiveness is considered to be an establishment's ability to execute superior strength than opponents (Yu *et al.*, 2019; Kuivalainen, Sundqvist, & Cadogan, 2010). It is categorised as a positive response to modest threats (Rauch *et al.*, 2009) and competitive behaviour (Lyon *et al.*, 2000). Although Lumpkin and Dess (2001) find no significant direct correlation between competitive aggressiveness and firm performance. However, some studies speculate that there is a relationship between competitive aggressiveness and organisational performance – especially internationally – and this dimension still exists and is considered an active element of EO (Yu *et al.*, 2019; Kuivalainen *et al.*, 2010). In a meta-analysis on competitive aggressiveness with regard to firm performance, Hughes-Morgan, Kolev, and Mcnamara (2018) find that there is a positive correlation among these variables. Another study by Kljucnikov, Belas, and Smrcka (2016) discover that majority of entrepreneurs seeing their behaviour as non-aggressive. According to the study by Zahra and Covin (1995), the behaviours shown can help a company compete with other companies in the market, therefore improving own overall performance. Hence, the above discussion leads towards the following expected relationship:

H1e: Competitive aggressiveness affects firm performance.

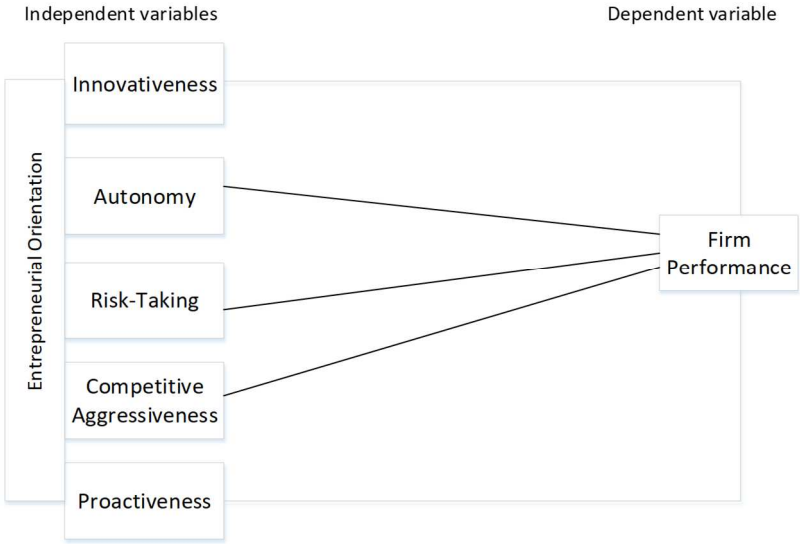

Figure 1. Research framework
Source: own elaboration.

RESEARCH METHODOLOGY

The model and pattern of research can represent the way of thinking in a defined system (Teles & Schachtebeck, 2019). In this article, we adopt a post-positivist approach for its objective nature and so as to interact with respondents as little as possible. The main motivation of the study following the post-positivist approach is to allow researchers to repeat and verify the obtained findings in the future (Teles & Schachtebeck, 2019). The data was collected from owners and managers of furniture manufacturing companies in Johor, Malaysia. However, we observed in sample selection that the companies must have been registered with the Federation of Johor Furniture Manufacturers and Traders Association. The reason for selecting the study sample from Johor was that most furniture establishments are located in that state.

An online questionnaire was prepared and sent to the managers of various furniture companies to collect empirical data. The questionnaires were also printed and delivered to managers. The survey consisted of two sections, i.e. demographic questions, which consist of company age, size, and location and the experience, education, and position of respondents. The second section consisted of 33, five-point Likert-scale questions about the six constructs identified in this study. The existing scale is derived from previous studies after extensive literature research. Entrepreneurial orientation construct items are based on Akbar *et al.* (2020), Arshi (2016), Dai, Maksimov, Gilbert, and Fernhaber (2014), Matchaba-Hove, Farrington, and Sharp (2015), and Tajeddini (2013). The items under the firm performance were taken from the study by Akbar *et al.* (2017, 2020), Matchaba-Hove *et al.* (2015), Nasir (2013), and Rajapathirana and Hui (2017). The questionnaire containing these items can be

found in Appendix A. In this study, 600 questionnaires were distributed in Johor. However, only 432 questionnaires were returned. Due to many missing sections in some questionnaires, the totals of 391 samples were selected for further assessment. PLS was used to conduct SEM. Table 2 below displays the questionnaire administration of participants.

Table 2. The analysis of questionnaires administration

Questionnaire characteristics	Frequency	Percentage
Total questionnaire administered	600	100%
Total retrieved	432	72%
Total valid	391	65.1%
Effective sample	391	65.1%

Source: own study.

Male respondents accounted for 57.3% of the sample, female respondents accounted for 42.7%. Forty-two point five per cent of the total respondents were in companies aged between one and four years, followed by 32% aged between five and nine years, 19.7% aged 10-14 years, and 5.8% aged 15 years. To be precise, 52.9% of the companies were large companies with more than 200 employees, while medium-sized companies accounted for 40.8%. The respondents' answers to small companies – less than 75 employees – accounted for 6.3%. Respondents' positions in the company indicated that 36.4% were middle management, 34.71% – top management, and 28.88% – lower management. The educational background of the respondents showed that 54.9% had a master's degree, 35% held Bachelor degree, and 7.3% had a high school diploma, while 2.9 percent had a PhD. The working experience of the respondents showed that 65.3% worked from one to five years, 17.7% worked from six to 10 years, while 16% worked 11-15 years in the same company. The percentage-wise establishment of companies in Johor state is 45.1% in Muar, 20.9% Segamat, 16.3% in Batu Pahat, 11.2% in Kulang, and 6.6% in Johor Bharu.

RESULTS AND DISCUSSION

The research evaluation model introduced in the previous section has been verified using the PLS-SEM method. The evaluation of conceptual and theoretical models in PLS-SEM involves a two-stage method internal model (measurement model) and then an external model (structural model). The main motivation for and essence of validating the model using this approach was to empirically gauge its performance with existing criteria that underpin the validation of measurement and structural models.

Measurement (Inner) Model Assessment

By evaluating the reliability of individual items, we used to evaluate the measurement model the Cronbach's alpha and reliability, convergence validity, the internal consistency of composite, and discriminant validity. Furthermore, to in-depth evaluate the measurement model, we applied the PLS algorithm process used to verify the validity and reliability of the construct, which consists of convergence and discriminative validity and the loadings of all indicators in their respective constructs (Urbach & Ahlemann, 2010). Figure 2 below shows the items load and Average Variance Extraction (AVE) values of the constructs. Table 3 below shows the outer loadings of the measurement model. All constructs

AVEs exceed the threshold of 0.50. Although except for three items, the loadings are close to or greater than 0.7 – that is, more than 0.5 – if the AVEs is achieved, the lower loadings items can be retained Hair, Ringle, and Sarstedt (2011).

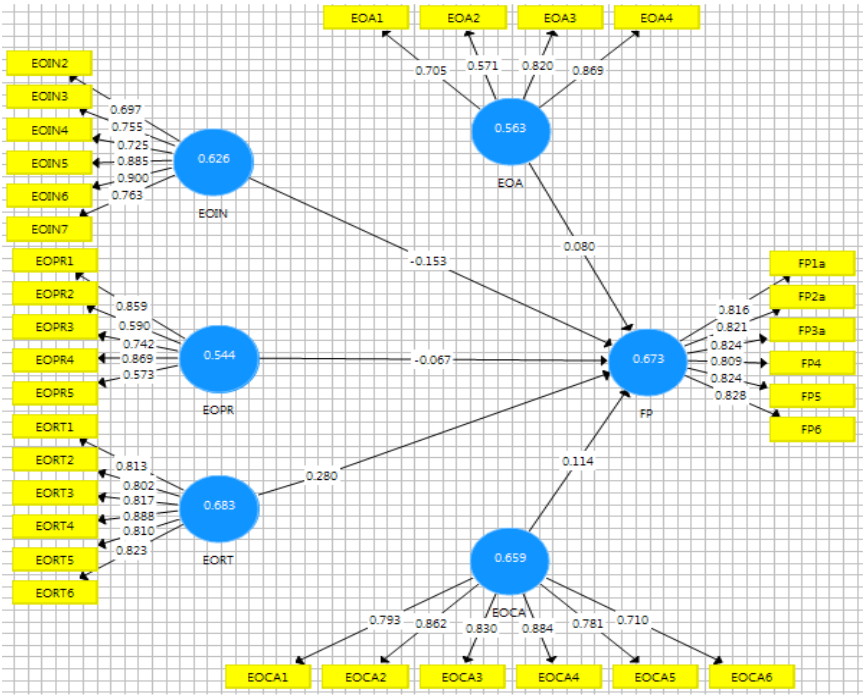

Figure 2. Measurement model
Source: own elaboration.

Table 3. Reliability of measurement (inner) model

Variable	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Autonomy	0.799	0.834	0.563
Competitive Aggressiveness	0.897	0.920	0.659
Innovativeness	0.903	0.909	0.626
Proactiveness	0.854	0.853	0.544
Risk-Taking	0.907	0.928	0.683
Firm Performance	0.903	0.925	0.673

Source: own study.

Individual reliability studies showed that the observed variables reached the minimum required level (λ≥0.70). Therefore, we recognised that these indicators are part of their corresponding constructs (Hair, Hult, Ringle, & Sarstedt, 2017). Composite reliability (CR) study showed that all values were higher than 0.70 (Table 3). The results showed that the measurement model was internally consistent with the findings of Hair *et al.* (2011) that all observed indicators or variables are measuring their corresponding latent variables.

By checking the factorial load of the project and its importance, the AVE and the number of iterations of the measurement model convergence were evaluated for convergence validity (Hair *et al.*, 2017; Ali Memon, Ting, Ramayah, Chuah, & Cheah, 2017; Wong, 2013; Hair *et al.*, 2011). The element must bear a higher load on its basic construct and must not bear a higher load on other structures to achieve the effectiveness of convergence. The findings of Hair *et al.* (2017) suggest that to achieve good convergence validity, the factor load must be greater than 0.7. Thus, it is recommended to delete elements with a load of less than 0.4 from the model (Hair *et al.*, 2011). Therefore, all items with load less than 0.4 were removed. Similarly, according to the proposal of Hair *et al.* (2013), items with a lower load but higher than 0.4 were retained, when the AVE value reaches the suggested edge of 0.5 or higher. The AVE is a large average value that measures the total square load of the indicators in the model, which is similar to the commonality of the constructs (Hair *et al.*, 2017; 2011). The basic assumption is that the average covariance between indicators must be positive. To achieve the effectiveness of convergence, at least 50% of all measurement models must be explained by model indicators (Memon *et al.*, 2017). Thus, the threshold for AVE is recommended to be at least 0.5 (Brooks & Brooks, 1993; Bryman, 2015; Hair *et al.*, 2011; 2017; Pituch & Stevens, 2016; Shah & Goldstein, 2006; Vinzi, Chin, Henseler, & Wang, 2010; Wong, 2013).

Table 4 shows that the maximum factor loads are greater than 0.6, and they are significant (t-start> 1.96; p-value<0.005). Overall, there are three items with the load below 0.6, but these items are retained as described by Hair *et al.* (2017), if the AVE reaches the recommended threshold. Similarly, Figure 2 and Table 3 show measurement models of the AVE for variables autonomy (0.563), competitive aggressiveness (0.659), innovativeness (0.626), proactiveness (0.544), risk-taking (0.683), and firm performance (0.673). All AVEs above keep the suggested minimum value of 0.5 (Memon *et al.*, 2017; Hair *et al.*, 2011). All factor loads of the outer load of the study variable are in less than 10 iterations, far below the maximum of 300 iterations (Wong, 2013). Therefore, the convergence validity of the research measurement model is established.

Discriminant validity shows that there is significant difference among the constructs which are not included in the theory. According to Fornell and Larker (1981), it is the first time introduces the method to verify that the square root of the extracted average variance (AVE) – on the diagonal of Table 5 – is higher than the communal variance among the construction and former model constructs. No data can be found along the diagonal of Table 5 (Mason & Perrault, 1991).

Table 4. Factor loadings of measurement model

Variable	EOA	EOCA	EOIN	EOPR	EORT	FP
EOA1	0.705					
EOA2	0.571					
EOA3	0.820					
EOA4	0.869					
EOCA1		0.793				
EOCA2		0.862				
EOCA3		0.830				
EOCA4		0.884				
EOCA5		0.781				

Variable	EOA	EOCA	EOIN	EOPR	EORT	FP
EOCA6		0.710				
EOIN2			0.697			
EOIN3			0.755			
EOIN4			0.725			
EOIN5			0.885			
EOIN6			0.900			
EOIN7			0.763			
EOPR1				0.859		
EOPR2				0.590		
EOPR3				0.742		
EOPR4				0.869		
EOPR5				0.573		
EORT1					0.813	
EORT2					0.802	
EORT3					0.817	
EORT4					0.888	
EORT5					0.810	
EORT6					0.823	
FP1						0.816
FP2						0.821
FP3						0.824
FP4						0.809
FP5						0.824
FP6						0.828

EOA, Entrepreneurial Orientation Autonomy, EOCA, Entrepreneurial Orientation Competitive Aggressiveness, EOIN, Entrepreneurial Orientation Innovativeness, EOPR, Entrepreneurial Orientation Proactiveness, EORT, Entrepreneurial Orientation Risk-Taking, FP, Firm Performance.
Source: own study.

Table 5. Discriminant validity Fornell-Larcker criterion

Variable	EOA	EOCA	EOIN	EOPR	EORT	FP
EOA	0.750					
EOCA	0.501	0.812				
EOIN	-0.190	-0.225	0.791			
EOPR	-0.021	0.044	0.064	0.738		
EORT	0.282	0.368	0.191	-0.215	0.826	
FP	0.246	0.288	-0.144	-0.133	0.330	0.820

EOA, Entrepreneurial Orientation autonomy, EOCA, Entrepreneurial Orientation Competitive Aggressiveness, EOIN, Entrepreneurial orientation Innovativeness, EOPR, Entrepreneurial Orientation Proactiveness, EORT, Entrepreneurial Orientation Risk-taking, FP, Firm Performance.
Source: own study.

Moreover, to further verify the realisation of the validity of the discrimination, we used the method of Heterotrait-Monotrait (HTMT). The HTMT method is considered to be the most conservative and appropriate standard for evaluating discriminant validity (Henseler & Sarstedt, 2013). The decision rule for establishing discriminant validity in the

HTMT method is that all correlations among the construct of concern and the remaining constructs are less than 0.85 ($r<HTMT_{0.85}$; Henseler, Ringle, & Sinkovics, 2009; Kline, 1994). The result of HTMT associated with the construct in the research model is provided in Table 6 below. All reported values are lower than the $HTMT_{0.85}$ standard, which further proves the realisation of the validity of discrimination.

Table 6. The Heterotrait-Monotrait ratio (HTMT)

Variable	EOA	EOCA	EOIN	EOPR	EORT	FP
EOA						
EOCA	0.593					
EOIN	0.378	0.241				
EOPR	0.198	0.093	0.316			
EORT	0.262	0.401	0.226	0.226		
FP	0.218	0.301	0.117	0.128	0.354	

EOA, Entrepreneurial Orientation autonomy, EOCA, Entrepreneurial Orientation Competitive Aggressiveness, EOIN, Entrepreneurial orientation Innovativeness, EOPR, Entrepreneurial Orientation Proactiveness, EORT, Entrepreneurial Orientation Risk-taking, FP, Firm Performance.
Source: own study.

