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Dynamic indexing and clustering of government strategies to mitigate Covid-19

Jani Kinnunen, Irina Georgescu, Zahra Hosseini, Ane-Mari Androniceanu

ABSTRACT

Objective: The objective of the article is to identify the reference group of countries with similar Covid strategies and other groups with their performance success, and to construct a composite Covid Mitigation Index for comparative purposes, thus, implying how to redesign the strategic policies.

Research Design & Methods: Gaussian Mixture Modelling and Factor Analysis: the main design is quantitative, using Gaussian Mixture Modelling to find the optimal number of country clusters, and Factor Analysis with Principal Axis Factoring (FA-PAF) to build a composite index of governmental policies. Data includes eight mitigation policy variables and three supporting economic policy variables. Data are aggregated to form three periods and the cluster changes are identified by Gaussian Mixture Modelling. Then, the Covid Mitigation Index (CMI) is constructed by FA-PAF to obtain a comparative measure over the periods and the country clusters. The results were obtained by means of R studio and SPSS.

Findings: The dynamic clustering leads to a decreasing number of clusters from nine clusters in the first period (January-February 2020), four clusters in the second period (March-April 2020), and two clusters in the third period (May-June 2020). In the first period, China (with CMI=48) took serious actions forming its own cluster, while 11 other countries (with CMI>10), e.g., early affected European countries such as Italy and Spain and large Asian countries such India and Indonesia, took moderate actions. In the second period all cluster averages were greater than China's in the first period, i.e., most world countries were dedicated to fight Covid-19. In Europe, Italy, San Marino and France showed the highest CMI values, similarly to Iraq and Palestine in the Middle East, Peru and Honduras in the Latin America, and China, India and Indonesia in Asia. In the third period, cluster averages showed even tighter policies even though 42 countries had lower CMI values than previously.

Implications & Recommendations: The approach provided a big picture for decision makers both in business and in governments. The key idea was to reveal reference groups of countries which help governmental actors to design and adapt their strategies over time by learning by their own experience and the results of the better performing clusters. It was suggested that a multi-criteria approach accounting for individual government's preferences over health and economy is used along with the presented approach.

Contribution & Value Added: Clustering with Gaussian Mixture Models and factor analysis based on Principal Axis Factoring for composite-index building were used. The methods are well-established, but they were applied in a novel way dynamically over time and for the composite CMI. CMI was built on two factors which identified the structure of mitigation policies and economic policies. The development of governmental polices over the first cycle of Covid-19 pandemic was described.

Article type: research article

Keywords: clustering; composite index; pandemic; public policy; Covid-19 mitigation

JEL codes: Z38, C82

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INTRODUCTION

The global Covid-19 pandemic has affected various aspects of life including health, economics, tourism etc. related to both private behaviour and governmental actions. While finding a solution to this epidemic requires a global consensus, governments are facing specific challenges in designing and implementing their policy decisions.

The objective of the study is to identify the reference group of countries with similar Covid strategies and other groups with their performance success and to construct a composite Covid Mitigation Index (CMI) for comparative purposes, thus, implying how governments can redesign the strategic policies. The two research questions are formulated as follows.

RQ1: Which clusters of countries may be identified during the period January-June 2020 and how do the clusters develop over time?

RQ2: How can the pandemic mitigation policies be compared using a composite index over the identified clusters and time?

To tackle the research questions, firstly, an approach to compare Covid-mitigation policies of world countries is presented. The Gaussian Mixture Modelling (GMM) (Bouveyron *et al.*, 2019) is used to obtain clusters of countries roughly over the first cycle of the current pandemic, January-June 2020. The research period is divided into three subperiods and the changes in country clusters are identified. Secondly, a composite index called Covid Mitigation Index (CMI) is constructed for all countries and each period, and the cluster averages of CMIs are used for comparative purposes. This is done by factor analysis with principal axis factoring, FA-PAF, which is a new approach, to the best knowledge of the authors, in constructing a composite index. It is an extension of a more traditional composite indexing by Principal Component Analysis (PCA). FA-PAF is better in detecting the structure, in this case, the factor of economic policies is separated from the factor of restriction-focused mitigation policies.

The originality of this study consists in applying GMM clustering and constructing the composite Covid-Mitigation Index by means of FA-PAF, rather than using the most common PCA approach. The proposed composite index has both a scientific value and a practical utility, since it can serve to the management of government policies during the Covid-19 crisis. So far, no such an index has been found in the literature.

The rest of the article is structured as follows. In the next section, relevant literature is reviewed. Then, the methods and the data used are described. We chose Gaussian Mixture Modelling as a soft clustering technique, in which each object belongs to each cluster with a membership degree. The objects generated by a Gaussian distribution are grouped in clusters. As a clustering method, GMM is more flexible than K-means clustering. While in K-means clustering the clusters are assumed to be round-shaped, characterised by the mean, in GMM clustering this assumption is less restrictive. In GMM clustering, the mean and the standard deviation characterise the clusters' shape (McLachlan & Peel, 2000). In the analysis part, firstly, GMM is dynamically applied over the three consecutive periods to obtain changing country clusters for each two-month period. Secondly, a composite index is built using FA-PAF and the index is used to interpret the dynamic clusters. Thirdly, the results are summarised by describing the development of the situation of the world countries over the three sub-periods. Finally, the article concludes and some future research opportunities and practical ways to use the presented approach together with county-specific preferences of health and economy are suggested.

LITERATURE REVIEW

Cheng *et al.* (2020) classified the policymakers' strategies against Covid-19 with respect to different dimensions: a) the action type of strategy (e.g., quarantine); b) the level of action (e.g., national); c) the target (e.g., national or provincial); d) the human or material target (e.g., travel or mask); e) the direction (e.g., inbound or outbound); f) the mechanism of action; g) enforcement; h) enforcer; and i) the timing of action. While governments and policymakers are focusing to find the best strategies to handle the tough health and economic situations, the result of a large survey covering 58 countries

demonstrated that majority of respondents were not satisfied with their governments' actions. The authors draw the attention of policymakers to reduce people's worry and depression and improve their mental health (Fetzer *et al.*, 2020).

Due to the importance of collecting and interpreting data to understand and find the better-implemented strategies to deal with the pandemic, many studies have started to collect data from available resources. Hale *et al.* (2020a) used the data collected in real time from the Oxford Covid-19 Government Response Tracker (OxCGRT) to understand the responses of governments of different countries during the pandemic. The results indicated that the governmental responses became stronger over time and variations of actions among the countries were reduced. Stronger mitigation policies lead to greater social and economic impacts. Several programmes have been implemented on national and transnational levels. For example, Androniceanu (2020) discusses the main EU's objectives and instruments applied to reduce the social and economic impact of the Covid-19 crisis, including a EUR 100 billion SURE programme to help with workers' income and to support businesses to stay active. Indeed, clustering the data helps policy makers and managers reduce the impacts of Covid-19 (Androniceanu & Marton, 2021). Accordingly, many researchers have attempted to cluster data and defined the algorithm based on that (Zarikas *et al.,* 2020, Kinnunen & Georgescu, 2020, Kinnunen *et al.*, 2020, Rahman *et al.*, 2020, James & Menzies, 2020, Andersen *et al.*, 2020; Kosach *et al.*2020).

Zarikas *et al.* (2020) made an analysis which resulted in clustering countries with respect to active cases, active cases per population and per area based on the epidemiological data of John Hopkins Coronavirus Resource Center. Some other researchers proposed algorithms through an intelligent fusion of healthcare and simulated mobility data, and their results demonstrated the significance of dynamic clustering for reducing lockdown coverage, economic loss, and military unit deployment (Rahman *et al.*, 2020; Androniceanu *et al.* 2020a; 2020b). By analysing the number of cases and deaths in each country, James and Menzies (2020) found similar clusters of countries and determined the most effective strategies. They suggested to implement easier access to early testing to manage the spread of the disease and emphasized the importance of timeliness of various lockdowns rather than their severity.

The activity of many corporations worldwide has been jeopardised due to Covid-19 implications. Sierra *et al.* (2020) discuss successfully implemented strategies in a metal working Mexican company, by computing a new index of organisational prevalence. Sawangchai *et al.* (2020) use an e-questionnaire on entrepreneurial Thai university students and prove that the quality of e-services and e-information positively influence e-learning education for entrepreneurs in the context of Covid-19 (Wach & Bilan, 2021; Nowiński *et al.*, 2020). Marona and Tomal (2020) discuss the implications of Covid-19 on the real estate market in Krakow. Real estate agents have been found to have intensified the use of digital technologies in running their businesses. Mollenkopf *et al.* (2020) examined how the supply chain ecosystem ensured the customers' well-being in the context of the Covid-19 pandemic. Pantano *et al.* (2020) propose some recommendations for retailers to follow in order to adapt to the increasing demand of consumers during Covid-19 pandemic. These recommendations would be: new dynamic capabilities, a more important role played by retailers as essential workers, digital communication and a focus on consumers' well-being.

The research by Davulis *et al.* (2021) evaluates some psychological support measures that could be taken to the Lithuanian population and entrepreneurs in order to improve their psychological well-being worsened by the Covid-19 pandemic. Such measures could include: an increase in the number of workplaces in medical institutions and schools, a raise in salaries, training for psychologists, campaigns to inform the population on available counselling. Haleem *et al.* (2020) briefly present the healthcare, economic and social daily effects of Covid-19. Following a study on Pakistani voluntary participants, Zandi *et al.* (2020) find out that doctors' exposure to Covid-19 patients positively impacts their job stress. Moyo (2020) tests three hypotheses on how the risk of Covid-19 influences poor working conditions and employee disengagement on an adult population from Matabeleland South Region, Zimbabwe.

Due to the rather original approach of this study, we did not form strong explicit hypotheses, but based on our preliminary findings in Kinnunen *et al.* (2020), the plausibility of a similar approach was demonstrated based on dynamic clustering with composite index building for the European Union countries over a three-month period and different techniques than in this study. We may expect a

decreasing number of identified clusters, as well as stronger and increasing government policies over time based on Hale *et al.* (2020a) and Kinnunen *et al.* (2020).

RESEARCH METHODOLOGY

The data is collected for 179 world countries for the period from January to June 2020 from Oxford COVID-19 Government Response Tracker (Hale *et al.*, 2020b) on governmental responses to the current pandemic. Table 1 presents the variables, their descriptions and coding in the original daily data.

Table 1. Used data variables and their coding

ID	Description	Coding of daily active policies
C1	Record closings of schools and universities	0 – no measures, 1 – recommended, 2 – required, 3 – required closing all levels
C2	Record closings of workplaces	as above
C3	Cancellation of public events	0 – no measures, 1 – recommended, 2 – required
C4	Restrictions on gatherings	0 – no measures, 1 – restrictions on gatherings >1000 people, 2 – between 101–1000, 3 – between 11–100, 4 – 10 or less
C5	Record closing of public transport	0 – no measures, 1 – recommended, 2 – required
C6	Stay at home requirements	0 – no measures, 1 – recommended, 2 – required with some exceptions, 3 – required with minimal exceptions
C7	Record restrictions on internal movement between cities/regions	0 – no measures, 1 – recommended not to travel, 2 – required not to travel
C8	Record restrictions on international travel of foreigners	0 – no measures, 2 – quarantine at some arrivals, 3 – banned some arrivals, 4 – total border closure
E1	Income support (direct cash payments) for households	0 – no support, 1 – less than 50% of lost salary, 2 – 50% or more of lost salary
E2	Debt/contract relief (frozen financial obligations, banning evictions, etc.)	0 – no debt/contract relief, 1 – narrow relief, specific to one kind of contract, 2 – broad debt/contract relief
E3	Announced economic stimuli (spending or tax cuts)	USD monetary value

Source: own processing adapted from Hale *et al.* (2020b).

The daily data is summed up to obtain weekly, monthly, and finally two-month aggregated values. This gives us three periods of data: (1) January-February 2020, (2) March-April 2020, and (3) May-June 2020.

The most frequent clustering technique is K-means algorithm, which assigns each object to exactly one cluster, uses Euclidean distance and produces circular clusters. In K-means algorithm each cluster centre is described using a single point in the feature space. If clusters overlap in the feature space, it is hard to know which assignment is right since both are plausible. We will apply Gaussian Mixture Models. GMM is a clustering technique based on probability density estimation using Gaussian mixture models and a procedure called Expectation-Maximisation (EM) to fit the model parameters (Bouveyron *et al.*, 2019). GMM is an extension of K-means algorithm in which clusters are modelled with Gaussian distributions. We have the cluster mean and covariance that describes their ellipsoidal shape.

Next, the model is fitted by maximising the likelihood of the observed data using EM. The EM algorithm will assign the objects to each cluster with a probability. After clustering one creates a probability model for the data. Based on this model one can sample new examples similarly to the initially measured data. Also based on this model one can compare two data collections like the training and test sets to see if they differ.

GMM is a probability distribution model. One begins with several mixture components indexed by *c*. Each mixture component is described by a Gaussian mixture distribution: the mean μ_c the variance/covariance σ_c and the size of the distribution π_c. The joint probability distribution is defined by the weighted average of the individual components: $p(c) = \sum_c \pi_c N(x; \mu_c, \sigma_c)$. The Gaussian *N()* is defined by μ_c and σ_c.

The GMM models are classified into three categories, according to the combinations of the constraints: spherical, diagonal, and ellipsoidal (Celeux & Govaert, 1995).
The EM algorithm has two iterative steps:

- the expectation step, where the expected probabilities of points to clusters are determined, starting from the current model parameters; and
- the maximisation step, where the optimal model parameters of each mixture model are determined considering the probabilities as weights.

To construct the composite Covid-Mitigation Index (CMI) we apply Factor Analysis using Principal Axis Factoring, FA-PAF (Fabrigar *et al.*, 1999) instead of the more typical approach based on principal components of PCA (Joliffe, 2002) to reduce the number of variables. The difference between the two approaches is that PCA assumes that there is no unique variance and, thus, the total variance of the used data is equal to common variance, i.e., shared by all the data, while FA-PAF allows the total variance to be composed of both the common variance and the portion of the total variance which is not shared, but is unique, i.e., variable-specific or errors coming from measurement. The FA-PAF approach is typically more realistic. New variables, factors, are constructed from the original data variables as linear combinations of original data. IBM SPSS v20 is used to reveal the data structure by extracting two factors from the rotated correlation matrix.

RESULTS AND DISCUSSION

Clustering by Gaussian Mixture Modelling

In the analysis, we have three periods in line with Androniceanu *et al.* (2020), but we will show the detailed analysis only for the middle period of March-April 2020. The similar analysis was conducted for the other two periods and we will only show the resulting clusters for these other periods.

Table 2 shows the three best clustering models according to Bayesian Information Criterion (BIC) using the expectation-maximising (EM) algorithm.

Table 2. BIC values of the top-three clustering models

VVE,4	VVE,3	VVE,5
-3997.348	-4018.504	-4025.652

Source: own calculations in R-studio.

The optimal model uses the VVE (ellipsoidal, equal orientation) covariance parameters with four clusters. The optimal model is selected according to several information criteria parameters, such as Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), Integrated Complete-data Likelihood (ICL) likelihood ratio (Biernacki *et al.*, 2000). The highest BIC (-3997.348) is given by the model VVE with four clusters as seen in Table 3. It means there are four clusters with variable volume, variable shape, equal orientation and ellipsoidal distribution. Cluster 1 has 30, cluster 2 has eight, cluster 3 has 53, and cluster 4 has 15 countries.

Table 3. The optimal VVE model with four components

log-likelihood	n	df	BIC	ICL
-1619.995	179	146	-3997.348	-4017.392

Source: own calculations in R-studio.

Figure 1 shows how GMM compares nine models to obtain the optimal number of clusters (horizontal axis) based on the BIC criterion (vertical axis).

GMMs have a semi-parametric model-based approach to density estimation. GMMs are able to accurately approximate any given probability distribution. The estimated mixing probabilities (π_k) for each member distribution in the mixture model are: π_1=0.18098992, π_2= 0.45644627, π_3= 0.27799583, π_4= 0.08456799.

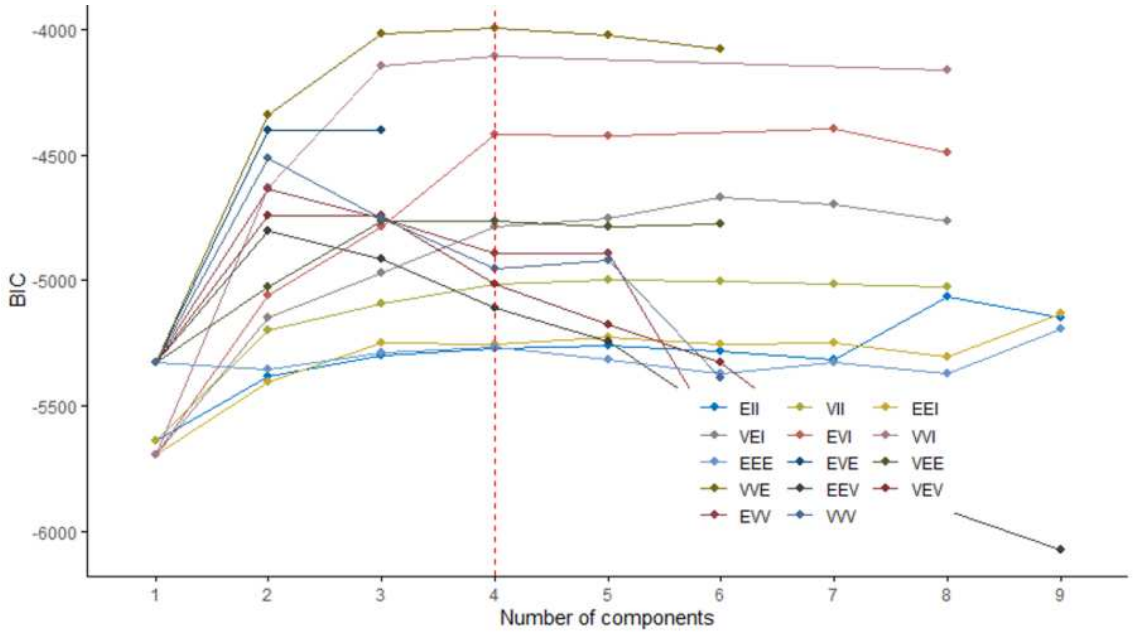

Figure 1. BIC scores for cluster models with profiles and the optimal number of clusters
Source: own calculations in R-studio.

The four clusters of period March-April 2020 are shown in Figure 2. After conducting GMM also for the two other periods, which is not shown here, we will see later also the other two periods and compare them dynamically.

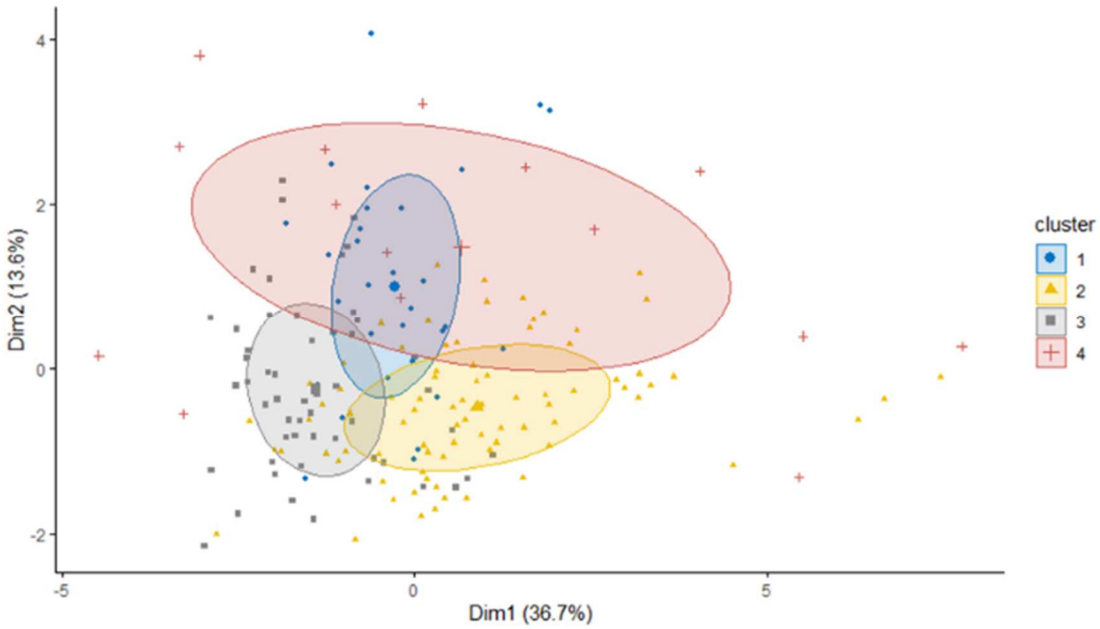

Figure 2. Elliptical four clusters of 179 countries in March-April 2020
Source: own calculations in R-studio.

Indexing by Principal Axis Factoring

Factor Analysis is applied with Principal Axis Factoring as the estimation method (FA-PAF). Figure 3 shows the screeplot (on left) of eigenvalues and the number of factors. One criterion typically used with PCA is to choose components/factors, which have eigenvalue > 1. The two first factors are seen in Table 4 to have eigenvalues > 1. Thus, we extract two factors. On the right side of Figure 3, the

rotated factor plot is seen in the space of the two factors. It is seen that mitigation-policy variables C1-C8 (blue dots) are clustered on the same sector with the largest values of factor 2, while economic policies E1-E2 (green dots) have the highest values of factor 1, while E3 is close to the origin.

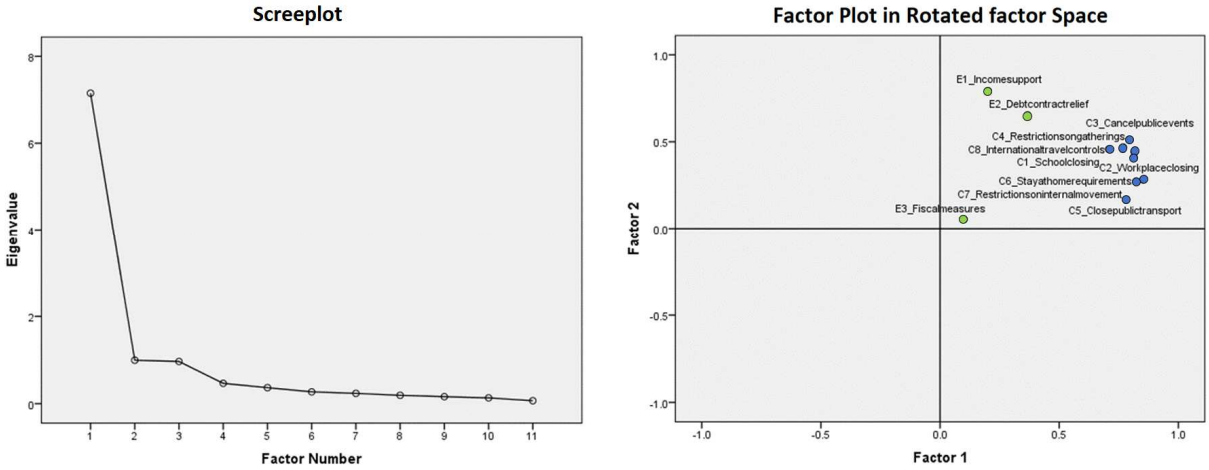

Figure 3. Screeplot (left) and the factor plot (right)
Source: own analysis with SPSS.

Table 4 shows the 11 factors which together explain 100% of the total variance, but we will retain only the first two factors, which together explain 68.58% of the total variance. This fact is confirmed by Kaiser criterion, according to which we retain the first two factors whose eigenvalues > 1.

Table 4. Total variance explained by each factor and cumulatively

Factor	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
F1	7.15	65.01	65.01	5.24	**47.67**	47.67
F2	1.00	9.05	74.06	2.30	**20.91**	**68.58**
F3	0.97	8.78	82.84			
F4	0.47	4.23	87.08			
F5	0.37	3.34	90.41			
F6	0.27	2.46	92.87			
F7	0.24	2.14	95.01			
F8	0.19	1.74	96.74			
F9	0.16	1.45	98.19			
F10	0.13	1.20	99.39			
F11	0.07	0.61	100.00			

Source: own calculations in SPSS.

Table 4 shows that factor 1 explained 47.67% of the total variance and factor 2 20.91%. These can be further used to obtain weights for factor 1 and factor 2 as their share of the total variance explained by the two (68.58%). Thus, to obtain CMI, we weigh factor 1 by 47.67%/68.58% and factor 2 by 20.91%/68.58%:

$$CMI = 0.592 * C7 + 0.572 * C6 + 0.566 * C1 + 0.565 * C2 + 0.552 * C3 + 0.542 * C5 + 0.535 * C4 + 0.535 * C8 + 0.242 * E1 + 0.199 * E2 \quad (3)$$

The rotated correlation matrix of Table 5 is used to construct the composite index. We will only consider the bold factor loadings which are greater than 0.5 in their absolute value. The variables are ordered by the factor loadings, i.e., factor 1 is correlated most strongly with Restrictions on internal movement (C7) and then in decreasing order, but relatively strongly with all variables C1-C8 except the economic policy variables E1-E3. Factor 2 is most correlated with Income support (E1)

and strongly also with Debt/contract relief (E2), while interestingly Fiscal measures (E3) will be the only dropped variable as its correlation with both factors is negligible.

Based on factor loadings of Table 5, we need a middle step to formulate the two factors as:

$$F1 = 0.851 * C7 + 0.823 * C6 + 0.814 * C1 + 0.813 * C2 + 0.794 * C3 + 0.780 * C5 + 0.769 * C4 + 0.708 * C8 \quad (1)$$

$$F2 = 0.793 * E1 + 0.654 * E2 \quad (2)$$

Table 5. Rotated correlation matrix

Variables	Factor 1	Factor 2
C7 - Restrictions on internal movement	**0.85**	0.28
C6 - Stay at home requirements	**0.82**	0.27
C1 - School closing	**0.81**	0.44
C2 - Workplace closing	**0.81**	0.41
C3 - Cancel public events	**0.79**	0.51
C5 - Close public transport	**0.78**	0.17
C4 - Restrictions on gatherings	**0.77**	0.47
C8 - International travel controls	**0.71**	0.46
E1 - Income support	0.20	**0.79**
E2 - Debt/contract relief	0.37	**0.65**
E3 - Fiscal measures	0.10	0.06

Source: own calculations in SPSS.

Dynamic clusters and CMI

Figure 4 visualises the selected loadings (> 0.5) between the two factors and the observed variables. Factor 1 seen in blue (F1) is loaded to C1-C8 (in the decreasing order from left) as described by Equation 1 and factor 2 (F2) is loaded to E1 and E2 as described by Equation 2.

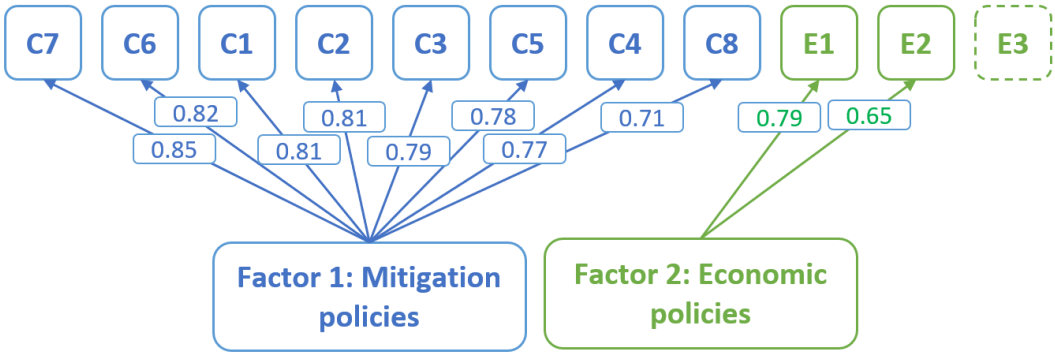

Figure 4. Factors are loaded to the observed variables

Source: own visualisation.

The previous results are combined by considering the obtained clusters of the three periods and their average values of the CMI. The values of the average CMI of each cluster over the three periods are collected in Table 6.

On the left side of Figure 5 the nine clusters of the first period of January-February 2020 are shown. They are obtained by GMM similarly to the way they are shown for March-April 2020. We notice from Table 6 that cluster 1 has 97 countries with negligible policy measures (CMI=0.0096), while other clusters are smaller, having 1-28 countries.

Cluster 8 is formed by China alone with CMI=48.4, which reflects the beginning of the pandemic in late 2019 already in China and its strict measures, while the second strictest measures were taken in cluster 5 with CMI=14.241. Cluster 5 is composed of 11 countries including, e.g., early affected European countries such as Italy and Spain, large Asian countries such as India and Indonesia.

Table 6. Dynamic clusters and average CMI values

Variables	January-February		March-April		June-July	
	CMI	countries	CMI	countries	CMI	countries
CL1_avg	0.096	97	57.837	30	71.962	34
CL2_avg	2.026	28	50.846	81	66.682	145
CL3_avg	2.996	9	67.145	53		
CL4_avg	5.573	16	49.259	15		
CL5_avg	14.241	11				
CL6_avg	4.702	12				
CL7_avg	0.964	2				
CL8_avg	48.376	1				
CL9_avg	6.494	3				

Source: own calculations.

Other clusters have CMI < 7 suggesting very limited policy measures by the end of February 2020. However, the larger number of clusters imply very diverse stages and policy measures over the world countries.

As seen at the right side of Figure 5, in addition to mainland China of cluster 8, only Hong Kong (26.7) and Mongolia (25.3) obtain CMI > 25 in the first period, and only six others (all in cluster 5) have CMI > 10, i.e., Macao (20.0 – not shown on the map), Vietnam (18.1), South Korea (15.5), Italy (14.3), Taiwan (13.1) and Indonesia (11.3). Other 18 countries have 5 < CMI < 10. 81 out of the 179 countries have CMI = 0.0 and have not yet started any mitigation policies in practice.

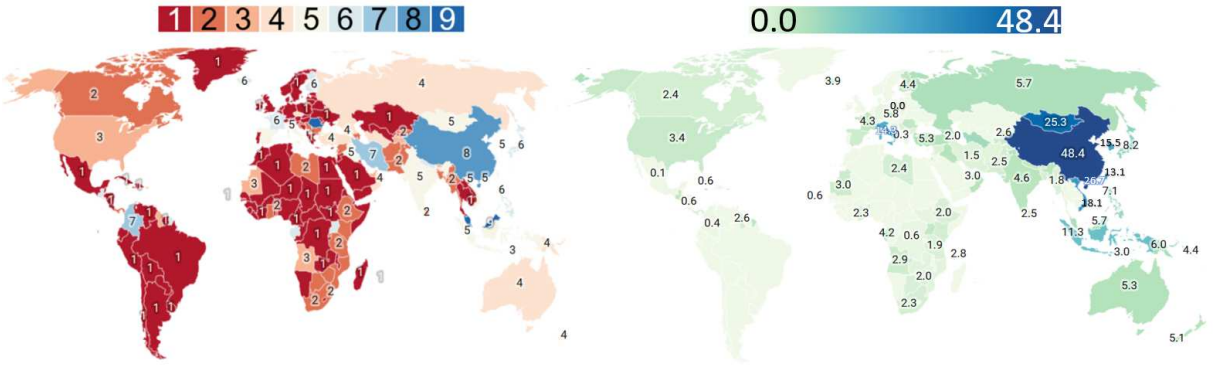

Figure 5. Nine clusters (left) and CMI (right) in the first period, January-February 2020

Source: own study.

The left side of Figure 6 shows the 4 clusters for the period March-April 2020 as was analysed previously. At this stage almost all world countries were hit by Covid-19. The cluster averages of CMI values range from 49.3 of cluster 4 with 15 countries including, e.g., the early hit Italy and China (the average is at the same level as CMI for China already in the first period, but now China's CMI=78.9, while Italy's is as high as 87.4) to 67.1 of cluster 3 with 53 countries, including e.g., Spain (CMI=69.1) and India (CMI=76.6).

The right side of Figure 6 describes the CMIs. Totally 11 countries have CMI > 75: Italy (87.4), Iraq (80.2), China (78.9), Philippines (78.4), Palestine (77.9 – not shown on the map), France (77.8), India (76.6), San Marino (75.9 – not shown), Peru (75.3), Georgia (75.2), and Honduras (75.1). The other 124 countries have 50 < CMI < 75; 38 countries have 25 < CMI < 50; 5 countries have 0 < CMI < 25, while only Gibraltar (not shown) of United Kingdom has CMI = 0.0.

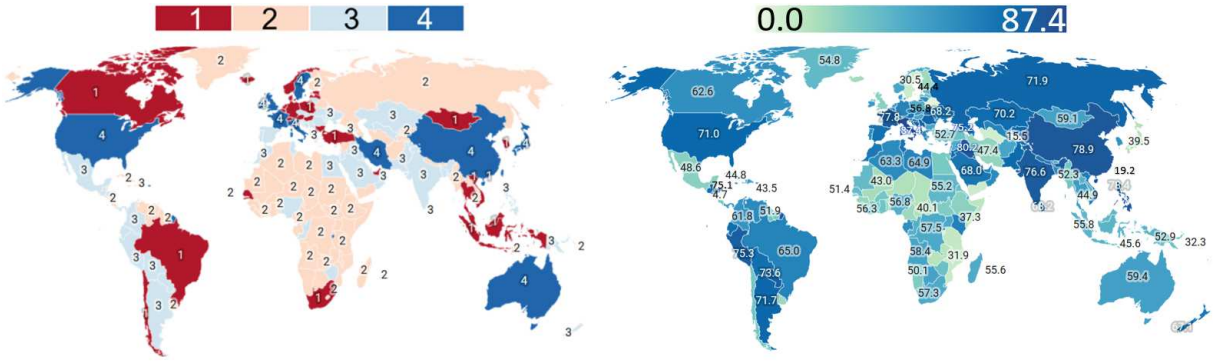

Figure 6. Four clusters (left) and CMI (right) in the second period, March-April 2020
Source: own study.

Figure 7 shows the two clusters for the period May-June. As seen on the left side of Figure 7, the small number of clusters imply convergence in Covid-mitigation policies. The peak of the first cycle of the pandemic has been passed in most of the world countries and mitigation policies are, however, strict on average: cluster 1 of 34 countries has CMI = 72.0 and cluster 2 has CMI = 66.7.

As seen on the right side of Figure 7, Honduras obtains the highest CMI = 100.0 followed by its neighbouring countries: El Salvador (96.1) and Guatemala (95.5). The next 75 countries, topped by Kenya (93.5), have 75 < CMI < 95; 71 countries have 50 < CMI < 75; 27 countries have 25 < CMI < 50, while the lowest CMIs are found in Gibraltar (0.0 – not shown on the map), Nicaragua (0.7), Belarus (11.1), Taiwan (18.1) and Turkmenistan (20.1) of which only Taiwan's low CMI is due to the Covid situation under control in May-June 2020.

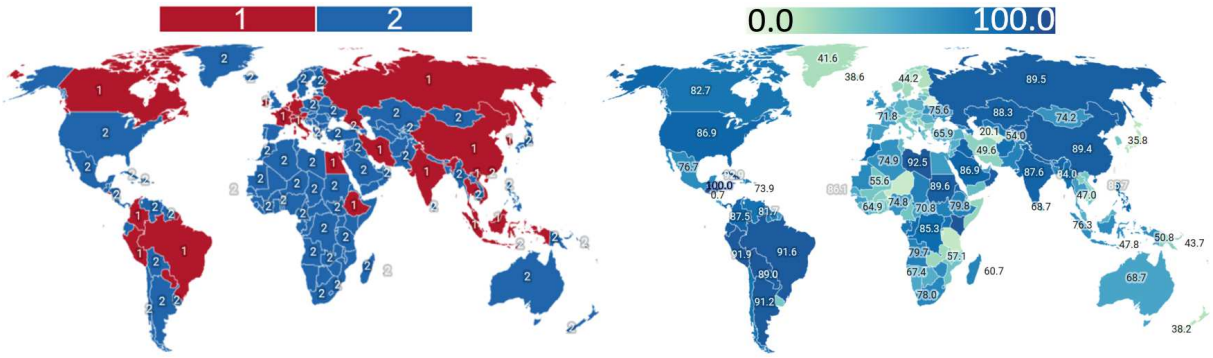

Figure 7. Two clusters (left) and CMI (right) in the third period, May-June 2020
Source: own study.

CONCLUSIONS

In this article, a dynamic clustering approach was introduced as a reply to the first research question to identify the country clusters and their development over time; the second research question on comparing the countries and their clusters was tackled with a new composite index. The study included most of the world countries (179). The multi-model approach of Gaussian Mixture Models, GMMs, was used for clustering and the Factor Analysis with Principal Axis Factoring, FA-PAF, was used to construct a composite mitigation index, CMI, to help compare the clusters and individual countries by their policies. The six-month research period from January to June 2020 covered most of the first wave of the Covid-19 pandemic. This was further divided into three two-month-long sub-periods, the optimal number of clusters was obtained by GMM, and the CMI values for all the countries and each period were computed based on the factor analysis. The FA-PAF method was further able to recognize two factors: the actual mitigation factor and the economic support factor.

The main finding of the study, in line with Hale *et al.* (2020a) and Kinnunen *et al.* (2020), include the detected decreasing optimal number of clusters, beginning with nine, decreasing to four, and ending up with only two clusters over the three sub-periods of the study. This implies that the government strategies converged over the time, i.e., the variation of mitigation policies decreased. At the same time, the policy measures strengthened (cf. Hale *et al.*, 2020a) when compared by cluster averages of CMI although for individual countries, CMI could decrease, specifically in the last sub-period due to the enhanced situation at the end of the first wave of the Covid-19 pandemic.

The approach provides a big picture for policy makers as well as business decision-makers by offering a new method which describes the policy environment and its development over time with a daily updated policy database of the Oxford Covid-19 Government Response Tracker allowing close to real-time updates and monitoring of the governmental mitigation policies. The methods were described and applied to world countries and the key results were visualised. There are several ways how the governmental or industry actors may utilise the results and the presented approach. Policy makers can directly benefit by identifying the reference groups/clusters of their countries with comparable strategies to mitigate Covid-19, while supporting the societies economically, and to other country clusters where they may preferably belong. Depending on the policy-makers' attitudes towards, for example, suppressing (i.e., mitigating) the spreading of the coronavirus and the economic consequences of these policies, an analysis can be extended, even out of the scope of this article, to healthcare-related measures, such as (cumulative) daily infected citizens, number of patients in intensive care, healthcare capacity limitations and death tolls, and their trends together with economic measures, such as decreases in economic production, trade or numbers of foreign visitors and increases in unemployment or bankruptcies in various sectors of the economy, and apply multicriteria optimisation together with the introduced CMI to support the strategy formulation with respect to a preferred outcome in comparison with a selected reference group of countries.

With the relatively large dataset like ours, the probabilistic GMM approach can be seen robust. However, methodological comparative study, e.g., with fuzzy clustering methods, could be useful specifically because many border-line countries may have high probabilities of belonging to a cluster different than that country is assigned to. A semi-automated software/system including such optional features for a user to select from a straightforward application of the presented ideas could be easily built. This may allow further choosing of other lengths of periods than the two-month periods of this study. Similarly, different composite indices, such as PCA-based, in addition to our FA-PAF-based index construction, could be included in the close-to-real-time monitoring system, which should also allow a larger set of variables. A more detailed analysis is suggested. The dataset was restricted to mitigation policies, which are specifically set up to hinder or stop the spreading of the virus, and economic support policies to help economies and households get over the pandemic when income generation is a restricted side-effect of the mitigation policies.

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Conflict of Interest

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

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How to increase the value of bilateral trade? Currency union versus fixed exchange rate regime

Oleksandra Ivanievna Stoykova

ABSTRACT

Objective: The objective of the article is to determine which exchange rate regime provides higher bilateral trade: fixed rate or currency union.

Research Design & Methods: An index was designed based on variables commonly recognised as those that might affect the value of bilateral trade and those that are differently affected by fixed exchange rate regime and currency union. These variables are trade openness, trading partner trade importance, similarities of government debt and borrowing, similarities of inflation, and the correlation coefficient of detrended GDP. The index serves as a dependent variable in the main model, which was created using principal component analysis. I also ran models with both trade openness and trading partner trade importance as dependent variables.

Findings: Although the index appeared to be higher in countries with a currency union, the results show that a currency union does not provide higher values of bilateral trade compared to a fixed exchange rate regime.

Implications & Recommendations: Research can be repeated with more attention dedicated to independent variables. Alternative de facto classifications of exchange rate regimes can be used for future studies as well.

Contribution & Value Added: The article contributes to existing studies on exchange rate regimes that commonly and interchangeably use notions of fixed exchange rate regime and currency union. To my best knowledge, there is no previous empirical research that would separately compare the impact on trade of these notions. The current study fills this gap.

Article type: research article

Keywords: fixed exchange rate; currency union; trade integration; Optimum Currency Area; exchange rate regimes

JEL codes: F15, F33, F36, F45

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INTRODUCTION

A currency union (CU) is one of the highest levels of economic integration. Without a doubt, a common currency has great advantages for the countries that adopt it. However, the example of the Eurozone illustrates that it can also cause significant problems. The main reason for such problems – and hence the major drawback of a currency union – is the inability to use exchange rate mechanisms as a tool of economic adjustment. A CU is hard to create in the first place, and then it is even harder to dissolve. In fact, it is almost impossible, or at least no such mechanism has been developed so far. On the other hand, politics play a significant role during the creation of a CU, and in some cases, it may prove to become an unavoidable obstacle. Finally, the cost of creating a CU can be prohibitive.

All of the above makes economists think about alternatives that can bring similar economic benefits but at the same time avoid such dramatic consequences. Although Rose and Engel (2002) or Bakucs, Benedek, and Ferto (2019) showed that countries within currency unions are more integrated than countries that have separate currencies, it still makes sense to consider a fixed exchange rate

regime[1] as a suitable candidate for a currency union alternative. There are several studies indicating that "hard peg" increases trade volume among countries by reducing exchange rate risk and transaction costs (Klein & Shambaugh, 2004).

There also exist several articles that discuss the differences between fixed exchange rate regimes and the Optimum Currency Area's (OCA) ability to promote macroeconomic indicators (De Grauwe, 2012; McCallum, 1995; Mendizabal, 2002). These scholars do not examine the issue directly but mention the difference of both regimes' characteristics concerning their ability to affect economic variables (Kinnunen, Androniceanu, & Georgescu, 2019). In fact, the two notions are commonly used synonymously. Already in 1961, Mundell stated that a currency area is a domain within which exchange rates are fixed. Engel and Rose (2002, p. 1) argue that "the large size of this 'border effect' is mostly the result of exchange rate volatility or, more generally, the consequence of having different national moneys." In this case, different currencies are used as a synonym for volatile exchange rates. However, low nominal exchange rate volatility is also a characteristic of a fixed exchange rate regime. Thus, we may suggest that the difference in the ability of pegs and common currency to promote macroeconomic indicators may be much lower than a consequent disadvantage of a CU as opposed to a fixed exchange regime. If this is a fact, many countries would choose the latter.