Besides, when the cross-factor load matrix is obtained (Chin, 2010), the results show that the correlation between these indicators and their construct is higher than that between other indicators.

Structural (Outer) Model Assessment

The validity of the measurement model was met according to the recommended standards, thus achieving the first stage of the two-stage PLS-SEM evaluation process. Structural model evaluation is a five-stage process involving collinearity evaluation, the significance test of relationship between structural models, R^2 level evaluation, effect-size evaluation, and final evaluation as the predicted correlation of the model (Hair *et al.*, 2011). Figure 3 below illustrates t-values of the structural model with corresponding path coefficients and factor loadings.

We sought to estimate the hypothetical relationship between potential endogenous constructs (firm performance) and exogenous constructs (autonomy, innovativeness, competitive aggressiveness, risk-taking, and proactiveness) through path coefficients in the structural model. Path coefficients close to +1 are considered to characterise a robust positive correlation, while path coefficients tending to -1 represent – a strong negative relationship (Hair *et al.*, 2017; 2011). The importance of path estimation was determined by bootstrapping process in Smart PLS-SEM software, using the critical t-value of the important test with an importance level of 5% (default setting).

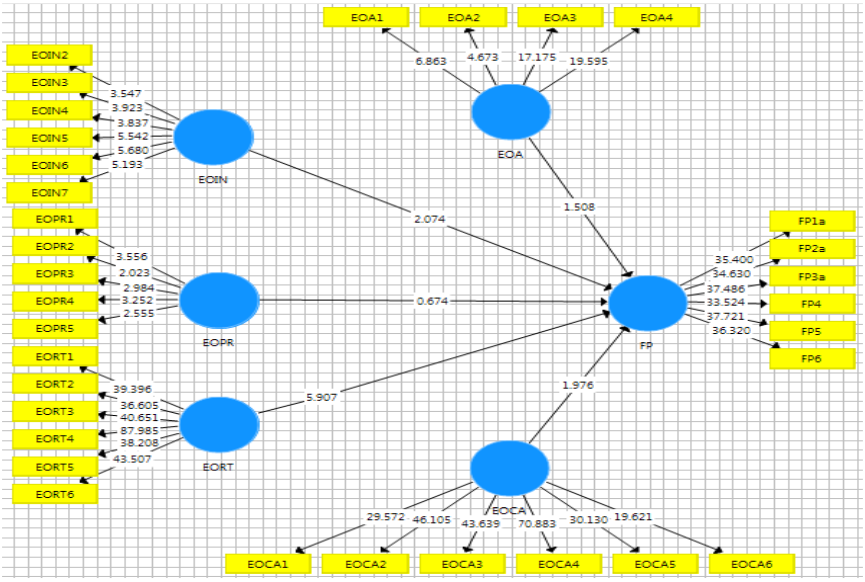

Figure 3. Structural model
Source: own elaboration.

Table 7. Path coefficients

Variable	Beta	Standard Deviation	T-Statistics	P-Values	f^2	Decision
EOA -> FP	0.080	0.053	1.508	0.066	0.006	Not supported
EOCA -> FP	0.114	0.057	1.976	0.024	0.010	Supported
EOIN -> FP	-0.153	0.074	2.074	0.019	0.023	Supported
EOPR -> FP	-0.067	0.099	0.674	0.250	0.005	Not Supported
EORT -> FP	0.280	0.047	5.907	0.000	0.067	Supported

EOA, Entrepreneurial Orientation autonomy, EOCA, Entrepreneurial Orientation Competitive Aggressiveness, EOIN, Entrepreneurial orientation Innovativeness, EOPR, Entrepreneurial Orientation Proactiveness, EORT, Entrepreneurial Orientation Risk-taking, FP, Firm Performance.
Source: own study.

Table 7 above demonstrates the path coefficients (β) and respective values of t-values, p-values, and f^2. The highest positively significant path relationship is the relationship between risk-taking and firm performance (β = 0.280, t = 5.907, p < 0.05), while the other positive relationship is that among competitive aggressiveness, innovativeness, and firm performance, with scores β = 0.114, t = 1.976, p < 0.05 and β = -0.153, t = 2,074, p < 0.05. Conversely, we also found substantial negative relationship among autonomy, proactiveness, and firm performance, with scores of β = 0.080, t = 1.508, p > 0.05 and β = -0.067, t = 0.647, p > 0.05.

According to Cohen, Manion, and Morrison (2013) R-squared values ranging from 0.1 to 0.12 reflect a weak relationship, values from 0.13 to 0.25 reflect a moderate relationship, and values of 0.26 or higher are generally considered substantial as a rule of thumb. Since the purpose of PLS-SEM is to explain the endogenous potential variance,

the key goal is to have a higher R-squared. After all, the adequacy of R-squared depends on the investigation background (Hair *et al.*, 2011).

The maximum R-square value of a firm's performance of 0.176 shows that the independent variables explain 17.6% of the firm's performance difference. The f^2 measures the change in R^2 due to the omission of the specific exogenous construct in the model. The f^2 is used to measure the effect of a singular exogenous construct on the R^2 value of an endogenous construct (Hair *et al.*, 2017). The effect magnitude is measured in the light of and following guidelines by Cohen (1988), in which f^2 values effects are considered to be small (0.02), medium (0.15), and large (0.35). The result indicates effect sizes of competitive aggressiveness (f^2 = 0.023), innovativeness (f^2 =0.023), and risk-taking (ƒ2 =0.067), which are slightly below moderate effect benchmark but higher than the small effect threshold. The f^2 value for autonomy and proactiveness has zero or below the small threshold effect sizes on R^2 values.

Discussion

The tested structural model provides some evidence that organisation performance is largely associated with the size of entrepreneurial orientation in Malaysian's furniture industry. It shows that improving entrepreneurship requires the full understanding of current trends and market demands. The study confirmed hypothesis H1a: innovativeness has significant positive relation with regard to firm performance (β = -0.1530, t = 2.074, p < 0.019). This finding is consistent with that of Cannavale and Nadali (2019), who state that innovation is the main appropriate dimension of EO to positively affect performance. The introduction of new developments in the market helps companies to gain and understand competition. Hypotheses H1c and H1e are the other influential items of EO – i.e. risk-taking and competitive aggressiveness – which significantly influenced firm performance (β = 0.280, t = 5.907, p < 0.000; β = 0.114, t = 1.976, p < 0.010). The risk-taking findings agree with many studies (Gibb & Haar, 2010; Cannavale & Nadali, 2019; Wang & Yen, 2012) that greater risk conditions will result in higher financial performance. The willingness of companies to invest resources in high-risk, high-return projects will have the advantage of increasing resources. Hughes-Morgan *et al.* (2018) and Kljucnikov *et al.* (2016) agree with our conclusion of competitive aggressiveness and state that the organisation that shows aggressive behaviour in the market can compete with their counterparts. Hypotheses H1b and H1d consider two dimensions of EO – i.e. proactiveness and autonomy – that have influenced firm performance negatively (β = -0.067, t = 0.674, p < 0.250) (β = 0.080, t = 1.508, p < 0.066). Wang and Yen (2012) agree that an organisation's ability to foresee future difficulties, needs, and changes in the market to benefit from is important. Lumpkin *et al.* (2009) suggest that giving autonomy to employees may motivate them but will affect the performance. These findings of autonomy agree with results of Yu *et al.* (2019), who find inconsistent relationship in this regard. There are several reasons to explain the significant results of EO on FP. First, the manager of a furniture company must take risks and innovate in the provision of services to attract more customers and new markets. The aggressiveness of furniture managers is another factor that can attract more customers and a new entry into the market. The findings of our research agree with the current literature (Arshi, 2016; Tajudin *et al.*, 2014; Coulthard, 2007; Keh, Nguyen, & Ng, 2007; Madsen, 2007; Chow, 2006; Wolff & Pett, 2006; Wiklund & Shepherd, 2005; Wiklund, 1999; Cannavale & Nadali, 2019) that risk-taking and innovativeness have a

unique attraction in sustaining the furniture business, among other industries. The results provide an opportunity for future research to understand the importance of EO in the improvement of performance. In this research, EO focused on entrepreneurship and product manufacturer market issues in product handling and the services they provide, including issues related to consumers, competition, and cross-functional coordination. This finding was supported by Aziz *et al.* (2014) and Akbar *et al.* (2020) that EO can improve the performance of the furniture industry. Therefore, we confirmed that EO was essential for determining firm performance in the furniture industry.

CONCLUSIONS

Our article refers to other authors' concerns and recommendations about the need to further research young people's entrepreneurial cycle in the furniture manufacturing field. This is important because entrepreneurship generates business and financial benefits, particularly for young people. It is a segment of export oriented industry with high purchasing power and impact. The interest in this field of research is also due to rapid innovation and rapid technology development, which is connected to the rapid changes in design and value.

We developed an entrepreneurial-oriented training model at the theoretical level, which is statistically significant and realistic, that furniture companies will be able to apply. The model contains dimensions of entrepreneurial orientation independent variables such as innovativeness, proactivity, autonomy, risk-taking, competitive aggressiveness, and the dependent variable of firm success. Many authors that we included find certain variables important and were never previously studied jointly. All of these observations and considerations improve the theoretical and practical awareness of entrepreneurship-driven research and training. The established Structural Equation Methodology (SEM) rigor helped us to generate a causal model that can sufficiently and completely predict the entrepreneurial orientation and firm results. This technique was successfully applied by other writers in the field of associated variables.

To control EO's impact on business success, we must understand the character of entrepreneurship in individual business positions and their mutual effect on firm results. The present literature indicates that there is a substantial transformation in the effect of entrepreneurship on the company's dissimilar functions; the effect on production tends to be almost absent. Furthermore, researchers discuss the influence of R&D, marketing, and sales separately. This article contributes to the scholarship by analysing how EO constructs have a dissimilar impact on business functions and how these functions form an internal value chain that defines the overall success of a company. Overall, most researchers can discover positive relationships with EO success that will improve over time, and they find several moderating factors that can strengthen this relationship. We hope our research ideas will provide the basis for further fruitful discussions and empirical research on EO concepts in different areas.

This work focuses on the particular segment of industry, which is a constraint. Future studies in other industries could validate our research outcomes and explore its generalisability in the industrial sector. Because of time and financial constraints, this study only targets Malaysia and cannot be applied to other countries, as each country has a different culture, and it is well established that culture influences the actions and approaches of individuals.

In this analysis, the dimensions of entrepreneurial orientation were analysed in a multi-dimensional manner, following Lumpkin's and Dess's (1996) research. Future re-examination can suggest testing our hypothesis on the basis of research ideas suggested by Covin and Slevin (1989). Hence, a single-dimensional structure was used jointly and created by battery indicators. To measure EO, there are different scales, while other measures may be used to determine whether the same results can be obtained. Future studies can be contrasted with varying scales, which will help to improve the comprehension of a scale's validity and, therefore, add to this vein of literature. Future research should also validate our work with various types of firms (such as non-profit firms), because they adopt a distinct cultural model from commercial firms and, therefore attract little attention from scholars (Cámara, 2018).

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The share of authors is: Fazal Akbar 70% (draft writing), Rao Aamir Khan 5% (final draft for submitting), Dr Fazli Wadood 20% (statistics write up), Abdul Talib Bin Bon 5% (draft correction).

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Acknowledgements and Financial Disclosure

We would like to acknowledge and thank anonymous reviewers for their meaningful insight and observations and also the editorial team for welcoming our research paper. Fazal Akbar is grateful to his supervisor, Prof Dr. Abdul Talib Bin Bon (Universiti Tun Hussein Onn Malaysia), who provided expertise that greatly assisted this research paper, even if Prof. Talib Bin Bon may not agree with all of the interpretations provided in this paper. Fazal Akbar is also grateful to Assistant Professor Dr. Fazli Wadood (the University of Buner) for assistance with the revision and proofreading of this paper, which significantly improved the manuscript.

Published by Cracow University of Economics – Krakow, Poland

Ministry of Science and Higher Education
Republic of Poland

The copyediting and proofreading of articles in English is financed in the framework of contract No. 913/P-DUN/2019 by the Ministry of Science and Higher Education of the Republic of Poland committed to activities aimed at science promotion.

Entrepreneurial Business and Economics Review

2020, Vol. 8, No. 4

10.15678/EBER.2020.080410

Entrepreneurial nascent behaviour: The role of causation process in opportunity discovery and creation

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ABSTRACT

Objective: The notion of opportunities is fast becoming a dominant topic in the field of entrepreneurship research. Based on the causation process, this study aims to identify the manager's decisions to take entrepreneurial action through opportunity discovery and opportunity creation indicators.

Research Design & Methods: This empirical study tests its hypotheses by using a sample of 400 senior and middle-level managers from Pakistan and applied a SEM structural equation modeling technique.

Findings: Our findings show that opportunity discovery and opportunity creation positively and significantly influence nascent entrepreneurial behaviour. Meanwhile, results reveal that the causation approach partially mediates the relationship between opportunity discovery, opportunity creation, and nascent entrepreneurial behaviour.

Implications & Recommendations: The results of this study elucidate senior and middle level managers from a SME sectors of Pakistan. On the basis of our findings, policy makers, managers and entrepreneurship researchers may better understand how to discover and create an opportunity in starting a new business.

Contribution & Value Added: This study is the first attempt that contributes to the field of entrepreneurship by taking the causation approach as a mediator and identifying the role of opportunity discovery and opportunity creation on developing nascent entrepreneurial behaviour among senior and middle-level managers in Pakistan.

Article type: research article

Keywords: opportunity discovery; opportunity creation; causation; nascent entrepreneurial behaviour; structural equation modeling

JEL codes: L26, M13

Received: 10 May 2020 Revised: 1 September 2020 Accepted: 4 September 2020

Suggested citation:

Li, C., Murad, M., Ashraf, S.F., Syed, N., & Riaz, M. (2020). Entrepreneurial nascent behaviour: The role of causation process in opportunity discovery and creation. *Entrepreneurial Business and Economics Review,* 8(4), 183-200. https://doi.org/10.15678/EBER.2020.080410

INTRODUCTION

Identifying an opportunity for launching a new venture is the greatest significant capability of the successful entrepreneur, and it is an essential issue in the study of entrepreneurship (Short, Ketchen Jr, Shook, & Ireland, 2010). Globally, it is acknowledged that entrepreneurship is a critical driver of employment creation and innovation, but it also contributes to the economic growth of nations (Li, Murad, Shahzad, Khan, & Ashraf *et al.*, 2020; Neneh, 2019). Many governments and private organizations are depending on entrepreneurial start-ups because this minimises the unemployment rate by providing job opportunities to individuals (Fuller, Liu, Bajaba, Marler, & Pratt, 2018). The process of creating a business is no easy task; ordinary practices begin with the ambition of an individual with capital and resources, an entrepreneur who identifies an opportunity (Edelman & Yli–Renko, 2010). The needs of an entrepreneur must garner support, gather necessary capital or resources, and produce ample commitment from investors to changethe idea from dream to reality (Tian, Yang, & Wei, 2019).

A new firm develops over a long period of time, a series of organising activities, preparing a business plan, securing financial resources, and hiring professional human resources (Castriotta, Loi, Marku, & Naitana, 2019; Greenberg, 2019). Opportunity discovery and opportunity creation are based on environmental factors and entrepreneurial actions (Alvarez & Barney, 2007; González, Husted, & Aigner, 2017). Prior studies explain that opportunity discovery concentrates on features of an entrepreneur, while opportunity creation focuses on organizational opportunities formed by the individual with their intellectual ideas (Chetty, Karami, & Martín, 2018; Edelman & Yli–Renko, 2010).