The main goal of this study is to investigate whether a common currency area can bring more economic benefits measured by the value of bilateral trade compared to a fixed exchange rate regime based on two groups of countries. The countries are chosen in such a way that one group within the sample comprises countries within a currency union – for which the exchange rate is fixed to a certain foreign currency – and the second group of countries uses a fixed exchange rate with the same currency as the CU. For instance, currency union A is fixed to country C's currency, while the group of countries B has fixed exchange rate regimes with the same country C's currency. The value of bilateral trade and the indicators that might affect it in the long run within a currency union are compared to the same between A and B so as to confirm the research hypothesis that a CU brings more economic benefits than a fixed exchange rate regime (for more, see Appendix A).

The article is divided into three parts. Firstly, a theoretical section reviews the differences between a fixed exchange rate and a currency union in general, but it also overviews the ability of both to promote trade values. The second part presents the methods employed in the study and describes the relevant data. It starts with an explanation of the sample choice and later discusses data and data sources, along with the index creation procedure. The next part shows the results obtained during the research, which is followed by conclusion.

LITERATURE REVIEW

The optimum currency area theory

Trade has played a crucial role in the emergence of developing economies (Gryczka, 2020; Loganathan *et al.*, 2020; Martyniuk & Murawska, 2021; Maciejewski & Wach, 2019). To address the main goal of the paper, we should discuss the costs and benefits of both regimes. As for the currency union, the framework used for analysis of its pros and cons is known as the optimum currency area (OCA) theory. According to its definition, a currency area is considered optimal if the benefits of having a single currency exceed its costs. In other words, the OCA is a region in which having single currency is the most efficient exchange rate regime.

Mundell (1961), father of the OCA theory, implicitly defines the OCA as a region in which the cost of losing the ability to conduct independent monetary policy is lower than the benefits from a single currency. Hence why he believed that countries should form a currency union if they do not suffer from asymmetric shocks. For situations when this is not the case, Mundell develops several criteria for the currency area to be considered optimal. Those are high labour mobility, price, and wage flexibility.

[1] It seems appropriate to mention that for the purposes of this paper the term "fixed exchange rate regime" indicates both "hard" and "soft" pegs, as defined by the International Monetary Fund (IMF, 2004) classification. However, if the difference is crucial or the terms "hard" and "soft" pegs were used in a cited article, the author may use those terms as well.

His findings are supported by modern investigations on labour mobility and regional factors of wages differentiation (Kostiukevych, Mishchuk, Zhidebekkyzy, Nakonieczny, & Akimov, 2020; Mishchuk, Samoliuk, Bilan, & Streimikiene, 2018).

The second best-known author in the OCA theory is McKinnon (1963), who complements Mundell's theory by dividing factors mobility among regions and industries. McKinnon believes that high labour mobility among industries can offset the importance of the mobility between regions. McKinnon agrees with the importance of Mundell's high capital and labour mobility but additionally stresses the importance of high openness to trade and the small size of the economy as criteria for an OCA.

However, Kenen (1969) indicates that perfect labour mobility does not exist. According to him, high product diversification is a more suitable criterion. Although, this is contradicts McKinnon's conclusion about trade openness because – as highlighted by Kenen – diversified economies are likely to have a relatively small marginal propensity to import.

In turn, Corden (1973) questions Mundell's suggestion that long run adjustment can be done with the help of labour mobility. However, he fully agrees with Mundell's suggestion that price and wage flexibility are the most essential criteria. Furthermore, Fleming (1971) and Magnifico (1971) highlight the importance of inflation similarities for successful monetary unification. In 1973, Mundell changed his mind about flexible exchange rate as an effective tool to stabilise the economy in case of asymmetric shocks. Instead, he then considered flexible exchange rate as a source of asymmetric shocks. In other words, he emphasised that one of the main (or even: the main) negative consequences of currency union no longer results in significant losses.

This view by Mundell is the first appearance in the OCA literature of what later will be named by Frankel and Rose (1998) as the endogeneity hypothesis of the optimum currency area criteria. This hypothesis implies that some criteria – mentioned as important for a successful currency union – can be satisfied not *prior to* a currency union formation but *after* countries peg their currencies. Researchers mention such sources of endogeneity as trade, labour market flexibility, institutions, financial integration, the synchronisation of shocks, and output (Frankel & Rose, 1998; Melitz, 2004; Baele *et al*. 2004, Ferto, 2018; Moździerz, 2019; Androniceanu, Kinnunen, & Georgescu, 2020). Among other institutional factors of endogeneity, positive changes in government expenditure and money supply are one of the main (Sriyana, 2019; Androniceanu, 2020). However, the endogeneity of mentioned indicators is not always the case. The OCA criteria may not have endogenous properties or even lead to opposite result. One of the examples of such a situation is Krugman's specialisation effect, which is mostly discussed within the new OCA theory, developed after the creation of the Eurozone. The new OCA theory again raised the issue of the loss of ability to conduct an independent monetary policy as a huge cost for member states (Alesina *et al.*, 2002, Melitz, 1991). Moreover, the new OCA theory highlights several other preconditions for the OCA, such as real convergence (Dellas & Tavlas, 2009), business cycle synchronisation (BCS) and its determinants (Frankel & Rose, 1998; Skare & Porada-Rochoń, 2019a), and the similarity of labour market institutions (De Grauwe, 2012).

Most of the aforementioned drawbacks apply to the case of fixed exchange rate. As I already mentioned, some of the discussed articles introduce the same notions interchangeably. The next subchapter focuses on the comparison of drawbacks of both regimes.

Currency union vs fixed exchange rate regime

The main difference between a currency union and a fixed exchange rate regime is that currency unions have one central bank for the whole area; hence, they share exchange rate and monetary policy. However, this results in one of the biggest disadvantages of the currency union: the impossibility to use the exchange rate mechanism for short-run adjustments among member states. According to the discussed OCA theory, such an action requires certain preconditions, such as similar inflation and gross domestic product (GDP) growth rates, high labour mobility, and a stable exchange rate for certain period. Hence why the use of a common currency requires a two-sided agreement. On the other hand, the adoption of a fixed exchange rate is a one-sided decision. Generally, a country can choose any other country to peg to despite their economic similarities, and the former can devalue its national currency rather easily if necessary, as I discussed above. At the same time, these

countries still benefit from certain privileges of the currency union, such as the promotion of international trade due to the lack of exchange rate uncertainty.

Nevertheless, the property of a fixed exchange rate regime to devaluate currency if needed is also its disadvantage. There is no 100% certainty that the peg will hold, which may also affect long-run expectations. A good example is the history of the exchange rate in Ukraine. During the 18-years-long period of a fixed exchange rate regime, the Ukrainian hryvna was devalued almost six times (Gorodnichenko, 2015).

Reinhart and Rogoff (2004) mention that – in most cases – their statistical approach fails to confirm exchange rate regimes *de jure*. Pegs are easier to abolish with the help of black market or dual exchange rates. If black or dual markets exist, such a country would have a higher deviation of the exchange rate on average. However, the possibility of the existence of a black market for national currency in the case of a currency union is very limited.

Difference between currency union and fixed exchange rate regimes in terms of their ability to promote bilateral trade

The literature in the field indicates that there are several macroeconomic variables that might be differently affected by fixed an exchange rate regime and a CU. This subchapter focuses on such indicators. Eventually, these indicators will be cross-checked with determinants of bilateral trade. If such an indicator appears to be on the list of the latter, it will be included in the index that will serve as a dependent variable in the econometric model. Obviously, the index will include proxies for bilateral trade itself.

Noteworthy, the leading indicator that is differently affected by discussed exchange rate regimes is bilateral trade. Frankel and Rose (1998) or Smutka, Svatoš, Tomšík, and Sergienko (2016) argue that trade indicators are endogenous. The positive influence of a CU on trade is also mentioned by Mundell (1961), Glick and Rose (2002), Rose and Engel (2002), and Beck (2017). The empirical results of these studies mostly vary from a 40% to 100% increase in bilateral trade in the case of the adoption of a single currency. However, there also exists an alternative view. Persson (2001) criticises the overestimating of the role of a CU membership. He claims that the fact that CU members are systematically different from non-members is likely to distort such results.

Moreover, there are several studies that emphasise the negative correlation between transaction costs and the volume of bilateral trade (De Grauwe, 2012; McCallum, 1995). Mendizabal (2002) indicates that the reduction of transaction costs is much lower – even though still present – in the case of fixed exchange rates compared to monetary union. However, one should account for trade volumes in a specific currency union. If intra-regional trade in an area is considerably small (service-oriented economies), the effect of the transaction cost reduction will not be noticeable. Hargreaves and McDermott (1999) evaluate the benefits of transaction costs in New Zealand in the case of a possible currency union with Australia so as to conclude that it would be rather small (-0.13%). The result for a New Zealand-USA union is estimated to be higher due to the widespread use of the USD. Since the value of transaction cost is different for a fixed exchange rate regime and a CU, the proxies for trade integration among countries should be developed into a dependent variable in this research (Malefane, 2021).

One of the differences between a fixed exchange rate regime and a CU is that the former can allow for a fluctuation of exchange rate, while the credibility of a stable rate is higher in the case of the latter. However, scholars have different opinions on the relationship between the variability of exchange rate and bilateral trade volumes. Among others, Klein and Shambaugh (2006), Tenreyro (2007), and Thursby and Thursby (1987) confirm the hypothesis that exchange rate risk negatively influences trade values. Alternatively, the Krugman specialisation effect shows that countries with zero or very low variability of the exchange rate can be more integrated even with a lower volume of international transactions. Furthermore, Dautovic *et al*. (2014) estimate that the effect of the strictness of exchange rate and intra-industry trade is negative. Broda and Romalis (2013) state that the relationship between trade and an exchange rate regime may be caused by reverse causality. This is not the case in CU with hard pegs because of a predefined exchange rate; however, this assumption questions previous findings on the relationship between exchange rate and trade. Nicita (2013) argues that exchange rate

volatility may not affect trade badly because of sunk costs and the availability of other financial instruments for countries with flexible exchange rate arrangements. All of the above only confirms the reason behind the inclusion of bilateral trade indicators into the independent variable.

Moreover, an increase in trade volume causes a rise in other macroeconomic indicators. For instance, BCS tends to increase with the rise in bilateral trade (Beck & Janus, 2013, 2014; Frankel & Rose, 1998). The opposite situation – known as the Krugman specialisation effect (Krugman, 1993) – shows that countries that experience an increase in trade are more likely to specialise in production. This leads to different productivity shocks and lowers business cycle correlation. Furthermore, BCS is sensitive to fluctuations of the exchange rate (Beck, 2019). Since BCS is a precondition in the OCA theory, states that consider joining a CU or fixing their exchange rate would definitely aim for higher values of the indicator. Noteworthy, bilateral trade and a number of other variables discussed in this research are considered as determinants of BCS; i.e. exchange rate fluctuation, transaction costs, membership in a CU, and financial integration. It is interesting that BCS – endogenous in the OCA theory mainly due to the influence of trade values – is itself a determinant of bilateral trade values (Inklaar *et al.,* 2008)

Financial integration is another benefit possibly obtained from the adoption of a CU (Skare & Porada-Rochoń, 2019b). Pagano (2004) concludes that both primary and secondary bond markets integrated significantly after the Eurozone creation. Lane (2006) mentions that the government bond spread dropped. Although this dynamics changed after the 2008 financial crisis, Afonso *et al*. (2015) estimate that it was mainly associated with a negative post-crisis growth. Therefore, the pure effect of a CU is puzzling. The relationship between financial integration and BCS is also ambiguous. Backus *et al.* (1992) and Imbs (2004, 2006) indicate negative correlation, while Kose *et. al*. (2012) and Monnet and Puy (2016) stress positive correlation. Given the relationship between BCS, trade, and financial integration, we may say that an indirect link exists between the latter two elements. This relationship emerges from Ricardian's and Heckscher-Ohlin's theoretical models (Kletzer & Bardhan, 1987), and it was confirmed by empirical studies (Beck, 2003). Hence why this indicator will be included in the index.

Noteworthy, most of the above studies were performed for European countries, and there is evidence indicating that the OCA theory and its endogeneity phenomenon in particular should be applied with caution for less developed countries (Stoykova, 2018; Adams, 2005).

RESEARCH METHODOLOGY

This section will present empirical research seeking to confirm the study's hypothesis: a currency union provides higher bilateral trade values for member countries compared to a fixed exchange rate regime. This section starts with an explanation of the sample choice, followed by a description of data and methodology. Results of estimations required for hypothesis testing appear at the end of the section.

Sample choice

To perform the analysis, we need two groups of countries: countries in a currency union – with their currency pegged to another foreign currency – and countries with fixed exchange rate regimes with the same currency as the first group. Moreover, these two groups of countries should have similar regional, economic, and cultural characteristics. This is needed so as to ensure that trade integration occurs due to a difference in the observed variable (currency union dummy). To ensure a relatively large sample, I worked on countries pegged either to the USD or the EUR since these are the most common pegs (Table 1).

As for countries pegged to the euro, there is a clear choice. Both the WAEMU and the CAEMC countries – the latter sharing a common border – should be included in the analysis. Among currently existing unions, these two groups have the highest economic and social similarities. European countries pegged to the EUR (i.e. Bulgaria, Bosnia and Herzegovina, and Denmark) could possibly serve as a third group in this sample. However, cultural similarity in these countries is not as high as in case of currency unions. Moreover, three countries would form a small sample that would differ greatly with both currency unions. As for dollarised countries, one should choose the one most similar to countries of the ECCU in terms of the abovementioned criteria. Given their geographical location, it is reasonable to take other Caribbean or Central American countries for this purpose. These are The Bahamas, Aruba,

Barbados, Belize, Curacao, Panama, Venezuela, and St Martin. Unfortunately, the analysis of existing databases gives no desired data for Anguilla, Curacao, and St Martin.

Table 1. Countries pegged to the EUR and the USD

Currency union membership	Countries pegged to the EUR	Countries pegged to the USD
Yes	*Central African Economic and Monetary Community (CAEMC):* Cameroon, Central African Republic, Chad, Gabon, Equatorial Guinea, Republic of Congo *West African Economic and Monetary Union (WAEMU):* Benin, Burkina Faso, Guinea-Bissau, Mali, Niger, Senegal, Togo	*Eastern Caribbean Currency Union (ECCU):* Anguilla, Antigua and Barbuda, Dominica, Grenada, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and The Grenadines
No	Bulgaria, Bosnia and Herzegovina, Cabo Verde, Comoros, Cote d'Ivoire, Denmark, Sao Tome and Principe	Aruba, The Bahamas, Bahrain, Barbados, Belize, Bermuda, Curacao, Djibouti, Eritrea, Hong Kong, Jordan, Oman, Panama, Qatar, Saudi Arabia, Sint Maarten, South Sudan, Turkmenistan, United Arabian Emirates, Venezuela

Source: own elaboration based on the International Monetary Fund (IMF) "De Facto Classification of Exchange Rate Regimes and Monetary Policy Framework," 2004.

The final list of analysed countries is as follows:

- WAEMU: Benin, Burkina Faso, Guinea-Bissau, Mali, Niger, Senegal, Togo;
- CAEMC Central African Republic, Cameroon, Chad, Gabon, the Republic of Congo, Equatorial Guinea;
- ECCU: Antigua and Barbuda, Grenada, Dominica, Saint Kitts and Nevis, Saint Vincent and The Grenadines, Saint Lucia;
- Central American and Caribbean countries: The Bahamas, Aruba, Barbados, Belize, Panama, Venezuela.

Index

Initially, bilateral data for 210 country pairs were collected. However, some of these pairs were dropped due to the lack of some entries. In the end, the sample was reduced to 160 cross-section observations. The aim adopted during the construction of the sample was to keep balance between the number of variables and the number of observations so as to obtain the highest possible combination of both. Cross-sectional data for 2017 was used, which was the last year with good-quality data available.

The dependent variable in the model was chosen to be the index that will capture all macroeconomic variables that are differently affected by the regimes under scrutiny and, at the same time, that are determinants and proxies of bilateral trade.

Bilateral trade openness and trading partner trade importance are used as a proxy for trade integration. Variables are measured using the formulas below. Data for trade is taken from the IMF Direction of Trade Statistics Dataset. Data for GDP comes from the World Bank Development Indicators Database (2000).

$$Trade\_openness(i,j) = \frac{X_{ij} + M_{ij}}{Y_i} \quad (1)$$

where:

X_{ij} - is bilateral exports between country i and country *j*;
M_{ij} - is bilateral imports between country i and country *j*;
Y_i - is real GDP of country *i*.

$$Trade\_importance(i,j) = \frac{X_{ij} + M_{ij}}{X_i + M_i} \quad (2)$$

where:

M_i - is total imports of country *i*;
X_i - is total exports of country *i*.

The inflation rate will be used as a first proxy for financial integration. This variable is represented by CPI-based inflation ($INFLATION_{ij}$). Another indicator is government net borrowing ($BORROWING_{ij}$), measured using the procedure described in König and Ohr (2013). Pairwise correlation for the preceding five-year period is considered for the construction of two previously mentioned variables. Finally, the similarity in government debt is also a variable ($DEBT_{ij}$), calculated as the difference in government debt of country i and an average value for the indicator within the analysed group; i.e. the African group and the American group. Perfect integration in the case of government debt is achieved when the difference equals zero. All data in this section is provided by the World Bank Development Indicators Database (2000).

Furthermore, I added a proxy for asymmetric movement of output, which is designed as a pairwise correlation coefficient of detrended GDP (Beck, 2013; 2017). Detrended GDP was obtained using the Hodrick-Prescott filter with lambda equal to 6.25, as proposed by Ravn and Uhlig (2002):

$$GDP_{ij} = cor(y_i, y_j) = \frac{cov(y_i, y_j)}{\sqrt{var(y_i) \times var(y_j)}} \tag{3}$$

in which, y_i, y_j are cyclical components of real GDPs for five preceding years in USD for countries i and j, respectively. The low value of the coefficient indicates divergent business cycles.

Finally, the index assumes the following form:

$$INDEX_{ij} = a \cdot TRADEIMPORTANCE_{ij} + b \cdot TRADEOPENNESS_{ij} + c \cdot GDP_{ij} + d \cdot INFLATION_{ij} + e \cdot DEBT_{ij} + f \cdot BORROWING_{ij} \tag{4}$$

in which, a, b, c, d, e, and f are corresponding weighting rates defined by principal component analysis (PCA).

Normalisation procedure

Because the constructed variables have different scales of measurement, the application of proper normalisation is required. This study employs a methodology similar to the one presented by König and Ohr (2013), in whose work all variables obtain values from zero to one, except for correlation coefficients.

We don't need to normalise trading partner trade importance because it takes a value from zero to one by definition. As for trade openness, the normalised values take the form of

$$Trade\ openness(i,j) = \left(\frac{Value_{ij} - Minvalue_i}{MaxValue_i - Minvalue_i}\right) \tag{5}$$

where:

$Value_{ij}$ - is the value of bilateral trade openness for country i with country *j*;
$Minvalue_j$ - is the minimum value of bilateral trade openness for country *i*;
$Maxvalue_j$ - is the maximum value of bilateral trade openness for country *i*.

However, correlation coefficients for GDP, inflation, and government net borrowing can assume values from minus one to one. Negative values indicate disintegration and are allowed for the index.

The ratio of public debt is transformed in the following way:

$$Public\ debt(i,j) = \left(1 - \frac{|Value_{ij} - AverageValue_j|}{|Max(Value_{mn} - AverageValue_n)|}\right) \tag{6}$$

where:

$Value_{ij} - AverageValue_j$ - $AverageValue_j$ is the public debt difference between the value of country i and the average value for the group; and
$Max(Value_{mn} - AverageValue_n)$ - is the maximum difference for the indicator among countries in the analysed group.

The weighing procedure was done using Principal Component Analysis For more, see Appendix B. Appendix C shows the index's results.

Independent variables

Apart from the variable of main interest – the currency union dummy – I decided to include additional gravity variables such as the logarithm of physical distance between countries and a categorical variable that measures the similarity in culture as a sum of several dummy variables: a dummy for common language, common borders, common colony, and a dummy indicating whether the countries were historically part of one country. All the data were taken from Centre d'Études Prospectives et d'Informations Internationales (CEPII) gravity dataset. The main reason for the inclusion of these variables was to separate other than currency union effects on dependent variable. Such an approach is commonly used to test the CU effect on trade (Rose, 2001). Because the index heavily relies on trade, the inclusion of gravity variables to the model is more than justified.

RESULTS AND DISCUSSION

This section describes the empirical results using the approaches discussed in the previous section.

Models

The estimations were performed using the ordinary least squares method improved with the Newey-West estimator because all of them exhibit autocorrelation, heteroscedasticity, or both. In addition to the main model, which illustrates the influence of the currency union dummy and other independent variables on the index, I decided to run regressions with both trade openness and trading partner trade importance as regressands.

Africa

The signs of all but one insignificant coefficient in the model with dependent variable "index" depicted in Table 2 coincide with the theoretical assumptions. The currency union dummy is significant at the 1% level and has a positive sign. Based on this model and given the same level of physical distance and cultural similarities, countries within MU have on average a 13% higher index than countries with fixed rates. As for the coefficient of determination, we may consider it high, especially in comparison to two other models. Significant at the 5% level, physical distance shows the expected result, which is consistent with gravity models. However, the categorical variable which summarises cultural, geographic, and historical similarities appears to be insignificant. A visual inspection of this variable indicates a very homogeneous characteristic of these countries, regardless of whether they belong to a single MU. About 85% of the sample has the highest or second-highest result for this variable. It is possible that dividing this regressor into four different variables may solve this issue.

A similar result appears in the next two models. However, the coefficient of determination is relatively low. In these models, 80% of the variation in the model is explained by other independent variables.

The effect of CU is extremely low. This might indicate that the members of a CU will benefit from higher trade values in the long run since it takes time for trade's determinants to affect it. However, that would only be true if the links between index components other than trade and bilateral trade are such as discussed in the literature. Moreover, as I already mentioned, the OCA theory and its endogeneity view are less applicable in the case of non-European countries. Furthermore, quite unexpectedly, coefficients of distance are lower than in the previous case.

America

A similar yet different outcome appeared for South and Central American countries. The significance of the proxy for similarity in all three cases supports the idea that its lack for African countries was due to geographical and historical homogeneity. The relative appearance of coefficients in the three preceding models is similar to the African case. Significant at the 1% level, physical distance has the second highest coefficient in the first model. In contrast, trade openness strongly relies on physical distance between partners in African countries. The most interesting observation is that the CU has a negative significant effect in all models. Such a result can be explained by the fact that the analysed countries

Table 2. Estimation results for African countries[2]

Dependent Variable	Index	Trading Partner Trade Importance	Trade Openness
Independent variables	X	X	X
Constant term	0.37079***	0.04681*	0.64521*
Log of physical distance	-0.04525**	-0.00701*	-0.09294*
Currency union dummy	0.13391***	0.00755***	0.08530***
Categorical variable "similarities"	-0.00168	0.00249	0.02351
R-squared	0.52448	0.25769	0.23910
Adj. R-squared	0.50494	0.22719	0.20784

*** significance at the 1% level, ** significance at the 5% level, * significance at the 10% level
Source: own elaboration based on the IMF Direction of Trade Statistics (DOTS), CEPII Gravity, prepared in Eviews 8.

mostly specialise in tourism, and the amount of international trade among them – the main component of the index – is lower than in the case of African countries. As I discussed in the theoretical part, bilateral trade values serve as a link between a currency union and all other components of the index. Moreover, the proportion of bilateral trade in American countries is only a small portion of its total trade. Given the latter and the relatively low R-squared, we may say that the relationship between a CU dummy and dependent variables might be just a correlation.

In the African countries, the amount of bilateral trade is significantly higher for those members of a CU that are landlocked. This suggests that the ability of a currency union to promote trade values is highly connected with geographical characteristics, such as common borders. The American sample comprises island nations, which significantly increases the cost of transportation between these countries.

The negative influence of currency union on trade also appears in the case of the Krugman specialisation effect. Due to the increase in trade, countries are more likely to specialise in production. Therefore, their income correlation decreases, while it is one of the index's components. However, this does not explain the phenomenon of the negative CU dummy coefficient for regression with two other dependent variables. Such a result also provides more evidence that the OCA theory might not apply to countries that are not members of the Eurozone.

Table 3. Estimation results for American countries[3]

Dependent Variable	Index	Trading Partner Trade Importance	Trade openness
Independent variables	X	X	X
Constant term	0.71380***	0.05547***	1.33418***
Log of physical distance	-0.08893***	-0.00702***	-0.17056***
Currency union dummy	-0.14715***	-0.01225***	-0.28199***
Categorical variable "similarities"	0.01672**	0.00116*	0.03276**
R-squared	0.31059	0.32208	0.31059
Adj. R-squared	0.28373	0.29567	0.28373

*** significance at the 1% level, ** significance at the 5% level, * significance at the 10% level
Source: own elaboration based on the IMF DOTS, CEPII Gravity, prepared in Eviews 8.

Given a sufficiently low coefficient in both cases, we may conclude that common currency does not have a considerable influence on bilateral trade values compared to fixed exchange rates.

Nevertheless, we should consider that the results differ across the analysed regions. Moreover, the coefficients for the currency union dummy are almost the same in absolute terms but appear to have opposite signs. We may say that the answer to the main hypothesis of the study is highly path dependent. Unfortunately, this finding cannot be confirmed by a different sample because such a sample does not exist. However, several studies indicate such a notion while analysing a neighbouring topic, the determinants of OCAs (Adams, 2005; Stoykova, 2018).

[2] The implementation of the "general to specific" strategy and the introduction of a quantile regression model do not provide quantitatively different results. For the results, see Appendix E and D, respectively.
[3] The introduction of a quantile regression model does not provide quantitatively different results. For the results, see appendix D.

CONCLUSIONS

This study was to test the hypothesis of currency union as a more favourable exchange regime than a fixed exchange rate regime for states that desire to promote bilateral trade. The study includes a literature review in order to find the indicators that are possibly affected differently by two extreme exchange rate regimes – the fixed exchange rate and the currency union – while simultaneously being determinants of bilateral trade. Unfortunately, the existing literature does not provide for an extensive overview of this topic. The research is complicated by the fact that the "fixed exchange rate regime" and the "currency union" are commonly used interchangeably. Nevertheless, the differences in the impact of both exchange rate regimes found in the literature and discussed in this article comprise the size of transaction costs, the level of confidence in the future exchange rate, the degree of correlation of business cycles, labour mobility, and nominal exchange rate volatility.

Undoubtedly, trade integration is the leading indicator presented by the literature as the one affected differently by mentioned regimes. Past research also identifies several bilateral trade indicators: BCS, financial integration, the probability of asymmetric shocks. Based on these findings, I developed my index, comprised of bilateral trade indicators and their determinants, which are affected differently by a CU and fixed rates. The sample included the CFA Franc Zone, the Eastern Caribbean Currency Union, and several dollarised countries. The second part of the article was devoted to these issues.

Considering all of the above, the index was constructed from the following variables: trade openness, trading partners trade importance, a correlation coefficient of detrended GDP, inflation similarities, and similarities of government debt and lending. Econometric research shows that the difference in trade integration for the samples follows factors other than the existence of a currency union. The currency union dummy appears to be significant in all models, regardless of the dependent variable. However, the coefficient of this dummy in some cases (American countries) appears to be negative. This indicates that we cannot reach a single conclusion about the difference in the influence on economic integration of a fixed exchange rate regime versus a currency union. Because the estimation outcome differs across each region, the proper analysis should be done for each specific case. Unfortunately, we cannot conduct the same research with a different sample because there is no other. To enrich this study and – possibly – obtain a less puzzling result, I propose the addition of other independent variables. For instance, by dividing trade into intra- and inter-industry trade. The inclusion of new dummy variables such as whether a country is landlocked or an oil exporter, along with the division of the categorical variable for cultural similarity into four separate dummies, may provide further insights. It is also worth trying to proxy physical distances between countries with physical distances between their capitals. Future research might also consider the inclusion of other economic variables proposed by integration indices, such as foreign direct investment flows or migration (Makieła *et al*., 2021).

Noteworthy, the results from these models should be interpreted with caution because some models exhibit heteroscedasticity, autocorrelation, or both. There is a possibility that robust standard errors – used to interpret the results – are not so precise as non-robust conventional ones.

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Appendix A: Justification of sample choice

1. Choose two currency unions (A and B) that satisfy all conditions depicted in Figure 1.
2. Check integration **within** CU A and **within** set of countries B.
3. Check integration **between** currency union A and set of countries B.
4. If integration in point 2 is higher than integration in point 3, conclude that currency union results in greater economic integration then fixed exchange rate regime.
5. Run a regression on integration with CU dummy as the independent variable to ensure that the difference in integration is caused by currency union and not other factors.

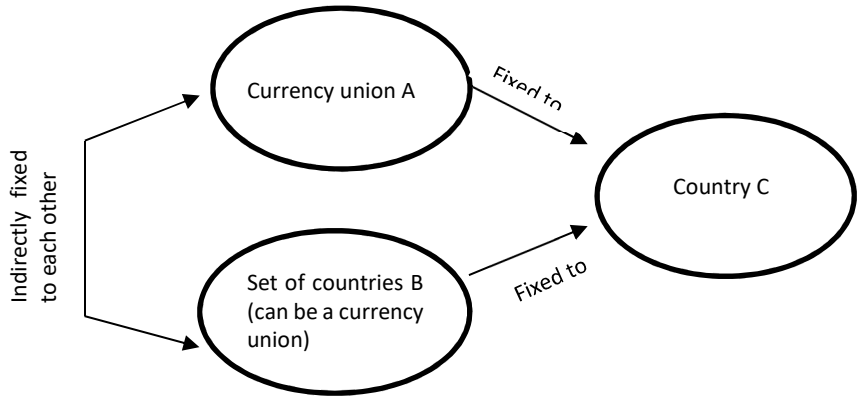

Figure A.1. Conditions for countries to fit required samples
Source: own elaboration.

Appendix B: Weighting procedure

PCA aims to reduce the dimension of the data set by creating new variables, which are called principal components, while keeping the highest possible number of variations. All new variables created by PCA are orthogonal. Mathematically, the procedure can be expressed in the following way:

Firstly, PCA looks for the $a_1'x$, which is the linear function of the element of a random vector x with the maximum variance.

$$a_1'x = a_{11}x_1 + a_{12}x_2 + \cdots + a_{1n}x_n = (x + a)^n = \sum_{j=1}^{n} a_{1j}x_j \quad \text{(B.1)}$$

where:

x_1, x_2, x_n - = the corresponding element of a random vector x with n dimensions;

$a_1'x$ - = first principal component.

Secondly, the procedure finds $a_2'x$, which is uncorrelated with $a_1'x$. This is continuous until $a_k'x$, being uncorrelated with $a_1'x$, $a_2'x$… $a_{k-1}'x$. The maximum possible number of principal components equals the length of the vector x. However, it is generally believed that all variation of x will be presented by the p principal component, where p is much less than n. Figures B.1 and B.2 depict the distribution of 50 observations for the vector x with n = 2 prior and after PCA.

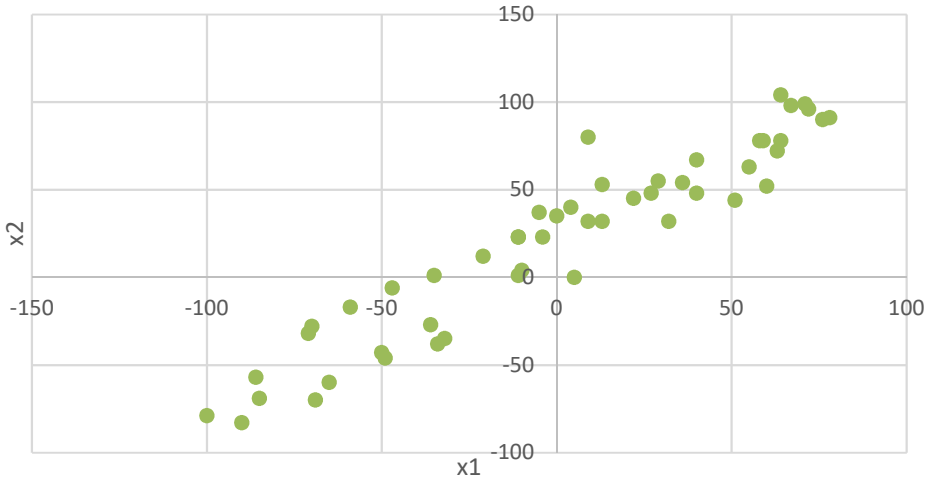

Figure B.1. 50 observations before PCA analysis
Source: own elaboration.

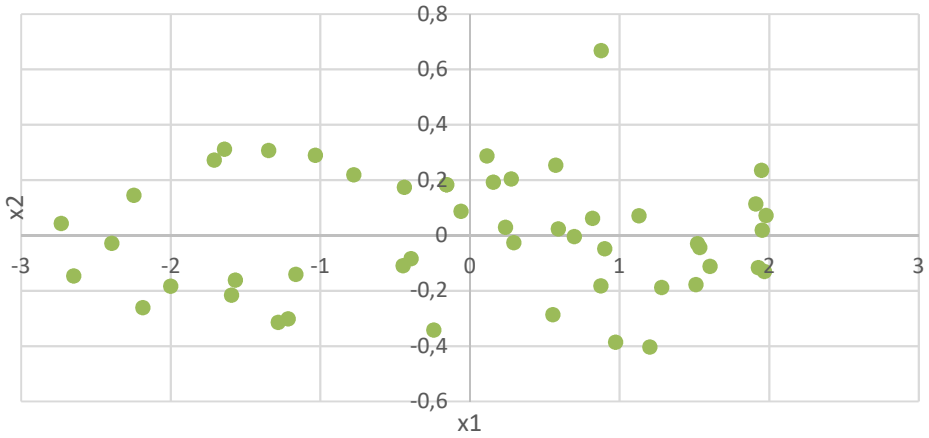

Figure B.2. 50 observations after PCA analysis
Source: own elaboration.

Appendix C: Results for the index

Table C.1. The index for African countries

Country Code*	BJ	BF	CM	CF	TD	CG	GQ	GA	GW	ML	NE	SN	TG
BJ	X	0.154	-0.023	.	-0.018	0.052	0.079	0.003	.	0.016	0.234	0.141	0.372
BF	0.154	X	-0.14	.	.	.	.	.	.	0.198	0.131	0.15	0.15
CM	.	.	X	0.053	0.165	0.267	0.129	0.162	.	.	.	.	.
CF	.	.	0.409	X	0.149	.	0.041	.	.	.	.	.	.
TD	.	.	0.241	0.099	X	0.208	.	0.162	.	.	.	.	.
CG	.	.	0.405	0.02	0.243	X	0.265	.	.	.	.	.	.
GQ	.	.	0.201	.	.	0.371	X	0.13	.	.	.	.	.
GA	.	.	0.226	0.03	0.134	0.225	0.145	X	.	.	.	.	.
GW	.	.	.	.	.	.	.	.	X	.	.	.	0.202
ML	0.214	0.195	0.065	-0.07	.	0.06	0.042	0.017	.	X	.	.	0.175
NE	0.277	0.144	0.061	.	0.085	.	.	0.002	.	0.257	X	0.145	0.248
SN	.	0.205	-0.083	.	.	0.002	-0.013	-0.044	.	0.274	0.11	X	0.093
TG	0.333	.	0.095	.	.	0.086	0.092	0.013	0.139	0.262	0.315	0.143	X

* Legend to Alpha 2 - country codes: BJ-Benin, BF-Burkina Faso, CM - Cameroon, CF-Central African Republic, TD-Chad, Congo-CG, Equatorial Guinea - GQ, Gabon - GA, Guinea-Bissau - GW, Mali-ML, Niger - NE, Senegal - SN, Togo-TG
Source: own study.

Table C.2. The index for American countries

Country Code*	AG	AW	BS	BB	BZ	DM	GD	PA	KN	LC	VC	VE
AG	X	0.183	0.288	0.536	0.279	0.343	0.321	0.397	0.317	0.288	0.394	0.269
AW	.	X	0.221	0.228	0.19	.	.	0.194	.			0.203
BS	.	0.174	X	0.191	0.119	.	.	0.193	.	.	.	0.154
BB	.	0.154	0.152	X	0.142	.	.	0.161	.	.	.	0.095
BZ	.	.	0.1	0.115	X		.	0.089	.	.	.	.
DM	0.103	0.103	0.116	0.073	0.084	X	0.086	0.166	0.12	0.072	0.122	.
GD	0.03	.	0.028	0.049	.	0.039	X	.	0.029	0.088	0.077	0.031
PA	.	.	0.059	.	0.013	.	.	X	.	.	.	0.063
KN	0.11	.	0.004	0.023	0.029	0.019	0.06	0.046	X	0.004	0.028	0.075
LC	0.011	.	0.032	0.043	.	0.02	0.046	0.025	.	X	0.06	.
VC	0.011	0.046	0.004	0.008	0.027	0.062	0.001	.	-0.009	0.008	X	0.004
VE	.	0.023	.	0.04	.	.	.	0.031	.	.	.	X

* Legend to Alpha 2 - country codes: Antigua and Barbuda - AG, Aruba - AW, Bahamas - BS, Barbados - BB, Belize - BZ, Dominica - DM, Grenada - GD, Panama -PA Saint Kitts and Nevis -KN, Saint Lucia -LC, Saint Vincent and The Grenadines -VC, Venezuela-VE
Source: own study.

Appendix D: Quantile regression models

Table D.1. Estimation results for African countries, quantile regression model

Dependent Variable	Index	Trading Partner Trade Importance	Trade Openness
Independent variables	X	X	X
Constant term	0.399442**	0.01000	0.004211
Log of physical distance	-0.04882*	-0.00162	-0.00063
Currency union dummy	0.110361***	0.005436**	0.00421**
Categorical variable "similarities"	-0.00307	0.00100	0.002154
Pseudo R-squared	0.32241	0.15805	0.12082
Adj. R-squared	0.29457	0.12345	0.08468

*** significance at the 1% level, ** significance at the 5% level, * significance at the 10% level
Source: own study.

Table D.2. Estimation results for American countries, quantile regression model

Dependent Variable	Index	Trading Partner Trade Importance	Trade Openness
Independent variables	X	X	X
Constant term	2.126249***	0.033696***	3.934849***
Log of physical distance	-0.367575***	-0.00162***	-0.531757***
Currency union dummy	-0.369762*	-0.005016*	-0.534923*
Categorical variable "similarities"	0.092186*	0.000770	0.126137
Pseudo R-squared	0.16419	0.180392	0.16419
Adj. R-squared	0.13163	0.14846	0.13163

*** significance at the 1% level, ** significance at the 5% level, * significance at the 10% level
Source: own study.

Appendix E: Strategy from general to specific

Table E.1. Estimation results for American countries, strategy from general to specific

Dependent Variable	Index	Trading Partner Trade Importance	Trade Openness
Independent variables	X	X	X
Constant term	0.362821***	0.058593***	0.252991**
Log of physical distance	-0.044796**	-0.007691***	-0.033229**
Currency union dummy	0.139257***	0.008530**	0.031594***
Categorical variable "similarities"	Dropped due to in-significance	Dropped due to insignificance	Dropped due to insignificance
R-squared	0.52428	0.23632	0.22681
Adj. R-squared	0.51143	0.21568	0.20591

*** significance at the 1% level, ** significance at the 5% level, * significance at the 10% level
Source: own study.

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Conflict of Interest

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An investigation of the nexus between globalisation dimensions and income inequality

Zita Tamasauskiene, Skaidrė Žičkienė

ABSTRACT

Objective: The objective of the article is to explore the nexus between changes of various globalisation dimensions, defined by either policy (*de jure)* or outcomes (*de facto)*, and the rise in income inequality in a panel of 27 EU countries during the period 1998-2017.

Research Design & Methods: In order to tackle endogeneity issues, the effect is empirically tested applying the appropriate one-step system generalised method of moments (GMM) technique. Globalisation is measured by the *de jure* and *de facto* trade, financial, social, and political KOF globalisation indexes. Income inequality is measured by net Gini. To examine the sensitivity of our findings, we apply the decile ratio and quintile ratio as dependent variables.

Findings: We have found several significant results. First, *de jure* trade and *de jure* financial globalisation exert a big affirmative influence on income inequality and suggest that changes in trade and financial policy have increased inequality in the EU countries. Second, the results testify that *de jure* and *de facto* political globalisation influence income inequality in various ways and opposing directions. Finally, the effect of social globalisation on income inequality lacks statistical significance.

Implications & Recommendations: De jure trade and financial globalisation measures which are based on tariffs, trade taxes, trade and investment regulations, etc. increase income inequality. Therefore, policymakers need to rethink their approach to trade and financial globalisation policy and ensure that the increasing benefits of globalisation and rising income would be distributed more equally between different groups of the population.

Contribution & Value Added: Economic literature has focused on the effect of different single indicators of economic globalisation on income distribution and inequality, while the effect of various globalisation dimensions is almost nonexistent. Contrary to previous studies, we also distinguish between *de jure* and *de facto* indicators of various dimensions of globalisation and reveal that they have diverse impacts on income inequality.

Article type: research article

Keywords: globalisation; dimensions of globalisation; income inequality; panel data; European Union

JEL codes: D63, F60, D31, C23, O52

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INTRODUCTION

Over recent decades, income and wealth inequality have changed in many countries of the world. High inequality in many economies is one of the biggest economic and social challenges for researchers and politicians. At the same time, however, globalisation has expanded in many countries of the world. In recent decades, the cross-border flows of goods, capital and people have increased dramatically, international trade has intensified and become more global, economies of different countries have become more dependent on the financial sector, capital has become more mobile, labour markets more flexible. An important issue these days is the influence of globalisation on growth, sustainable development, income, and wealth inequality.

Actual evidence on the nexus between globalisation and inequality is surprisingly contradictory. Several studies have found a positive link and sustain the hypothesis that globalisation increases inequality (Jaumotte *et al*., 2013; Bergh & Nilsson, 2010; Cabral *et al*., 2016; Gozgor & Ranjan, 2015). The results of other investigations (Zhou *et al.,* 2011; Faustino & Vali, 2013) show a negative nexus between trade openness and income inequality. Other studies (Roine *et al*., 2009), by contrast, find that neither trade openness nor financial integration has a clear effect on inequality, or find (Babones & Vonada, 2009) that inequality is not robustly related to trade globalisation.

In the studies mentioned above, the impact of globalisation on income equality was assessed using various single measures of economic globalisation: foreign direct investment (FDI), relative import and export prices, trade openness, tariff rates, capital account openness, etc. Yet, globalisation is not solely an economic process. Therefore, it is vital to consider the potential influence of political and social globalisation on income inequality. Furthermore, researchers do not distinguish between the effect of *de jure* and *de facto* indicators of globalisation on income inequality. If *de jure* indicators involve variables that incorporate institutions, resources, or policies empowering or alleviating real flows and activities, *de facto* indicators incorporate variables that express actual flows (Gygli *et al*., 2019, p. 2). Merging *de jure* and *de facto* globalisation indicators in one index may have probable distorting impacts in later applications (Martens *et al*., 2015, p. 5).

The goal of this article is to explore the nexus between changes of various globalisation dimensions, defined by either policy (*de jure)* or outcomes (*de facto)*, and changes in income inequality. The research is conducted using panel data of EU 27 countries for the time from 1998 to 2017.