The relationship between discovery and creation is defined in prior literature (Alvarez & Barney, 2007; Mansoori & Lackéus, 2019; Sarasvathy, Dew, Velamuri, & Venkataraman, 2010). Moreover, previous researchers explain that discovery and creation lead to improved entrepreneurial action and long-term influence on business performance (Foss & Klein, 2017; Sine & David, 2003). Other entrepreneurial studies focus on entrepreneurial alertness, proactive personality, and creativity towards measuring entrepreneurial intentions (Gieure, del Mar Benavides-Espinosa, & Roig-Dobón, 2020; Li, Murad, Shahzad, Khan, & Ashraf *et al.*, 2020; Neneh, 2019). Extant research identifies the importance of entrepreneurship with social cognitive theory, the theory of planned behaviour, social identities, alertness theory, and effectuation theory – so as to measure entrepreneurial intentions and behaviours (Baron & Ensley, 2006; Dutta & Thornhill, 2008). Among several theoretical perceptions in the literature, causation approach is neglected in the study of opportunity discovery, opportunity creation; but there also is no empirical research that would examine the mediating role of the causation approach on entrepreneurial intention in nascent entrepreneurial behaviour. In previous studies, causation approach appears as a positive indicator in the relationship between opportunity discovery and opportunity creation (Alvarez & Barney, 2007; Alvarez, Barney, & Young, 2010; Sarasvathy, 2001).

The gap identified by this study elaborates into two perspectives; firstly, most of the entrepreneurial studies use students as samples, and very few use non-student samples in entrepreneurial behaviour research (Schlaegel & Koenig, 2014; Shirokova,

Osiyevskyy, & Bogatyreva, 2016). For example, Bird (2015) finds that there are differences between students and non-students in how they form entrepreneurial behaviours. Meanwhile, existing studies indicate that research is needed to determine the employee entrepreneurial intention (Katsikea, Theodosiou, & Morgan, 2015; Pearce II, Kramer, & Robbins, 1997; Rosin & Korabik, 1991).

Secondly, this study covers the research gap with respect to entrepreneurial behaviour and manager's entrepreneurial intention to search for opportunity discovery and opportunity creation. Previous researchers focus on job satisfaction, characteristics, and manager intention towards resignation; few studies examined manager intention towards entrepreneurial behaviour. Krasniqi (2014) suggests that future research should be conducted on how individuals change their minds from job status to entrepreneurial action and when do they perceive good opportunity in the market. Accordingly, our study fills this gap in the literature of entrepreneurship by using the sample of senior and mid-level managers from the SME sector of Pakistan. Specifically, the objective of our study is to differentiate opportunity discovery vs opportunity creation through the causation approach, whether they develop a nascent entrepreneurial behaviour among managers or not.

The rest of the paper is divided into four sections: literature review, material and methods, results and discussion, and conclusion.

LITERATURE REVIEW

Opportunity Discovery (DIS) and Opportunity Creation (CRE)

According to Alvarez *et al.* (2010) opportunity discovery and opportunity creation are associated with entrepreneurial actions that entrepreneurs take to identify and exploit opportunities. Opportunity discovery highlights the high level of discovery view regarding search and scanning of the environment for competitive advantages (Brush, Greene, & Hart, 2001). On the other hand, the creation approach is related to entrepreneurial actions and is considered as a source of opportunities that would not be recognised without the actions of entrepreneurs (Burgelman & Hitt, 2007).

Numerous researchers note that opportunity discovery is independent of entrepreneurs, and it can be discovered by alert entrepreneurs (Cha & Bae, 2010; Upson, Damaraju, Anderson, & Barney, 2017). The nature of opportunities is the result of external shocks such as industry or market and technology changes. This kind of shocks leads to developing alertness in entrepreneurs to discover opportunities by conveying information regarding existing opportunities. However, proper planning and searching for information about the features of opportunities might be help to accomplish discovery. According to Leyden (2016), opportunity creation is a concept of a new combination of thoughts, awareness, and resources. Some scholars state that opportunities are not independent of entrepreneurs but created with the accrual of entrepreneurial intentions and actions (Smith & Gregorio, 2017).

Opportunity Discovery (DIS) and Entrepreneurial Nascent Behaviour (ENB)

Opportunity discovery contains entrepreneurial actions started by individuals and teams engaged to recognise an unkempt opportunity (Shu, Ren, & Zheng, 2018). Opportunity is associated with new products, goods, and materials, which show that the opportunity is greater

than the cost of production (Ren, Shu, Bao, & Chen, 2016). The literature suggests that individuals with the ability to discover an opportunity in the competitive market are more inclined to start a new business (González *et al.*, 2017). According to Miles *et al.* (2017), opportunity discovery refers to the identification of opportunity and taking action to exploit the opportunity so as to become an entrepreneur. Moreover, in the discovery view, individuals identify and exploit an opportunity with the help of prior knowledge and cognitive ability of individuals (Tabares, Chandra, Alvarez, & Escobar-Sierra, 2020). Accordingly, an individual opportunity discovery can influence their ability to create entrepreneurial intentions.

H1: Opportunity discovery is positively related to nascent entrepreneurial behaviour.

Opportunity Creation (CRE) and Entrepreneurial Nascent Behaviour (ENB)

Prior research finds that opportunity creation is a positive predictor for starting a new business venture (Mergemeier, Moser, & Flatten, 2018; Welter, Mauer, & Wuebker, 2016). In the creation process, opportunities for constructing products and services do not exist until entrepreneurs make them. In opportunity creation, entrepreneurs do not form the opportunity first and then take the necessary action, but they take an action and then wait to hear the outcome of their actions that they undertook in the market only then to re-take corrective actions based on feedback (Edelman & Yli–Renko, 2010). Therefore, opportunities require individual actions for the formation and social agreement for sustainability. According to Alvarez and Barney (2007), there are two methods of discovery and creation that inform the entrepreneurial behaviour. Firstly, the creation approach is to study market failure, which is to generate the opportunity by individual action. Thus, individuals with a greater level of opportunity creation are more likely to engage in forming an entrepreneurial business venture.

H2: Opportunity creation is positively related to nascent entrepreneurial behaviour.

Causation (CAU) and Entrepreneurial Nascent Behaviour (ENB)

According to Fisher (2012) two approaches are discussed in theories of entrepreneurship: causation and effectuation. The causation approach shows that results are achieved by beginning with ends, analysing estimated results, and performing competitive analyses (Alvarez *et al.*, 2010). In the effectuation process, a set of targets is given by choosing the appropriate effect, applying the affordable loss principle, and forming and leveraging strategic relationships. Therefore, in the causation process, individuals identify opportunities with the lower level of uncertainty while, in the process of effectuation, individuals identify opportunities with the high level of uncertainty. This study takes the causation approach to identifying the new business opportunities in the market. The causation approach helps entrepreneurs in the new business development process (Sarasvathy, 2001).

The causation approach refers to the planning and strategy approach containing such actions that create opportunity identification and new business formation (Chandler, DeTienne, McKelvie, & Mumford, 2011). The causation approach may help for those entrepreneurs start new businesses who bring resources together effectively and efficiently and work according to strategy (Delmar & Shane, 2004). Entrepreneurial behaviours are physical actions of an individual or team tasks essential to start and develop a new business venture. While several studies investigate entrepreneurial intentions models, there

are few studies available that reflect the entrepreneurial behaviour aspects and the implications of combined entrepreneurship theories such as causation, discovery, and creation (Fuller *et al.*, 2018; Neneh, 2019). Prior study by Chandler *et al.* (2011) develops and validates measurement scales to evaluate the application of causation and effectuation approaches in new business creation, and some items that they develop are directly associated with nascent entrepreneurial behaviour.

H3: Causation is positively related to nascent entrepreneurial behaviour.

Causation as a Mediator

The causation approach is associated with a specific result and focuses on choosing the means to create an effect (Chandler *et al.*, 2011). As cited by previous researchers, the causation approach is related to a strategy to initiate a new business through opportunity recognition and proper business plan development (Alsos, Clausen, Hytti, & Solvoll, 2016; Laskovaia, Marino, Shirokova, & Wales, 2019). According to Frese, Geiger, and Dost (2019), in the formation of new business, entrepreneurs must ensure a causation approach and clearly define objective-oriented tasks to accomplish a systematic search goal. Those entrepreneurs are engaged in opportunity discovery and opportunity creation to exploit their pre-existing resources and knowledge in the industrial market. Furthermore, in the process of causation, entrepreneurs divide prearranged aims and select between the means to achieve prearranged goals (Sarasvathy, 2001).

Moreover, causation involves the process of opportunity discovery, creation, search, and evaluation, along with the exploitation of opportunities. The principal perception of causation is associated with ‘opportunity recognition, scanning, evaluation, and exploitation of opportunities. Therefore, individuals with a high level of causation process engage in meaningful planning outcomes and purposeful searches, among other casual behaviours’ (Tryba & Fletcher, 2019). A study by de la Cruz, Jover, and Gras (2018) finds that effectuation theory positively and significantly affects entrepreneurial business performance and nascent behaviour. Therefore, to the best of our knowledge, prior studies did not explore the influence of causation approach on entrepreneurial intention and actions.

H4a: Causation will positively mediate the relationship between opportunity discovery and nascent entrepreneurial behaviour.

H4b: Causation will positively mediate the relationship between opportunity creation and nascent entrepreneurial behaviour.

RESEARCH METHODOLOGY

Conceptual Model

Based on the above hypotheses development, Figure 1 shows the proposed research model that indicates four factors, starting from opportunity discovery and opportunity creation to entrepreneurial nascent behaviour.

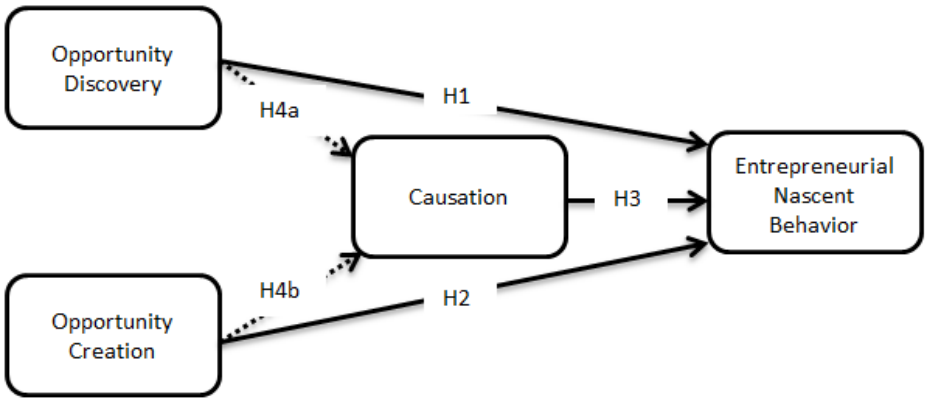

Figure 1. Research model
Source: own elaboration.

Sample and Data Collection

The data was gathered with a questionnaire survey of mid- and senior-level managers of the SME sector in Pakistan, mainly focused on big cities such as Karachi, Faisalabad, Lahore, Multan, and Sialkot. As suggested by previous studies, managers are appropriate samples when the study is focused on the prediction of individual entrepreneurial intention during job tenure, because they have some experience and working capital to begin a new business (Krasniqi, Berisha, & Pula, 2019). The sample size was set based on prior studies (Farooq *et al.*, 2018; Li, Naz, Khan, Kusi, & Murad, 2019). Moreover, in the absence of a comprehensive list of registered SME sector managers in Pakistan, we used a non-probability convenience sampling technique. An email was sent to different SMEs registered in chambers of commerce asking for their participation in the questionnaire survey and permission to contact with mid- and senior-level managers. The pen-and-paper questionnaire was developed and physically distributed to the managers who positively responded to the email request.

Furthermore, we employed a time lag approach for data collection. The duration of the data collection period was three months, completed in two rounds. In the first round, we gathered data regarding opportunity discovery and opportunity creation. In the second round, we collected data about causation and nascent entrepreneurial behaviour so as to avoid the issue of common method bias. A total of 450 questionnaires were distributed and 400 questionnaires were returned with a participation rate of 88.88%. Furthermore, 50 questionnaires were incomplete or either invalid, which eliminated them from further consideration. Among valid responses, 230 (57.5%) were male managers and 170 (42.5%) were female managers.

The majority of managers were aged between 31-40 and 18-30 years. The 220 (55%) respondents had a public sector university degree, while 180 (45%) had a private sector university degree. The participation rate of managers according to their firms location includes (24.8% from Karachi); (23.0% from Faisalabad); (19.0% from Lahore); (18.0% from

Sialkot) and (15.3% from Multan). Seventy per cent of managers worked in the manufacturing sector and 30% in the trading sector; 34% had a master's degree, 29% – a bachelor's degree, and only 10% had no university degree.

Measures

Opportunity discovery (OD) was measured using five items adapted from Ilozor, Sarki, Hodd, Craig, and Johnson (2006). This scale was tested and used in a previous study (Park, Sung, & Im, 2017); was sample item was *'*I am excited by the knowledge that there are many unexploited entrepreneurial opportunities.*'* The questionnaire on opportunity creation (OC) contained six items and based on a five-point Likert scale. This scale was adapted from Ilozor *et al.* (2006); a sample item was *'*I am a source of innovative ideas.*'* Causation (CAU) was measured using a seven-item scale developed by Chandler *et al.* (2011). This scale was also tested and validated by previous research (Alsos *et al.*, 2016); a sample item was *'*I analysed long-run opportunities and selected what I thought would provide the best returns.*'* The entrepreneurial nascent behaviour (ENB) questionnaire was measured using seven items developed by Gieure *et al.* (2020), which examined entrepreneurial behaviours as a result of entrepreneurial intentions; a sample item was *'*I am capable of developing a business plan.*'*

RESULTS AND DISCUSSION

The results were analysed using the Amos software 24.0 software package. For the prediction, structural equation modelling (SEM) methodology was applied to test the hypotheses. The SEM technique also incorporates measurement error and can reveal best-suited predictions of interaction influences such as mediation (Li, Wang, Haque, Shafique, & Nawaz, 2020). Moreover, SEM is the most appropriate technique used by prior studies for testing the relationship between indicators (Songling, Ishtiaq, Anwar, & Ahmed, 2018). However, before applying SEM, we tested the normality of data using kurtosis and skewness in the SPSS software, and we present the results in Table 1 below. As recommended by George (2011), kurtosis and skewness values must be between +/-2. Therefore, our data have normality and there is no issue of abnormality in the sample. Moreover, the mean and standard deviation was also indicated in Table 1.

Table 1. Descriptive Statistics

Factors	Mean	Std. Deviation	Skewness	Kurtosis
DIS	3.9805	0.78426	-0.800	0.344
CRE	4.1854	0.78262	-1.470	2.189
CAU	3.8946	0.76198	-0.585	0.458
ENB	3.5764	0.97777	-0.786	0.129

Note: DIS = Discovery, CRE = Creation, CAU = Causation, ENB = Entrepreneurial Nascent Behaviour.
Source: own study.

Measurement Model

Conformity factor analysis was performed to check the fitness of the model, and we show results in Figure 2 below. For the prediction of measurement model fitness, we found the following results: Chi-squares= 808.696, DF=269, CMIN/DF=3.006, CFI= 0.936, NFI= 0.907,

GFI= 0.860, AGFI= 0.830, TLI= 0.929, IFI= 0.936, RFI= 0.897, RMR=0.048 and RMSEA=0.071. Hence, the measurement model meets the criteria suggested by Gaskin and Lim (2017).

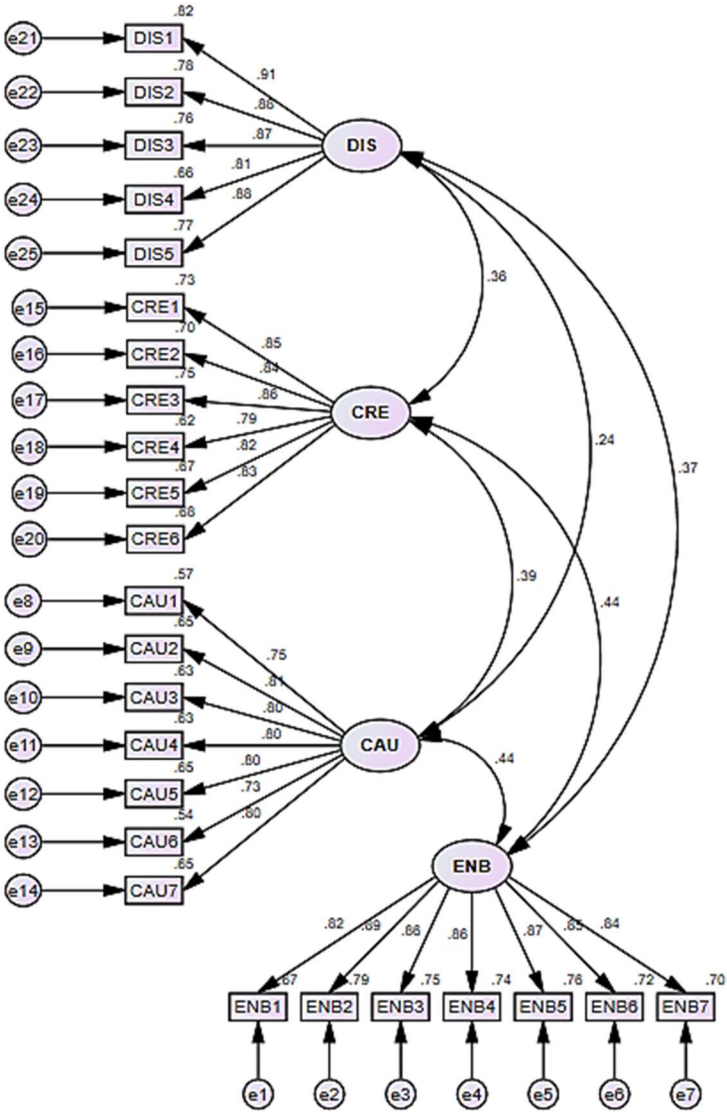

Figure 2. Measurement Model
Source: own elaboration.

Constructs reliability and validity were assessed through composite reliability, and average variance extracted (AVE). As suggested by Bagozzi and Yi's benchmark (1989), values of Cronbach's alpha must be >0.70 for composite reliability >0.80, with average variance extracted >0.50. Moreover, Table 2 shows values of Cronbach's alpha and composite reliability: entrepreneurial nascent behaviour 0.950, 0.952, causation 0.918, 0.920, op-

portunity creation 0.931, 0.940, and opportunity discovery 0.940, 0,943. Furthermore, values of AVE showed entrepreneurial nascent behaviour 0.733, causation 0.616, opportunity creation 0.693, and opportunity discovery 0.757. Thus, all the values are accepted and meet the threshold criteria.

Discriminant validity was assessed using a convergent validity test following the criteria (Fornell & Larcker, 1981). This criterion was widely accepted and used by several authors in prior studies (Li, Murad, Shahzad, Khan, & Ashraf, 2020; Li, Murad, Shahzad, Khan, Ashraf *et al.*, 2020). Table 2 represents the adequate discriminant validity because the square root of AVE was higher than values of its corresponding rows and columns. Lastly, the values under discriminant validity provided the results of positive correlations between all measurement constructs.

Table 2. Reliability and Validity Test

Factor	CR	AVE	MSV	MaxR(H)	ENB	CAU	CRE	DIS
ENB	0.950	0.733	0.192	0.952	**0.856**			
CAU	0.918	0.616	0.192	0.920	0.438***	**0.785**		
CRE	0.931	0.693	0.191	0.933	0.438***	0.391***	**0.832**	
DIS	0.940	0.757	0.134	0.943	0.366***	0.237***	0.357***	**0.870**

***significant (p<0.001).

Notes: CR = Composite Reliability, AVE = Average Variance Extracted, MSV = Maximum Shared Variance, DIS = Discovery, CRE = Creation, CAU = Causation, ENB = Entrepreneurial Nascent Behaviour.

Source: own study.

Common Method Bias

The common method variance was assessed using the method proposed by Harman's (1976) one-factor test. As per Harman's methodology, common factor variance is present when only one factor emerges from factor analysis and explains >50% of the variance (Podsakoff, MacKenzie, & Podsakoff, 2012). Therefore, we included all the measurement items introduced into the dimension reduction factor analysis using the rotated component matrix. The output of the rotated matrix created four factors with the first factor explaining the 38.85% of the total variance, which is below 50% of the total variance. Therefore, common method bias was not considered a problem in this study.

Structural Models

Before testing results for hypotheses, we examined the prediction of structural model fitness. The results were as follows: Chi-squares= 971.619, DF=372, CMIN/DF=2.612, CFI= 0.929, NFI= 0.890, GFI= 0.855, AGFI= 0.830, TLI= 0.928, IFI= 0.936, RMR=0.077, and RMSEA=0.059. To assess the variance of measures, structural model explained 16% of variance in the causation approach and 31% of variance in nascent entrepreneurial behaviour. As suggested by Chin (1998), desired R2 values must be greater than 0.1 or zero. This is not surprising because most entrepreneurial behaviour models in previous studies only explained between 11% to 34% of variance in nascent entrepreneurial behaviour (Li, Murad, Shahzad, Khan, & Ashraf *et al*., 2020; Shirokova *et al*., 2016). Meanwhile, we tested the hypotheses and offer the results in Figure 3 and Table 3 below. The first hypothesis of our study assumes that DIS is positively related to ENB. The findings illustrate that DIS has a positive and significant effect on ENB with standardised (β= 0.219***, C.R=4.635,

p<0.001). Therefore, H1 is supported. Moreover, we analysed the result of hypothesis 2 and found that CRE positively influences ENB with standardised (β= 0.259***, C.R=5.037, *p*<0.001). Thus, H2 is accepted. Furthermore, we tested the impact of hypothesis 3: CAU positively related to ENB and results indicate that CAU has a positive and significant effect on ENB with standardised (β= 0.296***, C.R=5.518, *p*<0.001). Hence, H3 is accepted.

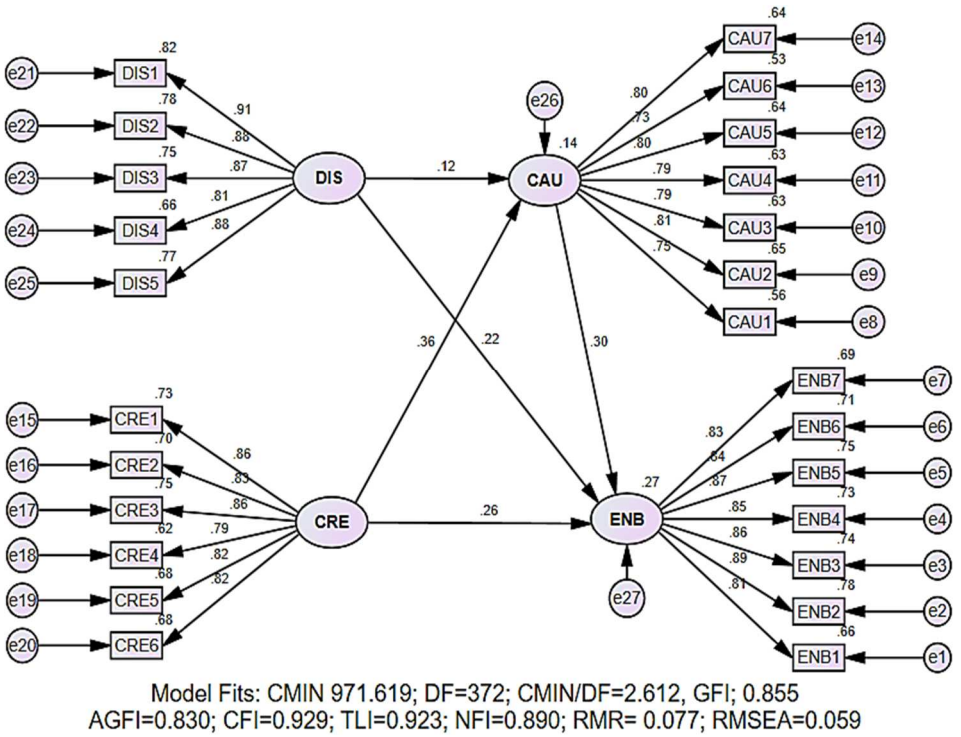

Figure 3. Structural model

Note: DIS = Discovery, CRE = Creation, CAU = Causation, ENB = Entrepreneurial Nascent Behaviour.
*p<0.05; **p<0.01; ***p<0.001
Source: own elaboration.

Table 3. Hypotheses results without a mediator

H	Dependent	Path	Independent	Estimate	Critical Ratio	*p*	Results
H1	ENB	←	DIS	0.219***	4.635	0.001	Supported
H2	ENB	←	CRE	0.259***	5.037	0.001	Supported
H3	ENB	←	CAU	0.296***	5.518	0.001	Supported

* p < 0.05; ** p < 0.01; *** p < 0.001
Note: DIS = Discovery, CRE = Creation, CAU = Causation, ENB = Entrepreneurial Nascent Behaviour.
Source: own study.

Mediation Testing

To test the mediation effect bootstrapping was performed with 5.000 subsamples and 95% confidence interval of the lower and upper bounds proposed by Preacher and Hayes (2008); we show the results in Table 4 below. In the bootstrapping method, we estimated

the standardised direct effect, standardised indirect effect, and standardised total effect. A significant indirect impact specifies the presence of mediation if $p<0.05$. Moreover, if direct impact is also significant ($p<0.05$), it revreals partial mediation; whereas, if direct effect is non-significant ($p>0.05$), it indicates full mediation.

Furthermore, as per hypothesis H4a, the results illustrate that CAU has a positive and significant indirect effect on the relationship between DIS and ENB standardised (β=0.037**, $p<0.05$). Likewise, we found that CAU also has a positive and significant indirect effect on the relationship between CRE and ENB standardised (β=0.108***, $p<0.05$). Thus, we can confirm that the CAU partially mediates in the relationship between DIS and CRE on ENB; hence, H4a and H4b are also accepted.

Table 4. Hypotheses results with a mediator

H	Path with a mediator	Standardised Direct Effect	Standardised Indirect Effect	Standardised Total Effect	*p*	95% Confidence Interval Bias-correlated percentile method	Percentile method
						Lower and Upper	Lower and Upper
H4a	ENB ← DIS (with CAU)	0.219***	0.036***	0.256***	0.001	0.007, 0.386	0.007, 0.380
H4b	ENB ← CRE (with CAU)	0.259***	0.105***	0.364***	0.001	0.058, 0.476	0.060, 0.478

Note: DIS = Discovery, CRE = Creation, CAU = Causation, ENB = Entrepreneurial Nascent Behaviour.
*p < 0.05; **p < 0.01; ***p < 0.001
Source: own study.

Discussion

Concerning H1, we found that opportunity discovery has a positive and significant impact on nascent entrepreneurial behaviour. This result is similar to previous studies by (Alvarez & Barney, 2007; Foss & Klein, 2017) who reported that opportunity discovery helps individuals to identify and exploit an opportunity, because identification depends upon the prior knowledge of individuals, while exploitation depends upon the cognitive abilities of individuals, which leads to the discovery of new opportunities that form entrepreneurial behaviour. Opportunity discovery would help to identify and exploit entrepreneurial opportunities as those opportunities are formed by entrepreneurial actions. This finding is also in line with (Chetty *et al.*, 2018; González *et al.*, 2017) who state that opportunity discovery and opportunity creation views are helpful in managers' decision-making processes and in developing an entrepreneurial behaviour.

Regarding H2, our results indicate that opportunity creation has a positive and significant influence on nascent entrepreneurial behaviour. Our results are consistent with Edelman and Yli–Renko (2010) and Hmieleski, Carr, and Baron (2015) who suggest that opportunities in the creation process are not assumed, as they can be created by capabilities, actions, and the enactment of entrepreneurs, and the exploration of ways to start a new business. Managers have more experience in handling business activities and perform day-to-day tasks related to the internal and external environment so as to identify opportunity discovery and opportunity creation. Therefore, managers with the high ability to discover opportunities have more capability to create a new business.

Concerning H3, we find that causation positively and significantly impacts nascent entrepreneurial behaviour. This hypothesis is also supported and the result is consistent with the causation approach of entrepreneurship and prior findings of Fisher (2012) and Pfeffer and Khan (2018) who recommend that the causation process is engaged in entrepreneurial behaviour to make their new venture more successful and help them to find innovative opportunities from the industry or market. Therefore, individuals with the high level of causation approach in opportunity discovery and opportunity creation are more likely to get involve in entrepreneurial activities.

Regarding H4a and H4b, the results indicate that the causation positively and significantly mediates the relationship between opportunity discovery, opportunity creation, and nascent entrepreneurial behaviour. Hence, these hypotheses are accepted and findings propose that causation is a significant predictor of opportunity identification and opportunity exploitation. Therefore, this finding is similar to Chandler *et al.* (2011) who suggest that the causation process encourages individuals to create venture.

This study provides some theoretical contributions to the field of entrepreneurship. Firstly, this study adds a theoretical contribution to the discovery and creation theories of entrepreneurship and is consistent with prior work on nascent entrepreneurial behaviour (Alvarez & Barney, 2007; Sarasvathy, Dew, Velamuri, & Venkataraman, 2003). Secondly, our study findings emphasise the importance of opportunity discovery and opportunity creation theories of entrepreneurship in new venture creation processes. We found that opportunity discovery and creation were positively and significantly related to nascent entrepreneurial behaviour to create a new venture. Thirdly, in line with the discovery and creation view of entrepreneurship (Edelman & Yli-Renko, 2010), our findings support the conceptualization of opportunity over the traditional discovery view. Lastly, this study findings support the views of Kirzner (1997) and Shane (2003) who state that opportunity is an objective state that exists in the environment, which the entrepreneur discovers, creates, and then exploits.

Based on our findings, this study provides practical implications. Firstly, it offers a better understanding of individual differences that enable the scanning and searching of managers' behaviours; especially their propensity to leave their job and become self-employed through an effective opportunity of new business development. Entrepreneurship educators could provide a flexible environment for managers, from which they can search for appropriate opportunities and then exploit them. Managers must dedicate some time to scan the competitive environment. They should know from where they can find a good opportunity for entrepreneurial setup. This kind of knowledge informs managers about various types of businesses that cover existing gaps and show potential upcoming future trends. Educators should arrange some entrepreneurial-based seminars and lectures to introduce popular examples of renewed entrepreneurs who discovered and created innovative businesses through innovative opportunity recognition.