The contribution of the investigation is two-fold. First, we identify the influence of globalisation on disposable income inequality through several dimensions, the economic (trade and financial), the political and social, as well as two indicators, *de facto* and *de jure* for every dimension. The selection of measures has significant consequences for empirical analysis (Kose *et al.,* 2009, p. 9).

To the best of our knowledge, Dreher and Gaston (2008) were the first to explore the effect of diverse dimensions of globalisation on household income inequality. Some researchers (Potrafke, 2013; Eppinger & Potrafke, 2016) use the KOF globalisation index as an instrumental variable for trade openness. However, these empirical investigations neglect the issue of how *de facto* and *de jure* indicators of various globalisation dimensions impact income inequality. Second, most of the studies in this field apply static panel data models. We use the one-step system generalised method of moments (GMM) dynamic panel estimator which explicitly takes into consideration potential endogeneity problems.

The remaining part of the article is structured as follows: part two reviews the literature concerning the impact of globalisation on disposable income inequality and formulates the hypotheses we examine in this research. The data and indicators used in the regression model are described in part three. The next part develops the model and methodology. Finally, we present the results of empirical analysis and discussion. The article ends with conclusions.

LITERATURE REVIEW

Income inequality is a product of macro processes, structural conditions, and institutional constructs. In the scientific literature, there is no unanimous attitude on the factors affecting income differentiation and inequality. Researchers (Jaumotte *et al.,* 2013; Kochan & Riordan, 2016) distinguish the following main causes of changing income inequality: technological change, trade globalisation, and financial globalisation. Schmid and Stein (2013) emphasize that the key factors determining income inequality are: cyclical and structural changes in the labour market, raising capital income and declining efficiency of public income redistribution. According to Tridico and Pariboni (2018), financialisation of economies in conjunction with globalisation generated the main mechanism which led to increasing income inequality. Although there is a disagreement over the direction of the influence of various globalisation dimensions on income inequality, most of the researchers agree that globalisation is one of the main determinants of income inequality.

The traditional international trade theory predicts that an increase in trade openness changes relative wages and salaries of higher-skilled employees in developed countries and increases inequality

in these countries. This theory relies on the Stolper-Samuelson theorem and anticipates that trade liberalisation will be good for the relatively plentiful factor. This factor will gain from international trade because liberalisation increases the price of it in real and nominal terms. Since developed countries are relatively abundant in physical and human capital, the theory anticipates that the liberalisation of trade will boost inequality in those countries.

But the Stolper-Samuelson theorem assumes full employment of workers and immobility of labour and capital. However, in recent years capital and labour mobility has increased. Trying to overcome shortcomings of the Stolper-Samuelson theorem during the past decades, new theories have been developed in the attempt to describe channels through which globalisation may affect income inequality. Dynamic industry theory (Melitz, 2003) takes into account the heterogeneity of firms in various branches of industries in leading and growing economies. According to this theory, firms producing products for export can hire more productive employees and pay them higher wages. This leads to increased wage inequality among sectors and higher income inequality.

Figini and Gorg (1999) proposed a hypothesis according to which multinational companies not only outsource activities using a large amount of low-qualified labour but also introduce new technologies in developing countries. The research results show that initially new technologies increase demand for qualified workers, which raises their relative wages, salaries and increases income inequality. However, in the second phase, wage inequality may decrease when previously low-skilled workers become more skilled because of the experience they gain using new technologies.

Many empirical studies have explored the relationship between globalisation and the distribution of income, but findings are highly mixed and inconclusive. Cabral *et al*. (2016) found that globalisation affects income concentration through the measure of financial integration which is based on portfolio equity and FDI stocks. Results suggest that globalisation impacts income concentration and inequality through FDI/equity flows channel. The study by Dreher and Gaston (2008) uses the KOF globalisation index in static and dynamic panel data models and shows that globalisation enhances inequality particularly in OECD countries.

However, the results of other researchers are in stark contrast and show that the influence of globalisation on income inequality is negative. Zhou *et al.* (2011), for instance, use two new indices of globalisation (the Kerney index and the principal components) and found a negative nexus between globalisation and income inequality. Jestl *et al*. (2018) investigate the effects of three dimensions of globalisation on wage inequality. Their results show that the effect of various globalisation dimensions is miscellaneous: migration and FDI increase wage inequality in the sample of 14 old EU countries, trade is the essential wage inequality cause in the new EU Member Countries.

It is necessary to mention that in empirical studies most commonly used indicators for globalisation are trade openness, relative import and export prices, and offshoring capital account liberalisation. Generally, it can be stated that investigation in this area is not yet conclusive and the results on the nexus between globalisation and income inequality are still mixed. The results differ depending on different models used to assess the nexus between globalisation and income inequality, estimation methods, explained and explanatory variables in regression analysis, data quality, and sample coverage.

The simplest international trade model predicts that increasing trade globalisation (through tariff reduction) worsens the distribution of income in developed countries. There are different ways how international trade may affect income inequality. Trade policy changes (taxes, customs tariffs, trade agreements) may increase employment opportunities but simultaneously may contribute to a lower wage share in national income, higher relative wages of skilled workers, wider wage differentiation. Stolper-Samuelson theorem also predicts trade liberalisation will increase inequality in developed countries. Globalisation may increase inequalities of relative wages among qualified and unqualified workers. From the above, we assume that:

H1: *De facto* globalisation of trade is linked to a rise in income inequality.

H2: *De jure* globalisation of trade is linked to a rise in income inequality.

The theory offers ambiguous predictions on the impact of financial globalisation on income inequality. Financial globalisation can allocate international capital more efficiently and stimulate inter-

national risk sharing (Dabla-Norris *et al.,* 2015, p. 20). FDI usually concentrates in technology-intensive higher-skilled sectors. This increases the demand for highly qualified workers and their wages. Feenstra and Hanson (1997) assert that FDI increases the demand for skilled workers and their wages in developed and developing economies. Some researchers argue that increased liberalisation of capital account may magnify the access of poor people to financial resources, but other scientists assert that it may disproportionately hurt the poor by increasing the probability of a financial crisis (IMF, 2007, p. 149). If financial flows are available to all people, they may decrease inequality by permitting human capital investments. But if financial resources are accessible only to those who have accumulated human capital, higher relative income and security deposit, this would likely increase income inequality. Due to the above-mentioned reasons we propose to verify the following research hypotheses:

H3: *De facto* financial globalisation is linked to a decrease in income inequality.

H4: *De jure* financial globalisation is linked to a rise in income inequality.

The theoretical forecasts concerning the nexus between political globalisation and income inequality are vague. By Dreher (2006), political globalisation sets minimum standards and therefore enhances equality within countries. Tsai (2007) reveals the affirmative effect of political globalisation on human welfare. The results of Yay *et al.* (2016) from fixed-effects estimations show that political globalisation measured by the KOF index has an affirmative impact on wage inequality. Bergh and Nilsson (2010) found that political globalisation does not increase inequality. According to Martens *et al.* (2015), there is a distinct difference between *de jure* and *de facto* indicators of globalisation. These indicators may vary considerably if a policy is rigorous on paper but helpless in practice (Kose *et al.,* 2009). The effect of political globalisation is likely to differ depending on the indicators of political globalisation. From the above, it is hypothesised that:

H5: *De facto* political globalisation is linked to a rise in income inequality.

H6: *De jure* political globalisation is linked to a decrease in income inequality.

There are no formal theories that forecast any distinct influence of social globalisation on wealth and income inequality. Shahbaz *et al.* (2018) point out that social globalisation connects people by enhancing flows of information and cultural closeness. Dorn *et al.* (2017, p. 9) emphasize that social globalisation may influence the distribution of income and inequality by augmenting information exchange, promoting migration and economic transactions. The baseline results of Bergh and Nilsson (2010) show an affirmative nexus between social globalisation and income inequality. Relying on this, we propose the hypothesis:

H7: *De facto* social globalisation and de jure social globalisation are related to a rise in income inequality.

RESEARCH METHODOLOGY

To investigate empirically the relationship between changes of various globalisation dimensions, defined either by policy or outcomes, and income inequality we use an unbalanced panel data covering 27 EU member states. Scientists use various income inequality measurement metrics. Income inequality may be measured using a variety of indicators: the Gini coefficient, decile ratios, quintile ratios, top income shares, bottom income shares, the Palma ratio, the Atkinson index, the Theil index, the Generalised entropy index. We follow researchers Agnello *et al.* (2012), Pérez-Moreno and Angulo-Guerrero (2016), Asteriou *et al.* (2014), Kunieda *et al.* (2014), Sánchez-López *et al.* (2019) who investigate the nexus among globalisation and income inequality and use the net Gini index for income inequality measurement. Moreover, Sánchez-López *et al*. (2019, p. 89) stress that "in order to make results comparable to those published in the literature" they use the Gini index after social transfers. Bergh and Nilsson (2010) do examine the influence of globalisation on inequality and also note that "preferred distributional measure and dependent variable is the net income Gini coefficient". Net income inequality is the distribution that matters for peoples' consumption possibilities (Brady & Sosnaud, 2009).

If income distribution is completely egalitarian, the Gini index is 0. If all incomes are accumulated by one person, the Gini index is 1.

Following the study by Voigt *et al.* (2015), in which they separate *de facto* and *de jure* components of institutions, we use *de facto* and *de jure* indicators of various globalisation dimensions. For measures of economic (trade and financial), political, and social globalisation, defined either by policy (*de jure)* or outcomes (*de facto)*, we employ the KOF indexes, presented in the database of the Swiss Federal Institute of Technology. Table 1 provides definitions of various globalisation dimensions. The KOF Index changes from 0 to 100, bigger index values show expanding globalisation and lower values explain otherwise.

Table 1. Definitions of variables and their sources

Indicator name	Short name of the variable	Description	Data source
Inequality variables			
Post-tax/transfer net Gini	*GINI*	Net income Gini coefficient is calculated by the formula	EUROSTAT-SILC
Interquintile ratio of disposable income	*Q5/Q1*	Top quintile share of income divided by bottom quintile share of income (Q5/Q1)	World Income Inequality Database
Interdecile ratio of disposable income	*D10/D1*	Top decile share of income divided by bottom decile share of income (D10/D1)	World Income Inequality Database
KOF Globalisation Indexes and variables included in its calculation			
D*e facto* trade globalisation	*KOFTrF*	Trade in services, Trade in goods, Trade partner diversity	KOF Swiss Economic Institute
De jure trade globalisation	*KOFTrJ*	Trade regulations, Trade agreements, Tariffs, Trade taxes	
De facto financial globalisation	*KOFFiF*	Portfolio investment, FDI, International reserves, International income payments, International debt	
De jure financial globalisation	*KOFFiJ*	Capital account openness, Investment restrictions, International Investment agreements	
De facto political globalisation	*KOFPoF*	International NGOs, Embassies, UN peace keeping missions	
De jure political globalisation	*KOFPoJ*	International treaties, International organisations, Treaty partner diversity	
De facto social (informational) *globalisation*	*KOFSoF*	International patents, Used internet bandwidth, High technology exports	
De jure social (informational) *g*lobalisation	*KOFSoJ*	Internet access, Television access, Press freedom	
Control variables			
Schooling (mean years)	*School*	Average number of years of education acquired by people aged 25 and older	Human Development Data
Population share with tertiary education	*Tertiary*	Population share with finished tertiary education (age 15-64, levels 5-8)	Eurostat
Expenditure on social protection	*SocProt*	Expenditure on social protection % of GDP	Eurostat
GDP per capita	*GDPperC*	GDP per capita units in national currency	Eurostat
Dependency	*Depend*	The proportion of the population over 64 and under 15	Calculated by authors using Eurostat data
Business research and development	*R&Dbus*	Business expenditure on R&D as % of total GDP	Eurostat
Government research and development	*R&Dgov*	Government expenditure on R&D as % of total GDP	Eurostat

Source: own study.

De facto trade globalisation index (*KOFTrF*) is calculated using data on trade in services, trade in goods and trade partner diversity. *De jure* trade globalisation index (*KOFTrJ*) combines measures of trade regulations, trade agreements, tariffs, and trade taxes. *De facto* financial globalisation index (*KOFFiF*) combines measures of portfolio investment, FDI, international reserves, international income payments, and International debt. *De jure* financial globalisation index (*KOFFiJ*) is calculated using data on capital account openness, investment restrictions, international investment agreements. The *de facto* measure of political globalisation (*KOFPoF*) captures the effect of international NGOs, embassies, and UN peace keeping missions. To measure *de jure* KOF political globalisation (*KOFPoJ*), the following variables are used: international treaties, international organisations, and treaty partner diversity. In the research, we measure social globalisation using *de facto* and *de jure* KOF informational globalisation indexes.

In order to increase the explanatory power of various aspects of globalisation on income inequality in all model specifications, we incorporate control variables: mean years of schooling (*School*), tertiary education (*Tertiary*), expenditure on social protection (*SocProt*), GDP per capita (*GDPperC*), the dependency ratio (*Depend*) as well as business enterprise R&D expenditure (*R&Dbus*) and government sector R&D expenditure (*R&Dgov*).

To check the influence of accumulated human capital in the different populations on income inequality, we include the variable of population share with finished tertiary education (*Tertiary*). In principle, the effect of higher education on income inequality is uncertain. It is expected that a greater access to higher education reduces income inequality as more employees can work in highly skilled jobs.

Therefore, education may have a notable contribution to reducing income inequality. However, it can also raise wage and income inequality when the wage premium of people with tertiary education increases. Following Cassette *et al.* (2012) to capture human capital development on income inequality we also include average years of schooling.

Income inequality depends on government social and labour policies. Governments mitigate income and wealth inequality via different public policy measures: progressive tax system and social assistance programmes. Theoretically, there is a basis to foresee that countries in which welfare systems are larger and expenditure on social protection bigger have lesser inequality because transfers of the public sector are considered to have a countervailing effect (see e.g. Åberg, 1989). We expect a negative relationship between *SocProt* and income inequality.

Research results show that the *GDPperC* level is related to income distribution and inequality (see Berg *et al*., 2012). Further, demographic factors and differences in income between workers and retired persons might also affect inequality. Following Bergh and Nilsson (2010) we include *Depend* ratio. This measure shows the proportion of the population whose age is lower than 15 and higher than 64 years and demonstrates the modification of people's age distribution. We expect that a bigger ratio of dependency will be linked to greater inequality.

Technological change is also considered as a potential factor in causing rising income inequality. For example, Dorn *et al.* (2017) assert that ignoring technological change in empirical assessment may cause an omitted variable bias. We control the technological progress by using *R&Dbus* and *R&Dgov*. Table 2 presents summary statistics of dependent and independent variables.

We use a panel data regression in this research. The advantage of applying the panel model is that it uses cross-sectional and time-series variations in the data. The following GMM model is used, and countries are indicated by i and 4-year-averages by τ:

$$Y_{i,\tau} = \partial\, Y_{i,\tau-1} + \beta_1 GF_{i,\tau} + \beta_2 GJ_{i,\tau} + \gamma' X_{i,\tau} + \vartheta_\tau + \varepsilon_{i,\tau} \quad (1)$$

Where: $Y_{i,\tau}$ is the dependent variable, income inequality measure; $Y_{i,\tau-1}$ is a one period lag of income inequality measure; $GF_{i,\tau}$ denotes *de facto* measures of various globalisation dimensions (KOF indexes *of de facto* trade, financial, political and social globalisation in various model specifications), $GJ_{i,\tau}$ denotes *de jure* indicators of various globalisation dimensions (KOF indexes of *de jure* trade, financial, political and social globalisation in various model specifications). We will test the hypothesis whether β_1 and β_2 are positive/negative and significantly different from zero. $X_{i,\tau}$ is a vector of control variables including *School, Tertiary, SocProt, GDPperC, Depend, R&Dbus, R&Dgov.* These variables are also used in the model as a test of sensitivity. Finally, ϑ_τ is fixed period effects; and $\varepsilon_{i,\tau}$ represents the

error term. To reduce skewness and heteroscedasticity of data and to facilitate the interpretation of coefficients we use dependent and independent variables in natural logarithms and transform a model into the linear one. We employ one-step system GMM procedures, using the GRETL programme.

Table 2. Descriptive statistics of dependent and independent variables

Short name of the variable	27 EU countries				
	Min	Average	Max	SD	Skewness
GINI	21	29.676	38.9	4.012	0.159
Q5/Q1	3.000	4.878	13.185	1.236	0.869
D10/D1	4.707	8.177	18.067	2.741	1.235
KOFTrF	30.016	63.883	89.462	15.312	-0.307
KOFTrJ	46.449	86.744	97.752	9.492	-2.14
KOFFiF	30.734	78.025	97.726	14.528	-0.927
KOFFiJ	28.406	76.177	93.165	12.028	-1.233
KOFPoF	35.046	82.894	98.026	15.032	-1.654
KOFPoJ	53.853	89.631	100	10.772	-1.372
KOFSoF	46.562	75.88	98.326	9.342	-0.312
KOFSoJ	54.417	87.595	98.647	7.065	-1.414
School	6.7	11.055	14.1	1.396	-0.561
Tertiary	6.9	21.708	40.4	7.911	0.040
SocProt	7.9	16.036	25.6	4.101	0.293
GDPperC	1,400	20,655.7	61,200	12,478	0.422
Depend	35.778	43.873	54.095	3.971	0.138
RD&bus	0.01	0.847	3.03	0.687	0.886
RD&gov	0.01	0.193	0.42	0.091	0.408

Source: own study.

We use the GMM model because the relationship between our explanatory variables and income inequality may be dynamic: past income inequality may also affect current year inequality. We measure various dimensions of globalisation, using the KOF indexes. However, the main drawback of empirical research that uses the KOF indices is the endogeneity problem when there is reverse causation (Potrafke, 2015). Gradstein (2007) indicates that politicians reacting to changes in income inequality may implement policies which favour globalisation.

Moreover, when independent variables are not strictly exogenous, traditional OLS, FE, or RE panel data model estimators may be inconsistent and biased. The GMM model widens the FE estimator and involves the lagged dependent variable values as instruments to control for dynamic endogeneity (Ullah *et al.,* 2018, p. 28). If endogeneity bias exists, researchers may obtain incorrect estimators (Ketokivi & McIntosh, 2017). To tackle endogeneity problems in our data, we use the GMM estimator. The GMM model yields consistent results when there are various endogeneity sources, exactly "unobserved heterogeneity, simultaneity and dynamic endogeneity" (Wintoki *et al.,* 2012, p. 588).

Following related studies, such as De Haan and Sturm (2017), Bergh and Nilsson (2010), we estimate the model, using non-overlapping five-year averages of variables for a few causes. First, dynamic one-step system GMM estimators require larger cross-sectional and fewer time points, as they are suitable for panels with short time dimensions (T) in order to evade the proliferation of instruments when applying GMM. Second, annual data on income distribution and inequality are noisy. Third, Khadraoui and Smida (2012) emphasize that averaging data over a period also solves missing data problems and becomes popular in dynamic models. Finally, averages decrease the probability that outliers, measurement errors, and changes in the business cycle impact the findings (Dorn *et al.,* 2017).

We calculate averages of 4-year accordingly: averaged annual 1998-2001 data were used as the observation for 2001; similarly, a 4-year averaged annual 2002-2005 data were taken as the value for 2005 and so on. Such calculations give us five time periods. The robustness of the link between various dimensions of globalisation and income inequality are examined using various dependent variables: quintile ratio and decile ratio.

The one-step system GMM estimator provides consistent and efficient estimates if the instruments are valid and if there is no second-order autocorrelation. Before interpreting the results, we perform the Sargan test to determine the validity of the model, and if the employed instruments are exactly specified. In the realized models all instruments are valid and there is no endogeneity problem because the p-value of the Sargan overidentification test is higher than 0.05. The number of instruments must be similar to the number of the countries analysed. To check for second-order autocorrelation of errors, we also perform the Arellano-Bond test because the dependent variable Gini coefficient is lagged. There is no second-order autocorrelation of errors if the *p*-value is higher than 0.05.

RESULTS AND DISCUSSION

In this part we submit the findings from panel regressions using one-step system GMM estimators. In contrast to the previous studies, we distinguish between the influence of *de facto* and *de jure* indicators of various globalisation dimensions on income inequality. Following Bergh and Nilsson (2010) and trying to avoid problems caused by multicollinearity, we include different dimensions of globalisation in different model specifications.

Table 3 shows the outcome of four GMM model specifications which differ solely by the included dimensions of globalisation. The estimates of the one-step system GMM regression show that *de facto* and *de jure* indicators of trade globalisation effects differently income inequality in 27 EU countries.

The results of regression analysis show negative but statistically insignificant relationship between *de facto* trade globalisation *(KOFTrF)* and income inequality, which rejects hypothesis 1. Our estimates also reveal the existence of the affirmative effect of *de jure* trade globalisation (*KOFTrJ)* on inequality and confirm hypothesis 2. An Increase in *KOFTrJ* by 1% increases inequality by 0.4% (see specification 1 in Table 3). *De jure* measures of globalisation aim at capturing conditions that influence international transactions. Since large companies dominate in global markets, they affect trade policy by increasing liberalisation of restrictions and most frequently capture gains from international trade at the expense of small enterprises. Small enterprises cannot benefit from international trade because they are underrepresented in trade policy decision-making. The dominance of large firms in global markets has implications for how trade policy affects inequality. Our research results are in line with Bergh and Nilsson's (2010) findings that policy reforms favouring trade openness have raised inequality of income. Gourdon *et al.* (2008) also found that trade openness, measured by changes in tariffs, has a meaningful affirmative impact on inequality.

Regression results reject hypothesis 3, which states that d*e facto* financial globalisation (*KOFFiF)* is linked to a decrease in income inequality. The country's openness to investment and international financial flows is measured by d*e jure* financial globalisation index (*KOFFiJ)* (Gygli *et al.,* 2019). Results of estimates reveal that there is an affirmative link between *de jure* financial globalisation and income inequality, thus supporting hypothesis 4. A rise in *de jure* KOF globalisation index by 1% increases inequality by 0.2%. Our results are in line with previous investigations which show that financial globalisation was the main driver of inequality (Asteriou *et al.,* 2014). The research results of Lang and Tavares (2018, p. 24) show an affirmative and statistically significant impact of economic globalisation on net incomes Gini.

The results of regression analysis show an affirmative nexus between *de facto* political globalisation (*KOFPoF*) and inequality and confirm hypothesis 5. An increase in *KOFPoF* index by 1% increases inequality by 0.11%. As regards the impact of political globalisation on income inequality, the research results are in line with Lee *et al.* (2020), but they do not distinguish between the impact of different measures of political globalisation. Controversial results have also been found in the literature. Estimates show that *de jure* political globalisation (*KOFPoJ*), which indicates the ability to take part in the global political collaboration, has a negative and statistically significant effect on income inequality. The coefficient indicates that a 1% increase in the *KOFPoJ* index reduces inequality by 0.15%. These results are not surprising due to the sophisticated link amongst the *de jure* political globalisation and income inequality; thus, they confirm hypothesis 6 which states that *KOFPoj* is linked to a decrease in

income inequality. Estimates in Table 3 allow to reject hypothesis 7, which states that policy and outcomes of social globalisation are related to a rise in income inequality. It bears to emphasize that the effect of *KOFSoF and KOFSoJ* on income inequality is not statistically significant.

Table 3. Income inequality and diverse globalisation dimensions

Variables	(1)	(2)	(3)	(4)
Lagged GINI	0.591*** (0.186)	0.709*** (0.176)	0.566*** (0.166)	0.620*** (0.138)
const	−0.888 (0.659)	−0.482 (0.570)	−0.052 (0.464)	0.130 (0.919)
KOFTrF	−0.100 (0.061)			
KOFTrJ	0.395*** (0.114)			
KOFFiF		−0.115 (0.083)		
KOFFiJ		0.199** (0.095)		
KOFPoF			0.112** (0.048)	
KOFPoJ			−0.148** (0.071)	
KOFSoF				−0.079 (0.100)
KOFSoJ				0.017 (0.161)
School	0.073 (0.061)	−0.012 (0.050)	0.039 (0.062)	0.030 (0.068)
Tertiary	0.011 (0.024)	0.007 (0.027)	−0.004 (0.031)	−0.008 (0.024)
SocProt	−0.063 (0.047)	−0.016 (0.045)	−0.056 (0.049)	−0.064 (0.047)
GDPperC	−0.049** (0.016)	−0.010 (0.019)	−0.007 (0.014)	−0.017 (0.015)
Depend	0.352* (0.181)	0.335* (0.202)	0.415** (0.172)	0.522*** (0.177)
RD&bus	−0.027** (0.013)	−0.035** (0.017)	−0.031* (0.017)	−0.042** (0.019)
RD&gov	−0.018 (0.017)	−5.248 (0.016)	−0.003 (0.011)	−0.011 (0.016)
No of instruments	22	22	22	22
AR(2) test *p*-value	(0.445)	(0.314)	(0.288)	(0.389)
Sargan test *p*-value	(0.620)	(0.423)	(0.708)	(0.756)

Note: Standard errors are reported in parentheses. All regressions include time dummies. ***, ** and * show respectively the significance at the 1%, 5% and 10% confidence levels.
Source: own study.

The lagged net *Gini* income index is statistically significant in each model specification. The estimation results support the view that a higher proportion of retired individuals increases inequality. Finally, the *R&Dbus* coefficient indicates that a 1% increase in business expenditures reduces inequality by 0.03-0.4%.

At the bottom of Tables 3 and 4 in conjunction with the regression coefficients we present the results of the required tests for checking the validity of the model. In all model specifications, the Sargan test *p*-value is bigger than 0.05. This shows that the employed instruments are correctly specified and there are no endogeneity problems. There is no second-order autocorrelation of errors in all model specifications, moment conditions are valid the p-value ranges from 0.29 to 0.45 (Table 3) and is higher than 0.05. The number of instruments (22) is not greater than the number of the countries (27).

To get additional insight into the impact of various dimensions of globalisation on income inequality and then to verify the robustness of main findings we perform sensitivity checks by changing the measure of the dependent variable. Gini is the most frequently used indicator of inequality, but one limitation of the *GINI* is that it is more sensitive to changes around the mean (Dabla-Norris *et al.,* 2015). Therefore, we additionally test the sensitivity of the results by using other inequality measures. We use decile ratios (*D10/D1)* and quintile ratios (*Q5/Q1)* as alternative measures of income inequality. These indicators are calculated using the World Income Inequality data.

Table 4. Sensitivity test: alternative measures of income inequality

Variables	Dependent variable – D10/D1				Dependent variable – Q5/Q1			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lagged dependent variable	0.406** (0.186)	0.448*** (0.163)	0.45546** (0.211)	0.396** (0.199)	0.568*** (0.142)	0.594*** (0.127)	0.621*** (0.150)	0.573*** (0.152)
const	−2.389 (1.640)	−0.849 (1.794)	−2.790 (2.009)	−0.147 (3.266)	−0.789 (1.251)	−0.4 (1.052)	−1.056 (0.956)	−0.014 (2.123)
KOFTrF	−0.299** (0.088)				−0.168*** (0.051)			
KOFTrJ	0.406 (0.438)				0.142 (0.303)			
KOFFiF		−0.460 (0.224)				−0.171 (0.142)		
KOFFiJ		0.07 (0.226)				−0.023 (0.134)		
KOFPoF			0.25 (0.177)				0.089 (0.081)	
KOFPoJ			−0.217 (0.217)				−0.153 (0.113)	
KOFSoF				−0.063 (0.25)				−0.065 (0.159)
KOFSoJ				−0.494 (0.501)				−0.23 (0.337)
School	−0.019 (0.224)	−0.297 (0.251)	−0.164 (0.281)	−0.255 (0.298)	−0.019 (0.135)	−0.161 (0.162)	−0.113 (0.159)	−0.135 (0.183)
Tertiary	0.017 (0.076)	0.031 (0.083)	−0.027 (0.078)	0.033 (0.106)	0.015 (0.044)	0.015 (0.051)	−0.017 (0.044)	0.014 (0.064)
SocProt	−0.267** (0.115)	−0.211** (0.097)	−0.203* (0.119)	−0.201* (0.112)	−0.198** (0.081)	−0.167** (0.067)	−0.145* (0.078)	−0.160** (0.074)
GDPperC	−0.089 (0.057)	0.015 (0.049)	−0.052 (0.069)	−0.031 (0.051)	−0.041 (0.027)	0.011 (0.029)	−0.012 (0.034)	−0.006 (0.030)
Depend	1.193*** (0.436)	1.241*** (0.428)	1.396** (0.603)	1.387*** (0.522)	0.637*** (0.227)	0.676*** (0.215)	0.732*** (0.279)	0.729*** (0.252)
R&Dbus	−0.050 (0.037)	−0.066* (0.035)	−0.089* (0.047)	−0.083* (0.048)	−0.022 (0.024)	−0.032 (0.023)	−0.041 (0.028)	−0.037 (0.031)
R&Dgov	−0.051 (0.050)	−0.034 (0.05)	−0.027 (0.056)	−0.017 (0.049)	−0.027 (0.025)	−0.012 (0.027)	−0.002 (0.028)	−0.007 (0.024)
No of instruments	22	22	22	22	22	22	22	22
AR(2) test p-value	(0.949)	(0.624)	(0.54)	(0.5893)	(0.621)	(0.361)	(0.340)	(0.334)
Sargan test p-value	(0.758)	(0.653)	(0.524)	(0.692)	(0.594)	(0.587)	(0.471)	(0.591)

Note: Standard errors are reported in parentheses. Regressions incorporate time dummies. ***, ** and * show accordingly the significance at the 1%, 5% and 10% confidence levels.
Source: own study.

The estimates with the decile ratio *(D10/D1)* and quintile ratio *(Q5/Q1)* as dependent variables are displayed in Table 4. *De jure* trade globalisation defined by policies (*KOFTrJ)*, has a diverse influence on income inequality when comparing with *de facto* trade globalisation (*KOFTrF)* defined by outcomes. However, once we measure inequality by decile ratio *(D10/D1)* or quintile ratio *(Q5/Q1)*, *de jure* trade globalisation (*KOFTrJ)* is no longer statistically significant, but the negative effect of *de facto* trade globalisation (*KOFTrF)* is statistically significant. The estimates of *de jure* and *de facto* social globalisation are consistent with those in Table 3. The determined significance of the effect of the globalisation on income inequality, using *(D10/D1) and (Q5/Q1)*, is somewhat distinct from those estimated when the net *GINI* coefficient is used and suggests that results are ambiguous. This may be because the operationalisation of income inequality to some extent made an impact on our research results.

Gini index is more responsive to changes around the mean of the income distribution than decile ratio or quintile ratio and it does not consider if income inequality alters because the poor become poorer, or the rich become richer, or both (Dorn *et al.,* 2017). Each indicator of income inequality focuses on one part of the full distribution and therefore does not provide full information or sheds light on different aspects of inequality. We also cannot eliminate the possibility the panel is not homogeneous according to the income inequality level and development level. We recommend further research in this direction.

As regards the control variables, *SocProt* negatively influences income inequality, and this impact is statistically significant in all specifications. Observing the impact of *Depend* on income inequality, using *D10/D1 and Q5/Q1* as dependent variables, is the same as using the *GINI* coefficient and is in line with what one might expect. An increase in *Depend* by 1% increases inequality by 1.2-1.4% when inequality is measured by the *D10/D1*, and by 0.64-0.73% when inequality is measured by the *Q5/Q1*.

CONCLUSIONS

Income inequality and globalisation in the EU countries have changed dramatically over the last two decades. Economic theory does not provide an unambiguous projection of the influence of various globalisation dimensions on income inequality. Contradictory results have been obtained in empirical studies that assessed the influence of globalisation on income inequality. While some studies confirm the hypothesis that globalisation increases income inequality, others disagree with this conclusion. Scientists reach different and even controversial results due to different measures of globalisation and income inequality, different model specifications, different periods and samples of countries. The present research provides a deeper analysis of this significant topic.

In contrast to preceding research, using the KOF globalisation index database, we control the influence of several globalisation dimensions (trade, financial, political, and social) on income inequality separately. We assess the impact of each dimension, using *de facto* and *de jure* indicators. This is done using a one-step system GMM estimation method which accounts for the endogeneity issue. As a test of sensitivity, we use decile ratios and quintile ratios as dependent variables. The research covers 27 EU countries for the period of 1998-2017.

The conducted research confirms four out of seven hypotheses. The main results obtained from a one-step system GMM model reveal that trade and financial globalisation, defined by policies (*de jure*), has a different influence on inequality than trade globalisation defined by outcomes (*de facto*). Overall, the results indicate that *de jure* trade globalisation, measured by tariffs, trade regulations, etc., is the driving force of income inequality. Results demonstrate that liberalisation of restrictions on flows of goods, capital, and labour across borders is more useful for large companies than small enterprises and rising income is not equally shared between various segments of population.

We find evidence that a greater extent of *de jure* financial globalisation is related to greater inequality. Political globalisation is a complex process and results show that *de facto* political globalisation contributes to greater income equality, while *de jure* political globalisation promotes more inequality. The influence of social globalisation on income inequality is statistically insignificant. Trying to correct the influence of other factors that may affect income inequality, we incorporate the same control variables in all the model specifications.

To test the sensitivity of the results, we use the other measures of inequality: decile ratio and quintile ratio. The results indicate a positive but statistically insignificant relationship between *de jure* trade globalisation and inequality. But when we use the decile ratio and quintile ratio instead of the Gini index as the dependent variable, our findings show a negative and significant effect of *de facto* trade globalisation on income inequality. This demonstrates that estimates are sensitive to measures of income inequality. Overall, results are in line with Auguste (2018). Globalisation is a complex and multidimensional process, that is why some of its dimensions contribute to greater income equality, some may have no or negligible effect, while others promote more inequality.

Taking into consideration the results of this research, it seems that policymakers need to rethink their approach to the trade globalisation policy, and first-order discussions and concerns must be the question of who receives benefits and who loses from changes in trade policy. The results of this research represent a supplementary contribution to the discussion by emphasizing the impact of various *de jure* and *de facto* indicators of various globalisation dimensions on income inequality.

Limitations and suggestions for future research

The research leaves several issues that should be considered in future research. First, the EU countries are not homogeneous according to the development level and seeking to get a deeper understanding of the estimates, we may split the countries into relatively higher and relatively less developed EU country groups and evaluate whether the impact of *de jure* and *de facto* indicators of different globalisation dimensions is of the same signs and significance in different EU country groups. Moreover, it can be assessed if the impact of various *de jure* and *de facto* globalisation measures varies across advanced, emerging economies and developing markets. Second, when evaluating the impact of *de jure* and *de facto* indicators of various dimensions of globalisation on income inequality, we used the dynamic panel GMM approach. Other approaches may also be used to investigate this impact. Third, the nexus between various globalisation dimensions and inequality can be non-linear: income inequality may firstly increase and then decrease in the globalisation process. Finally, future research should present trade policy recommendations ensuring that trade policy not only increases efficiency but also reduces income inequality within and between countries.

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Export-led growth hypothesis: Empirical evidence from the Southern African Customs Union countries

Malefa Rose Malefane

ABSTRACT

Objective: The objective of the article is to examine the export-led growth hypothesis in the Southern African Customs Union (SACU).

Research Design & Methods: This study employs annual data on output, exports, imports, and a structural dummy variable for SACU countries, namely, South Africa, Botswana, Lesotho, Namibia, and eSwatini. The study applies the cointegration test based on the Johansen (1988) and the Johansen and Juselius (1990) approach, followed by the vector error correction model and the trivariate Granger causality analysis.

Findings: All SACU countries, apart from Lesotho, have witnessed a significant positive relationship between exports and economic growth during the reviewed period. In the case of Lesotho, the study finds a negative relationship between exports and economic growth. Causality results confirm that the export-led growth hypothesis is valid in Namibia and South Africa, but not in eSwatini, Botswana, and Lesotho.

Implications & Recommendations: Based on the overall findings, this study mainly recommends that policymakers in SACU countries should consider providing extensive support for the development of infrastructure and trade-related logistics.

Contribution & Value Added: SACU countries rely on a narrow range of exports, which could affect their vulnerability to external shocks. This article provides empirical evidence on whether data from SACU countries is consistent with the export-led growth hypothesis.

Article type: research article

Keywords: exports; imports; economic growth; SACU; Granger causality

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INTRODUCTION

Since the earlier works of Balassa (1978) and (1985), empirical research has continued to probe the relevance and validity of the export-led growth hypothesis in the context of the industrialised, developing, and least-developed economies. While there is growing evidence on the export-led growth hypothesis, one could argue that the adoption of the export-led growth industrialisation on its own does not guarantee the realisation of growth-enhancing benefits. Although the export-led growth strategy provides growth opportunities, differences in technology across countries imply that countries adopting this strategy are likely to face varying effects resulting from export-promoting policies (see for example, Feenstra, 2015). Thus, there is no guarantee that the export-promoting strategy will always result in a positive causal effect on long-run economic growth.

Despite the contentious debate around the role of export-led growth strategies in economic development, several reasons explain why exports matter in driving economic growth. One of the conventional views arising from theoretical presumptions is that exports could be the key drivers of economic growth. Building on the classical theoretical viewpoints, the proposition is that export expansion tends

to cause a rise in output through improved productivity or large-scale production resulting from specialisation (Marin, 1992; Bahmani-Oskooee & Economidou, 2009). Country-based experiences, however, suggest that structural characteristics affect the extent to which exports stimulate economic growth.

Against this backdrop, this article aims to examine the export-led growth hypothesis in the five Southern African Customs Union (SACU) countries based on their experiences over the past four decades. The study hypothesises that economic growth, measured by the annual growth rate in the real gross domestic product (GDP), is positively related to exports and imports. The other hypothesis is that export expansion leads to economic growth in SACU countries. The motivation behind the current study is that over the past four decades, SACU countries have been operating under the export promotion regime, which has replaced the previous import substitution industrialisation regime.

Earlier studies that examined the export-led growth hypothesis in SACU countries mostly did so without considering structural breaks that result from external shocks (see Sinoha-Lopete, 2006; Jordaan & Eita, 2007; Bosupeng, 2015). In bridging the gap in SACU-related literature, the current study tests the significance of exports in promoting economic growth in the presence of structural changes emanating from external shocks. The study pursues these research questions: has the implementation of the export-oriented growth strategy boosted economic growth in SACU countries given the possible structural breaks? What country-specific factors affect the export-led growth strategy in SACU countries?

The novelty of the current study is two-fold – first, it provides a comparative analysis of SACU countries over the past four decades taking structural changes into account. The study also identifies major export commodities and factors that hinder export expansion from being translated into sustained economic growth as intended by the export-oriented policies that SACU countries have adopted. This article is organised as follows: after the introduction, the next section discusses literature review in which the study presents empirical evidence from developed and developing economies. Thereafter, the study provides an overview of the origins of the export-led growth strategy in the Sothern African Customs Union. The next section presents methodology and data, followed by the discussion of empirical findings. The last section concludes the study.

LITERATURE REVIEW

Various empirical studies on both developed economies and developing economies continue to probe the role of exports in economic growth. From these studies it emerges that while the proponents of export-led growth strategy favour export-promoting policies, export expansions per se do not always bring about significant growth effects. In some cases, the experiences surrounding export-led growth might be due to country-specific factors.

Empirical evidence from developed countries

Evidence from existing studies shows that export-led industrialisation applies to both developed and developing economies. In a study examining the export-led growth hypothesis in four industrialised countries, namely United States, Japan, Germany, and the United Kingdom, Marin (1992) finds that except for United Kingdom, exports, productivity, and terms-of-trade move together in the long run. The results further confirm that exports Granger- cause productivity in all four investigated countries.

In one of the studies focusing on the Southern European countries over the period 1960-2014, Konstantakopoulou (2016) employs the Pesaran, Shin, and Smith (2001) bound-testing approach to investigate the existence of a static and dynamic relationship between exports and economic growth. The study confirms a bidirectional Granger causality in Spain and Greece, but none for Italy. Moreover, the study establishes a unidirectional causality from exports to economic growth in Portugal.

Kónya (2008) employs the modified Wald statistics to determine the export-led growth hypothesis in twenty-five OECD countries. The findings show that there is no causality between exports and economic growth in Luxembourg and the Netherlands. The study finds a unidirectional causality from exports to economic growth in Iceland. The results also point to a bidirectional causality between exports and growth in Sweden and the United Kingdom. For some of the countries included in the study, the results are too controversial to arrive at unanimous conclusions.

In another study, Henriques and Sadorsky (1996) investigate the export-led growth hypothesis in Canada. While the results confirm the existence of a long-run relationship between real exports, real GDP, and terms-of-trade, no evidence supporting the export-led growth hypothesis prevails. Most importantly, their results indicate that for Canada, changes in GDP growth precede changes in exports.

Shan and Sun (1998) examine the export-led growth hypothesis in China during 1987-1996. The results indicate that even though a positive relationship between exports and output exists in China, there is no unidirectional causality from exports to output, which rules out the validity of the export-led growth hypothesis.

In a study based in Norway, Nesset (2004) examines the link from growth in exports to productivity growth over 1968-1992. The empirical results indicate that economic growth is productivity-led and not export-led, which leads to the conclusion that Norway must consider giving more direct productivity stimulus including research and development, infrastructure, and education support.

Fountas (2000) tests the export-led growth hypothesis for Ireland using two sample periods: 1950-1990 and 1981-1994. The results show no evidence of export-led growth over the period 1950-1990. However, the results support the export-led growth hypothesis for the period 1981-1994 suggesting the importance of export promoting policies that the country has adopted.

Empirical evidence from developing countries

In a recent study conducted in Latin America, Arteaga, Cardozo, and Diniz (2020) examine the effects of exports to China and the world, given a structural break. For the period 2002-2017, the results show that exports to China boost economic growth in South America but are detrimental to Mexico, Central America, and the Caribbean.

In a study focusing on Fiji and Papua New Guinea, Narayan, Narayan, Prasad, and Prasad (2007) investigate the export-led growth hypothesis in the two countries that experienced dismal economic growth in the past. The study finds evidence of the export-led growth hypothesis in the long run in Fiji and some evidence of export-led growth in the short run in the case of Papua New Guinea.

Abual-Foul (2004) examines the relevance of the export-led growth hypothesis in Jordan over 1976-1997 using the vector autoregression and the error correction model. The results support the export-led growth hypothesis leading to the conclusion that the export-led growth strategy has promoted faster economic growth in Jordan.

Maneschiöld (2008) uses data for Argentina, Brazil and Mexico to analyse the export-led growth hypothesis, where the introduction of the NAFTA is treated as the structural break point. The study finds evidence of bi-directional or unidirectional causality from exports to GDP supporting the export-led growth hypothesis in the three investigated countries for the pre- and post-break periods.

Malhotra and Kumari (2016) investigate the validity of the export-led growth hypothesis in Bangladesh, India, Pakistan, and Sri Lanka over the period 1980-2012. The results confirm the export-led growth hypothesis in India, but not in Pakistan, Bangladesh, and Sri Lanka. In another study conducted in South East Asian countries, Shirazi and Abdul Manap (2005) confirm the export-led growth hypothesis in Bangladesh, Pakistan, and Nepal, but not in India and Sri Lanka.

Focusing on sub-Saharan Africa, Bbaale and Mutenyo (2011) investigate the relationship between export composition and output growth in a panel of 35 countries for the period 1988-2007. The findings indicate that growth-enhancing effect can be attributed to agricultural exports and not manufactured exports.