The present study has some limitations. Firstly, our research focuses only on 400 SME's sector of senior and mid-level managers in Pakistan. Secondly, we used self-report questionnaires that may lead to common method bias. Therefore, we suggest that future research conducts a longitudinal study on different samples with effectuation theory on opportunity discovery and opportunity creation so as to measure business performance and contribute to the literature on entrepreneurship. Future research can also incorporate

cross-sectional investigation from other theories of entrepreneurship – e.g. social identity theory or social cognitive theory – to measure nascent entrepreneurship behaviour.

CONCLUSIONS

This study aimed to identify the role of causation process in opportunity discovery and opportunity creation in developing nascent entrepreneurial behaviour among managers from the SME sector. We found that opportunity discovery and opportunity creation positively and significantly affect nascent entrepreneurial behaviour through the causation process. This study examined the causation approach as a mediator with entrepreneurial behaviour. Prior studies paid more attention to the essential features of attitudes, perceptions, and intentions, while progress entrepreneurial behaviour on student samples and non-student samples were neglected, such as studies on manager entrepreneurial intention and action towards starting a new business (Gieure *et al.*, 2020; Neneh, 2019; Shirokova *et al.*, 2016). Thus, this study concludes that opportunity discovery, opportunity creation, and causation process can help managers to become an entrepreneur.

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Acknowledgements and Financial Disclosure

Project Funds: [1] Self-organized cluster entrepreneurship behaviour reform, evolution and promotion strategies study (No. 16BGL028), China National Social Science Foundation; [2] Study on Bottleneck and Innovation of Post-industrial Intellectual capital development in Jiangsu Province (No. 14JD009), Jiangsu Province Social Science Foundation Project. [3] Interactive effect between Self-Organised Innovation and Industrial cluster, Jiangsu Province Graduate Scientific Research Innovation Project. [4] Perception of fairness in self-organised mass Entrepreneurship (No. 4061160023).

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Ministry of Science and Higher Education
Republic of Poland

The copyediting and proofreading of articles in English is financed in the framework of contract No. 913/P-DUN/2019 by the Ministry of Science and Higher Education of the Republic of Poland committed to activities aimed at science promotion.

Entrepreneurial Business and Economics Review

2020, Vol. 8, No. 4

10.15678/EBER.2020.080411

Social entrepreneurship innovation: A study from Mexico

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ABSTRACT

Objective: The objective of this research is to explore the personal and organizational factors that lead to innovation among social entrepreneurs in Mexico.

Research Design & Methods: The study includes 81 social entrepreneurs from different regions of Mexico. A questionnaire was developed taking into account five factors: creativity, autonomy, tasks, and roles of the entrepreneur and the innovation of the process and product or service. We used the quantitative approach, with structural equations. The method used was partial least squares. The research model was tested and finally the relationship between variables were confirmed.

Findings: The relationship between the personal and organizational variables of the social entrepreneur on product or service innovation was verified. The social entrepreneur innovates to reach proposed goals. The mediation analysis was significative and provided new research patterns for future study.

Implications & Recommendations: It is necessary to sensitise the different governmental and non-governmental sectors that promote social entrepreneurship in Mexico. Social entrepreneurship education could contribute to address the economic and labour shortage in Mexico. Social entrepreneurship could be an alternative way for contributing to the development of the economy and employment, particularly in emerging markets.

Contribution & Value Added: This article highlights the personal and organizational factors of social entrepreneurs in Mexico that were previously studied. It contributes to the literature in the understanding of the innovation process that happens inside the social enterprise led by the business owner or manager.

Article type:	research article
Keywords:	social entrepreneurship; creativity; autonomy; innovation; partial least square; México
JEL codes:	L31, M14

Received: 17 June 2020 Revised: 21 September 2020 Accepted: 23 September 2020

Suggested citation:

De la Garza-Carranza, M.T., Guzmán-Soria, E. López-Lemus, J.A., & Sierra-Martínez, A.C. (2020). Social Entrepreneurship Innovation: A study from México. *Entrepreneurial Business and Economics Review,* 8(4), 201-202. https://doi.org/10.15678/EBER.2020.080411

INTRODUCTION

Social entrepreneurship (SE) in Mexico has been studied by different authors (Bojica, Ruiz-Jiménez, Ruiz-Nava, & Fuentes-Fuentes, 2018; Villegas-Mateos & Vázquez-Maguirre, 2020). These authors conclude that this type of organization is underdeveloped in Mexico, since there is no sustainable ecosystem that allows its development. They conclude that there are still legal and governmental aspects that exclude this type of organization from obtaining and managing resources. In answer to these issues, the Law of Social and Solidarity Economy was enacted in 2012, but it still has aspects that do not include a precise differentiation of SEs with other types of social or charitable organizations (Sandoval, 2019). Most studies conducted on Mexican SE focus on studies of rural organizations (Gómez-Carreto, Zarazúa-Escobar, Guillen-Cuevas, & Castellanos-Albores, 2018; Villanueva, Jimenez, Garrido, & Castro, 2012). This article contributes to explain from the viewpoint of activities carried out by entrepreneurs, and how the innovation process is performed in Mexican SE. In this way, the article contributes to a phenomenon that has not been addressed previously.

The objective of this research was to identify how entrepreneurial competencies at a personal level impact innovation in Mexican SEs. For this purpose, the article is divided into four parts. Firstly, a theoretical framework was developed in which the nature of social enterprises and the entrepreneur is addressed – taking into account their personal traits and organizational competencies – and the hypotheses are postulated. Subsequently, the study sample is described, along with descriptive statistics of items used. To test the hypotheses established in the model, the partial least squares technique was introduced with Smart-PLS 3. In the results section, we address the quality, reliability, and validity of the instruments used for the corroboration of hypotheses. Finally, the conclusions and recommendations are given regarding the skills and knowledge that must be reinforced so that social enterprises are sustainable and support social development in Mexico.

This work highlights the personal and organizational factors of the social entrepreneur in Mexico that had not been previously studied. It contributes to the literature in the understanding of the innovation process that happens inside the social enterprise led by the business owner or manager. Due to the severe crisis caused by the global pandemic, SE will be today a strategical sector for overcoming social lags, especially in emerging markets.

LITERATURE REVIEW

Social Enterprises

The attempt to conceptualise what a social enterprise is led researchers to divide it into two main approaches: the conceptualization that is taken from the European perspective and the one taken from the viewpoint of the United States of America (Defourny & Nyssens, 2010). The conception of social enterprise in Europe has a long tradition, since it traces its origins to the social and economic reconstruction of the twentieth century, but it was developed after the Second World War as a way to cover the ravages of war. For example, in some European countries such as Germany, Belgium, and England there is strong support for the third sector by the government, but there are different conceptions in each country. In order to identify and define social enterprises, the project 'EMES' was

created by the European Commission – an executive body of the European Union – that started in 1996 and ended in 2000. This acronym EMES stands for 'EMergence des Enterprises Sociales en Europe,' which integrated academics from different countries to carry out research on the subject (Davister, Defourny, & Gregoire, 2004). The definition proposed by the EMES on social enterprises is the following: Social enterprises are private non-profit organizations that provide goods or services directly related to their explicit objective of benefiting the community. In general, they rely on a collective dynamic that involves various types of stakeholders in their governing bodies, place a high value on their autonomy, and take economic risks related to their activity (Davister *et at*., 2004).

From the North American viewpoint, a social company is not well defined (Diochon & Anderson, 2009), since it bases on the entrepreneur, not the company (Vega & Kidwell, 2007). However, after an in-depth review, Diochon and Anderson (2009, p. 11) define it as: 'identifying an opportunity to improve social welfare, then acquiring and using the necessary resources to do so.' This definition includes the generation of profits, but without deviating from its basic mission: the social good. That is, SE can be commercially viable as long as it meets its social purposes (Emerson & Twersky, 1996). From a process viewpoint, Yujuico (2008) proposes that an SE involves innovation in the combination of resources of any kind to tackle pressing social problems. One of the organizations that have contributed in an influential way to the development of social entrepreneurs in the world is Ashoka. This non-profit organization was founded in 1980 by Bill Drayton, one of the main creators of the term 'social entrepreneur.' Ashoka currently promotes the development of organizations for the common good in 93 countries, including Mexico. Furthermore, Ashoka has created a global community that generates changes and innovations for the development of organizations that can transform and impact society. The main areas where Ashoka-sponsored organizations have developed are economic development, youth learning and development, the environment, education, health, human rights, and civic engagement (Sen, 2007).

Social Entrepreneurship

Many authors define the characteristic features of entrepreneurs, one of the most cited articles is the one by Lumpkin and Dess (1996) which defines entrepreneurial orientation as a set of attributes that the entrepreneur must have. These attributes include autonomy, risk-taking, proactivity, aggressiveness towards competitors, and innovativeness. However, SEs differ in their impact on the community from any other type of entrepreneur. Although there is no consensus about the definition of a SE (Germak & Robinson, 2014), one of the commonly accepted definitions is that of Zahra, Gedajlovic, Neubaum, and Shulman (2009). These authors consider that SEs require considering the motivational attributes of the individuals or groups of individuals who take associated risks. Moreover, all the elements that lead to creating a new organization, but without forgetting that it must be for a social benefit. Therefore, they define the SE as 'the person who encompasses the activities and processes undertaken to discover, define and exploit opportunities in order to improve social wealth by creating new companies or managing existing organizations in an innovative way' (Zahra *et al*., 2009, p. 522).

In this sense, Forouharfar, Rowshan, and Salarzehi (2018) reviewed definitions of SE by more than 20 authors to conclude the main features that define this term are 1) social

innovation that seeks to improve the conditions of those who are in a situation of vulnerability, 2) the social transformation of those involved in entrepreneurship, 3) the acknowledgement of chances that create social value, 4) a social mission, 5) initiatives not restricted to a single sector of society – as they can be for-profit or non-profit and may be in the public or private sector – and 6) creativity as the basis for the development and prosperity of entrepreneurship.

From a start-up viewpoint, three basic tasks must be carried out for a social enterprise to develop. 1) The definition of the opportunity to impact social and economic development in such a way that profits can be generated for those involved. 2) The start-up of an organization, for which the entrepreneur must have the necessary skills to operate a company. In this phase, a human resource base must be created to allow for the development of the organization's mission. 3) The creation of working capital that allows the organization to operate during start-up and development stages. Funding sources can be diverse and public funds can even be used (Perrini & Vurro, 2006). According to the aforementioned authors, the ventures are generally developed in social areas for attending to different needs of e.g. children, women, youth.

Based on previous studies, for a SE to be successful, s/he must have autonomy to direct efforts in search of social benefit, creativity to look for opportunities in the environment, constantly seek innovation in the product or service and in the processes, and finally, s/he must seek self-efficiency in order to achieve the organization's social goals. Next, we will detail each of these variables and identify the hypotheses.

Entrepreneur autonomy. Social psychologists found great success using intention-to-action models such as that developed by Ajzen (1987). This model has been widely used in practical situations such as career preferences or product purchases. When a behaviour is difficult to observe, the person's intentions are critical in the process, and this can also be applied to entrepreneurial behaviour (Krueger, Reilly & Carsrud, 2000). Autonomy then is the antecedent of entrepreneurial intention (Van Gelderen, 2010) and represents internal support for one's actions: it is the feeling that the actions belong to the person. Gibb (2002) states that more and more people are participating in the entrepreneurial movement as a result of various powerful trends in the society and the way people relate to governments, organizations, and others. These tendencies strongly favour self-sufficiency, and this is what an enterprise seeks, whether it has a social mission or not.

Autonomy is also a value significant for business entrepreneurs. Kirkeley (2016) investigated the role of values in entrepreneurial behaviour to find that the most important values among entrepreneurs are self-direction, ambition, creativity, and challenging the status quo. In the Mexican case, the main reason for starting a business is reaching financial independence, but also autonomy and personal development (Robichaud, Cachon, Taghzouti, Assaidi, & Codina, 2019). This study will evaluate the entrepreneur autonomy skill that has not been evaluated in Mexican social entrepreneurs.

Creativity. Amabile (1996) defines one's creativity as the production of new and useful ideas in any area. Creativity is characteristic of all people, but not all of us transform that creativity into something tangible. A creative idea should bring utility to the organization to influence the way a business operates (Fillis, 2002). Creativity for entrepreneurs has significant challenges since, in most cases, they do not have enough capital, and it is difficult to materialise creative ideas in goods or services (Ward, 2004). In the

case of social entrepreneurs, this creativity must recognise a need in the society so as to be able to generate better living conditions for those involved in entrepreneurship (Monllor & Attaran, 2008). Therefore, we consider that there must be a relationship between the autonomy of the entrepreneur and creativity.

Creativity means not only alertness towards opportunities in the market, it also means the creation of new possibilities (Kirzner, 2009). There is a strong relationship between bricolage – the combining and reusing of resources – and creativity (An, Zhang, You, & Guo, 2018). Creativity and autonomy are an alternative to resource constrains of the environment like the ones faced by SE. The impact of creativity in the output of SE has not been measured. Social innovation eventually links diverse factors, including the creativity of an entrepreneur. Thus, our first hypothesis is:

H1: There is a positive relationship between social entrepreneurs' autonomy and their creativity.

SEs' Innovation. Perrini and Vurro (2006) conceptualise the SE as the innovator who can contribute to social change, taking into account the classic process of entrepreneurship. Social innovation is developed when the patterns of social systems are changed and the innovation happens to fulfil a social need or market failure (Nicholls & Murdock, 2012). These innovations can be of different types: social integration, social assistance, sustainability, financing, or educational. Therefore, social innovation is an effort to develop new paths that lead to creating conditions of well-being for those involved in entrepreneurship and technology to positively influence this effort (Caroli, Fracassi, Maiolini, & Carnini-Pulino, 2018). According to Westley and Antadze (2010), a SE can be part of a social enterprise and simultaneously promote social innovation which seeks a permanent change in welfare conditions, such as the reduction of poverty, pollution, school dropout, or violence.

The SE offers alternative and innovative ways of tackling social value and wealth creation (Chell, Nicolopoulou, & Karataş-Özkan, 2010). Scillitoe, Poonamellee, and Joy (2018) propose a model for sociotechnological innovation. They posit that the innovation will depend on factors such as organization tenures, leader's enthusiasm for innovation, market orientation (profit, non-profit), and legal aspects. As organizations develop new ways of impacting the social sector, entrepreneurs develop competencies related to innovation. As for example, when a small rural ecotourism business has to develop competencies to do ecommerce This strategic development could create new clients, but it also demands the improvement of service.

For the purpose of this study, we consider two types of innovation: product (or service) and innovation process. Innovation in the product or service is related to the market or the final consumers of the venture. Improvement in the innovation process refers to the internal way of how the good or service is produced. There is a growing trend in social innovation to attack market niches that can contribute to social development (Witkamp, Raven, & Royakkers, 2011). Also, innovation help organizations to overcome turbulent environments of economy (Jiménez-Jiménez & Sanz-Valle, 2011). The objective is to develop innovative products or services that contribute to sustainable development. Therefore, we postulate the following hypotheses:

H2: There is a positive relationship between social entrepreneurs' creativity and the innovation process of the social enterprise.

H3: There is a positive relationship between social entrepreneurs' autonomy and the innovation process of the social enterprise.

H4: There is a positive relationship between innovation process and product (or service) innovation of the social enterprise.