Considering some of the existing empirical evidence based on previous studies conducted in the Southern African Customs Union (SACU) countries, there is a lack of consensus on the relationship and causality between exports and economic growth. For instance, Bahmani-Oskooee and Economound (2009) could not establish the direction of the long-run relationship between exports and output growth in Lesotho and several other developing countries. On the contrary, their study found that increased exports cause economic growth in the long run in South Africa, Swaziland, and a few other African countries.

In another study focusing on several Southern African economies, Sinoha-Lopete (2006) examines the export-led hypothesis for 1980-2002. The results confirm the export-led growth hypothesis

in Lesotho and eSwatini, but not in other countries related to the current study, which are Botswana, Namibia, and South Africa. In a country-based study focusing on Botswana, Bosupeng (2015) investigates the export-led hypothesis during 2003-2012. The findings reject the export-led growth hypothesis for Botswana.

Export-led growth in SACU: an overview

The 2002 SACU Agreement allows duty free importation of goods originating from the Common Customs Area although members can impose restrictions on trade where applicable. Under the Agreement, members can continue with pre-existing preferential arrangements, but goods admitted duty free under these preferential arrangements are liable to excise duties when exported to another SACU country (Southern African Customs Union, 2013).

Apart from the role played by SACU membership, the exchange rate arrangements in SACU also act as interlinkages in the sub-region. Under the Common Monetary Area (CMA) arrangement, all SACU countries except Botswana, have pegged their local currencies to the South African Rand (Stoykova, 2021). This implies that trade patterns in SACU are likely to follow fluctuations in the South African Rand. Again, South Africa is characterised by a large nontraded goods sector, which in turn determines the country's exchange rate (Makanza, 2015). For instance, in the face of macroeconomic shocks that affect relative prices, the real exchange (in South Africa in this case) will appreciate, causing prices in the domestic economy to be relatively higher than global prices.

The implication of South Africa's macroeconomic shocks for other CMA countries is that their relative prices are likely to follow the same trend as that of South Africa. In one of the studies related to this argument, Sendza and Diaba (2017) confirm a negative short-run impact of exchange rate volatility in South Africa over the period 1993 to 2014, and a positive impact in the long-run. During the period between 1993 and 2014, SACU countries witnessed an overall upward trend in their exports, apart from a slump in exports following the global financial crises of 2008/2009, which affected the major economies that trade with SACU countries (see SACU Annual Report; 2010, 2012 and 2015).

Looking at the transition in trade policy within the SACU countries over the past four decades, there is evidence of a radical regime shift from import substitution industrialisation to export-led strategy. In SACU, South Africa was among the first to implement the export-led strategy following the Reynders Commission of 1972 (see Bell, 1997). For Lesotho, the move away from the import-substituting industrialisation became vital in the national objectives. This has resulted in Lesotho's trade policy being more inclined towards stronger export orientation (World Trade Organisation, 1998). Although Botswana, Lesotho, Namibia, eSwatini, and South Africa adopted the export-led strategy at different points in time, each of these SACU countries has been operating under this new strategy for more than three decades. Hence, the expectation is that the regime shift to the export-led growth strategy should have benefited the SACU countries to some extent.

One prominent feature characterising the pattern of exports in SACU economies is that South Africa has been recording more exports than its SACU counterparts during the past years (Figure 1). As shown in Figure 1, the trends in exports for all the SACU countries during the period 1980 to 2018 are almost similar. The Figure shows that South Africa, followed by Botswana, surpassed other SACU countries in export performance during the reviewed period. Several reasons explain the differences in SACU countries. For Lesotho, the country still records the least exports compared to others in the customs union although its exports have picked up past the year 2000. The increase in Lesotho's exports is partly due to the Africa Growth and Opportunity Act (AGOA), which commenced in 2000. Under AGOA, Lesotho gains duty-free access to the United States in exports of clothing and textiles (see Malefane, 2007). For Namibia and eSwatini, the growth in exports was modest during the period under investigation as shown in Figure 1. One factor that has affected the exports in Namibia is slow growth in South Africa, the key trading partner for Namibia. Due to the slow growth in South Africa, the demand for Namibia's commodity exports has declined in recent years (United Nations, 2017).

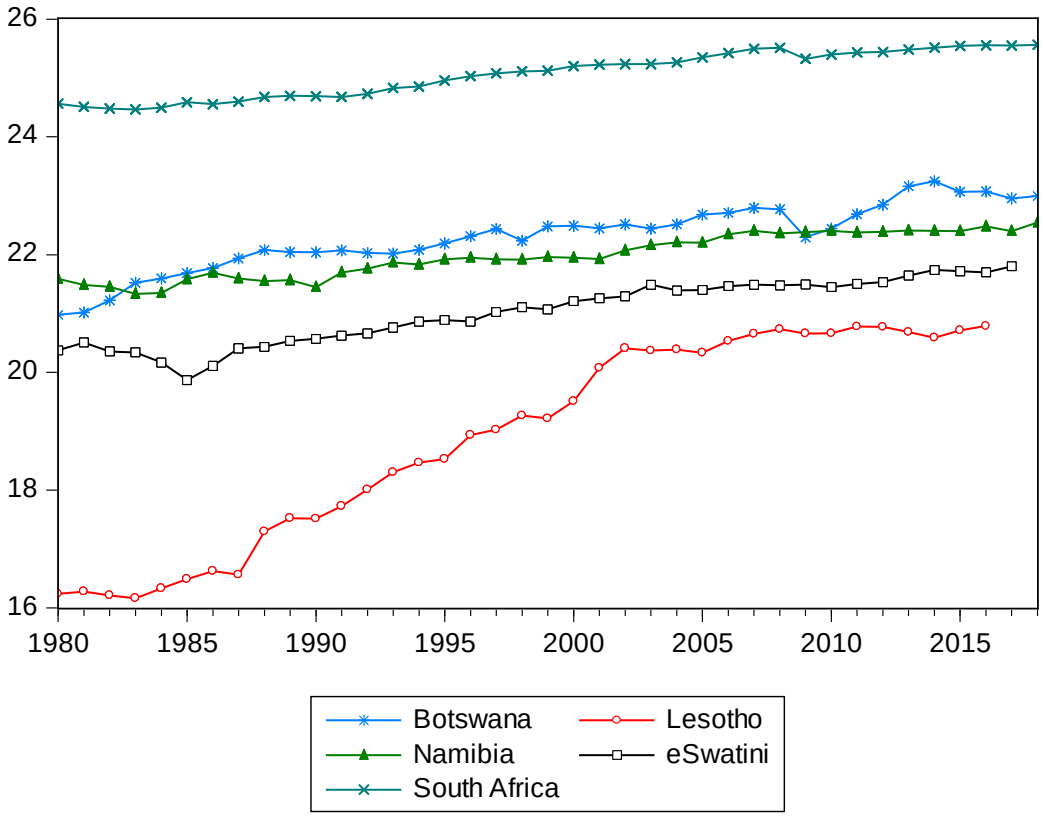

Figure 1. Trends in the log of real exports in SACU countries, (1980-2018)
Source: constructed from World Development Indicators (2019).

SACU countries are vastly diverse in their economic structures, including sectoral policies, market size and export commodities. In one of the latest trade policy reviews of SACU countries, the World Trade Organisation (2015) remarked that SACU has intra-country inequalities, which are among the highest globally. Despite their diversities, SACU countries continue to implement economic and policy reforms aimed at sustainable growth, job creation, and industrial development. Table 1 presents a summary of the policy objectives and challenges in SACU countries during the period between 2015 and 2020. The summary highlights strategic policy objectives, adopted measures, principal exports, and main challenges facing the export sector. As it can be deduced from Table 1, while SACU countries have varied economic objectives and goals, they generally seek sustainable economic growth and enhanced private sector development to aid job creation and poverty alleviation.

Table 1. Summary of economic developments and challenges in SACU countries

Country	Aims of strategic policies	Adopted measures	Principal exports	Main challenges
Botswana	sustainable economic growth; economic diversification; improved public-private partnership; accelerated private sector development; small and medium-sized enterprise (SME) development	diversified production by private sector; institutional support and development; capacity development programme for SMEs	diamonds; machinery and electrical equipment; salt and soda ash; gold; vehicles and transport equipment; meat and meat products	weaker global diamond demand; weak growth prospect of South Africa
Lesotho	improved private sector growth; inclusive and sustainable economic growth; infrastructure and human capital development; strengthening of national governance and accountability system	reforms in land ownership system; improvements in the business environment; political governance reforms	textiles, clothing, and footwear; diamonds; water	lack of skill and capacity; decline in textiles due to competition from Asian producers; macroeconomic instability; inadequate and poor-quality infrastructure; weak human capital and skill gap
Namibia	protection of intellectual property; promotion of value-added production; stimulation of downstream agro-industries; improved competitiveness and contribution of agriculture industries	upgrades in information and technology	diamonds; copper; uranium ores and concentrates	narrow export base; capacity constraints and shortage of skilled labour force; less competitive business environment; high production costs; infrastructure bottlenecks
South Africa	sustainable economic growth; job creation; reforming of state-owned enterprises	removal of barriers to mining investment; restructuring of major state-owned utility company (Eskom); reviewing of visa requirements to boost the tourism industry; allocation of telecommunications spectrum; creation of Special Economic Zones	gold; bituminous coal; manganese ores; diesel-powered trucks	lack of adequate skills; inadequate domestic infrastructure; lack of competition in goods and services market
eSwatini	food security; improved productivity; diversification of commercial agriculture; strengthening of economic governance; acceleration of diversified, inclusive, and sustainable growth	improvements in coal production; new legislation on telecommunications – independent regulation; scaling up of infrastructure	raw cane sugar and sugar-based products; chemical products; coniferous wood	vulnerability to climate change; limited economic classification and market concentrations; capacity constraints and skills shortages; deteriorating infrastructure

Source: own compilation based on World Trade Organisation (2015); African Development Bank – African Economic Outlook 2020; African Development Bank Country Strategy Papers (Online); Statistics Botswana (2020); Commonwealth of Nations; World Bank – World Integrated Trade Statistics (2020).

RESEARCH METHODOLOGY

Influenced by literature and the focus of trade policies in SACU countries, the current study develops these hypotheses:

H1: There is a positive relationship between exports and output growth in SACU countries.

H2: There is a unidirectional causality from exports to output growth in SACU countries.

This study employs annual data for output (Y), exports (X), imports (M), and structural dummy variable (DUM). The output variable is proxied by the log of real gross domestic product; exports are proxied by the log of real exports of goods and services; while imports are proxied by the log of real imports of goods and services. All values before the log transformation are at constant 2010 US$. Due to variations in data availability, the study uses different sample periods in empirical investigation. For Botswana, the sample period is 1975-2018, while it is 1960-2017 for Lesotho, 1980-2018 for Namibia and eSwatini, and 1960-2018 for South Africa. The data is from the World Bank World Development Indicators (2019).

The study constructs a structural dummy variable based on Bai (1997) and Bai and Perron's (1998a, 2003) procedure to capture the external shocks. The results of the multiple breakpoint tests are reported in the Appendix. The study did not construct any structural break dummy for Namibia since the structural break tests failed to confirm any significant structural breaks for the country. Based on Multiple breakpoint test results, the values for the dummy variable (DUM) for other SACU countries are as follows:

In the Botswana dataset, DUM takes value 1 in 1991 and 2009; 0 otherwise.

In the Lesotho dataset, DUM takes value 1 in 1977, 1998, and 2009; 0 otherwise.

In the eSwatini dataset, the value of DUM is 1 in 1985 and 2010; 0 otherwise.

In South Africa's dataset, DUM takes value 1 in 1977, 1985, and 2000; 0 otherwise.

Given the tendency of economic variables to follow random walks, the study tested the unit root using the Augmented Dickey-Fuller (ADF) test and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test. The null hypothesis for the KPSS test is that the series are stationary while the null hypothesis for the ADF test null hypothesis is that the series are non-stationary.

The study performed the cointegration test based on Johansen (1988) and Johansen and Juselius (1990). The advantage of the Johansen's approach is that it tests the null hypothesis of no cointegration against the alternative of one or more cointegrating vectors. The unrestricted vector autoregression (VAR) was specified as follows:

$$X_t = A_0 + \sum_{j=1}^{p} A_j X_{t-j} + \varepsilon_t \quad (1)$$

where:

X_t - vector of $(m\ X\ 1)$ nonstationary variables – output, exports and imports;

A_j - $(m\ X\ m)$ matrix of unknown parameters;

p - lag length;

ε_t - $(m\ X\ 1)$ vector of disturbance terms.

The Akaike information criterion (AIC) and the Schwarz criterion (SC) determined the maximum lag length. The maximum lag length for Botswana, Namibia, and South Africa is two (2), while it is one (1) for Lesotho and eSwatini.

The vector error correction model (VECM) specification of this study is:

$$\Delta X_t = \mu + \sum_{j=1}^{p-1} \Gamma_j \Delta X_{t-j} + \Pi X_{t-i} + \varepsilon_t \quad (2)$$

where:

μ - $(m\ X\ 1)$ vector of constant terms;

Γ, Π - coefficient matrices;

Δ - difference operator.

The study used a VAR Granger causality to determine the direction of causality between output, exports, and imports in the face of the structural changes.

Table 2. List of variables used in the analysis

Variable	Indicator	Source (the code of dataset)
Output (Y)	Real gross domestic product, constant 2010 US$	World Development Indicators, 2019 (NY.GDP.MKTP.KD)
Imports (M)	Imports of goods and services, constant 2010 US$	World Development Indicators, 2019 (NE.IMP.GNFS.KD)
Imports (X)	Exports of goods and services, constant 2010 US$	World Development Indicators, 2019 (NE.EXP.GNFS.KD)
Structural dummy (DUM)	Dummy variable capturing structural changes. Value 1 if there is structural change; 0 otherwise	Own computation based on Multiple breakpoint tests

Source: own elaboration based on World Bank World Development Indicators (2019).

Discussion of Results

As part of the empirical investigation, the study tested output, exports, and imports for a unit root, and Table 3 reports the results. The results from the ADF and KPSS tests show that, generally, the variables used in this study are first-difference stationary or are integrated of order one.

Table 3. Unit root test results

Variable	ADF Test				KPSS Test			
	Log levels		First difference		Log levels		First difference	
	No trend	Trend	No trend	Trend	No trend	Trend	No trend	Trend
Y_BWA	-4.90***	-1.63	–	-5.77***	0.82***	0.21**	0.71**	0.10
M_BWA	-1.46	-3.67**	-5.12***	–	0.82***	0.08	0.11	0.04
X_BWA	-2.71*	-2.56	–	-5.46***	0.79***	0.20**	0.32	0.08
Y_LSO	-1.97	-2.02	-7.76***	-8.14***	0.85***	0.15**	0.32	0.50***
M_LSO	-5.25***	-1.12	–	-6.44***	0.78***	0.21**	0.85	0.12
X_LSO	-1.99	-0.64	-6.05***	-6.51***	0.79***	0.16**	0.39*	0.12
Y_NAM	1.30	-3.06	-4.21***	-4.29***	0.74***	0.20	0.38*	0.12
M_NAM	0.30	-3.64**	-4.58***	–	0.70**	0.20	0.22	0.18**
X_NAM	-0.30	-3.64**	-6.19***	–	0.73**	0.09	0.17	0.12
Y_SWZ	-3.75***	-1.62	-4.01***	-4.96**	0.73**	0.17**	0.51	0.06
M_SWZ	-0.90	-3.04	-4.20***	-4.08***	0.66	0.09	0.06	0.05
X_SWZ	-0.86	-3.57**	-5.80***	…	0.70***	0.11	0.86	0.04
Y_ZAF	-0.17	-1.87	-4.14***	-4.09***	0.73**	0.16**	0.14	0.12*
M_ZAF	-0.33	-2.31	-5.67***	-5.60***	0.72**	0.11	0.09	0.09
X_ZAF	-0.30	-2.17	-5.67***	-5.59***	0.73**	0.15**	0.13	0.13*

Source: own computations. *, ** and *** represent significance level at 10%, 5% and 1% respectively. BWA, LSO, NAM, SWZ, and ZAF represent Botswana, Lesotho, Namibia, eSwatini, and South Africa. Y, M, X respectively denote output, imports, and exports.

Cointegration test results

After confirming the order of integration, the cointegration test was performed. Table 4 shows the results of the trace statistic and the maximum eigen-value statistic (λ-Max). The test statistics indicate the hypothesised number of cointegrating vectors for each one of the five countries under empirical investigation.

Table 4. Johansen cointegration test results

No. of Cointegrating Vectors	λ-Max Statistic	Critical Value	Trace Statistic	Critical Value
Botswana				
r = 0	35.95**	22.30	55.04**	35.19
r ≤ 1	13.87	15.89	19.09	20.26
r ≤ 2	5.22	9.16	5.21	9.16
Lesotho				
r = 0	27.85**	25.82	43.31**	42.91
r ≤ 1	8.79	8.79	15.46	25.82
r ≤ 2	6.67	6.67	6.67	12.52
Namibia				
r = 0	18.45**	17.80	29.48**	24.27
r ≤ 1	10.48	11.22	11.02	12.32
r ≤ 2	0.55	4.12	0.55	4.13
eSwatini				
r = 0	29.97**	22.30	48.61**	35.19
r ≤ 1	14.44	15.89	18.64	20.26
r ≤ 2	4.20	9.16	4.20	9.16
S. Africa				
r = 0	25.91***	17.80	28.04**	24.28
r ≤ 1	1.71	11.22	2.13	12.32
r ≤ 2	0.42	4.13	0.41	4.13

Source: own computations. ***and ** respectively represent a rejection of the null hypothesis of no cointegration at 1% and 5% level of significance.

The results in Table 4 indicate the rejection of the null hypothesis of no cointegration, and further point to one cointegrating vector in each one of the SACU countries. The confirmation of a cointegrating relationship allows the estimation of the vector error correction model (VECM). For Botswana, the study estimates the model with an intercept but no trend in the cointegrating equation (CE) and VAR. In the case of eSwatini, the study estimates the model with an intercept but no trend in cointegrating equation (CE), and no intercept in VAR. For Lesotho, the study estimates the model with intercept and trend in CE but no trend in VAR. For Namibia and South Africa, the study estimates the model with no intercept or trend in CE or VAR.

Table 5 reports the estimation results in which the regressors X and M in Panel A of the table are in levels, while ΔY_{t-1}, ΔY_{t-2}, ΔX_{t-1}, ΔX_{t-2}, ΔM_{t-1} and ΔM_{t-2} in Panel B are in the first difference.

Table 5. Summary of the estimation results

Panel A: Long-run results					
Regressor	**Botswana**	**Lesotho**	**Namibia**	**eSwatini**	**South Africa**
X	0.58*** (6.98)	-0.09*** (-3.03)	0.77*** (16.28)	7.19*** (3.89)	1.85*** (8.61)
M	0.34*** (4.02)	0.18*** (6.87)	0.28*** (5.73)	-8.23*** (-4.201)	-0.80*** (-3.67)
@Trend(60)	…	-0.03*** (-7.79)	…	…	…
Constant	-2.59*** (-3.47)	-17.90 …	0.28*** (5.73)	-83.88*** (5.42)	…
Panel B: Short-run results					
Regressor	**Botswana**	**Lesotho**	**Namibia**	**eSwatini**	**South Africa**
ΔY_{t-1}	0.21 (0.73)	0.35*** (2.97)	0.42** (2.50)	0.01 (0.05)	0.90*** (3.72)
ΔY_{t-2}	0.12 (0.42)	…	0.15 (0.92)	…	-0.49** (-2.19)
ΔX_{t-1}	-0.08 (-0.96)	0.01 (0.17)	-0.03 (-0.44)	-0.02 (-0.30)	-0.06 (-1.00)
ΔX_{t-2}	-0.10 (-1.32)	…	-0.10 (-1.77)	…	-0.04 (-0.78)
ΔM_{t-1}	0.03 (0.46)	0.04 (0.63)	0.01 (0.25)	0.04 (0.45)	-0.10** (-2.31)
ΔM_{t-2}	0.05 (0.77)	…	-0.17*** (-2.78)	…	0.02 (0.62)
DUM	-0.09*** (-2.65)	-0.01 (0.26)	…	-0.01 (0.01)	-0.04*** (--3.04)
ECT_{t-1}	-0.17*** (-2.68)	-0.64*** (-5.60)	-0.27*** (-3.21)	-0.02*** (-4.73)	-0.05*** (-4.70)
R^2	**0.38**	**0.44**	**0.27**	**0.36**	**0.58**
F-statistic	2.84**	7.59**	1.77	4.49**	9.52**

Note: T-statistics are in parentheses. *** indicates a significance level at 1%; ** indicates a significance level at 5%.
Source: own study.

Table 5 Panel A shows that there is a positive long-run relationship between exports and economic growth in Botswana, Namibia, eSwatini, and South Africa, and a negative relationship in Lesotho. The positive role of exports on economic growth has been echoed in other regions outside Africa. For instance, Hagemeger and Mućk (2019) found that exports played a major role in improving economic growth in Central and Eastern Europe during the period 1995 to 2014. In the case of Lesotho, however, the indication from the current results is that while other SACU countries have witnessed a positive role of exports on economic growth, Lesotho has had a different experience. These findings are an indication that the export-led growth strategy has not been successful in Lesotho, which could be linked to the country's low level of economic development and poor living standards relative to other SACU countries (see United Nations, Human Development Report, 2019).

The error correction model results from Table 5 Panel B show a negative and significant coefficient of the lagged error-correction (ECT_{t-1}) in all the countries. An error term that is negative and statistically significant confirms convergence towards long-run equilibrium. Based on the coefficient of ECT_{t-1}, this study concludes that the speed of adjustment to deviations from long-run equilibrium is higher in Lesotho than in other SACU countries. The results show that about 64% of errors from the past are corrected in Lesotho, whereas eSwatini and South Africa exhibit a much slower adjustment.

The results also show that the structural break dummy variable (DUM) has a significant negative effect on economic growth in Botswana and South Africa but has an insignificant impact in other SACU countries. A possible explanation for these results is that both South Africa and Botswana rely on exports of the mining sector, which are quite vulnerable to external shocks. Specifically, South Africa is a principal exporter of gold, while Botswana is a major exporter of diamonds. Observing the trends in past data, there is evidence that external shocks or global economic crises tend to cause a slump in export demand. Considering Botswana, for instance, the global financial crisis of 2009 exacerbated the country's vulnerability to external shocks given the country's heavy reliance on one major commodity, namely, diamonds (African Development Bank, 2020).

In the next step of the analysis, the study reports the results of the VAR Granger causality test to establish the direction of causality between output, exports, and imports, which are reported in Table 6.

Table 6. Results of the VAR Granger causality test

Country	Dependent Variable	Source of causality		
		Output	Exports	Imports
Botswana	Output	–	0.37	0.96
	Exports	5.53*	–	0.91
	Imports	7.04**	0.95	–
Lesotho	Output	–	0.01	3.58*
	Exports	0.02	–	3.90**
	Imports	0.07	4.14**	–
Namibia	Output	–	3.18*	0.25
	Exports	11.82***	–	7.75***
	Imports	2.14	1.73	–
eSwatini	Output	–	1.36	5.20**
	Exports	4.85**	–	0.06
	Imports	0.54	0.43	–
South Africa	Output	–	13.53***	16.74***
	Exports	4.40	–	6.28**
	Imports	3.74	8.94**	–

Source: own computations of estimation results based on data from World Development Indicators (2019). *, **, and *** denote significance level for Wald Statistics at 10%, 5% and 1% respectively. Values in the Table represent the computed Wald statistics.

The causality results in Table 6 suggest that there is export-led growth in Namibia and South Africa, but not in Botswana, eSwatini, and Lesotho. Namibia's results are consistent with Jordaan and Eita (2007). Their study confirmed the validity of the export-led growth hypothesis in Namibia. Similarly, the results for Lesotho and South Africa are consistent with Bahmani- Oskooee and Economound (2009). Their study found evidence of the export-led growth hypothesis in South Africa and a few other African countries but could not establish the direction of the long-run relationship between exports and economic growth in Lesotho.

There are different possible factors behind the varied experiences of SACU countries concerning the export-led growth hypothesis. One possible reason is that export-led growth in South Africa is likely to have resulted from the country's export base, which is more diversified than is the case with other SACU countries. In Namibia, significant export-led growth could be because while the country suffers from a narrow export base, its exports are not so vulnerable to external shocks as confirmed by the results from structural break tests discussed earlier in this article (also see the Appendix).

Another observation from causality results is that though this study could not confirm the export-led growth in Botswana, the results are consistent with Bosupeng (2015). That study revealed that economy of Botswana is driven by growth-led dynamics and not by export-led growth. Compared to the results from other studies conducted in developed countries, the results for this study are not different. Evidence from

some of the previous studies shows that although exports and output could be positively related, sometimes there is no unidirectional causality from exports to output, which rules out the validity of the export-led growth hypothesis (see Konstantakopoulou, 2016; Nesset, 2008; Shan & Sun, 1998).

CONCLUSIONS

The Southern African Customs Union (SACU) economies have switched the focus for their trade and industrialisation strategy from import substitution to export orientation for quite some time. However, whether SACU countries have realised significant growth effects from implementing export-oriented policies is controversial. This article revisits the export-led growth hypothesis debate in the Southern African Customs Union area, given the structural breaks. As is the case in several other emerging economies, exports from SACU countries have found it even more difficult to reach international markets due to a decline in export demand following the global economic crisis. Given the effect of the global economic crisis and structural changes on export demand, this article extends the empirical investigation by incorporating a structural dummy variable in the analysis.

The empirical results indicate a positive long-run relationship between exports and economic growth in Botswana, Namibia, eSwatini, and South Africa, but not for Lesotho. Lesotho's results show a significant negative relationship between exports and economic growth during 1960-2019. These puzzling results could be due to Lesotho's economic development that has probably affected the country's export potential. According to the United Nations Classification (2018), Lesotho is the only country in the SACU area that is a Least Developed Country (LDC). From these results, this study maintains that the effective implementation of export-oriented policies in developing economies must be accompanied by measures that reinforce trade capacity but also tackle the developmental challenges. Such measures could involve enhanced collaboration with external donors and other independent agencies that could assist with aspects like the widening of markets for SACU economies.

The causality results show that the export-led growth hypothesis holds in Namibia and South Africa, but not in Botswana, Lesotho, and eSwatini. The overall results of this study pose critical implications for SACU countries. First, there is a need to identify and address the factors that could have obstructed the export-led growth strategy in Lesotho. For all SACU economies, there is a need to address the constraints such as narrow export base, lack of skills, and inadequate infrastructure.

The second implication arising from the results is that in light of harnessing freer trade activities in the union and the African continent, SACU members could identify alternative measures that could aid the successful implementation of export-oriented policies. This recommendation requires SACU countries to develop alternative structures that aim at promoting partnerships while also ensuring the removal of potential barriers to trade-led growth.

It is advisable for policymakers in SACU countries to support infrastructure development and trade-related logistics to benefit the member countries. On this recommendation, this study admits that it could take several years to change some of the structural impediments of SACU countries, such as undiversified exports and skills shortages. Nevertheless, SACU countries could still find alternative ways to fast-track improvements in technology and skills development to bring about harmonious export-oriented industry.

This study is not free of limitations. The study does not explore the export-led growth hypothesis at a sectoral level. Future studies could benefit from investigating the major economic sectors.

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Appendix A:

Table A1. Results of the multiple breakpoint tests

Country	Sequence	Break dates	Scaled F-statistic	Critical value
Botswana	1	2009	61.67*	13.98
	2	1991	44.96*	15.72
Lesotho	1	1977	117.63*	13.98
	2	1998	33.29*	15.72
	3	2009	20.13*	16.83
Namibia	–	–	13.37	13.98
eSwatini	1	1985	131.17*	13.98
	2	2010	21.41*	15.72
South Africa	1	1977	249.99*	13.98
	2	2000	25.73*	15.72
	3	1985	32.52*	16.83

Source: own computations based on data from World Development Indicators (2019). * indicates statistical significance at 0.05 level.

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Conflict of Interest

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The role of environmental concern in explaining attitude towards second-hand shopping

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ABSTRACT

Objective: The objective of the article is to examine the role which environmental concern plays in explaining attitude towards second-hand shopping and the intention to go on a second-hand shop visit.

Research Design & Methods: The Norm Activation Model, including an additional variable – environmental concern, was used as the main theoretical framework. The research was conducted in Spain and Poland in 2019, with data collected among 403 respondents in Spain and 438 in Poland via the CAWI method, which was further processed using SEM.

Findings: The research allowed to indicate that the influence of environmental concern on attitudes (AT) towards second-hand shopping (SHS) is higher in Spain than in Poland, but the ascription of responsibility for environmental issues has a low level of impact on AT in both countries. The awareness of the consequences has a similar level of influence on AT in both countries and this to a highest degree.

Implications & Recommendations: Providing products with a second life supports the development of a circular economy, but this requires positive attitudes of individuals, which may be built to the greatest degree by strengthening the ascription of responsibility for the environment.

Contribution & Value Added: To fill a gap in literature on the subject in the study, it was aimed to develop a model explaining the impact of environmental concern on individuals' attitudes towards second-hand shopping.

Article type: research article

Keywords: environmental concern; second-hand shopping; Norm Activation Model; purchase attitude

JEL codes: D12, Q56

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INTRODUCTION

Second-hand shopping (SHS) intensively supports a circular economy, the fast development of which has been observed due to the increasing threat of climate catastrophe. SHS is defined as buying goods which were previously possessed by someone else (Roux & Guiot, 2008). It is an old phenomenon. For hundreds of years, people have exchanged, sold, bought and used second-hand products, but this did not attract much attention of researchers (Damme & Vermoesen, 2009). The rising power of production and producers, as well as new products in general were in focus. For years, second-hand products were associated with poverty, people used second-hand products mainly because they could not afford to buy new ones or they experienced a shortage of products, which was characteristic for socialist countries (Rulikova, 2019). However, what we have been observing for about 30 years, is the rapid growth of used product consumption, also in wealthy countries (Guiot & Roux, 2010). This has also gained a lot of interest of researchers in recent years (Abbes, Hallem, & Taga, 2020; Fernando, Sivakumaran, & Suganthi, 2018; Herjanto, Scheller-Sampson, & Erickson, 2016; Liang & Xu, 2018; Michno, 2019; Schallehn, Seuring, Strähle, & Freise, 2019). It is a kind of paradox that people who can afford to buy new items prefer to buy used ones. Why do they do that? The motivation is complex but it includes

economic factors (on the basis of price orientation, the power of bargaining, as well as critical orientation); ideological motivation – the need to be unique and nostalgia (Padmavathy, Swapana, & Paul, 2019), as well as hedonic and recreational motives – treasure hunting (Guiot & Roux, 2010). Ecological reasons for buying second-hand products have also been tested, but the results are not clear. Some results show that purchasing vintage or second-hand clothing is not directly motivated by ecological awareness (Cervellon, Wigley, Carey, & Harms, 2012). But other research provides evidence that the perceived sustainability of buying second-hand products positively influences the attitude towards buying them (Ek Styvén & Mariani, 2020). What is also important, there is great diversity of environmental reasons or being willing to act sustainably among consumer groups (Clausen, Blättel-Mink, Erdmann, & Henseling, 2010). The aim of this article is to examine the role of environmental concern (EC) in explaining second-hand shopping and then the intention to visit a second-hand shop. The Norm Activation Model was used as the main theoretical framework because environmental behaviour is related to people's values (Poortinga, Steg, & Vlek, 2016; Saleem, Eagle, Yaseen, & Low, 2018). We took EC into account by including a separate variable used for measuring general attitudes towards environmental issues and by designing two other independent variables derived from NAM: ascription, of responsibility as well as consequence awareness within the context of the environment. To the best of our knowledge, there have been no studies in which a model has been built and tested that would explain the attitude toward second-hand shopping or the intention to make a second-hand shop visit using the above mentioned variables.

Our study was conducted among 842 respondents from two countries, Poland and Spain, which strongly differ in terms of environmental concern; in Poland it is rather low, whereas in Spain it may be considered one of the highest in Europe (Poortinga *et al*., 2018). Structural equation modelling was implemented to conduct data analysis. The article has the following structure: the concept of environmental concern and its impact on consumer behaviour is first presented; then, second-hand shopping both in Poland and in Spain; and – as the last part of literature review – the hypotheses are developed. Finally, the method of collecting and processing the data is described, the results discussed and the conclusions presented.

LITERATURE REVIEW

The notion of concern for the environment and its influence on consumer behaviour

Environmental concern may be defined as one's perception and conviction that humans cause danger to the natural environment, and at the same time, are paradoxically, willing to protect it (Fransson & Gärling, 1999). Researchers apply this term when referring to a myriad environment-related conceptions, emotions and knowledge, as well as attitudes, values or behaviours (Bamberg, 2003). This concept entails, inter alia, three aspects: i) the rational awareness of a problem, ii) emotional affection due to a problem, and iii) willingness to undertake action in solving a given problem (Franzen & Vogl, 2013).

Environmental concern may be considered as the awareness of consequences when applying the norm activation theory of altruism proposed by Schwartz (1977). Empirical evidence indicates that concern for the environment may have major influence on pro-environmental behaviour. From this perspective, it seems to induce a sense of responsibility towards action, pushing a norm that is personal, or moral obligation towards acting in a certain manner (Kumar, Manrai, & Manrai, 2017). Pro-environmental norms mirror the degree to which an individual experiences some personal obligation towards contribution to solving an environment-related issue (Stern, 2000).

Attitudes concerning environmental issues are dependent on the relative significance that an individual places on himself, humankind, as well as the planet as a whole (Klöckner, 2013). According to Stern and Dietz (1994), the aforementioned attitudes may be connected to environmental consequences, categorised as egoistic or social-altruistic, and furthermore, biospheric outcomes concerning to three various underlying orientations of values. This value-basis theory could be considered as an extension of the Schwartz (1977) norm-activation model of altruism. It would suggest that environmental issues come forth due to people becoming conscious of the detrimental effects on something valued by them.

It seems interesting to view not only personal differences, but also those at a national level when considering environmental concerns, which are strongly linked with wealth of the nation. People residing in richer countries demonstrate greater concern for the environment. Individuals' environmental concern is affected by how wealthy a country actually is (Klöckner, 2013).

Nonetheless, differences from country to country are less defined than those found for individuals within a given country. According to Franzen and Vogl (2013), the environmental concern a person experiences is based on socio-demographic factors, i.e. gender, age, annual income and level of education. Furthermore, environmental concern is also linked to general trust towards others, affiliation to a party, as well as post-material values. Females tend to experience more concern than males. This may have its explanation in viewing various social roles. Those younger exhibit higher concern than older individuals, probably for the reason that their upbringing was during times of media attention focused on this issue. Nevertheless, environmental concern first shows an increasing trend to then decrease along with the aging process. Income level is further connected with environmental concern. Along with an increase in income, the higher the level of concern for environmental problems. Two facts allow us to find an explanation for this phenomenon. First of all, the affluent do not consider economic problems to be a concern. Thus, they may move on to other queries. Secondly, those with higher material status, as a rule, are more consumption-oriented, purchasing private goods and having a higher demand for public goods. Their willingness to pay the price for better-quality public goods is higher. Finally, education level is directly linked to environmental concern (Zsóka, Szerényi, Széchy, & Kocsis, 2013). If one's knowledge regarding environmental problems is higher, their concern for these issues is analogously greater.

Moreover, the orientation of values also regards environmental concerns. This may be explained by viewing the post-materialism hypothesis proposed by Inglehart (Inglehart, 1997). This theory indicates that when faced with changes, a society tends to develop economic-wise, while an economic crisis causes further generations to have higher materialistic values (i.e. economic growth, stability of prices). Generations that grow up in the conditions of economic prosperity demonstrate stronger post-material values (freedom as well as self-realisation). Post-material values have a positive connection with concerns for the environment for economic prosperity is not a matter to be solved.

Environmental concern turns into environmental behaviour when people make the decision to act. There are several types of pro-environmental behaviours. Determinants of action and their influence are varied. One group of environment-related behaviours is linked with the concept of frugality (reduction of use, recycling, re-using objects) (Fujii, 2006). In this sense, second-hand buying could be considered as an environmental behaviour related to the concern about the limited availability of natural resources. An attitude that is frugal is connected with cooperative behaviour in dilemmas regarding resources or behaviours concerning their conservation (Wilke, 1991). This requires motivation to save these resources, the concept of "efficiency", as well as strong confidence placed in others. The other side of second-hand buying is linked to the fact that some people that buy and use second-hand products may do so simply because they do not have the money to afford to buy new ones. This could be in connection with the egoistic outcomes pointed to by Stern, Dietz, and Kalof (1993) as frugal behaviour can be explained because of monetary cost savings.

The history of selling used products is quite long. Before the industrial revolution, when the supply of goods was not sufficiently large, all groups of people used to buy second-hand products, including even those affluent. Mass production caused a huge increase in supply, thus access to the offer of new products became much easier. The charity shops organised in Britain were very likely the first outlets oriented towards the sale of used products (Borusiak & Kucharska, 2019).

Second-hand shopping in Poland

In Poland people have used second-hand goods for years, but they did not buy them. They were distributed among family members or neighbours. The first shops with second-hand products appeared in Poland in the 60s of the 20th century and they offered products imported from Western Europe. They operated as commission stores, so goods were purchased from individuals who obtained them in the form of private imports. Products sold in those shops were recognised as high-quality, unique, desirable and quite expensive (Berlińska, 2008). But at the beginning of the 1990s, a new type of shop appeared –

offering used products (mainly clothes) imported on a huge scale from Western Europe. The products were very cheap (they were sold by weight) and very poorly presented. At the same time, Poland started to undergo an economic transformation which, at first, resulted in a high level of unemployment. People shopped at second-hand stores because buying new clothes and other products was not within their economic reach, thus buying used products was associated with economic necessity and low material status. Due to the results of research conducted in Poland in 2019, subjective norms (injunctive) regarding second-hand shopping were negatively related to second-hand product purchase intention. This means that bad associations with SHS still exist and second-hand shopping is not a desired behaviour. But what is also very important, the results of the same study show that personal norms regarding second-hand products are positively related to SHS intentions (Borusiak, Szymkowiak, Horska, Raszka, & Żelichowska, 2020). It is hard to assess the size of the used products market in general. It consists of two main segments: cars and fashion. Buying used cars in Poland is regarded to be smart shopping (due to the significant price drop of a new car even after short usage), although automobiles are not actually sold in second-hand shops. The number of shops in Poland was estimated at over 30 000 entities in 2015 (and still growing), mainly selling clothes. Approximately half of Polish society visits them, mainly for economic reasons and due to economic motivation (Rybowska, 2017).

Second-hand shopping in Spain

There are not many studies concerning second-hand buying in Spain. Traditionally, Spanish people have bought and used second-hand products for generations. This behaviour was linked to scarcity and poverty. Nowadays, two additional orientations are related to second-hand buying: fashion and sustainability. It can be said that it is more probable that consumers who are materialistic and environmentally-friendly will support the latter than those who are not. According to Mercado Nacional de los Mercados y la Competencia (MNMC) (2019), in 2018, 32% of second-hand buying was books and music, electronics totalled 14% (smartphones, ipads, etc.), 13% clothes and shoes, 11% was dedicated to furniture. The rest included sports (7%), cars (6%) and bicycles (6%). Furthermore, the value of second-hand buying through e-commerce in Spain grew from almost 20 million Euros in 2014 to almost 36 million Euros in 2017 (MNMC, 2019). This illustrates that it is a growing sector for some types of products, especially those related to an old-fashioned image.

In general, it is not clear how much second-hand buying is due to sustainability concern, to fashion or financial reasons in Spain. However, according to the Second Hand Effect report (2016), CO_2 emissions in Spain decreased in 2016 by more than 700 000 tons thanks to the used products market development. Among all the categories presented in the report, the so-called “vehicle” sales supported gas emission reduction the most - by 0.6 million tons. This reduction in the emission of carbon is equivalent to eliminating the negative results of all the traffic that a city like Madrid generates in almost three months or the production of almost three million sofas. Regarding savings generated in other categories, 65 000 tons stand out in the “home” sector or the 60 000 in "electronics". They are followed by such categories as “children and babies” (13 072) and “leisure and sports” (13 702).

Hypotheses development

As mentioned above, the Norm Activation Model (NAM) was applied as the main theoretical framework. The NAM is widely used for explaining the motives of altruistic, pro-social behaviour which benefits other people (Bamberg, 2012; Saleem *et al.*, 2018; Schwartz, 1977). Pro-environmental behaviour is regarded to be a special case of pro-social behaviour. According to the NAM, a person’s pro-social and pro-environmental personal norms, intentions as well as behaviours can be explained by two main variables or constructs: awareness of consequences (AOC) and ascription of responsibility (AOR). Being aware of consequences suggests whether a person is aware of any negative consequences that may be experienced by others or for those things an individual values when not acting in a pro-social manner. Ascribing responsibility is described by feelings of responsibility for negative consequences of not being pro-social. They influence pro-social behaviour with a personal norm as a mediator (De Groot & Steg, 2009). In the current study, AOC is related to the consequences of second-hand shopping for the

environment. According to the objective of this study, the awareness of consequences may be considered an important element predicting the attitude towards second-hand shopping (SHS) on the environment, which enables us to formulate the first hypothesis as follows:

H1: Being aware of the consequences (AOC) related to second-hand shopping on the environment has a positive correlation with the attitude towards second-hand shopping (AT) both in Poland (H1a) and in Spain (H1b).

The second variable –ascription of responsibility in this study is also related to environmental issues, thus, our second hypothesis was erected as the following:

H2: Ascribing responsibility for environmental concerns (AOR) has a positive correlation with the attitude towards second-hand shopping (AT), both in Poland (H2a) and in Spain (H2b).

As the main focus of this research is connected with environmental concerns, we included that variable into the research model and formulated the following hypothesis:

H3: Environmental concern (EC) is positively related to the attitude towards second-hand shopping (AT), both in Poland (H3a) and in Spain (H3b).

The final hypothesis is based on the assumption derived from the Theory of Planned Behaviour, stating that individual behaviour can be predicted, *inter alia*, by a certain attitude towards a given behaviour (Ajzen, 1991). This enables formulation of the hypothesis number four as:

H4: Attitudes towards (AT) thrift shopping have a positive correlation with intention of visiting a second-hand shop (ITV), both in Poland (H4a) and in Spain (H4b).

The proposed research framework is presented in Figure 1.

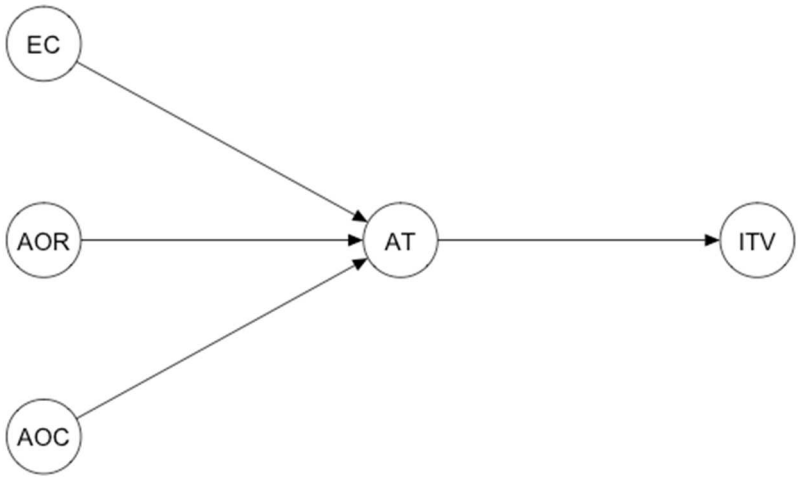

Figure 1. Research framework
Source: own elaboration.

RESEARCH METHODOLOGY

The study both in Poland and Spain was conducted using a self-administered questionnaire. It contained questions concerning five constructs (variables); attitude towards second-hand shopping (AT), environmental concern (EC), ascription of responsibility for environmental issues (AOR), being aware of the consequences of a SHS for the environment (AOC), intending to make a visit to a second-hand shop (ITV). The respondents provided their comments on the 1-7-point Likert scale 7 (1 – meaning "I strongly disagree" to 7 – denoting "I strongly agree"). The list of items used in the questionnaire is presented in Table 1. Participants were recruited from among undergraduate and graduate students of various fields. Participation in the study was voluntary, and participants did not receive any remuneration in Spain (Alicante, Seville, Valencia and Madrid) or in Poland (Poznań, Wrocław, Kraków). Additionally, the authors applied snowball sampling in order to increase the sample size. In total, 841

fully-completed surveys were collected between January and November 2019, including 438 from Poland and 403 from Spain. The number of participants in both groups is statistically equal to Chi^2 (1) = 1.38, p = 0.24. In the case of Polish respondents, the average age was 24.24 (SD = 6.24, min = 17, max = 68). The study involved 327 women (75.68%) and 111 men (25.34%). The average age in the Spanish group was 22.44 (SD = 2.56) and 329 were women (81.63%).

Table 1. Constructs and items applied in the research

Construct	Item	Source
Attitude towards second-hand shopping (AT)	AT1. I am satisfied when I buy used products.	(Joshi & Rahman, 2017; Maichum, Parichatnon, & Peng, 2016)
	AT2. I think buying a used product is beneficial.	
	AT3. I think buying a used product is a good idea.	
Environmental concern (EC)	EC1. I have great concern for the state of the environment in the world.	(Maichum *et al*., 2016)
	EC2. I feel readiness to reduce my consumption to play my part in protecting the environment.	
	EC3. Major social changes are needed to protect the environment.	
Ascription of responsibility for environmental issues (AOR)	AOR1. All customers need to take on responsibility for environmental problems that are caused by industry.	(Shin, Im, Jung, & Severt, 2018)
	AOR2. I think that every customer is partly responsible for the environmental deteriorations caused by industry.	
Awareness of consequences of SHS for the environment (AOC)	AOC1. In my opinion, second-hand shopping may help decrease the pace of exhausting natural resources.	(Shin *et al.*, 2018)
	AOC2. It is plausible that the second-hand may influence the environment.	
	AOC3. The second-hand sector may have effects on climate changes.	
Intention to go to a second-hand store (ITV)	ITV1. I am planning to visit a second-hand shop (brick & mortar or e-commerce).	(Shin *et al.*, 2018)

Source: own study.

This study was carried out in two stages, as in the proposal by Anderson and Gerbing (1988), indicating to conduct a separate analysis of validity and reliability of the constructs, as well as to test the hypotheses on the basis of the assumed research model applying structural equation modelling. This made it possible to estimate multiple regression equations conceptualised in the model implementing latent variables (Hair, Black, Babin, & Anderson, 2009). The R programming environment plus Lavaan, Psych and semTools suites were utilised in our analysis.

RESULTS AND DISCUSSION

Confirmatory analysis was conducted to assess the measurement model reliability and validity (Table 2). CFA results, taking a division into two groups into account, suggest compliance with the values proposed by Hair *et al*. (2012) ($\chi2$ = 198.92; CFI = 0.98; TLI = 0.97; GFI = 0.96; IFI = 0.98; $\chi2/df$ = 2.84; p<0.00, as well as RMSEA = 0.06).

All items of factor loading were above the level of 0.71, exceeding the recommended value of 0.6 (Chin, Gopal, & Salisbury, 1997). Furthermore, in order to conduct measurements of scale reliability, internal consistency was assessed applying Cronbach's α (Hair *et al*., 2012; Jarvis *et al*., 2003). The values obtained for Cronbach's α were within the range of 0.85 to 0.93 in the Polish group, and from 0.71 to 0.87 in the Spanish group, demonstrating good and very good consistency, as suggested in the work by Hair *et al*. (2012). To measure convergent and discriminant validity, two parameters were applied, that is Composite Reliability (CR) and Average Variance Extracted (AVE) were applied in addition to standardised factor loading. The AVE values came between 0.52-0.82, giving a total of 0.68,

exceeding the acceptable threshold of 0.5, as proposed by Hair *et al*. (2009). The CR values also surpassed the acceptable limit equalling 0.6, the values within the range of 0.77 to 0.94, totalling 0.96. The values obtained exceed the recommended values across both sets of data, indicating internal consistency of variables (Bagozzi & Yi, 1988). The AVE square root was also greater than the correlation between all of the constructs, which further suggests a good level of adequacy (Table 3). On the basis of the results presented above, it may be assumed that the presented conceptual model represents good validity, both being convergent and discriminant, as well as reliable.

Table 2. Confirmatory factor analysis

Country	Construct	Item	Loading	p-value	Cronbach's α	CR	AVE
Poland	AOC	AOC1	0.903	***	0.93	0.93	0.82
		AOC2	0.939	***			
		AOC3	0.884	***			
	AOR	AOR2	0.917	***	0.92	0.92	0.85
		AOR3	0.931	***			
	AT	AT4	0.898	***	0.93	0.88	0.77
		AT5	0.856	***			
		AT6	0.868	***			
	EC	EC1	0.84	***	0.85	0.86	0.75
		EC2	0.886	***			
	ITV	ITV1	1	***			
Spain	AOC	AOC1	0.891	***	0.77	0.76	0.52
		AOC2	0.599	***			
		AOC3	0.714	***			
	AOR	AOR2	0.918	***	0.87	0.88	0.78
		AOR3	0.845	***			
	AT	AT4	0.747	***	0.87	0.82	0.64
		AT5	0.808	***			
		AT6	0.858	***			
	EC	EC1	0.765	***	0.71	0.71	0.55
		EC2	0.719	***			
	ITV	ITV1	1	***			

Note: α – Cronbach's α, CR – Composite Reliability, AVE – Average Variance Extracted, *** ≤ 0.001
Source: own calculations.

Table 3. Correlations between constructs

Group	AOC	AOR	AT	EC	ITV
PL	**0.91**				
	0.63	**0.92**			
	0.60	0.50	**0.88**		
	0.51	0.53	0.46	**0.87**	
	0.49	0.46	0.64	0.42	NA[x]
ES	**0.72**				
	0.39	**0.88**			
	0.64	0.41	**0.80**		
	0.43	0.38	0.53	**0.74**	
	0.30	0.12	0.38	0.36	NA[x]

Note: values distinguished in bold represent the AVEsquare root x = Construct was measured using one item
Source: own calculations.

Empirical analysis applying the assumed theoretical model allowed to reveal a good fit ($\chi 2 = 182.92$; CFI = 0.98; TLI = 0.97; GFI = 0.96; IFI = 0.98; $\chi 2/df = 2.47$; RMSEA = 0.06), which may also be implemented in the assessment of influence on attitudes towards second-hand shopping and the intention to go to a second-hand shop via evaluation of the structural model with regard to size and significance

of path coefficients as well as R^2. All analysed path-coefficients in both groups were statistically significant and exceeded the 0.10 benchmark (Hair *et al*., 2012) – see Table 4. The results allow to suggest that AT formation via the following three components: AOC, AOR and EC, has positive and direct influence on ITV both in Poland and in Spain. Consequently, the results support all the hypotheses formulated in this study. This variance, which is explained via the model in the Polish group, was 48% for ITV and 49% for AT, while in the case of the Spanish data, R^2 was 17% and 58%, respectively.

Table 4. Effects between factors

Group	Endogenous variable	Exogenous variable	Beta	B	SE	*p*-value	Hypothesis
PL	AT	AOC	0.43	0.60	0.08	***	H1a: supported
ES	AT	AOC	0.49	0.75	0.11	***	H1b: supported
PL	AT	AOR	0.16	0.22	0.08	**	H2a: supported
ES	AT	AOR	0.10	0.16	0.08	*	H2b: supported
PL	AT	EC	0.22	0.31	0.08	***	H3a: supported
ES	AT	EC	0.35	0.54	0.11	***	H3b: supported
PL	ITV	AT	0.69	0.68	0.05	***	H4a: supported
ES	ITV	AT	0.41	0.29	0.04	***	H4b: supported

Note: * = <.05, ** = <.01, *** = <.001
Source: own calculations.

The differences are evident: in Spain, the influence of environmental concerns on the attitude towards second-hand shopping is much higher than in Poland. The influence of the other two variables on the attitude is similar in Spain and in Poland. But what is also interesting, the influence of attitudes towards second-hand shopping on individuals' intentions to go to a second-hand store is higher in Poland than in Spain.

The objective of the study was to analyse the role played by environmental concern in explaining the attitude towards second-hand shopping and the intention to go to a thrift shop. The Norm Activation Model, including an additional variable – environmental concern – is used as a theoretical framework. This model explains motivation for altruistic behaviour which benefits other people. The research was conducted in Poland and Spain. These two countries demonstrate vast differences regarding environmental concern. Spain shows one of the greatest environmental concern levels, but Poland is rated with its low level (Poortinga *et al*., 2018).

The study was based on four hypotheses. The first three hypotheses look at factors that create people's attitudes. These are the awareness of the consequences of second-hand shopping for the environment (AOC), ascription of being responsible for environmental issues (AOR), and concern for it (EC); which have a positive correlation with the attitude towards shopping at second-hand stores (AT). The last hypothesis relates to how attitude becomes behaviour (Theory of Planned Behaviour); the attitude towards second-hand shopping (AT) has a positive connection with the intention to go to a second-hand shop (ITV). The results confirmed all the hypotheses formulated in the current study. Therefore, it can be said that awareness can create attitude, and attitude can lead to action. However, the reasons for this action can be different. That is to say, people can be aware that their actions have an effect but the reasons for their actions may not necessarily be related to this awareness. In such a sense, there are differences between Spanish and Polish attitudes and behaviours. These results reveal two facts:

- the effects of environmental concern on attitudes towards second-hand shopping are greater in Spain,
- the influence of the attitude towards second-hand shopping is higher in Poland.

The variance that can explained by this model in the Polish group was 48% for ITV and 49% for AT, in the case of the Spanish dataset, R^2 was 17% and 58%, respectively. This result is in coherence with the findings obtained by Poortinga *et al.* (2018): 95.7% of Spanish people agree with the sentence that climate change is at least in part due to the activities undertaken by humans (89% in Poland). These differences may be explained by the socio-economic differences between these two countries. Engagement in climate change seems to be weaker (with exceptions) in Central and Eastern Europe. This

could be seen as a lasting confidence in the generation of fossil-based electricity, however, it is also the economic state and the pace of transformation among society that is experienced in this field (Balžekiene & Telešiene, 2017). People living in wealthier countries tend to show higher environmental concern (Klöckner, 2013), but this environmental concern does not necessarily imply that people take all actions positively influencing the environment. In fact, differences that are individual within a country seem to be more strongly defined than those found among various countries (Franzen & Vogl, 2013). In this sense, according to Poortinga *et al*. (2018), the opinion that the impact of climate change will be bad (that could be understood as an environmental concern) is supported by 87.9% in Spain (which is the highest number among all countries), but only by 66.3% in Belgium, 67.2% in Finland, 71.0% in Norway and 77.4% in Germany. All these countries are wealthier than Spain. This opinion is shared by 70.4% of Polish people. Furthermore, there may be a link with location, the more to the south of Europe, the higher the environmental concern as these areas may be more exposed to climate change effects. However, this idea is in contradiction to the fact that fossil fuel taxes appear to have more popularity in given Western European countries (Nordic), with a majority only in Sweden and Finland. The tax has the least popularity in Poland and Russia, while being relatively unpopular in the remaining East European and some South European countries, i.e. Spain and Portugal (Poortinga *et al*., 2018). It may be stated that Spanish people are aware of climate change effects but are not willing to pay for avoiding them. This could also explain second-hand buying in Spain.

The complexity of the reasons for second-hand buying is also demonstrated by the fact that the awareness of the consequence of second-hand shopping for the environment (AOC) and ascription of responsibility towards environmental issues (AOR) have similar influence in both countries.

CONCLUSIONS

In order to understand second-hand buying habits, it must be taken into account that second-hand product purchase is a clear, sustainable behaviour, but can also be related to fashion-oriented actions or nostalgia (Padmavathy, Swapana, & Paul, 2019). In many countries (also in Poland and Spain), SHS is also reinforced by the growth of on-line second-hand shopping (MNMC, 2019). Furthermore, another motivation for buying second-hand goods can be poor personal financial situation (Rulikova, 2019) and/or frugality, or the opportunity to buy a product of fairly good quality for a low price (Raszka & Borusiak, 2020). It seems clear that there is no easy explanation. As pointed out by Poortinga *et al*., (2018), Europeans, on average, seem to express more concern about energy costs than about climate change; one of the most greatly effective policies being reduction of carbon emission, increasing taxes on fossil fuels, which are considered far less favourable than other policies presented in the study. So, it could be said that people in both countries know the importance of their actions for the environment and that they are aware that second-hand shopping has a positive effect on the environment, but the main reasons for purchasing second-hand items are different in each country. This is also reinforced by differences in explained variances. Furthermore, some of the reasons for second-hand buying are not necessarily linked to environmental concern.

The current research could enable politicians and managers to be aware of how people understand environmental concern and link this concept to their own consumption behaviours, i.e. the attitude towards second-hand shopping. Effective communication campaigns promoting used-product purchases should implement environmental concern as an argument encouraging people to embrace second-hand shopping. These campaigns could contain presentations of the consequences of business models like fast fashion and build consumer responsibility towards the environment.

There are several limitations of the current study. The first is connected with the size and structure of the sample. The sample is not representative as respondents were mainly young; the average age among Polish respondents was 24.24 (SD = 6.24) and among those Spanish, 22.44 (SD = 2.56); while women made up the majority of the sample. This could bias the results, as it is known that young people and women are more environmentally concerned. Another limitation is the method of data collection: the applied technique of self-reporting may cause the results to be biased because of the effects of social desirability. Also important seems the fact that no specific products were considered

in the current research trial, and it is possible that the meaning of environmental concern on attitudes towards second-hand purchases depends on the type of product or even the retail format where it is sold (for example, it may be more favourable on second-hand online platforms).

In future research, it would be interesting to find out the determinants of attitudes towards second-hand purchases other than environmental concern, both in Poland and Spain, and to examine the strength of their impact on these attitudes. In further studies, the influence of environmental concern, responsibility ascription as well as consciousness of outcomes on attitudes towards second-hand purchase in other countries could also be considered in order to verify Inglehart's post-materialism hypothesis. Future research could be devoted to the influence of concern for the environment on intention to behave in an eco-friendly fashion, especially those which are connected with a willingness to accept making economic sacrifices in order to ensure proper protection of the environment.

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Internationalisation motives and the multinationality-performance relationship: The case of Polish firms

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ABSTRACT

Objective: The objective of the article is to investigate the moderating role of internationalisation motives on the multinationality-performance relationship of Polish firms.

Research Design & Methods: Our article uses panel regression models on a dataset of 97 Polish listed "new" MNEs with foreign activities established in the period of 2006-2013, gathered in a primary study.

Findings: We found that Polish firms show an inverted U-curve relationship between multinationality and performance, which is contrary to the predictions resulting from the traditional S-curve analysis. Moreover, we found that political-institutional motives positively moderate the multinationality-performance curve for sales growth, while efficiency-seeking motives have a similar effect on return on assets and return on sales. Finally, competitiveness-related motivations behind internationalisation moderate the inverted U-shaped curve for return on equity, although they are different than expected.

Implications & Recommendations: The article addresses the gap of limited consideration for the stage of internationalisation of the firms under study by focusing on newly internationalised firms from a post-transition economy. Secondly, as one of the very few studies, our work follows some recent calls to unbundle the substance of internationalisation by considering the moderating role of internationalisation motives.

Contribution & Value Added: This study helps to advance international business literature by testing longitudinally the MP relationship for Polish firms between 2006 and 2013.

Article type: research article

Keywords: multinationality; performance; internationalisation motives; Polish firms; international diversification

JEL codes: F23, L25, M16

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INTRODUCTION

The link between multinationality and performance (MP) has been an intensively debated research question for a couple of decades (Bausch & Krist, 2007; Glaum & Oesterle, 2007; Matysiak & Bausch, 2012; Nguyen, 2017; Gugler, 2019). The research question is examined through the lens of several academic disciplines, including international business, strategic management, entrepreneurship, finance, and marketing (Kirca, Roth, Hult, & Cavusgil, 2012; Obłój 2019). Extant literature predominantly focuses on establishing whether a general relationship between multinationality and performance exists and, furthermore, whether an ideal degree of internationalisation can be established. Despite a growing body of empirical research, the findings on the MP linkage remain inconsistent (Verbeke, Li, & Goerzen, 2009) and often described as contradictory or confusing (Nguyen & Kim, 2020). Some scholars attribute this situation to methodological limitations of extant research and call for a more in-depth exploration of contextual variables (Purkayastha, Sharma, & Karna, 2020; Tallman & Pedersen, 2012).

Thus, recent years have brought a growing recognition that the MP linkage is contextual by nature, i.e. its shape depends on a number of moderating variables (Bausch & Krist, 2007; Kirca *et al*., 2012; Geleilate, Magnusson, Parente, & Alvarado-Vargas, 2016; Shin, Mendoza, Hawkins, & Choi, 2017). Indeed, a number of factors identified in earlier studies can moderate the MP relationship, including firm-specific advantages and country-specific factors, e.g. firm size, industry, firm age, experience gathered in foreign market, R&D investments, and institutions in the country of origin.

Some argue that – among these contextual variables – the appropriate understanding of performance outcomes of internationalisation requires considering its underlying motives (Barłożewski & Trąpczyński, 2021; Elango, 2012; Verbeke & Brugman, 2009; Verbeke, Li, & Goerzen, 2009; Singla & George, 2013). In fact, firms expanding for different reasons will set their performance priorities in different areas, and hence the evaluation of internationalisation outcomes can be different for specific dimensions (Benito, 2015; Caputo, Pellegrini, Dabic, & Dana, 2016). Thus, internationalisation motives might be a critical variable altering the M-P relationship (Contractor, 2012; Verbeke & Forootan, 2012). However, we must highlight that extant literature offers no extensive study on the role of motives as a contextual variable (Li, 2007; Nguyen, 2011; Ruigrok & Wagner, 2004; Verbeke & Brugman, 2009; Verbeke & Forootan, 2012). While a number of factors associated with the international organisational structure of firms is used as explanatory variables, an investigation of strategic moderating factors remains mostly absent (Purkayastha *et al*., 2020). Jain and Prakash (2016) find a negative moderation of the MP relationship for the predominance of labour-seeking motives as opposed to market-seeking motives among Indian software firms. However, in doing so, they do not account for different performance effects of distinct motives, thus obscuring the actual implications of different types of foreign expansion. In fact, as in the case of many MP studies, there remains a disconnection between theoretical arguments and affected performance measures (Richter, Schmidt, Ladwig, & Wulhorst, 2017), particularly as the results can vary greatly among specific measures (Mullen & O'Hagan Luff, 2018).

In light of the above, the objective of this study is to investigate the moderating role of internationalisation motives on the multinationality-performance relationship, explicitly taking into account the multidimensional character of performance. In order to do so, the article uses panel regression models on a dataset of 97 Polish listed companies with foreign activities in the period of 2006-2013, with a total of 682 observations. Our study was set in the context of a post-transition economy in line with earlier calls to contribute to MP research progress by focusing on less advanced economies (López-Morales & Gómes-Casas, 2014; Geleilate *et al*., 2016). The post-transition context can pose an interesting opportunity for enriching existing international business concepts (Bučiūnienė, 2018; Paliokaite, 2019). Firms that originate from such an institutional setting were either created in the 1990s or existed before but without a chance to engage in international entrepreneurship (Sedziniauskiene, Sekliuckiene, & Zucchella, 2019). Either way, these firms are new to international business, hence they can be referred to as newly internationalised firms (Hoskisson, Wright, Filatotchev, & Peng, 2013; Ramamurti, 2009). Their study can help to advance MP research by focusing on the challenges of the early stage of international activities (Doryń & Stachera, 2008; Karasiewicz, 2013).

Our study contributes to existing research in several ways. Firstly, it follows recent calls to unbundle the substance of internationalisation by considering the moderating role of internationalisation motives (Verbeke & Brugman, 2009; Verbeke, Li, & Rugman, 2009; Li, 2007; Verbeke & Forootan, 2012; Jain & Prakash, 2016; Tohidi, Ghorbani, & Karhasi, 2020). Secondly, it dissects the effect of internationalisation on distinct performance dimensions, thus contributing to a more multidimensional understanding of this relationship. Moreover, by considering sales growth, we depart from the predominant focus on accounting measures in existing studies, which we believe increases the robustness of performed analyses (Li, 2007; Richter *et al*., 2017; Verbeke & Forootan, 2012).

This article has the following structure. The literature section discusses the overall nature of the MP relationship in the light of earlier research. Subsequently, we consider the role of internationalisation motives in order to formulate research hypotheses. Further, the article details the research design. The following section focuses on regression results, and the article finishes with a number of suggestions for future research.

LITERATURE REVIEW

Conceptual overview

The perspectives on the character of the MP relationship have evolved over years, only to end with no agreement among scholars (Matysiak & Bausch, 2012; Verbeke & Brugman, 2009; Verbeke & Forootan, 2012; Berry & Kaul, 2016). Firstly, researchers expected to detect a simple direct positive relationship between internationalisation and performance. Some argued that benefits of internationalisation would outweigh potential costs (Rugman & Oh, 2011). In subsequent years, others questioned this view and tested negative linear MP linkage (Matysiak & Bausch, 2012; Ruigrok & Wagner, 2004). The proponents of simple direct relationship argued that foreign exchange costs and other would outweigh potential benefits derived from international expansion – after reaching some point costs arising from liability of newness, liability of foreignness, complexity of foreign operations, and costs of product adaptation to local demands (Li, 2007). However, there appeared a third option that showed no significant MP relationship (Sullivan, 1994).

Since the 1990s, the benefits and costs of foreign expansion are more closely verified, as scholars introduce new U-curve and inverted U-curve shapes (Matysiak & Bausch, 2012; Annavarluja & Beldona, 2000). The U-curve stresses the importance of learning in foreign markets, which may help to increase benefits and reduce costs that arise at the inception phase of internationalisation (Ruigrok & Wagner, 2004; Rugman & Oh, 2011). According to Contractor (2007), the U-curve shape is likely to occur in developing countries and young industries, in which only a small fraction of firms managed to achieve a high level of internationalisation. In turn, the inverted U-curve shape should accentuate the stage of over-internationalisation, in which the increased costs of expansion outweigh additional benefits. This might be explained by growing costs of coordinating foreign operations with increasing cultural, geographical, legal, and language differences (Contractor, 2007; Li, 2007; Glaum & Oesterle, 2007; Gorynia *et al*., 2019). To reconcile the conflicting results, both curves were combined and a new, S-curve relationship with three stages was proposed (Contractor, Kundu, & Hsu, 2003). The first stage of early internationalisation refers to the dominating liability of newness and foreignness over initial benefits from expanding abroad. The second stage reflects the effect of scale economies and learning after a certain point. The last stage exhibits costs that arise from over-internationalisation and decreasing benefits (Riahi-Belkaoui, 1998). More recently, an M-curve relationship was proposed to explain performance changes of INVs (International New Ventures), i.e. young companies that started internationalisation from their inception. The proposal extends the S-curve and assumes that there is one more initial stage at very low levels of multinationality, in which INVs achieve net performance gains thanks to entering foreign markets (Lee, 2010). The last proposition is an inverted M-curve, which can be observed for firms following product customisation strategies (Almodovar, 2012).

In the context of post-transition economies and based on some earlier evidence, we argue that the internationalisation degree generally leads to better results than focusing solely on the local market. Usually, this result is explained by a set of benefits that may be derived from expanding abroad, including firms' greater flexibility, risk diversification, enhanced image, acquired knowledge and skills, ownership, and economies of scale (Wach, 2017; Szałucka, 2013; Cieślik *et al*., 2019, Cieślik *et al*., 2018; Kosach, Duka, Starchenko, Myhaylovska, & Zhavoronok, 2020). In general, firms should overcome costs of international expansion that may include e.g. costs of organisational change, coordination of entities and activities on foreign markets, monitoring of external providers, and institutional and cultural distance (Contractor, 2012).

Contrary to the opinion of some scholars on CEE firms' internationalisation, we suggest that – due to a relatively low level of internationalisation – there is no necessity for these newly internationalised firms to invest extensive resources at the very first stage of foreign expansion. This is largely because at the beginning they may receive only occasional sales orders that do not require a particular customisation of products and value chains. This agrees with the argument about the

predominance of market-seeking firms amongst firms from Central and Eastern Europe (Barłożewski, 2018; Gorynia, Nowak, Trąpczyński, & Wolniak, 2016). Even though they start foreign operations at a larger scale, new MNEs frequently seek opportunities in markets with a similar demand structure to their own, in order to be able to quickly expand their sales (Ramamurti, 2009). Such an approach further reduces costs of adaption to a new business environment. Hence, despite the lack of necessary knowledge, the predominant focus on competing with low prices and not quality, and also even due to the highly intensive competition in European markets, we argue that the short initial stage of internationalisation of Polish firms is linked to increasing performance, which represents the effect of "global illusion" identified by Almodovar (2012). However, we agree that shortly after companies undertake internationalisation in a more systematic manner, the liabilities of foreignness and related costs will increase, thus leading to performance declines (Gu, Yang, & Strange, 2018). Some global companies can suffer performance losses due to ineffective communication in this stage (Nwabueze, & Mileski, 2018; Haller, 2020). With accumulated business experience, firms eventually achieve a point of inflection, at which benefits from internationalisation begin to dominate over potential costs.

Accordingly, as a baseline effect for further discussion, we argue that there is an inverted U-curve M-P relationship in the case of Polish firms:

H1: There is an inverted U-shaped relationship between multinationality and performance for newly internationalised firms from post-transition economies.

Moderation hypotheses development

International expansion follows a number of motives (Verbeke & Brugman, 2009; Li, 2007; Jain & Prakash, 2016; Verbeke & Forootan, 2012; Witkowski *et al*., 2017; Pokorna *et al*., 2019; Lee & Fernando, 2020). Internationalisation motives determine location choices, ownership structure, choice of entry modes, and expected returns from expanding abroad, e.g. increase in net profits, risk reduction, increase in market share, access to diverse resources, and avoidance of hostile home-country conditions (Verbeke, Li, & Goerzen, 2009; Benito, 2015; Miller, Lavie, & Delios, 2016; Caputo *et al*., 2016). Moreover, let us underline that firms can be driven by a set of various internationalisation motives with similar significance, with distinct effects on firm performance in the long term.

There are a few studies devoted to the impact of international strategy and its motives on foreign market performance. They generally indicate a contingency between motivations for investment and their performance outcomes. In fact, internationalisation can fulfil a number of objectives from the headquarters' viewpoint (Demirbag, Tatoglu, & Glaister, 2007). Thus, it is the very motives behind particular expansion decisions that drive performance in its specific dimensions (Verbeke & Brugman, 2009; Verbeke, Li, & Goerzen, 2009). While this claim might seem intuitive at first glance, business reality shows that pre-defined targets for foreign expansion are far from guaranteed, often resulting in strategy changes (Benito & Welch, 1997). Thus, the verification of the relationship between motives and outcomes provides a direct indication as to the effectiveness of a firm's foreign expansion, particularly if we consider firms at early stages of internationalisation (Ramamurti, 2009).

Dunning (1988a; 1988b) argues that foreign expansion is undertaken to fulfil certain goals from the headquarters' perspective. These motives include strategic asset-, market-, and efficiency-seeking (Dunning, 1993). The first category of motives embraces firms that expand abroad in order to increase their international market share. Apart from market size and expected growth, such an expansion can be driven by the fact that a firm's key competitors, suppliers, or clients may establish themselves in a given market and incite the focal firm to follow them. Furthermore, the quest for additional sales in a foreign market may require a more substantial degree of adaptation to local market specificity. Moreover, not least important is the fact that costs of delivering products or services to a foreign market may make it economically more viable to serve it through a more direct presence.

In empirical research on the link between the internationalisation degree and its economic outcomes, some studies that examine the impact of the percentage of foreign revenues on firm performance find that it affects returns on sales, albeit in different ways. In fact, Quian (2002) finds a positive

effect, Capar and Kotabe (2003) observe a U-curved relationship, Contractor *et al.* (2003) and Li (2005) note a horizontal S-shaped effect, while Li and Quian (2004) find an inverted U-curve. In accordance with the outgoing argumentation that the impact of internationalisation on performance is context-dependent, we argue that the market-seeking focus in foreign expansion does not express itself in the direct effect of foreign sales on internationalisation performance, but it is moderated by the extent to which this foreign expansion is driven by market-seeking motivations. In fact, firms with dominant market-seeking motive of internationalisation will be most likely focused on using their own brands and trademarks to increase sales by expanding into new markets, which should mostly manifest itself in the growth of sales, market share, and volume sold (Benito, 2015). Moreover, empirical research on foreign affiliate performance identifies market-related objectives to affect sales performance more than other motivations (Demirbag, Tatoglu, & Glaister, 2007). Thus, in the context of newly internationalised firms from transition economies, we propose that:

H2: The effect in H1 is positively moderated by market-seeking motives so that this effect will be the strongest for sales growth.

However, internationalisation is not only driven by market-related motives. Firm expansion can also be driven by institutional factors. North (2011, p. 3) defines institutions as "the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction" (North, 2011, p. 3). Previous research based on this theoretical perspective to examine e.g. choices of foreign location (e.g. Globerman & Shapiro, 1999; Habib & Zurawicki, 2002), market entry strategy (e.g. Estrin, Baghdasaryan, & Meyer, 2009; Rodriguez, Uhlenbruck, & Eden, 2005; Yiu & Makino, 2002; Głodowska *et al*. 2019; Maciejewski & Wach, 2019), and outcomes of aforementioned decisions (e.g., Brouthers, Brouthers, & Werner, 2008). Based on the institutional view, these studies generally argue that the higher quality and stability of the institutional framework of a foreign market leads to higher levels of activity by foreign firms. By expanding to different institutional frameworks, firms can evade market imperfections in their own markets or leverage imperfections in the host countries (Kindleberger, 1969).

We argue that newly internationalised firms from transition economies – which perceive institutional pull factors in foreign markets as fiscal incentives or, conversely, push factors related to deficiencies in the home country environment – may be more inclined to leverage foreign markets potential and develop sales more easily thanks to the said easier environment for doing business. Obviously, institutional incentives can also be related to efficiency-driven investments abroad, but the aforementioned market-seeking focus of newly internationalised firms from transition economies shifts attention to sales-related effects. We argue that at initial stages of sales-driven internationalisation, the marginal benefits for companies are increasing. In the same vein, Geringer *et al*. (2000) find support for the fact that the ratio of sales by foreign subsidiaries – i.e. established in foreign institutional frameworks – positively affects sales growth. Conversely, from a certain threshold, the addition of further markets driven by institutional incentives can be questioned in light of the positive marginal effects on sales growth, as with the higher advancement of international operations the strategic needs of firms should be balanced across other motives. In this vein, we formalise this moderating effect as:

H3: The effect in H1 is positively moderated by home and host country institutional motives so that this effect will be the strongest for sales growth.

Another important motivation for international expansion pertains to the rationalisation of a firm's overall business operations by reaping cost benefits in such areas as manufacturing or sales by either concentrating activities in new locations with favourable cost levels or better exploiting existing capabilities (Dunning, 1993; Benito, 2015). Firms driven by the efficiency-seeking motive may be more oriented towards the long-term reduction of supply and production risks and costs (Li, 2007; Verbeke & Brugman, 2009; Krajcirova, Vaňová, & Munk, 2019).

In the context of post-transition economies, research evidences that lower labour costs of the foreign markets affect firm performance in foreign markets (Chan, Isobe, & Makino, 2008; Li *et al*., 2011;

Uhlenbruck, 1997; Jansto, Polakovič, Hennyeyová, & Slováková, 2019). For domestic enterprises it becomes risk factor in recruitment (Bilan, Mishchuk, Roshchyk, & Joshi, 2020), however, foreign firm performance increases due to efficient labour attracting strategies. Taking into account that this strategic focus in international expansion will predominantly affect the cost side of performance due to lower production costs or costs of serving clients, we can obviously expect a positive effect on return on sales (ROS). However, from a certain threshold of efficiency-driven expansion (e.g. construction of new units in low-cost host countries), we may question the ability to generate new high-margin sales, given the early stage of development of newly internationalised firms.

However, we simultaneously argue that since efficiency-driven expansion is frequently related to the possession of foreign manufacturing units, cost savings are related to substantial investment in foreign production, logistics, and advanced technological assets, hence further improving the ratio of the return on assets (ROA). Therefore, the positive effects of such investments will be observed at first. Subsequently, the costs of depreciation and amortisation, but also costs related to current maintenance and operation of new systems, facilities, and equipment, will outweigh potential benefits in the medium term, thus reinforcing performance declines in the conventional inverted U-shape. Accordingly, we formalise this posited moderating effect as:

H4: The effect in H1 is positively moderated by efficiency-seeking motives so that this effect will be the strongest for ROS and ROA.

Finally, an important category of foreign expansion motives is related to enhancing the overall competitiveness of firms involved in international business operations (Trąpczyński, 2016; Androniceanu, Kinnunen, Georgescu, & Androniceanu, 2020). By managing cross-border operations located in different countries, firms can gain access to various tangible and intangible resources that can be shared across the organisation (Dunning & Lundan, 2008). Studies on foreign affiliate performance consistently demonstrate that the possession of intangible resources by parent firm favours foreign affiliate performance (Brouthers, Brouthers, & Werner, 2008; Fang *et al.,* 2013; Xia, Qiu, & Zafar, 2007).

However, if the parent firm is to benefit from foreign expansion it must possess sufficient managerial capabilities (Hennart, 2012). Foreign expansion may be introduced either by transferring marketing knowledge to the foreign venture so as to enhance the international market position or managing knowledge transfers to learn from foreign affiliates and make new knowledge available to sister affiliates. Particularly in the case of emerging country firms – whose capabilities and experience with managing a growing international scale of activities are often inferior to their Western counterparts – the development or acquisition of more sophisticated capabilities can be a crucial source of competitive advantage. For instance, core role of the international orientation in SMEs competitive advantage is proved for Polish ventures (Sikora & Baranowska-Prokop, 2018).

Accordingly, the acquisition of new capabilities matters for performance as it allows firms to access inputs unavailable in domestic input markets (Verbeke & Brugman, 2009). Thus, given these otherwise unavailable new capabilities, the firm can realise more profit potential, since the absorbed know-how can arguably enable the realisation of higher margins owing to marketing capabilities and product quality, which usually stem from strategic asset-seeking by post-transition economy firms, including those from Poland. Hence, the return on sales can be expected to be particularly accentuated thanks to this type of internationalisation. At the same time, such an expansion should also manifest itself visibly in the return on equity (ROE) due to the fact that for the same equity, the firms that increase their profits are those that become more competitive in terms of e.g. strong brands or distribution channels. Hence, we propose that:

H5: The effect in H1 is positively moderated by motives related to competitive pressures so that this effect will be the strongest for ROS and ROE.

Figure 1 below summarises the conceptual development in the form of our research framework.

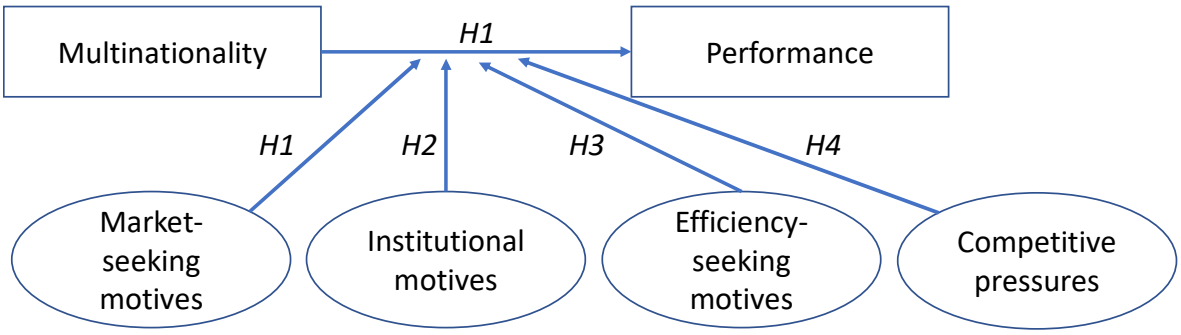

Figure 1. Analytical framework
Source: own elaboration.

RESEARCH METHODOLOGY

Data collection

Our analysis relied upon data obtained from 97 Polish listed newly internationalised firms with foreign activities established in the period of 2006-2013 (also see Barłożewski & Trąpczyński, 2021). As data on foreign activities are not readily available, we needed to use a two-stages approach to building a proprietary database for further exploitation. Firstly, we obtained firm-level financial data from consolidated financial reports and further documentation issued by all Polish firms quoted on the Warsaw Exchange Stock for the period under scrutiny. The established database contained 335 companies. Among those companies, we compiled a sample of 143 firms with min. 5% of total sales revenues received in other countries for the last three years to be covered in the analysis.

In the second stage, primary survey data on 97 firms from the sample of 143 was collected using mix mode CATI+CAWI method (Computer Assisted Telephone Interviewing + Computer Assisted Web Interviews). The questionnaire consisted of questions relating to geo-graphical regions served, experience gained abroad, entry modes, and motives of internationalisation. The survey was conducted under the authors' supervision by Indicator, an external research agency. Data gathered at both stages was subsequently merged and as a result, we constructed a data set containing 97 firms and altogether 682 observations.

Variable operationalisation

Dependent variable

Performance as a dependent variable was measured using return on equity (ROE; net profits to equity), return on assets (ROA; net profits to total assets), return on sales (ROS; net profit to total revenue from sales), and sales growth (percentage change in annual total revenue from sales). All of these are accounting measures mostly used in the research of the MP relationship, mainly due to easy access to data (Glaum & Oesterle, 2007) and because they are commonly used in extant research (Verbeke & Brugman, 2009). The use of these distinct measures was important for us to indicate the differentiated effects of internationalisation led by different motives, as postulated in our research hypotheses.

Explanatory variables

The main explanatory variable was the internationalisation degree computed as foreign sales to total sales (FSTS). Other authors underline that this measure is very limited in scope, captures only one dimension of multinationality, and thus may present a distorted view of firms' advancement in foreign operations (Sullivan, 1994; Dörrenbächer, 2000). However, as FSTS is frequently used by scholars (Yang & Driffield, 2012; Li, 2007; Bausch & Krist, 2007), sometimes even recommended until a better measure is designed and developed (Rugman & Oh, 2011), so we introduced the measure to the analysis due to very limited access to other data.

The moderating variables that make part of the research hypotheses were internationalisation motives. They were incorporated into the analysis using dummy variables representing market-seeking,

efficiency-seeking, competitiveness-related, and political-institutional internationalisation motives. The market-seeking motives stood for firms' willingness to gain new markets for their products and services. Efficiency-seeking motives represented firms' goals to reduce costs and increase profitability. Motives related to competitiveness were linked to gaining competitive advantages by acquiring new resources like technology, knowledge, skills absent from the local market but available abroad. The last category of motives was understood as entering other countries because conditions for doing business in those markets improve or foreign investors receive additional benefits or new restricted laws and regulations are introduced in the home market. In order to define the dominant internationalisation motives for a given entity (market, efficiency, competitiveness, and political-institutional), we formulated five detailed questions for each type. Answers were collected on a five-point Likert scale. The construction of questionnaire and rating values assigned to individual statements are described in Annex 1. For each of those motives, a firm-level compound index was designed and calculated (Cronbach's alpha coefficient greater than 0.5). The index represented the importance of a particular motive for a given company. Subsequently – regarding each motive – the sample was divided into two subsets with low and high value of the index, based on which adequate values for dummy variables were assigned.

Control variables

A series of control variables was added to the analysis so as to offset potential influences on performance known from extant literature.

Firm size (Bausch & Krist, 2007; Ruigrok & Wagner, 2004; Kirca *et al.,* 2012) was measured as medium vs large company, which was defined based on criteria applied in the Polish law:

1. A large company employs more than 250 people, its annual sales revenue exceed PLN 200 mio. (ca. EUR 50 mio.) and total assets exceed PLN 172 mio. (ca. EUR 43 mio.).
2. A medium company has 50 to 249 employees, sales revenue and total assets exceed both PLN 40 mio. (ca. EUR 8 mio.).

Firm age was controlled for by dummy variables representing young firms (equal to or below 12 years of age) and old firms (above 12 years of age). Another variable was geographical diversification, which represented the number of regions (out of seven) in which a given company was present. A further control variable was international experience, also reflected by whether expansion occurred after Poland joined the European Union (EU).

A subsequent variable was firm industry, as the literature argues that industry implies external conditions that significantly moderates the MP relationship, including minimal revenue threshold for scale economies (Hennart, 2007), initial costs incurred at the inception phase of internationalisation, changes required to adapt to local demands, and types of resources required to expand successfully, e.g. R&D for technology firms and advertising for firms delivering services (Kirca *et al.,* 2012). Our categorisation of industry features construction, heavy, light, IT and advanced technologies, trade, and services industries, for which we also controlled with dummy variables.

The final control variable related to the overall economic condition which was reflected by real GDP change in EU-15 countries (the number of member countries in the EU prior to the accession of ten candidate countries on May 1, 2004).

Analytical procedures

In order to verify our research hypotheses, multiple regression analysis was employed. Although we expected a U-curve relationship, we also tested linear and cubic shapes of the MP linkage to gain deeper insight into the empirical findings. Prior to the analysis, we verified whether our assumptions required for this statistical method were met. The variables were normally distributed, which we examined with the Kolmogorov-Smirnov test. There was no presence of heteroskedasticity issue, which we checked with the analysis of scattergrams of standardized residuals. There was no multicollinearity issue between independent variables, which we checked with the Pearson's r correlation coefficient (coefficient value exceeding 0.7 would imply problems with multicollinearity). No autocorrelation was present, which we checked with the Durbin-Watson test.