Entrepreneur tasks and roles. The creation of a company is a decision of the SE and is subject to a complex process in which intervene various factors. Kazanjian (1998) identified various activities that new organizations must consider to innovate: organizational systems, sales/marketing, human resources, strategic positioning, production, and external relations. These activities are known as entrepreneurship efficiency and were studied by various authors (Hsu, Wiklund, & Cotton, 2017; Mauer, Neergaard, & Linstad, 2017). Efficiency in entrepreneurship roles is generally accepted to predict the ability of the entrepreneur to generate new companies (Chen, Greene, & Crick, 1998; Douglas & Fitzsimmons, 2012). The high concept of efficiency in entrepreneurs implies that they can be alert to recognise opportunities in market imbalances and to evaluate opportunities in a timely manner (Tang, 2008).

Entrepreneurs need abilities and skills to identify and create business opportunities, but also to promote social innovation. The self-efficiency capabilities would help the entrepreneur to manage and take action in diverse situations (Valencia-Arias & Marulada-Valencia, 2019). Chen and Zhou (2017) found that entrepreneurial self-efficiency positively relates to innovation thanks to entrepreneurs' motivation to be efficient at a personal and organizational level and to achieve goals. But there are studies (Shepherd, Patzelt, & Baron, 2013; Cooper, Peake, & Watson, 2016) that confirmed the relationship between self-regulation, personal characteristics, and the entrepreneur task and roles. However, this relationship was never proved in the Latin-American context. Therefore, our last hypotheses are:

H5: There is a positive relationship between the tasks and roles a social entrepreneur performs and the innovation process of the social enterprise.

H6: There is a positive relationship between autonomy and the tasks and roles that the social entrepreneur shows.

The research model is shown in Figure 1.

Structural equation modelling (SEM) was used to test our research model. SEM is a statistical technique that helps to understand representations involving several variables in a model that goes beyond multiple linear regressions. The objective of statistical modelling through SEM is to answer complex questions regarding latent variables (Vargas-Chanes, 2019). SEM is a variant of traditional multivariate models, in which a structural equation model is a system of multiple regressions that are interconnected by paths, in which an independent variable could be connected with multiple dependent or mediating variables (Fox, 2002). The objective of SEM is to represent causal relationships between two or more latent variables at the same time. Russell, Kahn, Spoth, and Altmaier (1998) propose that SEM is useful to evaluate the mediation effects of an intervention programs in the current study, in which we have one independent variable (creativity), three mediating variables (autonomy, innovation process, and task and roles), and one dependent variable (the innovation of product or service).

There are currently two types of SEM generally used. One is based on covariance to confirm or reject theories, while the other one is based on partial least squares (PLS) to develop theories in an exploratory study. The latter technique has the advantage that it

can handle small sample sizes and the distribution of the data does not need to be normal, since it is a non-parametric technique (Hair, Hult, Ringle, & Sarstedt, 2016). The software used for the analysis was Smart-PLS 3.

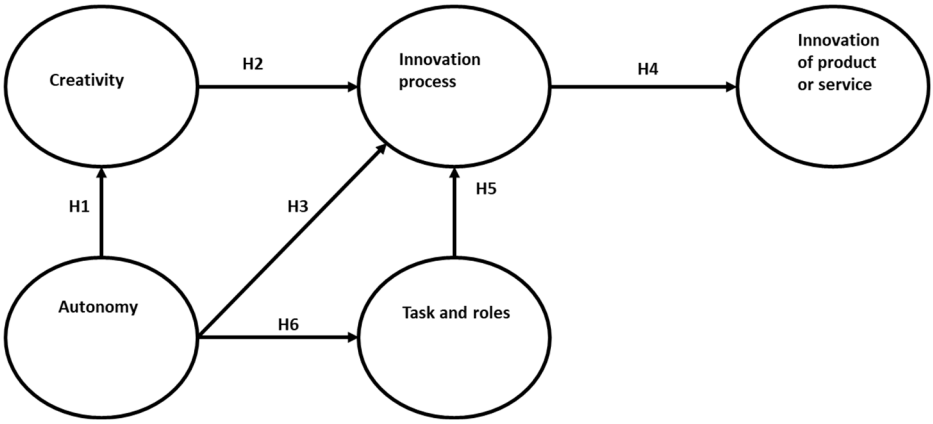

Figure 1. Research model
Source: own elaboration.

RESEARCH METHODOLOGY

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Sample and Data Collection

The sample was obtained for convenience because there is no registered list of SEs in Mexico. The respondents were located through their social networks, following the type of social impact they had in the community. Once located by Facebook, email, or phone, 81

responses were obtained from SEs from the states of Guanajuato, Jalisco, Oaxaca, and Querétaro. Like most of Mexico, these states continue to struggle with development, especially in rural communities. In our sample, 57% of the respondents were women and 43% men. Among them, 41% were between 24 and 30 years old, 57% were between 31 and 40 years old, and 2% were over 40. Four per cent had basic education, 23% – a high school degree, 2% – a technical degree, 58% – a bachelor's degree, and 13% – a master's degree. Most of the organizations were young, because 81% were between one to three years old, a small amount (10%) was less than one year old, and only 9% were more than four years old. In the studied population, 26% of companies had less than three employees, 70% – from four to 10 employees, and 4% had more than 10 employees. In the vast majority of cases, companies were of the service type (97%), although a minority was in the manufacturing industry (3%). Regarding the experience of the entrepreneurs, 5% were recently new, 90% had less than five years of experience, and 5% had more than five years of experience such organizations. Among the interviewed, 56% stated that they were owners of the companies, and 44% – their main administrators.

Development of Instruments

As described above, the instrument or questionnaire has five variables. The measurement instrument was originally developed by Ahlin, Drnovšek, and Hisrich (2014). It was taken as the basis for the questionnaire of creativity, innovation process, product or service innovation, and tasks and roles. These authors based their questionnaire on Hills, Lumpkin, and Singh (1997) to develop the creativity items. Regarding the innovation process, the scales were developed by Jiménez-Jiménez and Sanz-Valle (2011), while for the innovation of the product or service we used the questionnaire by Yang, Wang, and Cheng (2009). We adopted the tasks and roles questionnaire from Chen *et al.* (1998). Finally, the autonomy questionnaire was taken from the one developed by Engle *et al.* (2008). Table 1 shows the items used in each of the questionnaires cited, along with their mean and variance of the 81 collected cases. In all cases, a Likert scale from 1 to 7 was used, in which 1 meant totally disagree and 7 totally agree. Regarding the sample size, the generally accepted criterion is to look for the significance level of 5%, the power of the test of 80%, and the minimum value of R^2 of 0.25 (Wong, 2013). Thus, for our study, the suggested sample size is 80. Hence, the criteria are meet. Table 1 shows the descriptive statistics of the data.

As shown in Table 1, most of the items are in the range of 6, which means that a general agreement is shown by the entrepreneurs. The higher standard deviations were obtained in items C2, IN3, and T3, so these activities show higher variability.

RESULTS AND DISCUSSION

Measurement Model

To evaluate the reliability and validity of the measurement model, the convergent validity and internal consistency of the model was collected in Table 2. For convergent validity, outer weights were estimated by a partial multiple regression for the latent variable using the PLS algorithm: 'High outer loadings on a construct indicate that the associated indicators have much in common' (Sarstedt, Ringle, Smith, Reams, & Hair, 2014, p. 102). Generally, an outer loading should be higher than 0.70. The square of a standardised indi-

Table 1. Statistics of the items used

Item, author	Mean	Standard Deviation
Creativity (C) Hills *et al*. (1997)		
C1. I am a very creative person.	6.41	0.932
C2. I take a few minutes a day or a week to get creative.	5.77	1.325
C3. I regulate my time.	6.41	0.787
C4. I am very sensitive to problems that others do not see.	6.70	0.601
Autonomy (A) Engle *et al*. (2008)		
A1. I have many ideas.	6.42	0.739
A2. I can express my own personality and creativity.	6.51	0.654
A3. I am in charge and in control of my work.	6.42	0.722
Innovation of product or service (IN) Yang *et al*. (2009)		
IN1. The number of firm's new products that are first-to-market (or early market entrants).	6.07	0.959
IN2. The number of new products and/or services a firm has introduced to the market	6.28	0.794
IN3. The speed of firm's new product and/or services development.	5.78	1.107
Innovation Process (I) Jiménez-Jiménez & Sanz-Valle (2011)		
I1 The number of changes introduced in processes.	6.32	0.819
I2. Pioneer disposition to introduce new processes.	6.12	0.900
I3. Clever responses to new processes introduced by other companies in the same sector.	5.99	0.994
Task and roles (T) Chen *et al*. (1998)		
T1. I can set and achieve profit-based goals.	6.32	0.772
T2 I can control costs.	6.42	0.687
T3. I can define the roles of the organization.	6.21	1.021
T4. I can define responsibilities.	6.32	0.933
T5. I can develop new ideas.	6.35	0.824
T6. I can develop new products and services.	6.15	0.989
T7. I can establish a company.	6.35	0.938

Source: own study.

cator of an outer loading represents how much of the discrepancy in that element is explained by the latent variable. Finally, Table 2 shows the extracted average variance (AVE). For the internal consistency of the questionnaire used, it presents two indicators: the widely used Cronbach's alpha and composite reliability, which presents fewer drawbacks than Cronbach's Alpha (Bagozzi & Yi, 1988).

Model Evaluation

As a first step, we calculated the Pearson's correlations among studied variables. This is shown in Table 3, all the correlations are statistically highly significant, because they have a p value of less than 0.01. In order to obtain the results for the path model, we used a bootstrapping resample method for exploratory analysis as recommended. The results of the path model appear in Figure 2. According to Hair Jr *et al*. (2016), no effective measures have yet been developed that can assess the adequacy of the model. However, general measurements such as the standardized root mean square residual (SRMR) have been pro-

Table 2. Parameters of the measurement model

Latent variable	Indicators	Convergent validity			Internal consistency reliability	
		Indicator Loadings >0.70	Indicator reliability (loading²) >0.50	AVE >0.50	Composite reliability >0.70	Cronbach´s Alpha >0.60
Creativity	C1	0.958	0.917	0.856	0.960	0.943
	C2	0.966	0.933			
	C3	0.905	0.819			
	C4	0.858	0.736			
Autonomy	A1	0.949	0.900	0.871	0.953	0.926
	A2	0.919	0.844			
	A3	0.931	0.866			
Innovation process	I1	0.842	0.708	0.823	0.933	0.891
	I2	0.955	0.912			
	I3	0.921	0.848			
Tasks and roles	T1	0.907	0.822	0.840	0.974	0.968
	T2	0.876	0.767			
	T3	0.914	0.835			
	T4	0.947	0.896			
	T5	0.916	0.839			
	T6	0.904	0.817			
	T7	0.951	0.904			
Innovation of product or service	IN1	0.913	0.833	0.777	0.913	0.856
	IN2	0.824	0.678			
	IN3	0.905	0.819			

Source: own study.

posed. To obtain the SRMR, two matrices are developed: sample covariance and predicted covariance. The difference of both is a measurement of statistical accuracy. Therefore, this indicator allows for evaluating the average magnitude of discrepancies between observed and expected correlations as an absolute measure of the fit criterion (model). A value less than 0.10 or 0.08 (Hu & Bentler, 1998) is considered a good fit. Henseler *et al*. (2014) present the SRMR as a degree of goodness of fit for PLS-SEM that can be used to avoid erroneous description of the model. In this case, the value of 0.086 was obtained, which complies with the established parameter. A generally accepted parameter to assess the degree of predictability of the model is the multiple determination coefficient or R^2, which explains the proportion of the total variance in the variable explained by the regression. In this case, we can see that in the predictor or dependent variables, all the values of R^2 are greater than 0.60 (Creativity, Innovation process, Tasks and Roles, and Innovation of the product or service).

As we obtained acceptable results for the reliability and validity criteria of the constructs or latent variables – but also for the indicators of the model – we can corroborate our hypotheses, because all paths are significant. As Hair, Sarstedt, Hopkins, and Kuppelwieser (2014) state: 'path coefficient values are standardised on a range from 1 to -1, with coefficients closer to 1 representing strong positive relationships and coefficients closer to -1 indicating strong negative relationships' (p. 114). This parameter is useful in testing our hypothesis.

Table 3. Pearson correlations of studied variables

Construct	Creativity (C)	Autonomy (A)	Innovation product or service (IN)	Innovation process (I)	Tasks and Roles (T)
C	1				
A	0.676**	1			
IN	0.751**	0.772**	1		
I	0.809**	0.808**	0.795**	1	
T	0.708**	0.789**	0.660**	0.815**	1

Source: own elaboration.

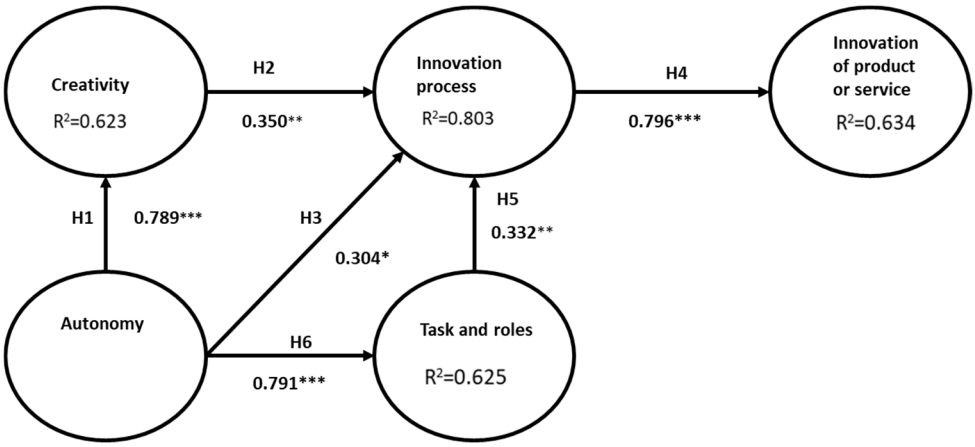

Figure 2. Results of the path model

Notes for the model: ***p<0.001 (very high), **p<0.01 (high), *p<0.05(moderate). The path coefficients are from the original sample. R2 is the multiple determination coefficient.
Source: own elaboration.