Table 1. Sample characteristics

Sector	Specific activities	Large firms, *N=58*		Medium firms, *N=39*		Total, *N=97*	
		#	%	#	%	#	%
Construction sector	construction firms	9	9.2%	2	2.1%	11	11.3%
	developers	–	–	1	1.0%	1	1.0%
	construction materials	5	5.2%	2	2.1%	7	7.3%
	Total	*14*	*14.4%*	*5*	*5.2%*	*19*	*19.6%*
Trade and services	retail trade	3	3.2%	1	1.0%	4	4.2%
	wholesale trade	4	4.1%	4	4.1%	8	8.2%
	hotels and restaurants	1	1.0%	–	–	1	1.0%
	other services	1	1.0%	3	3.1%	4	4.1%
	Total	*9*	*9.3%*	*8*	*8.2%*	*17*	*17.5%*
Heavy industry	chemical	1	1.0%	–	0.0%	1	1.0%
	electromachinery	8	8.3%	4	4.1%	12	12.4%
	energy	–	–	1	1.0%	1	1.0%
	metal	9	9.3%	3	3.1%	12	12.4%
	automotive	3	3.1%	–	–	3	3.1%
	Total	*21*	*21.7%*	*8*	*8.2%*	*29*	*29.9%*
Light industry and consumer goods	wood	2	2.1%	–	–	2	2.1%
	light industry	1	1.0%	4	4.1%	5	5.1%
	food	6	6.2%	3	3.1%	9	9.3%
	artificial materials	1	1.0%	3	3.1%	4	4.1%
	Total	*10*	*10.3%*	*10*	*10.3%*	*20*	*20.6%*
High-tech sector	pharmaceuticals	1	1.0%	1	1.0%	2	2.0%
	IT	3	3.1%	6	6.3%	9	9.4%
	telecommunications	–	–	1	1.0%	1	1.0%
	Total	4	4.1%	8	8.3%	12	12.4%
TOTAL		**58**	**59.8%**	**39**	**40.2%**	**97**	**100.0%**

Source: own study.

Moreover, we used the Cook's distance measure to identify influencing outliers, which indicated values greater than 1.0 as influential. As the data on internationalisation degree measured by FSTS were significantly skewed (high value of skewness), we transformed it using the natural logarithm function to ensure normal distribution of that variable. The characteristics of our sample are reported in Table 1.

As we employed a panel data set in our study, we considered whether to estimate either fixed effects or random effects models as they may generate different results. One of the major preconditions to use random effects models was that observations should be selected randomly from a given population (Dougherty, 2011). In our study, this assumption was not met as our initial sample consisted of all firms listed on the Warsaw Stock Exchange, and they cannot be considered a random sample. Thus, we decided to employ the fixed-effects model.

RESULTS AND DISCUSSION

The results of the moderated panel regression are reported in Table 2. We found that the M-P relationship fits an inverted U-shape curve for all dependent variables except from ROE, thus providing partial support for our baseline Hypothesis 1. The reasons that ROE did not exhibit a significant M-P linkage could be found in the observed high fluctuations in firms' equity over the eight-year period covered. In turn, this could have been not only the result of achieved financial performance but also of the firm's dividend policy, merger and acquisition transactions, and other reasons. Consequently, they could have a strong impact on return on equity precluding from identifying a significant MP relationship for this dependent variable. The inverted U-shape of the MP linkage allowed for making inferences about the

optimal degree of internationalisation to maximize performance in terms of profitability and firm growth. Depending on the variable, the maximum point was achieved at FSTS between 12% and 13%.

Our findings from the context of newly internationalised firms from a post-transition economy help to understand the apparent inconsistencies in extant findings on the MP relationship (Barłożewski & Trąpczyński, 2021). Scholars argue that the said relationship may be only a loose association, as there is no specific reason for it to exist (Hennart, 2011; Berry & Kaul, 2016). However, the question arises whether firms would internationalise if they did not anticipate superior results related to the new activities (Contractor, 2012). We argue that for firms entering the international business environment with limited experience and managerial capabilities, internationalisation generally does bring benefits – up to a certain point, from which these apparent limitations become more impactful. This perspective resonates with the arguments of Powell (2014) in that both insufficient and excessive levels of multinationality can be negatively related to performance. We should also note that newly internationalised firms do not expand out of necessity but rather managerial choice, as in the case of the studied empirical context the home market is large enough to offer early development opportunities, at least in some industries (Sekliuckiene, Jarosiński, & Kozma, 2019).

Furthermore, with regard to the hypothesised effects of internationalisation motives, the findings for the moderation of market-seeking motives turned out to be significant for sales growth and ROE (Table 2), yet the moderating term coefficient had a negative sign, thus indicating an opposite moderation to the expected relationship. Due to the complexity of interpreting moderating effects, we prepared a graphical representation of the moderating effect of market-seeking motives in two subgroups (where the group corresponding to a low relevance of a given motive embraces survey evaluations below the value of 3.5, while the group corresponding to a high relevance includes values above that threshold). As Figure 2 revealed, the curve for stronger market-seeking motives did become flatter for lower FSTS levels, but the curve declined more steeply for higher FSTS levels. Paradoxically, a sharper focus on market-seeking motivations in foreign expansion based on the experience of "new" multinationals could not turn out to be sustainable in the end. Therefore, on the whole, we found no support for Hypothesis 2. However, we should note that the size effect measured by the adjusted R^2 was between 11.6% and 15.7%, which can be considered moderate.

Table 2. Findings of moderated panel regression for firm performance

Explanatory variables	Model 1	Model 2	Model 3	Model 4
Year	-0.004	-0.004*	-0.004**	-0.008***
Intercept	-3.037***	-0.799***	-0.808***	-1.107***
Main effects				
FSTS	-0.047†	-0.016†	-0.023**	-0.007
H1: (FSTS)^2	-0.006	-0.004*	-0.006***	0.000
Market-seeking motives	-0.008	0.004	-0.009	0.014
Home and host country institutional motives	-0.008	-0.017*	-0.016*	-0.026*
Efficiency-seeking motives	-0.002	-0.009	-0.020*	-0.023†
Motives relating to competitive pressures	-0.017	0.004	0.016*	0.003
Moderating effects				
H2: FSTS x market-seeking motives	-0.016†	-0.002	-0.005	-0.013*
H3: FSTS x home and host country institutional motives	0.021*	-0.001	-0.001	-0.002
H4: FSTS x efficiency-seeking motives	-0.011	0.006†	0.009**	0.004
H5: FSTS x motives relating to competitive pressures	0.006	-0.006*	-0.002	0.009†

Explanatory variables	Model 1	Model 2	Model 3	Model 4
Control variables				
Firm size	0.067***	0.018*	0.013**	0.039**
Firm age	0.018	0.001	0.017†	0.023
Geographic diversification	0.002	0.007***	0.006***	0.006**
Internationalisation since 2004 (1)	-0.006	-0.016†	-0.027**	-0.043***
Building and heavy construction (2)	-0.028	-0.002	-0.001	0.002
Light manufacturing industry (2)	0.015	0.011	0.015	0.012
Wholesale and retail trade, services (2)	0.047†	-0.005	0.003	0.017
IT and new technologies industry (2)	0.002	0.017	0.000	-0.003
GDP change (UE-15) in real terms	0.030***	0.008***	0.008***	0.012***
R^2 adj.	0.157	0.116	0.154	0.129
F	6.860***	5.702***	7.712***	6.235***
N	630	716	729	708

Significance levels: **p<0.01; *p<0.05; †p<0.1 Dependent variables: Model 1 – Sales growth, Model 2 – ROS, Model 3 – ROA, Model 4 – ROE. (1) Benchmark values relate to "Expansion before 2004" (entry of Poland into the EU). (2) Benchmark values relate to "Heavy manufacturing industry".
Source: own study.

On the contrary, in the inverted U-shape for sales growth (Model 1 in Table 2), the effect of the degree of internationalisation was positively moderated by institutional motives. In other words, the inverted U-shape was flatter for firms driven more strongly by institutional factors. In order to facilitate the interpretation of this effect, we provided a visual interpretation of the moderation in Figure 3. Accordingly, we found support for Hypothesis 3.

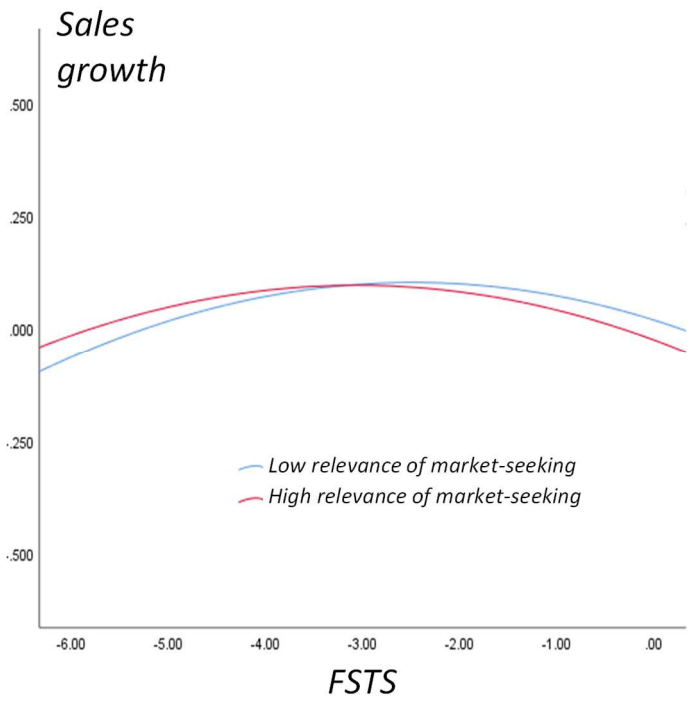

Figure 2. Moderating effect of market-seeking motives
Source: own elaboration.

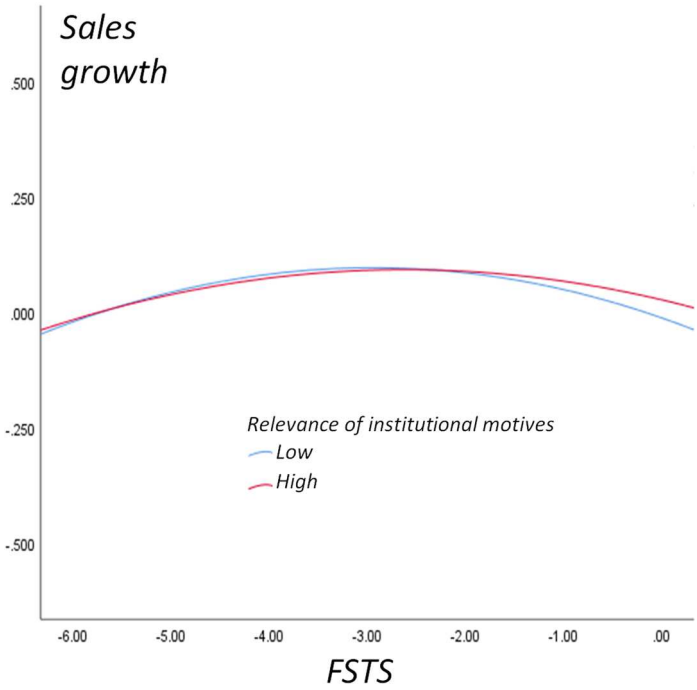

Figure 3. Moderating effect of institutional motives
Source: own elaboration.

Furthermore, we found that efficiency-seeking motives negatively moderate the inverted U-shape for both ROA and ROS, based on the regression results. The findings for efficiency-seeking motives may be explained by higher costs arising from liability of newness and foreignness compared to potential savings achieved through deployment of operations across borders. The regression results suggested that going abroad with efficiency-seeking motive in mind could be beneficial in terms of profitability measured by ROA and ROS in the long-term, after a higher degree of internationalisation is achieved. However, our complementary analysis of the moderated curves demonstrated some ambiguous findings (Figure 4). In fact, for both ROS and ROA, the moderating effect seemed to be negative, with the performance declining for higher levels of multinationality if the focus on cost efficiency was predominant. This would suggest that in the case of early-stage multinationals, the ability of managing cross-border efficiency-oriented operations may not turn out beneficial from the viewpoint of the entire firm.

Finally, for competitive pressure-related motives, we found support for their positive moderating effect for the effect of internationalisation on ROE (and negative for ROS), thus providing partial evidence in support of Hypothesis 5. In fact, internationalisation driven by competitive pressure is not oriented towards short-term profitability or cost-efficiency, as it is guided by more long-term, strategic premises. The graphical interpretation of moderations shown in Figure 5 corroborates this assertion.

To summarise the findings on the moderating role of internationalisation motives, we answer extant calls to decompose the contextual complexity behind the MP relationship (Griffith, Cavusgil, & Xu, 2008; Contractor, 2012; Kirca *et al*., 2012; Tallman & Pedersen, 2012; Yildiz, 2013; Berry & Kaul, 2016; Dittfeld, 2017). By decomposing performance into distinct dimensions, we show that internationalisation undertaken with different underlying logics has distinct implications from the parent firm's viewpoint (Trąpczyński, 2016). While scholars acknowledge that effects of the internationalisation degree must be considered from the perspective of motives (e.g. Jain & Prakash, 2016), they did not analyse the specific performance implications of various motives in a multidimensional manner.

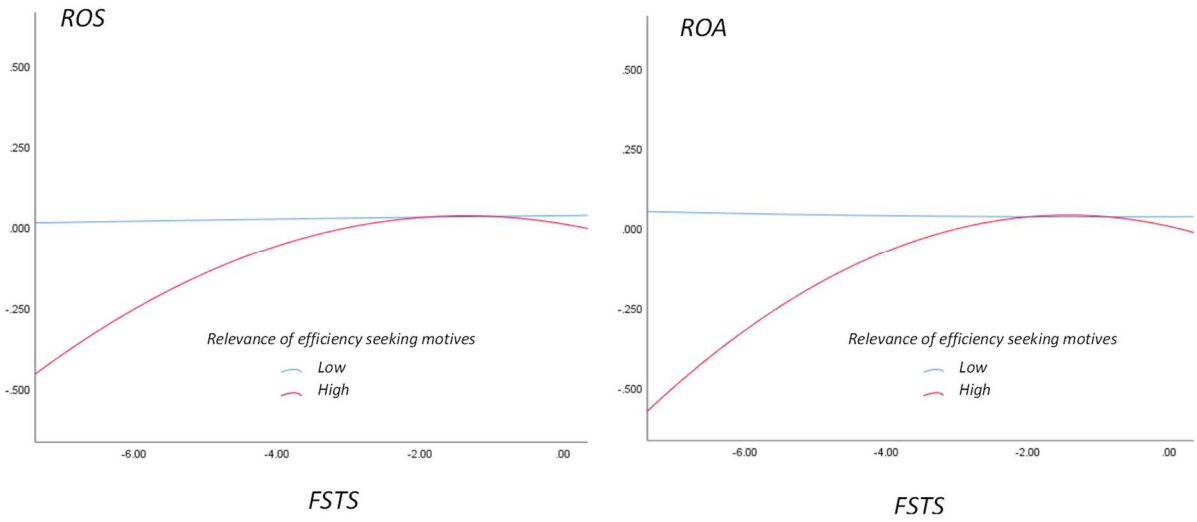

Figure 4. Moderating effect of efficiency seeking motives
Source: own elaboration.

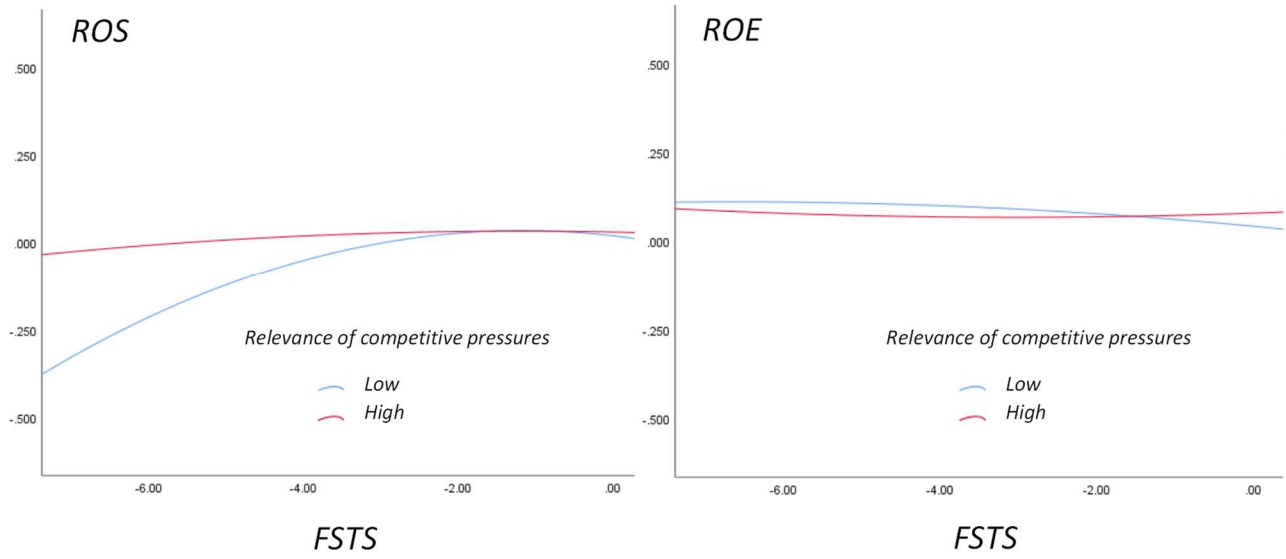

Figure 5. Moderating effect of competitive pressure-related motives
Source: own elaboration.

Among the control variables, only a few provided evidence of a significant effect, including firm size, geographical diversification, starting expansion after Poland accession to the EU and real GDP change in EU-15 countries. With regard to firm size, the findings suggest that larger companies achieved better financial performance than smaller firms, which confirms the analysis in the previous sections. In the case of Polish companies, this finding should be explained by access to larger resources and years of experience accumulated in the international arena.

The results for geographical diversification suggest that firms operating in a larger number of markets achieve higher profitability of assets and sales. This may lead to the conclusion that geographical diversification may reduce total risk. As far as firm experience goes, firms with the lowest experience – i.e. those which started foreign expansion after Poland accessed the EU – exhibited significantly lower results than other companies. Finally, a very significant control variable was real change in GDP of EU-15 countries, which are the main exporting partners of Polish firms. All this leads us to the conclusion that the GDP variable should be mandatory present in the future longitudinal research.

CONCLUSIONS

The relationship of the degree of internationalisation with firm performance is a continuously growing area of research, and studies devoted to newly internationalised firms from post-transition economies can pose a fertile ground for refining current knowledge in the field. In conjunction with continuously evolving views on the nature of the MP linkage, this warrants further discussion on that subject, especially when longer periods of analysis and – so far largely neglected – contextual variables are considered. This article contributes to the advancement of the MP relationship analysis in two ways. Firstly, we conducted a longitudinal analysis, which is arguably one of the very few such attempts in the CEE region. This analysis offers a strong support for an inverted U-shape MP relationship, which in turn proves to be contrary to theoretical predictions based upon commonly adopted S-curve in advanced economies.

The empirical findings seem to be more in line with the first two stages of the recently proposed M-curve, i.e. the "global illusion" and subsequent fall in performance. We may expect that the inverted observed U-relation would change with the increasing multinationality level of Polish firms. Then, new stages in the MP relationship could emerge giving empirical evidence for the inverted S-curve and, eventually, for the M-curve.

The unique contribution of our study pertains to the differentiated role of internationalisation motives on the relationship between multinationality and performance. At the same time, the study shows that performance is not a monolithic construct, and therefore different types of international operations have distinct effects on performance. We incorporated a large set of contextual variables, providing more texture to the frequently superficial treatment of internationalisation.

Among the tested control variables, a significant effect was observed for firm size, international experience, geographical diversification into dissimilar markets, and general economic conditions measured by percentage change of real GDP. Control variables not significant in the analysis comprised firm industry and firm age. This may lead to the conclusion that the contextual nature of the MP relationship can be related only to a limited set of variables, whose nature still must be identified and influence explained. We based our study on a limited empirical sample due to the constraints of data access. Future studies should use larger firm samples in a broader variety of industry settings in order to better control for sectoral effects, but also to capture more contextual effects. Moreover, studies recurring to more recent data could be used in order to compare the findings of the present study with the development of firms that were exposed to challenges of changing global environment and adjusted their business models accordingly. Still, the predominance of SMEs among the new multinationals under study here makes the findings relatively stable over time, since most fundamentals of the internationalisation process of these firms have not changed over the last couple of years, with high-tech and services constituting the minority of the sample.

However, let us note that the growing internationalisation degree of Polish firms may reveal other shapes of the MP linkage in the future. Based upon the findings from this study, we should first expect to see an inverted S-curve and eventually also an M-curve. The latter should be observed when Polish companies close the gap in terms of advancement in international activities between them and firms from developed countries. In turn, this will require not only the active exploitation of foreign markets but also the introduction of adequate internal changes to drive performance.

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Entrepreneurial marketing: Between entrepreneurial personality traits and business performance

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ABSTRACT

Objective: Practices of traditional marketing cannot be fully applied to small and medium-sized enterprises (SMEs). SMEs owners have a responsibility to replace the practice with innovative behaviour such as entrepreneurial marketing (EM). This objective of this study is to examine the role of EM in business performance and the role of entrepreneurial personality traits as antecedents of EM.

Research Design & Methods: A quantitative research approach was adopted with a questionnaire to collect data from 187 SMEs owner/managers in Indonesia. SEM-PLS analysis was used for hypothesis testing.

Findings: The results indicate that EM has a positive effect on business performance. SMEs owners/managers with the characteristics of extraversion, agreeableness, and conscientiousness can encourage the implementation of EM, which impacts business performance. Extraversion, conscientiousness, and openness to experience have a positive effect on business performance. EM is an important factor in maximising business performance, and entrepreneurial personality traits are needed to support the development of EM.

Implications & Recommendations: This study contributes to research specifically on the role of EM in improving business performance. In addition, it revealed the importance of the entrepreneurial personality traits of owner/managers in developing EM in SMEs.

Contribution & Value Added: This study offers an empirically based explanation of entrepreneurial personality traits effects on EM and business performance. It also identifies new opportunities for future research in the field of EM.

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INTRODUCTION

Marketing is a fundamental business activity for the achievement of small and medium-sized enterprises' (SME) growth and success (Franco *et al.*, 2014; Reijonen, 2010). Researchers agree that marketing in small firms is different from that of large firms. Marketing in SMEs is unstructured, spontaneous (Gilmore *et al.*, 2001), informal, and reactive to market opportunities (Franco *et al.*, 2014). This is because SMEs have limited resources (Becherer *et al.*, 2012; Sadiku-Dushi *et al.*, 2019), marketing knowledge (Gilmore *et al.*, 2001), and marketing capabilities (Sok *et al.*, 2017). Therefore, traditional marketing theory does not provide a sufficient explanation of marketing in SMEs (Reijonen, 2010). Entrepreneurial marketing (EM) develops as marketing in small companies with limited resources (Sadiku-Dushi *et al.*, 2019).

EM prioritises an 'effectual tactic' in meeting the unique needs of SMEs rather than prioritising marketing concept in general (Beverland & Lockshin, 2004), in which entrepreneurs recognise, explore,

and exploit opportunities leading to strategic decisions (Morrish, 2011). EM is more dynamic and sensitive than other approaches in providing opportunities (Mort *et al.*, 2012), and it is more customer-oriented: EM can bind customers like family (Sigué & Biboum, 2019) and is considered to be more low cost and innovative in marketing implementation (Sadiku-Dushi *et al.*, 2019). EM emphasises the role of ideas, intuition, and informal networks in marketing orientation (Stokes, 2000).

Entrepreneurs play an important role in developing opportunities for marketing in SMEs (Whalen *et al.*, 2016). One factor driving the success of entrepreneurs is individual characteristics (Brandstätter, 2011; Lazear, 2005). Through the personality approach, the type of personality causing the success of entrepreneurs can be discovered. According to Nave *et al.* (2017), personality predicts behaviour, and personality differences will cause differences in behaviour. Entrepreneurial behaviour tends to be informal, unplanned, and reliant on individuals' intuition and power to make things happen (Haworth & Brearley, 1991). Likewise, EM focuses on entrepreneurs' behaviour (Hills & Hultman, 2012). EM in small businesses is a part of entrepreneurial behaviour, so it will be influenced by the owner (Franco *et al.*, 2014).

Studies exploring EM were conducted by previous researchers (Miles *et al.*, 2015; Morrish, 2011; Stokes, 2000), while several other scholars used EM as an independent variable in growth and performance. Previous studies empirically shown that EM positively predicts performance (Becherer *et al.*, 2012; Eggers *et al.*, 2020; Fard & Amiri, 2018; Hamali, 2015; Sadiku-Dushi *et al.*, 2019). Researchers discussed the predictors of EM, such as environmental and organisational influences (Morris *et al.*, 2002), while others studied EM in a strategic context (Sullivan Mort *et al.*, 2012) and in relation to firm capabilities (Whalen *et al.*, 2016). Unfortunately, previous research on EM in SMEs remains limited (Peterson, 2020), especially about the role of entrepreneur on EM. Previous studies showing the role of entrepreneurial personality traits in business performance are still limited. Previous studies did not really support all personality traits dimension towards performance (Franco & Prata, 2019; Hachana *et al.*, 2018; Leutner *et al.*, 2014; Zhao *et al.*, 2010). Therefore, we address this gap in previous studies by investigating to what extent EM affects business performance, especially in the Indonesian context, while also investigating the role of entrepreneurial personality traits as antecedents of EM. As suggested by Hills and Hultman (2012), more complex research on EM is still required. Therefore, we propose our research model to fill the gap left by previous studies.

This study is based on quantitative data collected from 187 SMEs owner/managers in Indonesia. In developing countries, such as Indonesia, entrepreneurship is the backbone of the national economy because it can contribute to the creation of job opportunities. According to Statistics Indonesia (known locally as BPS), unemployment reached 7.05 million people in 2019, while poverty affected 25.14 million people. Furthermore, 70.49 million people (55.72% of the population) was working in informal activities (including self-employment, temporary work, freelance). The data shows that Indonesia must be able to reduce the amount of unemployment and poverty. One option is the development of SMEs, as informal business activities were proved to have especially high employment rates. According to Global Entrepreneurship Monitor (GEM) data, Indonesia had perceived opportunities rate (POR) of 54.9% in 2018, exceeding the global average of 45.6%. The perceived capabilities rate (PCR) was 64.1%, exceeding the global average of 49.15% (G.E.M., 2018). Based on the POR and PCR indicators, Indonesia has a strong potential to develop entrepreneurship. Therefore, EM is an important factor for the development of SMEs in Indonesia.

The following section will discuss the literature review to develop a hypothesis. Next, we will explain the measurements, the sampling method, data collection techniques, and data analysis. Then ensues the presentation of data analysis results and their discussion. The paper ends with conclusions and suggestions for further research.

LITERATURE REVIEW

Entrepreneurial marketing

EM is the exploitation of opportunities to obtain and retain customers through innovation, leveraging of resources, risk-taking, and value creation (Morris *et al.*, 2002). EM is conducted by small companies and new businesses that utilise available and limited resources (Becherer *et al.*, 2012; Ionita, 2012; Kraus *et*

al., 2010; Sadiku-Dushi *et al.*, 2019) by focusing on opportunities to design or develop something new to create value for customers (Hills & Hultman, 2012; Hisrich & Ramadani, 2018; Ionita, 2012). When actively applied and disseminated by top management, EM can evolve into an organisational culture that forms the basis for competitive advantages that are difficult to imitate (Whalen *et al.*, 2016).

There is a difference between entrepreneurial marketing and traditional marketing. Traditional marketing is customer-oriented: the method is the 4P or 7P marketing mix, with formal market intelligence. Meanwhile, EM is innovation-oriented: the methods are word-of-mouth, direct selling, and referrals, with market intelligence in the form of informal networking and information gathering (Stokes, 2000). Due to limited resources, SMEs often cannot apply traditional marketing directly. Jones and Rowley (2009) emphasise that that EM is an approach more recommended for SMEs than focusing on sales and promotion. The network referred to in the EMICO framework consists of customer relationships and networks, owner/manager personal communication networks (PCNs), business networks, university networks, and business support networks.

EM emphasises innovation, creativity, and proactiveness (Hisrich & Ramadani, 2018; Kraus *et al.*, 2010; Solé, 2013). Kilenthong *et al.* (2015) view the dimensions of EM as consisting of growth and opportunity orientation, customer focus, market analysis, value creation, and proximity to markets. Growth orientation reflects the owner's/manager's ambition to create growth (Kilenthong *et al.*, 2015) as a long-term company goal (Westerlund & Leminen, 2011). The second EM dimension emphasises opportunities, such as producing products or new processes (Becherer *et al.*, 2012), which has a long-term orientation towards exploiting opportunities (Hills *et al.*, 2008). Network marketing is an important dimension of EM, because owners/managers who rely on the network will obtain information about untapped customer values (Kilenthong *et al.*, 2015). SMEs generally obtain market information informally from customers (Lindh, 2005). The advantage is that the owner/manager is closer to the market and can identify opportunities directly (Kilenthong *et al.*, 2015).

Fard and Amiri (2018) state that EM affects SMEs' market and innovation performance. Franco *et al.* (2014) argue that EM has an important role in business growth and sustainability. Recent research by Sadiku-Dushi *et al.* (2019) tests EM dimensions against SMEs' performance, in which opportunity focus, resources leveraging, and value creation had a positive effect on SMEs' performance. Becherer *et al.* (2012) find that value creation as an EM dimension affects business performance: financial performance, growth, and customer satisfaction. In the context of research on EM in Indonesia, Al-Manasra *et al.* (2013) and Hamali (2015) state that EM affects business performance.

Previous studies contributed to the understanding of the relationship between EM and business performance, agreeing that EM is critical to SMEs' business performance. SMEs that implement EM will gain a competitive advantage and will differ from their competitors (Jones & Rowley, 2009). Thus:

H1: Entrepreneurial marketing has a positive effect on business performance.

Entrepreneurial personality traits

Personality traits are characteristics of an individual that include emotions, mindset, and behaviour (Mcshane & Von Glinow, 2010). Personality traits related to entrepreneurial business performance (Hachana *et al.*, 2018) become an important factor that encourages the success of entrepreneurs (Franco & Prata, 2019) because the personality traits of the owner/manager will affect company strategy (Peterson *et al.*, 2003). Personality will predict behaviour, while differences in a person's personality will lead to differences in behaviour (Nave *et al.*, 2017). Several personality trait models exist but the most popular one is the *Big Five* (Mcshane & Von Glinow, 2010; Northouse, 2019): extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. This study adopts the Big Five model.

Extraversion refers to individuals who enjoy social interaction, are sociable, expressive, and oriented to the outside world (Ciavarella *et al.*, 2004). Extraversion is manifested in full interaction with business activities, the owner/manager is involved in a self-development process (Franco & Prata, 2019). SMEs' activities involve social interaction, so extraversion plays a role in business performance because extroverted individuals tend to be directly involved in business activities. Franco and Prata

(2019) and Zhao *et al.* (2010) report that extraversion is a dimension of the Big Five model related to effective business performance.

Agreeableness is a term used to describe a person who is pleasant, warm, obedient, and trustworthy (Ciavarella *et al.*, 2004). Entrepreneurs with high agreeableness have positive interpersonal relationships (Zhao & Seibert, 2006) and are more likely to develop business continuity (Baron & Markman, 2000). Founders with personality traits of agreeableness tend to be more successful in managing family SMEs (Franco & Prata, 2019). Agreeableness can be a significant predictor of entrepreneurial success (Leutner *et al.*, 2014).

Conscientiousness is an awareness of the company's long-term goals (Ciavarella *et al.*, 2004), an entrepreneur must have a high level of awareness and a sense of optimism to deal with a dynamic business environment (Crane & Crane, 2007). They must be hard-working and persistent to achieve their goals (Zhao & Seibert, 2006). Franco and Prata (2019), Zhao *et al.* (2010), and Hachana *et al.* (2018) remark that conscientiousness is a dimension of the Big Five model related to effective business performance.

Neurotic individuals are often impulsive; they experience mood swings (Franco & Prata, 2019), feelings of anxiety, nervousness, sadness, and tension (Brandstätter, 2011), and they tend to lack the courage to take risks and build social capital (Baluku *et al.*, 2016). Entrepreneurs with low neuroticism are self-confident and calm (Zhao & Seibert, 2006). Franco and Prata (2019) argue that neuroticism is a dimension of the Big Five model that is negatively related to business performance. Zhao *et al.* (2010) and Hachana *et al.* (2018) observe that emotional stability is a characteristic of entrepreneurial personality related to effective business performance.

Openness to experience is a personality trait that describes someone who seeks new, imaginative, and creative ideas Zhao *et al.* (2010). However, it has been negatively related to business performance (Ciavarella *et al.*, 2004), even though the findings Franco and Prata (2019), Hachana *et al.* (2018), and Zhao *et al.* (2010) show the opposite to be the case.

Entrepreneurs have specific personal resources that enable them to take advantage of new opportunities by managing their resources (Alvarez & Busenitz, 2001). One of these personal resources are personality traits. If one's personality traits are valuable, rare, and irreplaceable, this will create a competitive advantage that will drive business performance (Franco & Prata, 2019). Thus:

H2a: Extraversion has a positive effect on business performance.

H2b: Agreeableness has a positive effect on business performance.

H2c: Conscientiousness has a positive effect on business performance.

H2d: Neuroticism has a positive effect on business performance.

H2e: Openness to experience has a positive effect on business performance.

EM is one of the marketing strategies in small businesses and part of entrepreneurial behaviour. Research conducted by Franco *et al.* (2014) on SMEs found that marketing activities were reactive to opportunities, meaning that the owner/manager determine the process of decision-making. According to Nave *et al.* (2017), personality predicts behaviour, and personality differences lead to differences in people's behaviour. EM focuses on entrepreneurs' behaviour (Hills & Hultman, 2012).

Entrepreneurs use EM behaviours to escalate competitive advantage. These behaviours demonstrate an SME's entrepreneurial approach towards coping with limited (Fard & Amiri, 2018), SMEs require different or unique resources in order to develop competitive advantage and competitiveness (Fillis & Rentschler, 2005; Mansion & Bausch, 2020; Sahid & Habidin, 2018). This is in line with the resource-based view (RBV) that unique or distinct resources act as drivers towards sustainable competitive advantage (Barney, 1991). The RBV is used in this study to show the role of entrepreneurial personality traits on EM and business performance.

Farrukh *et al.* (2016) explain that there is a positive relationship between extraversion personality traits and openness to experiences, but also between emotional stability and entrepreneurial behaviour. A direct positive relationship is found between the locus of control personality trait with performance results. Moreover, proactivity has an indirect relationship with financial performance and the quality of relationships through entrepreneurial behaviour (Watson *et al.*, 2020).

Loveland *et al.* (2015) state that emotional stability and extraversion are personality traits related to successful sales performance. Caliskan (2019) reports that agreeableness and extraversion are significant predictors in explaining relationship marketing practices. Conscientiousness has a great impact on the preferences of financial and social practices in relationship marketing, while high emotional stability explains the preferences of relationship marketing financial practices only. Thus:

H3a: Extraversion has a positive effect on entrepreneurial marketing.

H3b: Agreeableness has a positive effect on entrepreneurial marketing.

H3c: Conscientiousness has a positive effect on entrepreneurial marketing.

H3d: Neuroticism has a positive effect on entrepreneurial marketing.

H3e: Openness to experience has a positive effect on entrepreneurial marketing.

RESEARCH METHODOLOGY

Sample and data collection

Survey method was chosen for data collection in this study. This study involved SMEs' owners/managers with national and international market scope in East Java, Indonesia. According to the Department of Cooperatives and SMEs East Java, there are 1483 SMEs, of which 350 have national and international markets. The sampling technique used simple random sampling. The sample size of 187 owners/managers was obtained from the Slovin formula at a 5% error level.

Data collection used questionnaires in hard copy form, distributed to owners/managers of UKM. Enumerators were involved in visiting each SME selected as part of the sample to fill out the questionnaire. Data collection ran from September to December 2019. The questionnaire used hard copies with the consideration that not all SMEs in Indonesia actively use email; besides, by visiting directly, the response rate was expected to be better. The returned questionnaires that fulfilled the requirements for analysis numbered 187 out of 200 respondents (response rate 94%), consisting of 86% male and 14% female respondents. Moreover, 14% of businesses were running for five to 10 years, 38% for 10-20 years, and 48% for more than 20 years.

Measures

Entrepreneurial personality traits

The construct of entrepreneurial personality traits adopted the Big Five theory, measured by five dimensions: extraversion, agreeableness, conscientiousness, neuroticism and openness to experience (Franco & Prata, 2019). The level of reliability measurement for extraversion was $\alpha = 0.957$, agreeableness $\alpha = 0.935$, conscientiousness $\alpha = 0.922$, neuroticism $\alpha = 0.961$, and openness to experience $\alpha = 0.937$, which indicated very good reliability.

Entrepreneurial marketing

The measurement of EM construct was adopted from Kilenthong *et al.* (2016), who proposed six dimensions: growth orientation, opportunity orientation, total customer focus, value creation through networks, informal market analysis, and market proximity. The level of reliability measurement for EM was $\alpha = 0.888$, which indicated very good reliability.

Business performance

The measurement of the business performance construct was adopted from Choi and Williams (2016), who proposed three dimensions: market share, growth rate, and profitability. The owner/manager was required to compare market share, growth rate, and profitability with competitors for a period of three years. The level of reliability measurement for business performance was $\alpha = 0.909$, which indicated very good reliability. All constructs were measured using a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5).

Data analysis

Hypothesis testing in this study used structural equation modelling (SEM); SmartPLS 3 software was used for analysis. The advantages of the PLS-SEM method were that the method can test measurement models and structural models and take into account measurement errors. Besides, PLS-SEM offers accurate analysis results for small sample sizes (Hair *et al.*, 2019). This study analysed the causal relationship between the latent variables of entrepreneurial personality traits, EM, and business performance. Therefore, PLS-SEM was an appropriate method if the research objective was theory development and prediction (Hair *et al.*, 2011).

RESULTS AND DISCUSSION

Descriptive statistics

Descriptive analysis results in Table 1 show the average level of high business performance. According to the owners/managers, success is seen in the market share by continued increase over the last three years. In addition, according to the owners/managers, the owned or run company experienced sales growth over the past three years. Furthermore, there was an increase in profits over the last three years.

Table 1. Descriptive statistics

Variables	Mean	SD
Extraversion (E)		
E1	3.209	0.682
E2	3.214	0.737
E3	3.299	0.667
Agreeableness (A)		
A1	2.786	0.676
A2	2.995	0.705
A3	2.818	0.723
Conscientiousness (C)		
C1	3.957	0.839
C2	3.861	0.829
C3	3.925	0.817
Neuroticism (N) *		
N1	3.866	0.636
N2	3.840	0.736
N3	3.920	0.645
Openness to experience (O)		
A1	3.668	0.888
A2	3.711	0.809
A3	3.727	0.899
Entepreneurial marketing (EM)		
EM1	3.048	0.704
EM2	3.059	0.740
EM3	3.176	0.825
EM4	2.807	0.690
EM5	3.845	0.783
EM6	3.583	0.906
Business performance (BP)		
BP1	3.973	0.797
BP2	3.877	0.821
BP3	4.000	0.913

Note: * Inverted Item.
Source: own elaboration in SmartPLS (2020).

In terms of measuring EM of the owner/manager, the SMEs studied have a moderate EM intensity (on the scale of one to five). The dimensions that support EM are owners/managers who have an orientation such that their business continues to experience growth by actively seeking opportunities in national and international markets, but also by looking for product opportunities that are of interest to consumers by conducting market analysis, although informally. Owners/managers admitted that the key to the success of their businesses is the desires and expectations of customers, so the former never cease building relationships with customers, suppliers, and distributors. The SMEs' owners/managers make decisions based on customer feedback. Information from customers is considered when determining marketing strategies and how to make relationships with customers more effective.

The results from the measurement of entrepreneurial personality traits indicate that the SMEs owners/managers already had personal values that supported entrepreneurial behaviour, that is they scored highly in conscientiousness, and openness to experience, and moderately on extraversion and agreeableness, low on neuroticism.

Measurement model

Model estimation and research hypothesis testing used SmartPLS software. Table 2 presents the loading values and t-values for each construct analysed in the study. The criteria used for loading values was above 0.7, indicating that the construct can explain the variant of the indicator, and the indicator has a satisfactory level of reliability (Sarstedt *et al.*, 2017). Loading values for the five indicators of entrepreneurial personality traits, the five indicators of EM and the three indicators of business performance shows that each has a loading value of > 0.7 and a significant t-value (t-value > 1.96). Only one indicator of EM (opportunity orientation) has a loading value of < 0.7 but a significant t value. According to (Hulland, 1999), the minimum acceptable loading value is 0.4; thus, the opportunity orientation indicator remains acceptable.

The assessment of composite reliability to measure internal consistency is presented in Table 3. The criterion of composite reliability must be greater than 0.7 (Hair Jr *et al.*, 2014) for the model to have good internal reliability. All constructs have a composite reliability above 0.7, which indicates good reliability. Furthermore, to evaluate convergent validity, we look for average variance extracted (AVE) criteria greater than 0.5 (Hair Jr *et al.*, 2014). The AVE value in each construct is greater than 0.5; thus, all constructs fulfil the convergent validity criteria. Meanwhile, discriminant validity uses AVE criteria in which the AVE of each latent construct must be higher than the highest squared correlation between latent constructs (Hair Jr *et al.*, 2014). The AVE value is shown by the numbers on the diagonal in Table 3, wherein the AVE value of each latent construct is greater than the highest square correlation between latent constructs. Therefore, the model meets the discriminant validity criteria.

Structural model

Structural models were used to evaluate causal relationships between constructs in the model. The criterion for evaluating the model structure is the coefficient of determination R^2. The test results showed that $R^2 = 0.696$ for business performance and 0.537 for EM, explaining 69.6% of business performance variance and 53.7% of EM variance. The evaluation results indicated that the business performance and EM coefficients in the model were categorised as fairly good.

The assessment of the quality of the model is from the value of cross-validated redundancy (Q^2) to assess the predictive relevance of the model. The value of $Q^2 > 0$ indicates the accuracy of the model's prediction (Hair *et al.*, 2011). The Q^2 value for the BP construct is 0.522 and for the EM construct is 0.296, so the exogenous construct has predictive relevance for the endogenous construct.

Table 2. Constructs and loading factors

Constructs	Loadings	t-value
Extraversion (E)		
E1	0.959	132.980
E2	0.921	58.937
E3	0.935	80.152
Agreeableness (A)		
A1	0.952	82.464
A2	0.858	29.492
A3	0.916	41.270
Conscientiousness (C)		
C1	0.949	79.003
C2	0.938	80.388
C3	0.946	74.401
Neuroticism (N)		
N1	0.940	65.431
N2	0.805	16.914
N3	0.930	64.545
Openness to experience (O)		
O1	0.942	53.197
O2	0.881	26.218
O3	0.915	54.828
Entrepreneurial marketing		
EM1	0.573	9.943
EM2	0.802	30.329
EM3	0.751	23.966
EM4	0.767	19.259
EM5	0.846	48.594
EM6	0.776	23.116
Business performance		
BP1	0.887	51.049
BP2	0.894	63.624
BP3	0.850	32.672

Source: own elaboration in SmartPLS (2020).

Table 3. Evaluation on Measurement Model

Constructs	Composite Reliability	E	A	C	N	O	EM	BP
Extraversion (E)	0.957	**0.938**						
Agreeableness (A)	0.935	**0.298**	**0.909**					
Conscientiousness (C)	0.961	**0.460**	**0.362**	**0.944**				
Neuroticism (N)	0.922	**0.261**	**0.429**	**0.284**	**0.894**			
Openness to experience (O)	0.937	**0.343**	**0.370**	**0.466**	**0.408**	**0.913**		
Entrepreneurial Marketing (EM)	0.888	**0.562**	**0.482**	**0.593**	**0.404**	**0.468**	**0.757**	
Business Performance (BP)	0.909	**0.545**	**0.445**	**0.725**	**0.377**	**0.613**	**0.688**	**0.877**

Source: own elaboration in SmartPLS (2020).

Hypotheses testing and scientific discussion

Table 4 presents the path coefficient values that show causal relationships between constructs, The p-value for testing the significance of causal relationships between constructs, all of which meet the criterion for significant (*p*-value < 0.05) (Hair *et al.*, 2011).

Table 4. Hypothesis testing

Relationship	Path coefficient	P values
EM → BP	0.238	0.000
Extraversion → BP	0.129	0.023
Agreeableness → BP	0.054	0.338
Conscientiousness → BP	0.382	0.000
Neuroticism → BP	0.012	0.818
Openness → BP	0.254	0.000
Extraversion → EM	0.299	0.000
Agreeableness → EM	0.196	0.001
Conscientiousness → EM	0.303	0.000
Neuroticism → EM	0.112	0.054
Openness → EM	0.106	0.062

Source: own elaboration in SmartPLS (2020).

The results indicated that EM has a positive and significant effect on business performance; H1 was confirmed. This agrees with previous research (Al-Manasra *et al.*, 2013; Fard & Amiri, 2018; Hamali, 2015) that affirms the effect of EM on SMEs' performance. Owners/managers who are oriented towards business growth will prioritise long-term business growth over short-term profit (Westerlund & Leminen, 2011), so they make an effort to seek new opportunities and realise them. Therefore, there is an increase in market capacity, sales, or business scale. Small and medium-sized enterprises that implement EM will gain a competitive advantage and will be distinct from their competitors (Jones & Rowley, 2009). Furthermore, owners/managers make the customer an important component of their business, always focusing on fulfilling their desires and request (Hills & Hultman, 2012; Hisrich & Ramadani, 2018). Owners/managers actively use market and customer information when making decisions with regard to new products and services (Kilenthong *et al.*, 2015). In general, within SMEs, market information is obtained informally by the owners/managers. They will introduce new products and services if customer demand suggests that they should.

The results showed that business performance is determined by entrepreneurial personality traits. Of the Big Five, extraversion, conscientiousness, and openness to experience are elements of entrepreneurial personality positively related to business performance. Therefore, H2a, H2c, and H2e were confirmed, while H2b and H2d were not. The present study indicates that owners/managers who succeed in building a business have personality traits of extraversion, conscientiousness, and openness to experience. Extraversion is an entrepreneurial personality trait with the strongest relationship with business performance; that is, it plays the most important role in achieving SME success.

The owners/managers of SMEs have high extraversion so they tend to be directly involved in business activities (Leutner *et al.*, 2014), they carry out social interactions with customers and suppliers. Such an engagement helps to raise awareness of the importance of building networks with external resources (Hachana *et al.*, 2018). The owners always seek opportunities to start new projects, they dare to set challenging goals, and they exhibit the energy needed to move forward. This can be achieved best if they are extraverts. The results of the present study support the findings of Franco and Prata (2019) and Zhao *et al.* (2010). These authors state that extraversion is the dimension of the Big Five personality model needed for success.

Conscientiousness has an effect on business performance because a person who possesses it has a sense of responsibility and attention to detail. Such people run their companies in a principled manner. They work hard and persistently to achieve their goals (Zhao & Seibert, 2006), which ensures long-term business continuity (Ciavarella *et al.*, 2004). Openness to experience has an effect on performance: entrepreneurs with imaginative and creative characters enjoy discovering new ideas (Zhao *et al.*, 2010). Conscientiousness personality traits are clearly a competitive advantage when it comes to business performance.

The present study has elaborated the relationship between entrepreneurial personality traits and business performance, and in doing so, it has extended our understanding of the importance of social aspects of personality entrepreneurship in fostering unique characteristics of SMEs (Darcy *et al.*, 2014).

We have argued that entrepreneurs with extraversion, conscientiousness, and openness to experience provide their companies with unique characteristics or critical resources for competitive advantage, because management in SMEs is usually conducted in a highly personalised manner and is strongly influenced by personality (Beaver & Jennings, 2005).

The results of the study showed that extraversion, agreeableness, and conscientiousness are positively associated with entrepreneurial marketing, so H3a, H3b, and H3c were confirmed, while H3d and H3e could not have been. The findings indicated that entrepreneurs with high levels of extraversion, agreeableness, and conscientiousness support EM in SMEs. Personality predicts behaviour, and personality differences will lead to differences in people's behaviours (Nave *et al.*, 2017). One manifestation of entrepreneurial behaviour is EM (Hills *et al.*, 2008). The results of the study support the findings of Loveland *et al.* (2015) that extraversion personality traits are related to sales performance. Agreeableness, extraversion, and conscientiousness are significant predictors of successful relationship marketing practices (Caliskan, 2019). Entrepreneurial personality traits predict human behaviour, including entrepreneurship (Ahmad, 2010). Therefore, our findings indicate that extraversion, agreeableness, and conscientiousness will encourage entrepreneurial behaviour in general (Farrukh *et al.*, 2016) and EM in particular.

The present study offers an insight into the nature of SME owner/managers who possess the entrepreneurial personality traits of extraversion, conscientiousness, and openness to experience, and who develop their EM capabilities to increase competitive advantage. This perspective supports the resource based view (RBV), which argues that EM and entrepreneurial personality are unique resources that drive business performance and sustainable competitive advantage (Barney, 1991). The present study has proven that entrepreneurial personality traits are antecedents of EM, that extraversion, agreeableness, and conscientiousness in particular play a role in increasing EM, and that EM can drive business performance.

CONCLUSIONS

The present study investigated the role of EM in business performance and the role of entrepreneurial personality traits as antecedents of EM. The results showed that EM has a positive effect on business performance, and that SMEs focused on growth, opportunities, customers, networks, informal market analysis, and market proximity in their marketing activities can improve business performance. This can be achieved more easily if the SME owner/manager shows traits of extraversion, agreeableness, and conscientiousness. Another finding was that, amongst the Big Five entrepreneurial personality traits, extraversion, conscientiousness, and openness to experience determine business performance success. Therefore, extravert and conscientious SME owners/managers who are open to experience will influence the implementation of EM in SMEs, which will improve their business performance.

One implication of the present study for management is that entrepreneurs should have a set of EM practices that maintain or improve business performance (Kilenthong *et al.*, 2015), because not all the principles in marketing literature can be used in small businesses (Mort *et al.*, 2012). Another implication is that extraversion, conscientiousness, and openness to experience determine business performance. Finally, successful entrepreneurship is inseparable from the characteristics of the individual (Stokes, 2000). Therefore, it is important that SMEs foster extraversion, conscientiousness, and openness to experience.

This research has limitations. The study was conducted only on SMEs in Indonesia. Replication studies in several other countries are likely to yield different results, but allowing comparison with the results of this study may open up new areas for further research. Secondly, business performance in this study was measured by collecting subjective opinions of owners/managers using market share, growth rate, and profitability measures compared to competitors over three years (qualitative measures). Further research could add a quantitative measure from their financial statements or SMEs internal notes as a measurement of business performance.

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Conflict of Interest

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Institutions and entrepreneurship: Empirical evidence for OECD countries

Latif Khalilov, Chae-Deug Yi

ABSTRACT

Objective: The objective of the article is to test the bidirectional association of institutions and entrepreneurship in 19 OECD countries over the period of 2014-2016.

Research Design & Methods: Most of the previous studies emphasise the role of institutions in entrepreneurial activity, while ignoring the role of entrepreneurship in the building of institutions. We estimate how institutions and entrepreneurship relate to each other and contribute to economic growth. For the estimation, we apply the structural equation modelling (SEM) with panel data.

Findings: Estimated results show that the regulatory dimension of institutions and entrepreneurship have a strong bidirectional relationship – as we expected – while the normative dimension of institutions and entrepreneurship have a unidirectional association. These two interrelated factors stimulate economic growth.

Implications & Recommendations: Policymakers should create a more friendly regulatory environment for entrepreneurship to flourish. In this process, institutional entrepreneurs also play an important role.

Contribution & Value Added: There is a need for research on the bilateral relationship between institutions and entrepreneurship. Most previous articles consider the effect that is transmitted from institutions to entrepreneurship. However, there exists a two-way causal relationship between institutions and entrepreneurship that is worth exploring. In this regard, the greatest contribution of this article is that it is one of the first empirical works devoted to testing the two-way causal relationship between institutions and entrepreneurship.

Article type: research article

Keywords: institutions; entrepreneurship; human capital; economic growth

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INTRODUCTION

The study of the new institutional theory dates back to the 1970s (Scott, 2008) and has spawned a big audience of scientists who continue to contribute to its development. Since the theory's beginnings, numerous articles have been presented to explain the part of institutions in society. North (1990) offers the following definition of institutions: "[i]nstitutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction." Simply put, institutions are the rules and norms that we, as people, follow in our daily lives (Sautet, 2005). However, the study of the institutional theory has paid very little attention to entrepreneurship, and the association between these two interrelated components of economic development remains implicit (Sine & David, 2010).

This fact raises two interrelated questions on the relationship between institutions and entrepreneurship (Sine & David, 2010; Tolbert, Davide, & Sine, 2011):

RQ1: How do institutions influence entrepreneurial activity?

RQ2: How does entrepreneurship impact the existing institutional environment?

We should note that the impact of institutional quality on entrepreneurial activity (Bosma, Content, Sanders, & Stam, 2018) and the impact of entrepreneurial activity on existing institutions – if any – have been studied in isolation, at least empirically.

The matter of institutions in economic growth has gained much consideration from scholars, both hypothetically and empirically. Acemoglu, Johnson, and Robinson (2005) state that institutions are the fundamental causes of economic growth, and only these fundamental causes can explain why a few nations are wealthier and develop quicker than others. A similar idea was proposed regarding entrepreneurship. According to Sautet (2005), the abundance and absence of entrepreneurship are not the main reasons for development and developmental lag, respectively. Baumol (1990) suggests that it is not the offer of entrepreneurship but the rules that undergo significant changes. Considering entrepreneurship is never scarce, why has it developed much more in some countries than in others? As institutions matter for economic growth, they are also important for entrepreneurial activity. Institutions create incentives for key economic actors (Acemoglu *et al*., 2005). As one of the key actors in society, entrepreneurs are also motivated by supportive institutions. Differences in institutional quality offer distinct incentives to engage in various entrepreneurial activities. Since entrepreneurship is the creation and discovery of new and differentiated products (Sine & David, 2010; Sautet, 2005), institutions determine under what conditions entrepreneurs can use available resources to conduct business (Bosma *et al*., 2018). Changes to this set of rules lead to the emergence of *productive*, *unproductive*, or *destructive* entrepreneurial activity (Baumol, 1990).

The relationship between the institutional theory and entrepreneurship remains unclear and lacking in relevant research, with few researchers investigating this theoretical relationship (Hwang & Powel, 2005; Sine & David, 2010). Some recent studies develop a theoretical approach to examine two-way causal relationships between institutions and entrepreneurship, showing how institutions support entrepreneurial activity and how institutional entrepreneurs change and build new supportive institutions. To study the impact of institutions on entrepreneurship, three dimensions of institutions are used: regulative, normative, and cultural-cognitive (Scott, 2008). Most empirical studies use simple least squares regression methods to test the correlation between institutions and entrepreneurship and the impact of these two factors on economic growth (Bjornskov & Foss, 2013; Bosma *et al*., 2018; Stam & Van Stel, 2011; Urbano & Aparicio, 2016). However, not many scholars have used the structural equation modelling (SEM) approach. One exception is Castano-Martinez *et al*. (2015), who use the SEM method to estimate the effect of different policy remedies on entrepreneurial activity to advance growth. However, they limit their study to 13 European countries for 2012.

This article empirically examines the causal associations of institutions and entrepreneurship in 19 OECD (Organization for Economic Co-operation and Development) countries over the 2014-2016 period. To our best knowledge, a limited amount of experiential work has highlighted the impact of entrepreneurship on institutions or causal relationships between them. Recently, Samadi (2019) has studied the causality of institutions and entrepreneurship by applying the Granger causality test. However, most previous empirical studies that test the link between institutions and entrepreneurship focused on the impact transmitted from institutions to entrepreneurship. Nevertheless, the emergence of new players and institutional entrepreneurs, such as large firms and professional associations, modify existing institutions or build new ones (Greenwood, Suddaby, & Hinings, 2002). In this regard, ours is one of the first empirical studies to examine the impact of entrepreneurship on institutions.

For our test, we apply the structural equation modelling (SEM) method to find an interrelated association between the institutional environment and entrepreneurial activity in OECD countries. Countries gathered in the OECD have more developed institutions and are considered the best places for entrepreneurship compared to other countries. Moreover, the OECD provides an environment in which countries around the world can compare policy experiences and find answers for common socioeconomic problems (usoecd.usmission.gov). Testing our hypothesis in OECD countries provides a good example for other countries. All the above motivated us to conduct research on the example of OECD countries.

Section two summarises the theoretical background and literature review on this topic, along with the proposed hypotheses. Section three presents our data and models. Section four outlines the estimation results and discussions, and section five provides concluding remarks.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Over the past few decades, institutions—as a set of rules—have gained increasingly more attention from scholars. Distinguished scholars of new institutional economics such as Coase (1998), North (1990), Williamson (2000), and Acemoglu *et al*. (2005) note the importance of institutions in economic development. Menard and Shirley (2011) mention that there are two prominent schools of thought in the study of modern institutional economics: one of Coase and Williamson, which focuses on property rights and contracts, and the other of North, which emphasises the role of the state and institutional environment. Coase (1937) notes that low transaction costs and clearly defined property rights help overcome the problem of externalities. North (1990) argues that institutions as a set of rules play a key part in maintaining order and security in society. He develops a framework for institutional change and applies it to the problems of economic development (North, 1992). According to Williamson (1985), institutions with low transaction costs coordinate the relationship between individuals and groups (Herath, 2005). Considering their role as fundamental causes of economic growth and development, only institutions may explain the differences in income distribution and influence the structure of economic incentives for individuals to save, invest, and innovate (Acemoglu *et al*., 2005).

From institutions to entrepreneurship

Most previous studies in institutional economics largely ignore the role of institutions in entrepreneurship (Sine & David, 2010). However, recently, voluminous studies have focused on examining the effect of institutional environment on entrepreneurship (Angulo-Guerrero, Perez-Moreno, & Abad-Guerrero, 2017; Aparicio, Urbano, & Audretsch, 2016; Castano-Martinez, Mendez-Picazo, & Galindo-Martin, 2015; Williams & Vorley, 2015; Muralidharan & Pathak, 2016; Fuentelsaz, Gonzalez, & Maicas, 2018). As mentioned above, this approach creates an unclear relationship between institutions and entrepreneurship and requires uncovering how institutional environment can influence entrepreneurial activity. Baumol (1990) proposes that institutions might influence the allocation of entrepreneurship but not its supply. Hwang and Powell (2005) study the part of institutions in the advancement of entrepreneurship and argue that changes in the institutional environment create great opportunities for entrepreneurs. Cultural-cognitive, normative, and regulative dimensions of institutional environments (Scott, 2008) relate to entrepreneurship and shape the entrepreneurial process, creating certain opportunities and obstacles for entrepreneurs (Sine & David, 2010; Tolbert *et al*., 2011). Institutions create entrepreneurial choices via the following steps: a) founding new organizations by providing individuals with new opportunities to enter market activities; b) introducing decision-making processes on how to design new organizations; and c) managing external relations with partners (Tolbert *et al*., 2011). In general, institutions give the right guidance to the entrepreneurs and, most importantly, reduce the uncertainty in their social interactions (Sautet, 2005).

Although it is difficult to measure and choose the correct proxies of institutional environment, several empirical works have been conducted to examine their effect on entrepreneurship. Bosma *et al*. (2018) study the impact of regulatory, cognitive, and normative measures of institutions on different indicators of entrepreneurship and, in turn, summarise several previously relevant empirical articles that investigate the association of various indicators of institutional dimensions and entrepreneurship. Nissan, Galindo and Picazo (2012) and De Clercq, Danis, and Dakhli (2010) examine the influence of the normative dimension of institutions on entrepreneurial activity. Meanwhile, Van Stel, Storey, and Thurik (2007), Bjornskov and Foss (2008), and De Clercq *et al*. (2010) test the impact of the regulatory dimension of institutions on entrepreneurship. Castano-Martinez *et al*. (2015) find that the role of the regulative and cognitive dimensions of institutions is significant in explaining entrepreneurship.

The normative dimension emphasises a deeper moral base for legitimacy and includes norms and values (Scott, 2008). Norms and values indicate what is "good" or "appropriate" to evaluate entrepreneurial activity (Sine & David, 2010). According to Castano-Martinez *et al*. (2015), socially recognised entrepreneurial achievements play a part in the development of new entrepreneurs. The more we value entrepreneurship, the more entrepreneurs appear in the economy. Considering the normative institutional environment, De Clercq *et al*. (2010) develop five questions for an expert questionnaire to determine whether entrepreneurship is a good career choice. Based on these discussions, we propose our first hypothesis:

H1: The high value of entrepreneurship has a positive impact on entrepreneurial activity.

The regulative measure of institutions includes rules, laws, and sanctions (Scott, 2008). Supportive regulatory regimes give impetus to entrepreneurship, while hostile regulations suppress its development (Sine, David, & Mitsuhashi, 2007; Sine & David, 2010). Numerous studies have analysed the impact of regulatory regimes on entrepreneurial activity (Van Stel *et al*., 2007; Bjornskov & Foss, 2008; De Clercq *et al*., 2010; Bosma *et al*., 2018). Bjornskov and Foss (2008) use indicators of the Economic Freedom Index to examine the effect of the regulatory environment of institutions on entrepreneurship.

Moreover, regulatory regimes are important in explaining economic growth. As noted above, recent studies in institutional economics consider the regulatory environment of institutions as fundamental causes of economic growth and development, and only regulatory regimes can explain why some countries are wealthier and grow faster than other countries (Acemoglu *et al*., 2005). According to them, this is due to the incentive-creating nature of economic and political institutions. However, this only happens under the high quality of economic institutions. This leads to our next hypothesis:

H2: An economically free society has a positive impact on the prosperity of entrepreneurial activity and economic growth.

Entrepreneurship has been emphasised as one of the primary factors of economic progress. Its role in economic prosperity is explained through its innovative effect on economic performance. The entrepreneurship theory argues that, as a channel of knowledge spillover, it provides the most important apparatus to economic prosperity (Audretsch, Keilbach, & Lehmann, 2006). The proponent of the entrepreneurship theory, Joseph Schumpeter (1934), considers the importance of entrepreneurship due to its innovative nature in the process of economic progress. Bosma *et al*. (2018) provide a summary of recent empirical studies on the effect of entrepreneurship on economic growth. Braunerhjelm, Acs, Audretsch, and Carlsson (2010) and Castano-Martinez *et al*. (2015) find positive entrepreneurship-growth correlations by applying Romer's production function and the structural equation model, respectively. Consequently, we set forth the following hypothesis:

H3: Entrepreneurship has a positive impact on economic prosperity.

We also include human capital as a control variable to account for alternative explanations of entrepreneurial activity and economic growth. Endogenous growth theory argues that human capital is a central component of long-run economic growth. However, achieving long-run economic prosperity requires large investments in human capital, innovation, and knowledge. A pioneer of the endogenous growth theory, Romer (1990) argues that the supply of human capital determines long-term growth by increasing the knowledge of the population. Human capital is an important source of innovation due to spillover effects. According to Acs, Braunerhjelm, Audretsch, and Carlsson (2009), the spillover effect of knowledge is important for creating a set of technological opportunities. They argue that knowledge spillovers stimulate entrepreneurial activity and is a vital source of economic growth.

Moreover, the importance of human capital for economic prosperity – as a source of innovation – leads to investment in human capital. Moog (2002) and Cassar (2006) argue that human capital investment has a significant impact on the growth of start-ups, finding that start-ups with highly educated founders are much more successful compared to those with less-educated founders. Differences in

experiences, knowledge, and skills of individuals explain the speed at which they explore and use entrepreneurial openings (Shane & Venkataraman, 2000). Better education helps transform entrepreneurial opportunities into a real business and makes entrepreneurship flourish (Reynold, Hay, & Camp, 1999). This leads to our next hypothesis:

H4: Human capital has a positive impact on entrepreneurship and growth.

From entrepreneurship to institutions

Thus far, institutional and entrepreneurial research – mostly empirical – has drawn attention to the one-way association of institutions and entrepreneurial activity, in which institutions explain entrepreneurial activity in the economy. However, recent studies on institutions and entrepreneurship are increasingly drawing attention to entrepreneurs as reformers of existing institutional environments (Sine & David, 2010; Kuchar, 2016; Fuentelsaz, Gonzalez, Maicas, & Montero, 2015). Actors that modify current institutions and build new ones are called "institutional entrepreneurs" (Beckert, 1999; Maguire, Hardy, & Lawrence, 2004; Greenwood *et al*., 2002). According to Sine and David (2010), entrepreneurs change or modify existing institutions through theorizing, integrating, and exteriorizing activities. Theorization concerns constructing a new set of problems and solutions; integration is the addition of new practices and ideas to existing institutional orders; and exteriorizing refers to experiencing a new set of ideas as a natural part of the environment (Sine & David, 2010). Hwang and Powell (2005) study how new experiences and structures become institutionalised.

There are several examples of how professionals – as key institutional entrepreneurs – modify existing institutions. Back in the sixteenth and seventeenth centuries, the rise of the Atlantic trade steadily empowered the de facto role of merchants in England by constraining the power of the king. This helped merchants alter existing institutions to strengthen their property rights (Acemoglu *et al*., 2005). The role of influential chefs, who gave birth to French gastronomy in the nineteenth century, is another example of how professionals performed a key part within the rise of new institutions (Ferguson, 2004; Hwang & Powell, 2005). These discussions lead us to develop our next hypotheses:

H5: A society with developed entrepreneurial activity has a positive impact on the status of entrepreneurs.

H6: Entrepreneurship has a positive influence on the improvement of economic freedom.

RESEARCH METHODOLOGY

Model specifications

In this study, we apply structural equation modelling (SEM) to examine our hypotheses. The SEM method is a combination of factor analysis and regression, which enables users to find causal associations of latent variables. The strength of SEM is that it allows us to simultaneously test measurement and structural models and provide direct and indirect effects (Bullock, Harlow, & Mulaik, 1994). Furthermore, the SEM method enables theory testing and development and provides an assessment of the relativity of hypotheses to the concerned theory (Bullock *et al*., 1994; Barclay, Higgins, & Thompson, 1995). This process is conducted by examining the consistency of measures and evaluating the associations between given latent variables (Barclay *et al*., 1995). Besides, when researchers use the SEM, they can find an answer to a number of interconnected research questions in several types of analyses by modelling the relationship between several constructs simultaneously.

The SEM comprises of measurement (or outer) and structural (or inner) models. The structural model part relates all exogenous and endogenous latent or unobserved variables to one another. As shown in Figure 1, the structural model part of our general model has both recursive models (one-way causality) and non-recursive models (two-way causality).

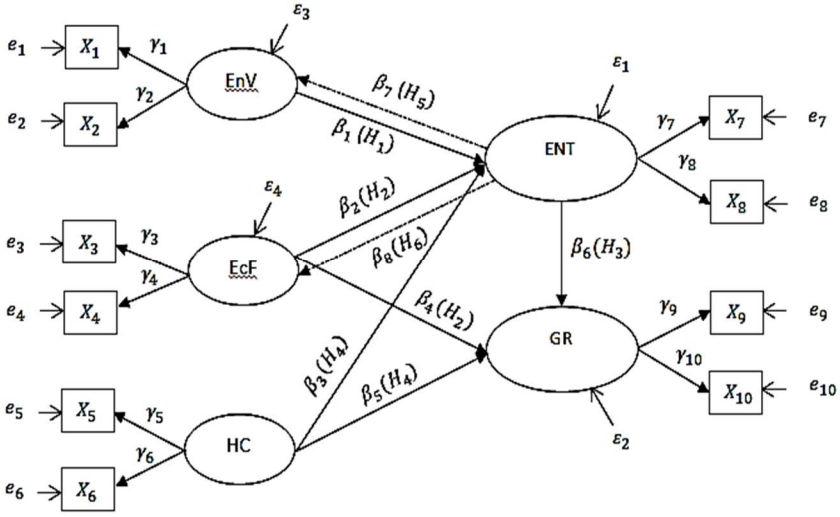

Figure 1. The Structural Equation Model
Source: own elaboration.

For our example, the matrix representation of the structural model is given below:

$$\begin{bmatrix} ENT \\ GR \\ EnV \\ EcF \end{bmatrix}_{4\times1} = \begin{bmatrix} \beta_1 & \beta_2 & \beta_3 & 0 \\ 0 & \beta_4 & \beta_5 & \beta_6 \\ 0 & 0 & 0 & \beta_7 \\ 0 & 0 & 0 & \beta_8 \end{bmatrix}_{4\times4} \begin{bmatrix} EnV \\ EcF \\ HC \\ ENT \end{bmatrix}_{4\times1} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \\ \varepsilon_4 \end{bmatrix}_{4\times1} \quad (1)$$

The measurement model links observed variables to latent variables. There are two different types of measurement models: a) formative, in which observed variables cause latent variables, and b) reflective, in which observed variables reflect latent variables. In this study, our measurement models are reflective (Figure 1). The matrix form of the model is shown below:

$$\begin{bmatrix} X_1 \\ X_2 \\ X_3 \\ \vdots \\ X_{10} \end{bmatrix}_{10\times1} = \begin{bmatrix} \gamma_1 & 0 & 0 & 0 & 0 \\ \gamma_2 & 0 & 0 & 0 & 0 \\ 0 & \gamma_3 & 0 & 0 & 0 \\ \vdots & \vdots & \vdots & \vdots & \vdots \\ 0 & 0 & 0 & 0 & \gamma_{10} \end{bmatrix}_{10\times5} \begin{bmatrix} EnV \\ EcF \\ HC \\ ENT \\ GR \end{bmatrix}_{5\times1} + \begin{bmatrix} e_1 \\ e_2 \\ e_3 \\ \vdots \\ e_{10} \end{bmatrix}_{10\times1} \quad (2)$$

We use the partial least squares (PLS) regression approach. Currently, PLS regression is often used in various research fields to estimate structural equation models. In this regard, PLS has a specific advantage over ML and GLS estimation. First, unlike in ML or GLS estimation, multivariate normality assumption can be relaxed in PLS (Barclay *et al*., 1995). Second, experience shows that PLS regression is the right estimation method of complex causal models built on small-size data and many observable and latent variables (Barclay *et al*., 1995; Henseler, Ringle, & Sinkovics, 2009; Tenenhaus, 2008). Third, the SEM method has simple systematic convergence, which allows users to apply it easily (Tenenhaus, 2008). Finally, PLS regression is an appropriate method of estimation for both formative and reflective models (Henseler *et al*., 2009).

Data

We restrict our analysis to 19 member countries of the OECD for 2014-2016, as data are not available for all member countries (Australia, Chile, Estonia, Finland, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, the United Kingdom). For the estimation purposes, the data are taken from different open sources, including the World Bank open data, the United Nations Human Development Data (UNDP HDR), the Fraser

Institute's Economic Freedom data, and GEM (Global Entrepreneurship Monitor). We include the normative and regulative dimensions of institutions in our analysis to check the effect of institutions on entrepreneurial activity and vice versa.

As a normative dimension of institutions, we take entrepreneurial value data from the GEM. Data on economic freedom as the measure of the regulatory measure of institutions are derived from the Fraser Institute Economic Freedom data. Indicators of entrepreneurship are also taken from the GEM. Table 1 below provides a complete overview of our latent and observed variables with definitions and sources of data.

The GEM collects primary entrepreneurship data based on large-scale Adult Population Surveys of individuals aged 18-64 in each GEM economy and provides a complete set of entrepreneurship indicators (Bosma & Kelley, 2019). Thus, the GEM is considered a unique source of data for entrepreneurship researchers.

Table 1. Constructs, measures, and sources of data

Latent variables	Observed variables and definitions	Source
Entrepreneurial Value (EnV)	High status of successful entrepreneurs' rate (X_1) – the ratio of population aged 18-64 who admit that prosperous entrepreneurs achieve high positions.	GEM
	Entrepreneurship as a good career choice rate (X_2) – the ratio of population aged 18-64 who admit that doing a business is a good choice of job.	
Economic Freedom (EcF)	Legal quality (X_3) – the quality of protection of people and their legally acquired property	Fraser Institute Economic Freedom project
	Regulatory efficiency (X_4) – the efficiency of credit, labor market regulations, and business regulations	
Human Capital (HC)	Log of mean years of schooling (X_5).	UNDP HDR
	Log of population with at least some secondary education (% of people aged 25 and older) (X_6).	
Entrepreneurship (ENT)	Entrepreneurial employee activity rate (X_7) – the degree of employee involvement in entrepreneurship.	GEM
	Motivation index (X_8) – the ratio of people in TEA who are interested in improving opportunities.	
Growth (GR)	Log of GDP per capita (PPP) (X_9).	World Bank
	Log of employment to population ratio (percentage of people aged 15 or older) (X_{10}).	UNDP HDR

Source: own study.

RESULTS AND DISCUSSIONS

From institutions to entrepreneurship

The proper evaluation of interrelated measurement and structural models leads to the correct conclusion about the hypothesised relationship between latent variables. The interpretation of PLS-based SEM results was conducted through the evaluation of the robustness of the outer model, followed by the evaluation of the inner model (Fornell & Lacker, 1981; Barclay *et al*., 1995). Although PLS has less extensive statistics (Gefen, Straub, & Boudreau, 2000), specific conclusions could have been drawn from the results. The additional statistics of Cronbach's alpha, average variance extracted (AVE), composite reliability, and individual item consistency assessed the robustness of constructs' measures in the PLS regression.

As the first step in analysing the PLS structural equation model is to evaluate the measurement model, we began by assessing the consistency of the measurements before inferring the association between constructs. In this regard, we first examined individual item consistency by studying the loadings of the observed variables. Scholars suggest 0.7 as the minimum acceptable threshold for individual item reliability (Barclay *et al*., 1995; Carmines & Zeller, 1979). In our example, the second variable (X_2) of entrepreneurial value was far from the suggested minimum threshold and seemed an unreliable

measure of entrepreneurial value (Table 2). Three potential reasons for the low loadings were as follows. First, measures are simply unreliable; the second reason refers to methods effect, while the third lies in the multidimensionality of constructs (Barclay *et al*., 1995). Not knowing the exact reason for this low loading, we decided to drop item X_2 from entrepreneurial value. Moreover, since our hypothesised model was a reflective measurement model, individual items would be interchangeable, and any single item can generally be removed without changing the meaning of the construct (Jarvis, Mackenzie, & Podsakoff, 2003). According to previous studies, the use of a single item can be successful in many circumstances when applying SEM modelling (Petrescu, 2013).

Table 2. Loadings and cross-loadings of measures (the hypothesised model)

Variables	EnV	EcF	HC	ENT	GR
X_1	0.891	0.402	0.408	0.355	0.384
X_2	-0.708	-0.306	-0.507	-0.228	-0.318
X_3	0.502	0.925	0.382	0.782	0.824
X_4	0.307	0.911	0.558	0.696	0.787
X_5	0.548	0.557	0.957	0.530	0.645
X_6	0.477	0.385	0.932	0.440	0.509
X_7	0.297	0.773	0.531	0.909	0.831
X_8	0.366	0.616	0.350	0.831	0.608
X_9	0.472	0.738	0.440	0.621	0.808
X_{10}	0.256	0.709	0.573	0.758	0.838

Source: own study.

As a gauge of the internal consistency of the measurements, we used Cronbach's alpha and composite reliability statistics. These are the most widely used measures of reliability. The minimum threshold of Cronbach's alpha for internal consistency is 0.6 for exploratory research (Nunnally, 1967) and 0.7 for confirmatory research (Nunnally, 1978; Nunnally & Bernstein, 1994). However, most recent studies accept 0.7 as an appropriate lower threshold to evaluate reliability (Cortina, 1993). In the case of composite reliability without an exact criterion, 0.7 is often considered the minimum reliability threshold (Segars, 1997). In our example, our first construct – entrepreneurial value – had inconsistencies regarding these two measures. We were able to improve composite reliability by dropping an unreliable measure. This confirmed our decision for removing the second item (X_2) of entrepreneurial value in the ensuing analysis. Furthermore, the removal of X_2 increased the composite reliability, Cronbach's alpha, and AVE of the respective measurement model. However, the value of Cronbach's alpha is positively correlated with the number of measures, meaning an increment within the number of items leads to an increment in Cronbach's alpha (Hair, Black, Babin, & Anderson, 2010). Thus, the Cronbach's alpha of growth construct fell below the suggested minimum threshold of 0.7, but its composite reliability was well above the benchmark level of 0.7. The other three remaining constructs had a satisfactory degree of consistency (Table 3).

Table 3. Construct reliability and validity (the hypothesised model)

Variables	AVE	Composite reliability	Cronbach's α	Correlation of Constructs*				
				EnV	EcF	HC	ENT	GR
EnV	0.647	0.123	-0.898	0.805				
EcF	0.843	0.915	0.814	0.445	0.918			
HC	0.892	0.943	0.881	0.545	0.508	0.945		
ENT	0.758	0.862	0.687	0.373	0.806	0.518	0.871	
GR	0.677	0.808	0.524	0.437	0.878	0.618	0.840	0.823

* Diagonal elements in the "correlation of constructs" matrix are the square roots of average variance extracted (AVE).
Source: own study.

The AVE assesses the convergent validity of the measurement models (Gefen *et al*., 2000; Hair *et al*., 2010). An AVE value of less than 0.5 casts doubt on the validity of individual measures (Fornell &

Larcker, 1981). This validity test results showed measurements with a satisfactory degree of convergent validity. Table 3 above demonstrates the reliability and validity statistics.

The next statistics of consistency was discriminant validity. There are several criteria for assessing the discriminant validity of PLS-based SEM. One is cross-loadings of items, while another involves the Fornell and Larcker criterion. According to cross-loadings of indicator criteria, indicators should have more loadings on the assigned constructs than on other constructs. All given variables satisfied this criterion (Table 2). Based on the second criterion of discriminant validity assessment – the Fornell and Larcker criterion – the square root of the AVE of a certain construct should be greater compared to correlation with other constructs (Barclay *et al*., 1995; Gefen *et al*., 2000; Hair *et al*., 2010). Thus, when the square root of AVE is greater than the off-diagonal elements, discriminant validity of our sample would be appropriate. In our sample, there was some controversy in the case of economic freedom-growth and entrepreneurship-growth constructs. However, in both cases, the bias was very small: 0.055 and 0.017, respectively (Table 3). In general, this assessment further supported the discriminant validity of measurement models.

Once the consistency of the measurement models was ensured, we evaluated the structural model. For this, PLS provides a bootstrapping method to obtain the necessary statistics. Based on these statistics, we evaluated the hypothesised associations the constructs.

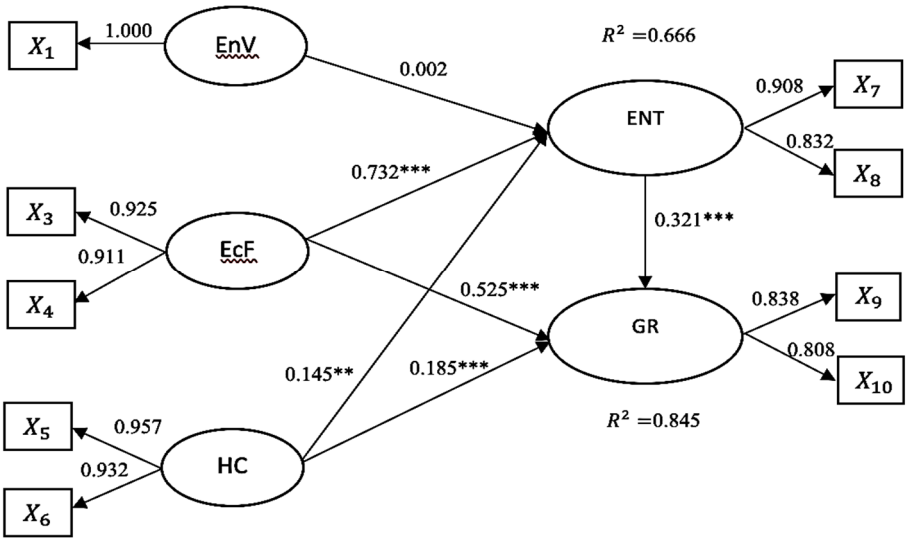

Figure 2. PLS algorithm results (final model) *** p < 0.01; ** p < 0.05.
Source: own elaboration.

Accordingly, Table 4 below presents the outcomes of bootstrapping, which shows the results of our analysis. Based on the given statistics, Hypothesis H1 was not supported due to an insignificant path coefficient (β_1= 0.002) at the 5% significance level. Thus, it seems that the value of entrepreneurship is not the driving force behind entrepreneurship for this group of countries. This finding does not support the findings of previous studies in which the normative dimension of institutions was an important driver of entrepreneurship (Stephan & Uhlaner, 2010; Danis, De Clercq, & Petricevic, 2011; Bosma *et al*., 2018).

Hypothesis H2 was confirmed with significant and positive path coefficients (β_2*=0.732* and β_4*=0.525*) at an appropriate significance level. This proves the idea that improvements in economic freedom promote entrepreneurial activity and lead to the economic prosperity of society. Consequently, these results are in line with the findings of De Clercq *et al*. (2010), Castano-Martinez *et al*. (2015), and Bosma *et al*., (2018). Moreover, the finding of a relationship between economic freedom and growth is consistent with the findings of Brkich (2020), who finds that improved economic freedom leads to economic growth in European countries.

Similarly, we examined whether Hypothesis H3 is significant. Obtained path coefficients verified that Hypothesis 3 had the same significance level (β_6= 0.321). This confirms that entrepreneurial ac-

tivity positively affects economic prosperity. Furthermore, this finding confirms the hypotheses of previous studies that entrepreneurship positively impacts growth (Castano-Martinez *et al*., 2015; Aparicio *et al*., 2016 and Bosma *et al*., 2018).

Table 4. Path coefficients of the SEM approach (final model)

Relations	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	*t*-statistics
EnV -> ENT	0.002	0.002	0.090	0.022
EcF -> ENT	0.732***	0.741	0.059	12.309
EcF -> GR	0.525***	0.526	0.089	5.916
HC -> ENT	0.145**	0.139	0.072	2.006
HC -> GR	0.185***	0.187	0.057	3.249
ENT -> GR	0.321***	0.319	0.102	3.161

*** p < 0.01; ** p < 0.05; R2 for ENT = 0.666; R2 for GR = 0.845.
Source: own study.

Table 5. Direct, indirect, and total effects between constructs (final model)

Relations	Direct Effect	Indirect Effect	Total Effect*
EnV -> ENT	0.002		0.002
EnV -> GR		-0.016	
EcF -> ENT	0.732		0.732
EcF -> GR	0.525	0.235	0.760
HC -> ENT	0.145		0.145
HC -> GR	0.185	0.047	0.232
ENT -> GR	0.321		0.321

* Total effect = Direct Effect + Indirect Effect
Source: own study.

Moreover, our statistics proved Hypothesis H4. Obtained path coefficients (β_3= 0.145 and β_5= 0.185) with significant *t* values verified positive and significant relations of human capital and entrepreneurship with economic growth. This means that the economies with highly developed human capital contribute to the development of entrepreneurship. This is further corroborated by the results of Moog (2002), Kassar (2006), and many others, who state that skilled and educated people are more successful in entrepreneurial activities. Moreover, countries with higher investment in human capital achieve higher levels of economic growth. This finding supports and agrees with those of Pelinescu (2015), who finds that innovative and skilled human capital drive economic growth.

The *R*-squared value as a percentage measure of variance explains percentage variance in the endogenous latent variables due to exogenous variables. The values of R^2 indicate that a 67% change in entrepreneurship and an 85% change in economic growth is explained by our model, which is very significant.

Moreover, PLS regression generates indirect and total effects of developed constructs (Table 5). In the case of economic freedom and human capital, their total effect on entrepreneurship is equal to their direct effect (path coefficients) as no indirect effect is predicted. Similarly, entrepreneurship too has only a direct effect on growth equal to its total effect. However, economic freedom and human capital have both direct and indirect effects on economic growth, while their sum is equal to their total effect on growth.

From entrepreneurship to institutions

As PLS regression cannot estimate reciprocal (two-way) causation in a single test, we separately estimate the other causality that moves from entrepreneurship to institutions. As mentioned above, the first step in analysing the PLS-based SEM is the assessment of the consistency of the measurement model. In this respect, in the case when the impact was transmitted from entrepreneurship to institutions, we also first examined the consistency of observable variables by studying their loadings with corresponding latent variables. Since we worked with the same measures and

constructs in two cases, the reliability and validity assessment results of the measurement models were the same. As discussed in the first part of the discussion, only the second variable (X_2) of entrepreneurial value seemed invalid because its value exceeded the recommended minimum threshold of 0.7. Due to this unreliable indicator, the consistency of the construct of entrepreneurial value did not satisfy the minimum thresholds, which motivated us to abandon the X_2 item. In the following analysis, we generated results without this variable.

Then, we turned to the analysis of path coefficients. The PLS algorithm resulted from the general structural equation model, in which the effect was transferred from entrepreneurship to institutions as presented in Figure 3.

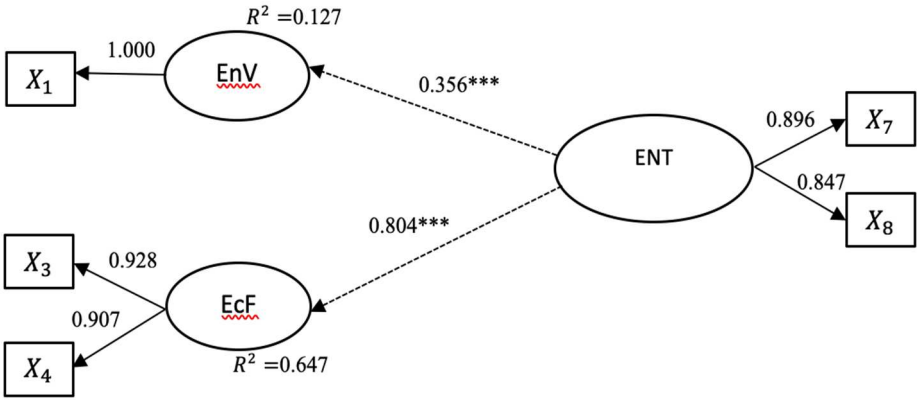

Figure 3. PLS algorithm results (final model) *** $p < 0.01$
Source: own elaboration.