The structural model evaluations from the outcomes of the PLS algorithm confirm all of our hypotheses. In this sense, two parameters were considered to accept or reject our hypothesis: 1) the Pearson correlation between variables obtained by the sample (Table 3), and 2) the path coefficient and test estimates by the bootstrapping method and their significance levels. Benitez, Henseler, Castillo, and Schuberth (2020, p. 12) state that, '[s]tandardized regression coefficients are interpreted as change in standard deviations of the dependent variable if an independent variable is increased by one standard deviation while all other independent variables in the equation remain constant.' Thus, we present four parameters in assessing the relationships between the latent variables: a) Pearson correlation (ρ), b) standardized regression coefficient from the sample (β), c) Student's t-test for the parameter from the bootstrapping method, and d) the α of the significance for the test. For H1, the relationship between the variables autonomy and creativity is accepted (ρ=0.676, β= 0.789, t=15.4, and α=0.000). This implies a strong relationship between these two personal attributes of an entrepreneur. Our findings are consistent with Smith, Bell, and Watts (2014) who found that SEs exhibit better relations in creativity levels, daring, and need for self-sufficiency than traditional

entrepreneurs. Hypothesis 2 assesses the relationship between creativity and innovation process (ρ=0.809, β= 0.350, t=2.89, and α=0.004). This hypothesis is also confirmed. Vuong and Napier (2014) propose that creativity should encourage the innovation process in the organization, especially in entrepreneurship. Hypothesis 3 foregrounds the relationship between the autonomy of an entrepreneur and the innovation process (ρ=0.808, β= 0.304, t=2.10, and α=0.033). In this case, the hypothesis is accepted, but the significance of the test is moderate. These results confirm the study by Baron and Tang (2011) performed in the USA, who nevertheless identify the dynamism of the environment as the mediation variable. In this sense, future studies in turbulent times could analyse the economic environment as part of the entrepreneurship process. Hypothesis 4 established a positive relationship between the variables of innovation process and the innovation of product or service. Hypothesis 4 is also accepted (ρ=0.795, β= 0.796, t=12.07, and α=0.000), which means that is a strong relationship between these two variables. Aksoy (2017) found a strong positive relationship between product novelty and market results in small businesses. Hypothesis 5 is confirmed (ρ=0.815, β= 0.332, t=2.58, and α=0.010), as the task and roles that an SE performs are activities needed to promote the innovation process. Ng and Lucianetti (2016) found that when a person rises in self-efficacy beliefs, it promotes idea generation, diffusion, and implementation over time. Finally, hypothesis 6 stated that the relationship between autonomy and entrepreneur's roles and tasks is significant (ρ=0.789, β= 0.791, t=15.64, and α=0.000), which is also confirmed. Shir, Nikolaev, and Wincent (2019) found a strong relationship between autonomy and entrepreneurship. The freedom of behaviour that an entrepreneur has in operating a company is one of the reasons why a person becomes an entrepreneur.

Additionally, we calculated indirect effects. These paths can contribute to the exploration of new possibilities in research of SEs personality and skills. The variance accounted for (VAF) determined the size of the indirect effect in relation to the total effect. The objective was to 'determinate the extent to which the variance of the dependent variable is directly explained by the independent variable and how much of the target construct's variance is explained by the indirect relationship via the mediator variable' (Hair, Hult, Ringle, & Sars, 2014, p. 225). We employed the bootstrapping method to assess this effect and obtain VAF indexes for total indirect effects. The confidence intervals and the t statistics are shown in table 4.

Table 4. Mediation effects analysis

Path	VAF	Lower bound (2.5%)	Upper bound (97.5%)	t	p
A-I	0.669	0.533	0.786	10.22	0.000
A-IN	0.549	0.314	0.820	4.16	0.000
C-I	0.286	0.117	0.489	2.98	0.003
T-IN	0.262	0.103	0.261	2.54	0.012

Note: A (Autonomy), IN (Innovation product or service), C (Creativity), I (innovation process), T (Task & roles).
Source: own study.

The mediation results showed that all paths are significant because in all cases $p<0.01$, which means that all studied variables are necessary for the innovation of products or services. Once the entrepreneur has an innovation in the market, the social innovation begins due to the actions done by the entrepreneur.

CONCLUSIONS

The importance of social entrepreneurship goes farther than simply a charity organization. Santos (2012) states that, 'SE is an innovation process in the economy that can happen in different institutional contexts, is based on value creation, and operates by its own rules and logic. It is an approach that seems well suited to address some of the most pressing problems in modern society and improve capitalism' (p. 350). The impact of social enterprises in economy is difficult to measure in this moment because the category is not well defined in an economic classification, but as Harding (2004) proposes, this kind of organizations could be the basis of a new economy, especially in turbulent times.

The aim of this study is to investigate the personal and skills characteristics of SEs. Regarding personal characteristics, our study proposes that there is a relationship between autonomy and creativity of the entrepreneur. Hypothesis 1 is accepted due to the strong relationship between the variables. Authors such as Perry-Smith and Mannucci (2017) and Bacq, Ofstein, Kickul, and Gundry (2015) support this idea. Moreover, in an analysis carried out on social and non-social entrepreneurs, Smith *et al*. (2014) found that the need for autonomy is greater among the former. Hypotheses two and three relate to autonomy and creativity in product innovation. Both hypotheses are accepted because they present positive significant statistical parameters. In this sense, Orth and Volmer (2017) establish a relationship between creativity, autonomy, and innovative behaviour based on the personal characteristics of a worker. At present, no literature on this relationship was found for SEs. This work presents a theoretical contribution in this regard.

In relation to the skills presented by the SE, hypothesis 4 establishes a positive relationship between innovation in a process and innovation in a product or service. This relationship is significant and, therefore, hypothesis 4 is accepted. In this sense, Lumpkin *et al*. (2013) identify that social companies are looking for breaks in the market to correct difficulties in the environment, thus providing a solution to various problems that currently worry the society, e.g. poverty, education, or health. Moreover, SEs present opportunities to challenge and develop new capabilities and contribute to national systems of innovation, especially in emerging markets (Rao-Nicholson, Vorley, & Khan, 2017).

Hypothesis five refers to tasks and roles and the innovation that the social innovator must carry out in the process, which was studied by Chen *et al*. (1998) on diverse entrepreneurs. In relation to the management of tasks and roles, creativity, and innovation Ahlin *et al*. (2014) establish a positive relationship between these three factors. Finally, hypothesis six refers to the tasks and roles and autonomy of the SE. This last relationship is accepted because it presents a positive and significant statistical relationship. Cavazos-Arroyo, Puente-Díaz, and Agarwal (2017) establish the personal characteristics of an SE with the tasks and roles that the entrepreneur must develop. Their study was conducted in Mexico among potential aspiring SEs in the state of Puebla. In general, our results agree with the findings of De la Garza-Carranza, Zavala-Berbena, López-Lemus, and López-de-Alba (2019) who show that the skill to manage an SE business is important to avoid failure.

An SE strives to maintain the results of the organization while seeking a social benefit for the community, which could be especially difficult in a restricted economy. There are success stories in Mexico that show that SEs can create organizations (Wulleman & Hudon, 2016). In the studied cases, most organizations are small and of the 'social bricoleur' type

(Zahra *et al*., 2009). A bricoleur SE is one who uses any type of resources to conduct the task for social benefit. These entrepreneurs make a significant effort to correct the social imbalances in their environment.

Our analyses leads us to conclude that the SE needs certain skills and personal traits to perform their work. This paper emphasises, that SE are important for the construction of feasible development strategies, for those suffer conditions of inequality in the society. Particularly in the Mexican case, there are many areas of opportunity for the creation of social innovation, since currently 42% of the population lives in poverty and 7.4% in extreme poverty (CONEVAL, 2018). Furthermore, there are important challenges in education, health, food, and housing. These problems that afflict a large number of Mexicans must be part of government strategies, but also of civil society, which is willing to commit itself in an organised way through social ventures. Our research results must be carefully observed, and they should influence organizations that help to develop social enterprises such as universities, local and federal government, and other ventures that promote a social change.

As the new economic crisis rises from the COVID-19 pandemic, many governments in emerging countries are facing social challenges to combat hunger and poverty. According to the International Labor Organization (ILO, 2020), the impact in Mexican society in terms of job loses is significant. This economic crisis is especially hitting women and young people. The most vulnerable sectors are manufacturing, hospitality business, and construction.

One of the strategies that the Mexican government can implement is to develop incentives for developing SEs. Mexico has a lot of resources in terms of culture, crafts, agriculture, and nature. Consequently, the idea of developing centres for the development of SEs – particularly in vulnerable communities – could create a social impact and mobility for those in vulnerable situation. To do this, the Ministry of Education may promote centres of SE development in its university network. For example, Tecnológico Nacional de México has around 250 campuses in all regions of Mexico. Thus, the results of this study could impact the development of abilities and characteristics that the SE need to develop a new venture.

This study presents limitations regarding the sample size due to the lack of a reliable list of SEs, while companies of this type generally have a local action where they market their products or services. Future studies should consider a larger sample size differentiated in organizations that have been operating for a longer time in order for the latter to relate to experience and social impact. The social impact of SEs was not measured in this study due to technical difficulties. Firstly, most SEs considered in the sample are young, and the social impact is directly related to the nature of the business, so it could be questionable after measurement. Secondly, there is no consensus on how to measure the social effect of SEs, because this concept is constructed of diverse aspects: economic, educational, stakeholders, and personal impacts to entrepreneurs and communities (Caroli *et al*., 2018). In this sense, the topic could be interesting for new research initiatives.

As our results suggest, the education of community leaders and university students in SE is an activity that should be considered by policymakers so as to increase the number of organizations devoted to social change. Thus, the development of strategies to include these topics in business courses could be a contribution of educational researchers into SE creation. In this sense, there is an opportunity for Mexican educational managers in developing SE curricula (Kickul, Gundry, Mitra, & Berçot, 2018).

As for proposals of future research related to entrepreneurs, we suggest two important aspects of SE. Firstly, more skills should be investigated regarding the planning capacity and how this activity is developed in actions for increasing innovation and achieving a social change. In this sense, there is an important lack in the literature in how innovation contributes to social change and how this concept could be measured. Secondly, it could be interesting to explore the interaction of factors that create synergies to influence the performance of entrepreneurs for achieving social goals.

The literature about SEs is under development especially in emerging economies. Moreover, the resources and legal aspects of SEs are insufficiently developed in Mexico, which offers opportunities for practitioners and researchers. SEs contributions to the economy and employment should be considered an emerging topic in the business literature, especially in times of crisis like the one we are currently experiencing.

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Ministry of Science and Higher Education
Republic of Poland

The copyediting and proofreading of articles in English is financed in the framework of contract No. 913/P-DUN/2019 by the Ministry of Science and Higher Education of the Republic of Poland committed to activities aimed at science promotion.

Entrepreneurial Business and Economics Review

2020, Vol. 8, No. 4

10.15678/EBER.2020.080412

The COVID-19 pandemic impact upon housing brokers' workflow and their clients' attitude: Real estate market in Krakow

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ABSTRACT

Objective: The objective of the article is to assess the impact of COVID-19 pandemic upon the workflow of real estate brokers and their clients' attitude as exemplified by the real estate market in Krakow.

Research Design & Methods: For the purpose of assessing the impact of COVID-19 pandemic upon the aspects of the real estate market under consideration, a survey questionnaire with open-ended questions was distributed amongst all the real estate brokers associated in the Małopolska Real Estate Brokers Association.

Findings: The findings indicate that the COVID-19 pandemic has had a considerable impact upon the workflow of real estate brokers and their clients' attitude. The real estate brokers began to render online services to a greater extent, thus they intensified the use of digital technologies in running their businesses. On the other hand, their clients like landlords in numerous cases changed their strategies, i.e. from short-term rental into the long-term one. In turn, tenants began to demand lower rents and higher standards of apartments.

Implications & Recommendations: The conducted studies have made it plausible to state that the COVID-19 pandemic has had a significant impact upon the real estate market. However, it bears noting that we do not conclude to what extent those changes are permanent, therefore the need for further studies.

Contribution & Value Added: This article counts among the first ones in the world to address the issue of COVID-19's impact upon the housing market.

Article type: research article

Keywords: housing market; COVID-19; SARS-CoV-2; realtor; housing preferences

JEL codes: D22, D23, H12, R00

Received: 1 September 2020 Revised: 22 September 2020 Accepted: 28 September 2020

Suggested citation:

Marona, B., & Tomal, M. (2020). The COVID-19 pandemic impact upon housing brokers' workflow and their clients' attitude: Real estate market in Krakow. *Entrepreneurial Business and Economics Review,* 8(4), 221-232. https://doi.org/10.15678/EBER.2020.080412

INTRODUCTION

As of September 22, 2020, the COVID-19 pandemic has caused over 960,000 deaths and more than 31 million confirmed cases all over the world (Johns Hopkins Coronavirus Resource Center, 2020). The outbreak of COVID-19 has influenced almost all the aspects of human life (Zahra, 2020; Ratten, 2020a, 2020b; Liguori & Winkler, 2020) and has completely changed the economic environment (Kuckertz *et al.*, 2020; Kufel, 2020; Korzeb & Niedziółka, 2020). In particular, as Nicola *et al.* (2020) note, the emergence of coronavirus may be considered in the context of the effect upon primary, secondary, and service sectors. The last of the three includes the housing market, which has been impacted by the novel pandemic in many aspects. The immediate influence of COVID-19 pandemic upon the housing market mostly refers to the occupation of professionals operating in that market, along with its specific segment, i.e. the rental housing market. Let us note that – until now – no scientific research has been conducted to the extent of the aforementioned aspects. Furthermore, the objective of the article is to assess the impact of COVID-19 pandemic upon the workflow of real estate brokers and their clients' attitude as exemplified by the real estate market in Krakow.

Taking into account the abovementioned goal, this article will provide answers to the following research questions:

RQ1: Has the COVID-19 pandemic had a considerable impact upon the operations of house brokers? If there were significant changes in the workflow of real estate brokers, what were those changes? Has the emergence of COVID-19 extended the time of online work in the case of real market professionals and caused the digitalisation of real market brokers?

RQ2: Has the COVID-19 pandemic changed the attitude of rental housing market participants? Is the change in tenants' preferences and, on the other hand, in landlords' strategies particularly noticeable?

This study contributes to the development of relevant existing literature in several ways. This article counts among the first ones in the world to address the issue of the impact of COVID-19 upon the housing market. Secondly, this article presents a synthetic overview of the scientific research conducted hitherto at a boundary between the COVID-19 pandemic and the housing market. Moreover, this article depicts unique studies conducted to the extent of the change in the workflow of real estate brokers, but also in the change in landlords' and tenants' attitude in the housing market as a result of the COVID-19 pandemic.

The rest of this paper is organised as follows. The next section provides a literature review on the impact of the COVID-19 pandemic on the housing market. The methodology of the research is then presented, followed by the results of the analysis and their discussion. The last section contains the main conclusions and limitations of this study and directions for future analyses.

LITERATURE REVIEW

The impact of COVID-19 pandemic upon the housing market has not been comprehensively analysed in the scientific literature until now. However, we did find some articles which attempt to analyse the impact of COVID-19 pandemic upon the housing sector.

All the studies conducted hitherto may be grouped thematically in reference to the following issues:

1. housing prices,
2. homelessness,
3. housing architecture,
4. private sector of the rental housing market,
5. bank borrowing as the funding source of housing transactions,
6. residential property sale transactions.

Housing Prices and the COVID-19 Pandemic

Let us note that as far as the impact of COVID-19 pandemic upon the housing market is concerned, the issue of residential property prices prevails in the press. However, due to the unavailability of data, only one credible scientific research was conducted in this area. The research concerned the impact of COVID-19 pandemic on housing prices in Italy (Del Giudice, 2020). The results of the study show that the emergence of coronavirus did not cause a sharp fall in property prices, which oscillated around 4-7%. Other preliminary expert analyses also indicate that the occurrence of COVID-19 pandemic has not brought about considerable changes in the dynamics of prices in the housing market (Bloom, 2020; Glapiak, 2020).

Homelessness and the COVID-19 Pandemic

The issue of homelessness against the background of COVID-19 pandemic has been highlighted, among others, by Mendes (2020). According to this author, during the COVID-19 pandemic, urban social movements intensified to demand housing for everyone because only this way might the obligation of social isolation be fulfilled. A similar topic was addressed by Morgan (2020) who claims that the mechanism of social distancing as a tool for reducing the infection rate is not effective in numerous countries (e.g. in Ghana) due to the prevalence of homelessness and very poor housing conditions amongst the substantial part of the society. The aforementioned issue further considered within the framework of research conducted by Benavides and Nukpezah (2020), who note that in order for the needs of the homeless to be satisfied effectively during the COVID-19 pandemic, officials must cooperate at all the levels of public institutions.

Housing Architecture and the COVID-19 Pandemic

Scientists also highlight that the COVID-19 pandemic makes it necessary to redesign existing residential buildings and to design new residential buildings in a specific manner. D'Alessandro *et al.* (2020) focus on the lockdown period when people were forced to remain at home for a longer time. The authors note that this was a period that caused a deterioration of the society's health condition in terms of non-infectious diseases such as cardiovascular diseases, diabetes, or mental disorders from the more sedentary lifestyle, higher consumption of food and beverages, tobacco smoking, and drug abuse. Furthermore, D'Alessandro *et al.* (2020) emphasise that virus transmission in result of intra-household transmission is still another problem caused by the lockdown period, which resulted from the inadequate housing construction and the lack of necessary equipment, e.g. an air exchange system. Taking the above into consideration, the Authors have put

together a set of recommendations regarding healthy, safe, and sustainable housing that could respond to the present and future pandemics and the problems they engender. Those recommendations were issued in seven areas: (i) the accessibility of green spaces and natural environment for residents, (ii) building design characteristic of easy adaptability, (iii) housing space of high thermal comfort and air quality, (iv) water consumption and wastewater treatment management, (v) solid waste disposal management, (vi) the automation of residential buildings, (vii) the use of innovative building units in order to reduce the quantity of bacteria and viruses on surfaces. In turn, Fezi (2020) postulates for residential building design to be based on the so-called Intermediate Housing, according to which multi-family buildings should ensure a separate entrance for every apartment. Hence, virus transmission could be restricted more in result of the actual separation of residents in a given building, which is impossible in a typical multi-family building due to shared entrances that may become contaminated.

The Private Sector of Rental Housing Market and the COVID-19 Pandemic

The COVID-19 pandemic considerable impacted the private sector of rental housing market. The adverse impact of coronavirus has been and still is experienced mostly by landlords who rent out their property for short periods of time. This mostly results from the fact that in some of the countries, that type of property rental has been suspended. Furthermore, people continue to fear the possible virus threat, which makes them postpone their tourist or business plans. As far as tenants' viewpoint is concerned, we should note that the COVID-19 pandemic has undoubtedly caused difficulties in paying rent for some due to the turmoil in the labour market. As Maalsen *et al.* (2020) note, in some of the countries e.g. in the United Kingdom, Australia, or the United States of America, governments decided that tenants may defer their accounts payable until the situation returns to normal. Furthermore, Maalsen *et al.* (2020) emphasise that the time of COVID-19 pandemic is a unique period during which tenants and scientists may draw attention and obtain widespread feedback on systemic problems of the private sector in the rental housing market.

Bank Borrowing as the Funding Source of Housing Transactions and the COVID-19 Pandemic

The current coronavirus pandemic has had a considerable impact upon the approach of banks to borrowing as the funding source of housing transactions. As Nicola *et al.* (2020) note, UK banks have begun to claim substantially higher contributions from borrowers in order to extend a loan. In a number of countries, the so-called loan repayment holidays have been offered for borrowers who have found themselves in a poor financial standing as a result of COVID-19 pandemic.

Residential Property Sale Transactions and the COVID-19 Pandemic

The issue of property sale transactions is still another aspect that has been come across within the framework of the scientific research conducted in light of the COVID-19 pandemic. The pandemic has undoubtedly reduced the number of face-to-face meetings arranged for the purpose of showing residential property offered for sale. Instead, real estate brokers have begun to use modern technologies such as FaceTime or Skype to a greater extent in order to show online property to interested persons (Nicola *et al.*, 2020; Koszel, 2020).

Conclusion

We should note that the aforementioned studies on the issue of COVID-19 pandemic and the housing market should be continued. After all, these analyses insufficiently stem from objective quantified figures or questionnaire-based surveys and, in the majority of cases, they exclusively display authors' opinions. Furthermore, the COVID-19 pandemic continues, and the second wave of infections occurred in the fourth quarter of 2020. Thirdly, the housing market usually responds to external stimuli with a delay, which is why changes in this market are visible only after some time; i.e. we should expect the pandemic to impact prices.

RESEARCH METHODOLOGY

For the purpose of conducting the intended study, a survey questionnaire with open-ended questions was distributed by means of a Google form amongst all the real estate brokers associated in the Małopolska Real Estate Brokers Association, i.e. 226 persons. The questionnaire consisted of five closed-ended questions and two comprehensive open-ended questions. Within the context of the presented findings, the respondents were asked questions that read as follows:

1. How and whether did the workflow of the Real Estate Office that you are employed in change under the influence of COVID-19 pandemic? If it did, may the changes be permanent, i.e. may they continue in the office after the pandemic is over?
2. Have you noticed the impact of COVID-19 pandemic upon (1) the change in tenants' preferences and (2) landlords' strategies in the housing market in Krakow?

The above questions were to reveal respondents' views on changes in the workflow of real estate offices that process transactions concluded in Krakow housing market in result of the COVID-19 pandemic, but also to identify the changes in their clients' preferences and attitudes. The other context was driven by the focus on the rental housing market due to the direct and immediate impact of COVID-19 pandemic upon that segment of the market; e.g. the sudden stagnation in the short-term rental market and the premature termination of rental agreements by students and staff members affected by the pandemic to the greatest extent.

The inclusion of open-ended questions allowed us to derive some typical benefits that in principle arise from qualitative analyses; among other things, they mostly referred to the possibility of the in-depth presentation of worldviews.

The first dispatch was arranged for 23 July 2020 and the second one – on 28 July 2020. The final output was 22 responses from – in most cases – real estate brokers with considerable experience in the real estate market; only one respondent had experience from three to five years, while the rest had over 10 years of experience (15 brokers) or from six to 10 years. Detailed characteristics of the group of respondents are presented in Table 1.

Notwithstanding the low response rate of 9.73%, the study may be considered credible. Firstly, surveys among enterprises are characteristic of a substantially lower response rate compared to other kinds of respondents, such as local municipalities. Secondly, the analysis conducted by Holbrook *et al.* (2008) proves that surveys with a low response rate are marginally less accurate than those with a high response rate. The low response rate

is also mentioned in Pilař *et al*. (2018). At the same time, we should note that considering the survey questionnaire was addressed to real estate offices that process only transactions in the housing market in Krakow, we may state that the real response rate has been higher. That is, a part of real estate offices associated in the Małopolska Real Estate Brokers Association do not process transactions in the Krakow market or do not specialise in residential property trade, focusing on parcels of land or commercial property.

Table 1. Characteristics of the group of respondents

Variable	Variable values	Proportion of the Sample Response (%)
Sex/Gender	Male	54.50
	Female	45.50
Experience	3-5 years	4.50
	6-10 years	27.30
	above 10 years	68.20

Source: own study.

RESULTS AND DISCUSSION

Our study indicates that in over 70% of cases, the workflow of real estate offices has changed in result of the COVID-19 pandemic. The changes aim at maximum precaution measures to ensure the utmost safety of staff members and clients of real estate offices, which entails imposing stricter safety rules and broader IT use in order to limit the number of face-to-face contacts. The answers often repeated, as in the case of one of the respondents saying, 'we care about the safety of staff members and clients (masks, antibacterial gels, etc.).' Another respondent noted that 'the changes in the period from March till May 2020 related to the necessity to disinfect and cover one's mouth and nose or wear gloves, which are currently less frequently practised.' Furthermore, many responses referred to the issue of reducing the number of both client and staff team meetings to the absolute minimum. One of the responses included the following statement: 'in the office we only make appointments with clients, we work online.' Another answer included the following statement: 'a substantial part of work occurs online. The first presentation of an apartment happens online. Team meetings have been moved to the Internet.' Furthermore, the answer is very often that real estate agents are more cautious about direct contacts with clients, limiting them to those meetings that are more likely to be successful (i.e. commencement of a rental agreement, preliminary agreement, etc.). Within this context, one of the brokers stated that 'a more selective approach to the client as far as a face-to-face meeting is concerned will certainly translate into a larger volume of transactions and time saving.' Still another respondent answered as follows:

> I am trying to make more arrangements online before an on-site meeting; e.g. I always provide the client with a website link to the property offered for sale or photographs of an apartment. I don't make on-site appointments in respect of a real estate that a client has not seen online before – even when a sale offer is not ready yet, I e-mail a client to verify any potential interest. I ask a client more questions before a meeting in order to limit redundant meetings to the minimum.

Here, we reach an important point, namely the change in clients' attitude noted by one of the surveyed brokers, who observed 'an increase in the number of exclusive right-to-sell agreements. I hope the changes will be permanent.' Such an answer implies that a part of clients also reduce the number of face-to-face contacts with real estate brokers during the pandemic, while attempting to sell or rent out an apartment via one real estate broker and not via many competing brokers, which is most often practised in Poland. The aspect of decreasing occupational involvement in face-to-face contacts among professionals in the real estate market is also noted by Koszela (2020) who – having conducted a study on the impact of COVID-19 pandemic upon the real estate market in Poland – informs that over 60% of respondents devote much more time to online work in result of the emergence of COVID-19.

Still another response of the surveyed broker draws attention to a different important aspect: 'we launch video talks, for instance, via Zoom, within the framework of both regular talks with staff members and talks with clients, in order to reduce the number of face-to-face meetings and mitigate the risk of infection, which at the same time saves us time and money spent on commuting.' Here appears the issue of using the IT to a greater extent for the purpose of daily work at a real estate office. The pandemic has undoubtedly made it necessary to use advanced technologies on a greater scale also among the specialists who operate in the housing market. Solutions such as video talks, virtual walks, or online agreement commencement – though known before the pandemic – are now standard arrangements in daily work of more and more real estate broker offices. Therefore, it is not surprising that the answers given by the respondents were: 'for the benefit of those interested, we use such IT tools as WhatsApp, Skype, Messenger, etc., for the purpose of presenting a real estate online. More and more individuals sign agreements online' or 'we provide clients with the opportunity to see a real estate online.' To summarise, we may state that the COVID-19 pandemic has accelerated the digitalisation of businesses ran by real estate brokers, which means that traditional business models in the housing market begin to transform into such models in which advanced technologies are used to a greater extent (Tomal, 2020a).

Moreover, we should note that the greater use of modern technologies by small companies, such as real estate offices, has made it possible for them to avoid a complete economic shutdown. On the one hand, these technologies have become for small companies a survival strategy during lockdown (Akpan *et al.*, 2020), while on the other hand, an opportunity for development. The latter aspect is also indicated by Kuc-Czarnecka (2020), who shows that the current and potential future lockdowns can be a catalyst for the development of information and communication technologies, which will make it possible for firms to reduce the digital deprivation that affects around 14% of Poles.

The second descriptive question was to identify the changes in the clients' attitude, including but not limited to the landlords' strategies and tenants' preferences in the housing market in Krakow. Approximately 80% of the surveyed real estate brokers drew attention to the changes in two areas. Firstly, a substantial part of the respondents noticed a change in the landlords' strategies from short-term into long-term rental: 'landlords who rent out apartments on a daily basis, namely tourist apartments, are forced to accept no tenants within the coming 12-24 months or offer their apartments for rent in the housing

market for at least one-year-long rental.' Another broker noted: 'landlords offer temporary promotions – especially in the very city centre – in order to spare no effort to rent out apartments at any cost, thus shifting from the short-term rental to the regular, long-term one.' Still another broker emphasised the landlords' agreement to reduce rents: 'there is a noticeable consent to reduce the rent for current tenants compared to previous months.'

There also appeared responses emphasising the raising standards of offered apartments: 'landlords lower prices and attempt to ensure a better comfort for tenants, competing with other landlords.'

On the other hand, changes in tenants' preferences may be noticed, which is exemplified by the following response provided by one of the surveyed individuals: 'tenants expect lower rents, waiting for more attractive, that is, cheaper offers; new residential buildings are most preferred by the tenants; even when they are built a poorer location, lower rents encourage to rent larger apartments.' Another broker similarly noted that 'tenants often seek attractive rents; they want to take advantage of the situation in order to lower the cost of rent.' Another interviewee remarked that the tenants 'look for apartments closer to the city centre in return for rents comparable to the rents for apartments located farther away from the city centre.' Respondents also drew attention to the prevalence of short-lived agreements: 'people currently negotiate rents and enter into agreements for shorter periods due to the uncertain times.' In turn, another one of the surveyed staff members of the real estate office noted that 'the tenants expect larger apartments with a little garden or a balcony,' which of course may in the future impact long-term changes in housing market preferences (not only in the rental housing market), accounting for the necessity to revise findings of research conducted hitherto (even the latest one) not only in terms of the real estate market in Krakow (Głuszak & Małkowska, 2017; Głuszak, 2018; Tomal, 2020b) but also in other parts of Poland (Źróbek-Różańska & Szulc, 2018; Tanaś, Trojanek, & Trojanek, 2019; Jancz & Trojanek, 2020) and around the world (Sika & Vidová, 2017; Soon & Tan, 2019; Opit, Witten & Kearns, 2019).

CONCLUSIONS

The conducted research has allowed us to accomplish the outlined objective and answer both research questions. It is utterly plausible to state that the COVID-19 pandemic has considerable impacted the workflow of real estate brokers and their clients' attitudes. The real estate brokers started working online to a greater extent and, thus, intensified the use of digital technologies in their businesses. Furthermore, the COVID-19 pandemic forced real estate broker offices to undertake various precaution measures in the case of face-to-face contacts, which are commonly recognised within the framework of other kinds of economic operations. On the other hand, clients' attitudes have also changed. Taking particularly into account the rental housing market, many landlords changed their strategies, namely from the short-term rental model into the long-term one. In turn, in the current situation, tenants began demanding lower rents and higher-standard apartments. Moreover, so-called exclusive right-to-sell agreements started to gain popularity.

However, when presenting the above conclusions, we should be aware that this study has certain limitations that concurrently constitute the prerequisite for undertaking subsequent research in the future. As we already mentioned, in the questionnaire-based survey open-ended questions were exclusively used to achieve the research goal.

It allowed us to derive specific benefits typical for qualitative analyses, i.e. an opportunity to present a more accurate image of reality, particularly in the situation when it has not been sufficiently studied or diagnosed, which undoubtedly is the case with the emergence of COVID-19 pandemic. It appears that we should continue qualitative analyses by means of other research techniques, including but not limited to in-depth and focus group interviews. Notwithstanding the fact that the current studies are not representative in nature, which is the also case with other qualitative analyses suggested by us, they may nevertheless constitute good input data for the purpose of future quantitative analyses. The latter should broaden the extent of the study and include brokers that are not members of associations, in particular those representing large foreign broker chains. Furthermore, we should remember that the real estate market is characterised by significant localism, thus we must extend our analyses to include foreign real estate markets, not only the Polish one. Moreover, in the course of our analyses, we discovered that the COVID-19 pandemic impacts clients' preferences in the housing market. At present, we cannot definitely judge whether these changes are substantial and permanent, which nevertheless calls for new research to address this issue as well.

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Acknowledgements and Financial Disclosure

This project has been financed by the Ministry of Science and Higher Education within the "Regional Initiative of Excellence" Programme for 2019-2022. Project no.: 021/RID/2018/19.

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

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Ministry of Science and Higher Education
Republic of Poland

The copyediting and proofreading of articles in English is financed in the framework of contract No. 913/P-DUN/2019 by the Ministry of Science and Higher Education of the Republic of Poland committed to activities aimed at science promotion.

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ISSN 2353-883X

eISSN 2353-8821