Thereafter, Table 6 demonstrates the outcomes of bootstrapping. According to available path coefficients, entrepreneurial activity thus appeared statistically significant and positively affecting entrepreneurial value in society (β_7= 0.356). This proves the expectation that a high degree of entrepreneurship leads to an improvement in the status of entrepreneurs. This result is consistent with the point of Tolbert *et al*. (2011) and findings of Kuchar (2016) who notice that entrepreneurs as institutional agents affect and change institutions. These findings helped us conclude that entrepreneurial value and entrepreneurship have a one-way relationship, not a causal two-way relationship, thus proving hypothesis H6.

A significant and positive path coefficient (β_8= 0.804) confirmed our expectation that entrepreneurs can also modify existing regulatory environments and serve as a driving force for economic freedom. According to the obtained value of the R^2, a 65% variance in economic freedom was explained by the model. Consequently, this result is consistent with the points of Sine and David (2010) and the results of Samadi (2019) who declare that entrepreneurs are important in creating a friendly regulatory environment.

Table 6. Path coefficients of the SEM approach (final model)

Relations	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	*t*-statistics
ENT -> EnV	0.356***	0.352	0.094	3.800
ENT -> EcF	0.804***	0.811	0.034	23.347

*** $p < 0.01$; R2 for EnV=0.127; R2 for EcF=0.647.
Source: own study.

In this case, when the effect is transmitted from entrepreneurship to institutions, total effects between constructs equal direct effects (path coefficients) as no indirect effect is predicted.

CONCLUSIONS

This article sheds light on the study of bidirectional causation between institutions and entrepreneurship. Following our six hypotheses, we tested the link between the two chosen institutional dimensions

and entrepreneurship and, simultaneously, the impact of the regulatory environment, entrepreneurship, and human capital on economic growth. To empirically test our hypotheses, we chose 19 OECD countries and used a PLS-based structural equation model.

Our empirical results did not prove the hypothesised bidirectional causation between the normative dimension of institutions and entrepreneurship. In our sample, an entrepreneurial value that is a proxy of the normative dimension of institutions has a unidirectional association with entrepreneurship. Thus, a society with developed entrepreneurial activities has a positive effect on the status of entrepreneurs, not vice versa. However, as we expected, the regulatory dimension of institutions and entrepreneurship have a significant bidirectional relationship. The quality of the regulatory environment is highly likely to promote both entrepreneurial activity and economic prosperity. Improvements in the quality of the regulatory environment – such as regulatory efficiency and the rule of law – stimulate entrepreneurship and fuel economic growth. In turn, entrepreneurship also affects the regulatory dimension of institutions. As professionals, entrepreneurs can modify the existing regulatory environment and serve as institutional entrepreneurs. The next important finding is that entrepreneurship proved to be a major driver of economic growth due to its innovative nature. Entrepreneurial societies achieve economic prosperity thanks to their innovative and productive entrepreneurs. Finally, in agreement with previous studies, we also explored that human capital as an important source of innovation creates long-term economic growth. The innovative nature of human capital requires investments. Thus, improving the quality of human capital contributes to the prosperity of entrepreneurship.

As we mentioned above, the greatest contribution of this article is that it is one of the first empirical works devoted to studying bidirectional causality between institutions and entrepreneurship. However, we would not say that we have covered all parts of the research into relations between institutions and entrepreneurship. Instead, our study proposes a new empirical approach to the study of these mutual relations. Given the economic implications of this study, further in-depth research on the correlations of institutions and entrepreneurship is required.

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The contribution of Khalilov Latif is 70% (shaped main concept and research idea, developed research model and methodology, analysed and interpreted the results) and the contribution of Yi Chae-Deug is 30% (helped with research ideas, methodology and analysis).

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Conflict of Interest

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Advancing entrepreneurial career success: the role of passion, persistence, and risk-taking propensity

Hussein-Elhakim Al Issa

ABSTRACT

Objective: The objective of the article is to investigate the influence of passion on entrepreneurial career success while the mediating effects of persistence and risk-taking propensity between passion and success are explored.

Research Design & Methods: Questionnaires were administered to collect data about passion, persistence, entrepreneurial career success, and risk-taking. PLS-SEM was applied for testing the hypotheses with the use of 256 usable responses.

Findings: Statistically significant and positive relationships were found in the direct relationships: passion-persistence, passion-risk-taking, passion-success, persistence-success, and risk-taking-success, while persistence and risk-taking were found to mediate the passion-success association.

Implications & Recommendations: The importance of passion as an influence is verified and can be utilised for nurturing efforts that drive positive persistence and risk-taking propensity for entrepreneurial career success.

Contribution & Value Added: The shortage of studies that explored the relationships between passion, persistence, and risk-taking for the career success of entrepreneurs motivated the present research. Exploring the intervening effect of risk-taking propensity and persistence between passion and success is unprecedented.

Article type: research article

Keywords: risk-taking propensity; persistence; harmonious passion; obsessive passion; entrepreneurial career success

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INTRODUCTION

Entrepreneurship is believed to be an important engine of the collective wellbeing and a remarkable mechanism of economic progress (GEM, 2020). Passion is part of the theory of positive psychology and so has a deep influence on people's psychological and behavioural activities (Stroe *et al.*, 2018; Thorgren *et al.,* 2015). Presently, scholars are applying passion theory to understand entrepreneurial behaviour. Passion theory can be used to explain entrepreneurial behaviour because passion is a central characteristic to have for inspiration (Montiel-Campos, 2018). By persevering and tirelessly following goals, entrepreneurs achieve success (Al Issa, 2020; Milanesi, 2018). Attaining entrepreneurial success requires years of unyielding effort. GEM (2020) report shows that most economies have higher levels of early-stage entrepreneurship than established ventures, with a distinct delay in transition which might indicate difficulties in transitioning these into established businesses. A lot of research has examined the factors behind working towards the attainment of career goals and giving up on them (Efobi & Okoh, 2018; Karaman *et al.*, 2019; Mooradian *et al.*, 2016; Poczwardowski *et al.*, 2014). A blend of such neglected factors is passion, persistence, and risk-taking propensity.

The reason behind the need to study entrepreneurial career success (ECS) as a proxy to performance is the trouble in detaching a career from business success for entrepreneurs. That is because entrepreneurs decide what success means to them. Besides financial attainment, success can be measured with satisfaction and achievement outcomes (Salisu *et al.*, 2020; Wach *et al.*, 2018). Passionate and persistent people are absorbed by what they do and desire it tenaciously until they succeed in it (Cardon, 2013; Baum & Locke, 2004). The literature study has revealed three factors that are generally accepted to represent entrepreneurial career success well, namely, career satisfaction, perceived career achievement, and perceived financial attainment (Lau *et al.*, 2007; Wach *et al.*, 2018).

In this research, ECS is a subjective construct that denotes less tangible perception of what is important to achieve in career success (McDonald & Hite, 2008). The first dimension of the ECS construct is career satisfaction which means how much the person likes his or her career to the point of resisting to take on other means of livelihood (Priyono, 2017; Kautonen & Palmroos, 2010). The second dimension is perceived career achievement which is viewed as worthwhile career attainments (Lau *et al.*, 2007). The last dimension is perceived financial attainment, which is a valuable financial gain that marks the highpoint of an entrepreneurial career, especially when it exceeds others' (Lau *et al.*, 2007).

Passion takes the form of a powerful tendency to devote a great deal of time and energy, i.e., persistence to reach high degrees of performance required to succeed in business ventures (Vallerand *et al.*, 2003). When failures inevitably happen, what keeps an entrepreneur from giving in is their passion, as revealed by prior studies proving that passion impacts persistence (Al Issa *et al.*, 2019; Cardon *et al.*, 2015; Liang *et al.*, 2018). Persistence is assumed to be related to improved performance directly (Duening *et al.,* 2019; Wu *et al.*, 2007), and indirectly as theorised in its association with pursuing difficult growth goals and venture survival and growth (Baum *et al.*, 2001; Chang *et al.*, 2007; Gartner *et al.*, 1991). This indicated an indirect influence between passion and its associated performance.

Likewise, passion has been theorised as related to risk-taking as it is attached to the formulation of fresh strategies to allow business growth (Chen *et al.*, 2015; Santos *et al.*, 2020). At the same time, risk-taking as part of entrepreneurial orientation (EO) is related to performance (Adomako *et al.*, 2016; Pratono, 2018). Besides, insights into the associations between passion, persistence, and risk-taking with a nascent outcome like entrepreneurial career success could aid in determining if there is the best equilibrium or a practical game-changer for the variables outside which their impact is harmful instead of being favourable for entrepreneurs. Given the discussion above, we aim to realize the research objectives below:

1. To investigate the connection between entrepreneurial passion (EP) and entrepreneurial career success (ECS).
2. To test the mediating effect of persistence (P) on the relationship between EP and ECS.
3. To determine the mediating effect of risk-taking propensity (RTP) on the relationship between EP and ECS.

It would be particularly interesting to verify in the current study a novel, complex, and possibly negative relationship between obsessive and harmonious passion with entrepreneurial career success while exploring potential mediators like persistence and risk-taking. The study sheds light on the value of connections that entrepreneurs might have beyond the sphere of business should they not monitor and rein in their entrepreneurial passions.

Malaysia has developed extensive initiatives to boost entrepreneurial education and skills and experts point out that physical infrastructure and entrepreneurial opportunities are abundant (GEM, 2018; Avvisati *et al.*, 2020). In Malaysia, the establishment of a new business is deemed a suitable way to become wealthy yet not more than 50% think it should be an attractive career choice (GEM, 2010). That is most likely because attaining entrepreneurial career success normally requires years of unyielding effort. This makes Malaysia a model prototype to examine the impact of passion, persistence, and risk-taking on entrepreneurial success.

This research article starts by reviewing relevant anecdotal and empirical evidence to provide understanding for the concepts studied. It is then followed by sections that discuss all the methodologies and analysis techniques applied in the research. Finally, a discussion of findings, implications,

and conclusion are laid out. This last section also suggests possible future research work arising from this study.

LITERATURE REVIEW

Empirical evidence containing entrepreneurial passion is expanding around the world (Cardon *et al.*, 2017; Murnieks *et al.*, 2020; Santos *et al.*, 2020). The impact passion has on entrepreneurial behaviour can be derived from the leading work by Cardon and Kirk (2013), Murnieks *et al.* (2014), and Vallerand *et al.* (2003). The proposed model in the present research is inspired by the theoretical framework outlined in Iyortsuun *et al.* (2019) linking passion as an antecedent to performance and mediated by behaviour. The self-determination theory (SDT) (Deci & Ryan, 2012), identity theory (Burke & Reitzes, 1981, 1991), and Social Cognitive Career Theory (SCCT) (Brown *et al.*, 2011), which is based on Bandura's (1986) social cognitive theory (SCT), support the current study's model which investigates the impact of passion on entrepreneurial career success as well as the intervening effects of persistence and risk-taking propensity on the passion-success association (Figure 1).

The self-determination theory (SDT) claims that people engage in activities in the hope of growing psychologically and satisfying the basic psychological needs of autonomy competence and relatedness (Vallerand, 2016). SDT suggests that individuals would rather feel in-charge of their actions, and if something makes a formerly liked activity feel like a requirement instead of a chosen task then it will weaken their motivation. This is not evident as much in work as it is in the leisure activities of our own choice. A limited few of these activities start to resonate with our core until they become part of our newly determined identity.

SDT indicates that certain activities trigger feelings of social acceptance from the environment and self-esteem from personality. There are two ways individuals bring things inside them: autonomous and controlled. If the social environment is supportive of the need for autonomy, then it leads to harmonious passion. If the social environment is controlling, then it leads to obsessive passion. People with obsessive passion show inflexible tenacity for activities owing to an intense desire to take part in the activity they see as meaningful and pleasurable. On the other hand, harmonious passion displays flexible persistence toward the activity due to an independent internalisation into the self. It produces a drive to endorse the activity and engage in it willingly. For entrepreneurs, this passion takes the form of a powerful tendency to devote a great deal of time and energy in the form of persistence, in doing all the entrepreneurial activities that they are passionate about.

According to identity theory, self-defining activities that people have passion for hold meaning in one's identity (Cardon & Kirk, 2015). Entrepreneurial passion is aroused because certain venture-oriented activities are meaningful and significant to the identity. As a result, an entrepreneur exhibits persistence in activities that substantiate and confirm the identity activated by passion. Positive psychology theory also supports the notion that people continue doing activities that invoke feelings that put them in a positive emotional state (Stroe *et al.*, 2018; Thorgren *et al.,* 2015). These deeply meaningful activities bolster role identity and ease the risk of identity threats (Cardon *et al.*, 2009).

Finally, the Social Cognitive Career Theory (SCCT) asserts that desire and likelihood of reaching an outcome are vital elements when a big change is about to take place, such as embarking on a new venture journey. However, individuals must have cognitive abilities, like passion, persistence, and risk-taking propensity to attain entrepreneurial career success. Outcome expectations are beliefs about the consequences of engaging in desired tasks. For entrepreneurial career success, passion fuels motivation and enriches the welfare and makes sense out of the ordinary life while taking the necessary risks and persisting against all odds. Stronger passion for an activity influences success through heightened initiative, persistence, and risk-taking to guarantee success.

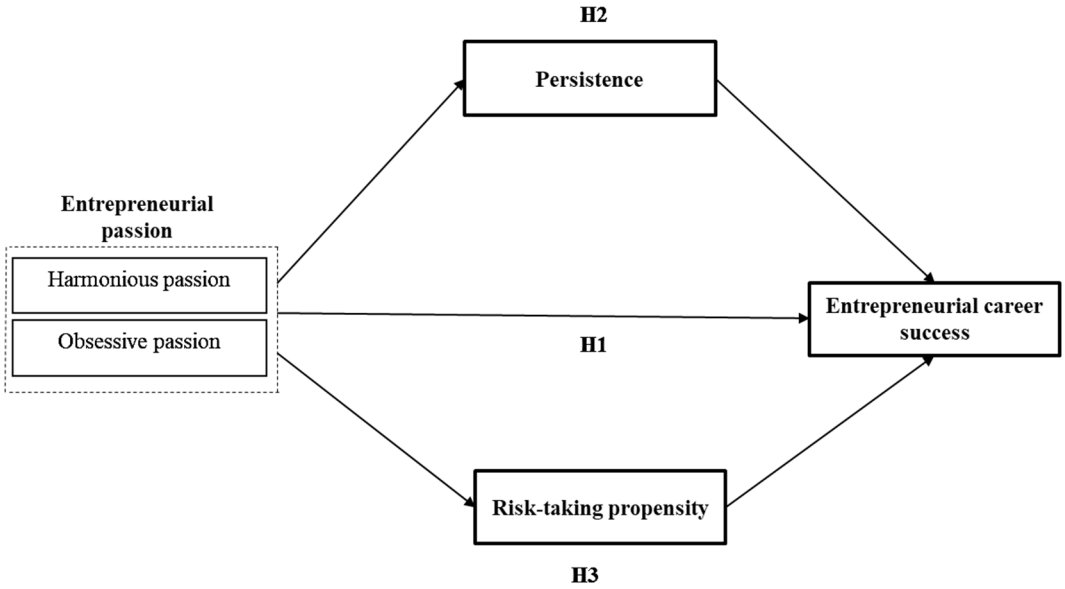

Figure 1. Research Framework
Source: own elaboration.

Passion and entrepreneurial career success

Entrepreneurial passion is a powerful tendency for entrepreneurial endeavours that people feel strongly about and so spend a good deal of time and energy on (Vallerand *et al.*, 2003). The first dimension of passion are harmonious passions which arise from independent absorption of interest into one's identity that creates a strong desire and individual approval for the venture. The second are obsessive passions which are controlled internalisation that derives from within the self or social pressures connected with the activity. Individuals who have an obsessive passion can therefore end up feeling an irresistible urge to take part in their valuable and pleasurable activity. Still, the entrepreneur might have difficulties focusing on entrepreneurial activities and performing them to the point of successful completion because of the sense of obligatory association now with the expected extrinsic reward.

The success of an entrepreneurial venture hinges on what constitutes success in the entrepreneur's venture and her/his career. Scholars recognized that in addition to monetary gain, there are important and meaningful ways to gauge success that include satisfaction and achievement outcomes (Salisu *et al.*, 2020; Wach *et al.*, 2018). Past studies have identified passion as a predictor of various outcomes and performance directly (Ho & Pollack, 2014; Iyortsuun *et al.*, 2019; Ma *et al.*, 2017; Vallerand, 2008) and indirectly (Baum & Locke, 2004; Murnieks *et al.*, 2014). Boon *et al.* (2020) examined the effect of team passion on performance and showed that teams need to be passionate about activities right for a particular stage in venture development. For example, Vallerand *et al.* (2008) found that harmonious and obsessive passions lead to committing to deliberate practice which impacts sports performance. Another example is the study by Mueller *et al.* (2017) which revealed a significant link between passion and firm performance. Therefore, in the current study, it is proposed that passion will lead directly to higher performance in the form of entrepreneurial career success. Keeping this discussion in mind, the following three hypotheses are presented, one of which was the main hypothesis for the EP construct and the remaining two were sub-hypotheses formulated for each passion dimension:

H1: Entrepreneurial passion (EP) is positively and significantly related to entrepreneurial career success (ECS).

H1a: Harmonious passion is associated with ECS.

H1b: Obsessive passion is associated with ECS.

Persistence as a potential mediator

Persistence has been deemed a necessary characteristic of successful entrepreneurs (Caliendo *et al.*, 2020; Kuratko & Hodgetts, 2007; Wu, Matthews, & Dagher, 2007). Entrepreneurial persistence is displayed by an entrepreneur's constant optimistic upkeep of entrepreneurial enthusiasm and endlessly revived vigorous effort in a new business venture in the face of opposing pressures or attractive options. The literature on entrepreneurship persistence offers the widespread notion that persistence is the work of a variety of antecedents. The characteristics of an entrepreneur (Brüderl & Ziegler, 1992; Caliendo *et al.*, 2014; Cardon & Kirk, 2015) and attributes of a new business (Fritsch *et al.*, 2007; Chu *et al.*, 2011) are the major factors of persisting.

When entrepreneurs fail, their passion for their business activates their persistence until they achieve success. This is because persistence is the "goal-directed energy sustained over time" (Shane, 2003, p. 268). Prior studies have shown how passion affects persistence and it has been theorised for identity-related reasons and the emotional component of passion (Al Issa *et al.*, 2019; Cardon *et al.*, 2015; Chandler & Jansen, 1992; Liang *et al.*, 2018).

By the same token, studies show that high performers work on improving skills to become experts and so excel at what they do. Therefore, in the current study, it is proposed that entrepreneurs persist at their ventures until they succeed in it as a career (Vallerand, 2008). Persistence is assumed to be related to improved performance directly (Duening *et al.*, 2019; Wu *et al.*, 2007) and indirectly as theorised in its association with pursuing difficult growth goals and venture survival and growth (Baum *et al.*, 2001; Chang *et al.*, 2007; Gartner *et al.*, 1991). For example, Wu *et al.* (2007) in a longitudinal study of emerging entrepreneurs in a mid-western state in the USA found that business growth expectations are positively related to entrepreneurial persistence. Given the discussion above, the following three hypotheses are put forth, one of which was the main hypothesis for the persistence construct, and the remaining two were sub-hypotheses formulated for each passion dimension:

H2: Persistence (P) will mediate the effect of EP on ECS.

H2a: P will mediate the effect of harmonious passion on ECS.

H2b: P will mediate the effect of obsessive passion on ECS.

Risk-taking propensity as a potential mediator

Risk-taking is making decisions to dedicate resources to plans with uncertain outcomes (Anderson *et al.*, 2015). It is important to examine risk-taking propensity (RTP) in the current model because studies analysing entrepreneurial risk-taking often neglect to consider the amassed wealth as an antecedent of this risk (Zahra, 2018). At the individual level, a study by Kollmann *et al.* (2017) conducted on 104 dyadic entrepreneurial teams found that innovativeness facilitates team performance but also found that diversity in pro-activeness and risk-taking within a team impairs team performance. Moreover, Vallerand *et al.* (2008) discovered that harmonious passion for dramatic arts has a positive impact on life satisfaction, while obsessive passion is not related to it. A possible explanation is that obsessive passion leads to smaller degrees of satisfaction than a harmonious passion in pursuit of greater outcomes. Since people are risk-averse when positive things happen and risk-seeking when negative ones happen (Bazerman & Moore, 1994), therefore, the current study proposes to verify the conflicting results for the risk-taking propensity association with performance and the possible mediating role of risk-taking on the passion-success association.

Passion for expanding enterprises is related to creating fresh strategies for business growth (Campos, 2017; Chen *et al.*, 2015; Santos *et al.*, 2020). Also, the RTP dimension is an integral part of the EO construct but it has shown inconsistent results for its relationship with firm outcomes (Musa *et al.,* 2014; Palalic & Busatlic, 2015; Zhao *et al.*, 2011). For example, Pratono (2018) conducted a study that involved 390 Indonesian SME owner-managers and confirmed the positive RTP-performance association. Moreover, Fairoz *et al.* (2010) verified that only proactiveness reported a significant positive association with performance but risk-taking or innovativeness did not. Therefore, the present research seeks to investigate the intervening effect of RTP between passion and ECS. Taking into account these arguments, the

following three hypotheses are presented, one of which was the main hypothesis for the persistence construct, and the remaining two were sub-hypotheses formulated for each passion dimension:

H3: RTP will mediate the effect of EP on ECS.

H3a: RTP will mediate the effect of harmonious passion on ECS.

H3b: RTP will mediate the effect of obsessive passion on ECS.

RESEARCH METHODOLOGY

Sampling

Data were collected in person by research assistants from entrepreneurs in three Malaysian northern states, Kedah, Penang, and Perlis. At the outset, 400 questionnaires employing purposive sampling were circulated, only 256 fulfilled the conditions and were employed in the remaining analysis, obtaining a response rate of 64%.

The purposive sampling used took advantage of expert judgment to select non-random elements that represented a cross-section of the population. This ensured that genders and a variety of businesses were represented sufficiently due to their importance in the study (Lavrakas, 2008). Characteristic elements of Malaysian entrepreneurs ensured extra variety in terms of wholesale and retail trade, smaller businesses, newer firms, and gender. Given this subjectivity, this method is considered most appropriate for small samples from a limited geographic area i.e., states in northern Malaysia. The lowest number of respondents was estimated at 119 as also validated with a priori G*Power analysis (Bruin, 2006).

The sample was made up of respondents involved in a variety of businesses. The highest percentage of entrepreneurs were in wholesale and retail trade (36.3%), followed by varied categories like street hawkers, barbers/beauty salons, and cobblers (14.5%), and hotels and restaurants (11.7%). Further, most of the entrepreneurs were females (55.7%, n=144), with the majority having fewer than five employees (66.8%), and their source of capital investment from personal savings (59.7%). Most of the firms studied were under six years in business (66.4%), which is in-line with studies that claim new ventures are in a serious developmental phase at some point in their first six years and are deemed start-ups (Shrader, Oviatt, & McDougall, 2000). Also, the first six years are important because a venture shows its potential for initial performance, such as revenue and an increase in hired employees, whereas in later years these factors may be less pertinent (Hmieleski *et al.*, 2013). In this study, most of the businesses were considered in a major developmental stage as most respondents identified themselves as novice entrepreneurs with under six years in business (66.4% n=168) and the remaining were classed as habitual entrepreneurs (33.6% n=85) (Hmieleski *et al.*, 2013; Ucbasaran *et al.*, 2001).

Measures

Entrepreneurial career success

The entrepreneurial career success was measured against 14 items, categorised under the three dimensions: career satisfaction, perceived career achievement, and perceived financial attainment, which were adopted from Salisu *et al.* (2019), and by the work of Lau *et al.* (2007) and Greenhaus *et al.* (1990). ECS is operationalised as the total positive and desirable outcome individuals have achieved through their career experience (Salisu *et al.*, 2017). The standard five-point Likert-like scale ranging from “strongly disagree” to “strongly agree” was applied and had internal consistency of 0.939.

Entrepreneurial passion

The entrepreneurial passion was measured using six items, three of which measured harmonious passion and three items measured obsessive passion as adopted from Murnieks *et al.* (2020) and in accordance with the work by Vallerand *et al.* (2003) and validated by Marsh *et al.* (2013). The standard five-point Likert-like scale ranging from “strongly disagree” to “strongly agree” was used and had internal consistency of 0.742.

Persistence

The persistence was measured against five items (Baum & Locke, 2004; Van Scotter & Garg, 2019). The five-point Likert scale was used while estimating internal consistency of 0.874.

Risk-taking propensity

To measure entrepreneurial risk-taking propensity exclusively, seven items were included (Covin & Slevin, 1989; Morgan & Strong, 2003; Tan & Litschert, 1994; Venkatraman, 1989) that had internal consistency of 0.812. One of the most debated issues in entrepreneurial orientation is the approach towards its dimensionality (Covin & Slevin, 1989; Lumpkin & Dess, 1996; Santos *et al.*, 2020). The current research assumed its multidimensionality as more appropriate to tap the multifaceted nature to explore the possible polarised effects of passion and its mediated prediction of success guiding the selection of the risk-taking propensity.

RESULTS AND DISCUSSION

The article reports findings and interpretations of the main analyses carried out, namely the exploratory factor analyses, the assessments of measurement and structural models, and hypothesis testing. There were no indications of non-response bias as presented by an independent sample t-test to compare the study's variables. All *p* values were above 0.05 in the t-test results indicating no difference between responders during the two months of data collection (Pallant, 2013). The output from SPSS was checked for outliers by looking at the Mahalanobis distances for values that are greater than (16.27) the critical chi-square. Three cases were identified and removed from the data set, cases 184, 240, and 244, with values 25.3, 25.6, and 21.1, respectively (Tabachnick & Fidell, 2007).

Table 1. Descriptive statistics and correlations

Variables	Mean	SD	1	2	3	4	5	6
1: Gender	1.56	0.50						
2: Years in business	1.34	0.47	-0.11					
3: ECS	3.89	0.70	0.05	0.26**	0.01			
4: EP	4.23	0.58	-0.04	0.29**	0.17**	0.51**		
5: P	3.71	0.64	-0.02	0.17**	0.17**	0.53**	0.56**	
6: RTP	4.36	0.63	-0.05	0.13	0.04	0.60**	0.48**	0.45**

Note: N=256. ** $p < 0.01$
Source: own study.

Pearson correlation is typically used to exhibit the direction and the strength of the relationship between continuous variables (Pallant, 2013). According to the results, correlations were significant between passion, persistence, risk-taking, and success (Table 1).

The effects of common method variance were treated by safeguarding the anonymity of the surveyed entrepreneurs, decreasing evaluation fear and clarifying the items by elucidating each indicator. Likewise, Harman's single factor showed the first factor explaining less than 50% of the total variance as recommended by MacKenzie and Podsakoff (2012). After the retrieval of all the questionnaires, a data cleaning process showed that less than 5% values were missing per indicator and so these were replaced with SPSS's Expectation-Maximisation function. Normality was established for all variables using the Q-Q plot, which was very close to a straight line and the histogram was nearly bell-shaped, and the de-trended normal Q-Q graphical showed no gathering of points, with the majority accumulating near the zero. Furthermore, VIF (variance-inflated factor) was below 5, at 1.995, 1.583, and 1.919, and tolerance values were all above 0.20, at 0.501, 0.632, and 0.521 for entrepreneurial passion, risk-taking, and persistence, respectively, which indicated that there were no multicollinearity issues among the constructs.

The PLS-SEM measurement model was carried out for confirmatory factor analysis. All items loadings were retained as their factor loadings were > 0.5 as presented in Figure 2. Convergent validity via higher AVE was confirmed (Fornell & Larcker, 1981). Examining the outer models was the first step in evaluating the measurement model. The outputs also showed satisfactory composite reliability limits ranging from 0.825 to 0.947.

The evaluation of the measurement model began by inspecting the outer model and then the valuation of discriminant validity. The first method to establish discriminant validity was the examination of the cross-loadings of the indicators, which showed all item loadings greater than all cross-loadings with other constructs. Likewise, the Fornell-Larcker's criterion (1981) was met with square roots for all AVEs higher than inter-construct correlations and so discriminant validity at the construct level was also established. Lastly, discriminant validity was also established with the heterotrait-monotrait ratio (HTMT) (Henseler *et al.*, 2015). To assess the structural model, this study adhered to the statistical procedure recommended by Hair *et al.* (2017). The procedure is composed of six main steps that begin by inspecting collinearity issues via VIF. The results show that all main hypotheses were accepted at $p < 0.01$ except for one rejected (Table 2 and Figure 2). The rejected hypothesis 1b proposed that obsessive passion was related to success. Interestingly, persistence and risk-taking propensity fully mediated the association between obsessive passion and entrepreneurial career success.

PLS-SEM assessed the model's predictive capability and revealed the R^2 for success (0.488, 0.479 R^2 Adjusted) and persistence (0.390, 0.385 R^2 Adjusted); they were deemed moderate and weak, respectively (Cohen, 1988). The assessment of the effect sizes (f^2) were small at 0.048 for harmonious passion and success, very small at 0.000 for obsessive passion and success, and small at 0.033 for persistence and success, but there was a large effect for risk-taking and success (Kenny, 2016). Next, the Q^2 values were estimated which was 0.262 (omission distance D=7) for success, 0.248 for persistence, and 0.121 for risk-taking, indicating predictive relevance of the model. Finally, predictive relevance measured with the effect size q^2 on success was small at 0.012, 0.098, 0.019, and -0.001 and for persistence and risk-taking, harmonious passion, and obsessive passion, respectively (Hair *et al.*, 2017).

The current framework presents entrepreneurial passion as sparking entrepreneurial career success mediated by persistence and risk-taking propensity after controlling for gender and years in business. A parametric multi-group analysis was run using SmartPLS v.3 to compare the two genders (F=141, M=112) and novice (n=167) and habitual entrepreneurs (n=85) as recommended by Ucbasaran *et al.* (2001) and Westhead *et al.* (1998), there was no significant difference found in the variables regarding gender. However, the results showed that EP for habitual entrepreneurs predicted persistence to a significant extent in comparison to novice entrepreneurs ($\beta = 0.277$; t-value = 2.914; $p < 0.004$). Moreover, there was no significant difference in the mediation of P and RTP on the EP-ECS relationship for both novice and habitual entrepreneurs. This means that the direct effect of habitual was more significant than for novice entrepreneurs. A possible interpretation is that as habitual entrepreneurs gained more experience, they needed to rely more on their passion to persist in their business pursuits to secure entrepreneurial career success.

The initial objective was to investigate the EP-ECS association paralleled by the first hypothesis which showed a significant and positive effect (Table 2). The sub-hypothesis H1a that proposed harmonious passion associated with entrepreneurial success was also accepted (standard beta = 0.199, t-statistic = 3.181, $p < 0.001$). Previous studies have also demonstrated that passion impacts success/performance (Iyortsuun *et al.*, 2020; Murnieks *et al.*, 2014; Vallerand, 2008). However, the sub-hypothesis H1b that proposed that obsessive passion is associated with entrepreneurial success was rejected. Obsessive passion can be possessed by an entrepreneur in a position of experiencing an irrepressible impulse to participate in business that they feel vital and pleasing. Still, these same people might have difficulties focusing on entrepreneurial activities and performing to the point of success because of the sense of obligatory association that now exists with the extrinsic reward i.e., financial attainment.

Obsessive passion makes people experience an intense desire to take part in an activity. However, the lack of direct relationship between obsessive passion and success might be due to the agony felt and lower levels of career satisfaction in a destructive spiral process coupled with the pressure of chas-

ing high performance levels that is typically associated with obsessive passion. This suggests the existence of an indirect relationship between obsessive passion and performance as Vallerand (2008) found, with deliberate practice mediating the relationship. Another reason for the lack of influence of obsessive passion on success is the torn sense of pressure and impulse to succeed combined with a concern and fear of performing poorly. Moreover, entrepreneurial demands like wearing many hats but at the same time maintaining a balanced life for optimal performance is often at odds with the rigidity of obsessive passion that takes over and results in less-than-ideal conditions from lacking versatility.

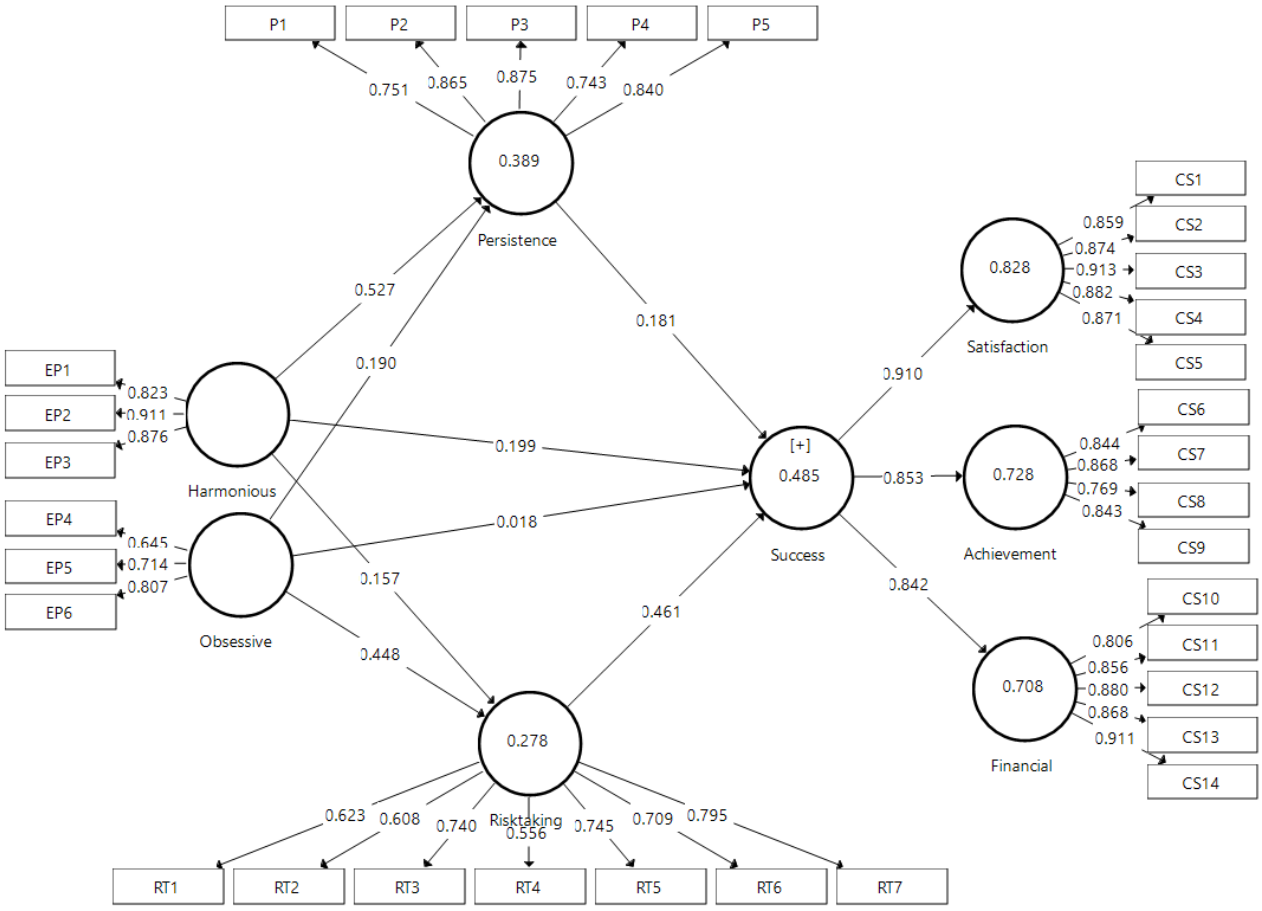

Figure 2. PLS-SEM Measurement model analysis
Source: own elaboration.

The second aim of the study attempted to check if there is a mediating effect by persistence on the passion-success association. The parallel second hypothesis was accepted, revealing that persistence has a complementary and partial mediating role on the passion-success association (standard beta = 0.121, t-statistic = 2.839, $p < 0.005$). Similarly, persistence had a complementary and partial mediating role on the harmonious passion-success association (standard beta = 0.095, t-statistic = 2.499, $p < 0.012$). Also, persistence had a complementary and partial mediating role on the obsessive passion-success association (standard beta = 0.034, t-statistic = 1.974, $p < 0.048$). This was consistent with previous research that discovered a positive and significant persistence-performance association (Baum *et al.*, 2001; Duening *et al.*, 2019) and association between passion and persistence (Cardon *et al.*,2015; Liang *et al.*, 2018). In this case, the neutral effect of obsessive passion on success due to feeling pressured to perform and rigidity is redeemed by the rise of persistence to achieve the overall entrepreneurial career success.

The third aim of the study attempted to check if there is an intervening effect of risk-taking propensity on the (entrepreneurial passion (EP) and entrepreneurial career success (ECS)) EP-ECS association and was paralleled by the third hypothesis, that risk-taking propensity will mediate the effect of

entrepreneurial passion (EP) and entrepreneurial career success (ECS), which was accepted. The mediating effect of risk-taking was found to be significant (standard beta = 0.214, t-statistic = 3.007, $p < 0.003$). Similarly, risk-taking had a complementary and partial mediating role on the harmonious passion-success association (standard beta = 0.072, t-statistic = 2.410, $p < 0.016$). Also, risk-taking had a complementary and partial mediating role on the obsessive passion-success association (standard beta = 0.207, t-statistic = 5.224, $p = 0.000$). This is consistent with past work that suggested the possible mediating effect of risk-taking on the passion-success association (Bazerman & Moore, 1994; Vallerand *et al.*, 2008), and risk-taking relationship with performance (Pratono, 2018; Santos *et al.*, 2020). Since mediating constructs address why particular events take place, the risk-taking propensity experienced by entrepreneurs emerges from the work of obsessive passion to achieve career financial success as shown by work associated with risk-taking and performance (Games & Rendi, 2019; Wales, 2016).

Table 2. Summary of hypothesis testing

Paths	Beta	T-value	P value	Decision
H1. EP → ECS	0.182	3.209	0.001	Accept
H1a. Harmonious EP → ECS	0.199	3.181	0.001	Accept
H1b. Obsessive EP → ECS	0.018	0.295	0.768	Reject
H2. EP → P → ECS	0.121	2.839	0.005	Accept (complementary – partial mediation)
H2a. Harmonious EP → P → ECS	0.095	2.499	0.012	Accept (complementary – partial mediation)
H2b. Obsessive EP → P → ECS	0.034	1.974	0.048	Accept (indirect-only – full mediation)
H3. EP → RTP → ECS	0.214	3.007	0.003	Accept (complementary – partial mediation)
H3a. Harmonious EP → RTP → ECS	0.072	2.410	0.016	Accept (complementary – partial mediation)
H3b. Obsessive EP → RTP → ECS	0.207	5.224	0.000	Accept (indirect-only – full mediation)

Source: own study.

CONCLUSIONS

The current research bridges a gap in the scarce studies exploring predictors of entrepreneurial career success. The findings uncovered that the two types of passions, namely harmonious and obsessive, can have a strong relationship with success, especially if mediated by persistence and risk-taking propensity. Theoretically, the current model verifies the past finding of a complex link between obsessive passion and performance (Vallerand, 2009). The negative effect of obsessive passion on intrinsic motivation from aggressively competing with others is now verified in entrepreneurship as it was in sports.

An important practical implication of this study concerns, for example, how entrepreneurs may end up working long hours into the night and weekends, and if obsessive passion is involved, entrepreneurs may lose track of time, even ignoring their family call for family time much to the detriment of those relationships. This would not be the situation in harmonious passion because the entrepreneur may leave the activities that he or she is passionate about when necessary and thus avoid conflict between business and family that could spell a disaster. The current findings suggest that with an obsessive passion, an entrepreneur would stand a slim chance of success if not for persistence and risk-taking.

The current study has a limitation regarding the small number of entrepreneurs surveyed in only three states in Malaysia (n = 256). Another limitation is the use of self-rating scales, which tend to contribute to response bias. Also, the cross-sectional nature of the study makes the findings difficult to generalise. Future research is advised to include a larger sample and a longitudinal study can offer the advantage of tracking changes over time. One of the limitations of the current study is controlling only for gender and years in business as suggested by (Liu *et al.*, 2018; Ucbasaran *et al.*, 2001). Future studies could also explore the effects of age, size of the venture, and work experience on entrepreneurial career

success. Previous studies proposed that demographic variables such as age of the business, experience, education, and gender might have an impact on firms taking advantage of opportunities (Chang *et al.*, 2012; Gupta *et al.*, 2014).

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Nascent entrepreneurs of millennial generations in the emerging market of Indonesia

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ABSTRACT

Objective: The objective of the article is to investigate the empirical linkages between personality, cultural values, and entrepreneurial characteristics and entrepreneurial behaviour in the context of SMEs' run by millennial generations in Indonesia.

Research Design & Methods: This study used survey methods to reveal the relationship between variables through hypotheses testing on 551 respondents from among SMEs' owners who just started business (nascent entrepreneur) in Banjarmasin, Indonesia, with the use of structural equation modelling.

Findings: Although the results prove that personality, cultural values, and entrepreneurial characteristics significantly affect entrepreneurial behaviour, the entrepreneurial characteristics that distinguish entrepreneur from non-entrepreneurs are rated the lowest. The impact of low self-efficacy, which does not support the implementation of entrepreneurial activities, makes it difficult to justify the millennial entrepreneur respondents are genuine to become the businessman or they are naively pursuing an unfeasible or inoperable opportunity.

Implications & Recommendations: Since the extant literature is very scarce in fully addressing the new generation of entrepreneurs, our model can be used to identify unique characteristics of millennial entrepreneurs from emerging market countries.

Contribution & Value Added: Up to this point, the majority of research in the field originated from English-speaking countries. The current study provides additional evidence on the entrepreneurial tendency of millennial Indonesians, which contributes to the growing international research on this generation.

Article type: research article

Keywords: characteristics; personality; cultural values; entrepreneurial; behaviour; millennial

JEL codes: M13, N45, R11

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INTRODUCTION

Previous studies show that the tendency in the development of entrepreneurship is triggered by economic pressures on an individual, who seeks to create employment for himself (Freiling & Harima, 2019), avoid unemployment (Meyer & Meyer, 2020), alleviate the frustration from a former job (Duan *et al.*, 2020), and seeks a better life (Chansuchai, 2019) with different results of regarding success (Covin *et al.*, 2020). However, most recent studies on entrepreneurship still focus mostly on old-timers, meaning entrepreneurs born in the 1950s, 1960s, and 1970s (Liu *et al.*, 2019). Thus, it remains unknown whether the current millennial generation is as passionate as the older one in starting new ventures. However, entrepreneurship researchers are very interested in exploring recent business rise and fall. Improved methodological rigour in the determination of nascent entrepreneurs – i.e. businesspeople who recently opened new business (He *et al.*, 2020) – motivates many scholars to analyse the existence of nascent entrepreneurial attempts.

Examining some notable millennial entrepreneurs like Mark Zuckerberg (Facebook), Brian Chesky (Airbnb), and Kevin Systrom (Instagram), we detected that they exclusively stem from western and developed countries. However, the world's economic movement slowly repositions from the western to the eastern hemisphere and from the northern to the southern hemisphere (Makszin *et al.*, 2020), which is a tendency that may produce millennial entrepreneurs in Indonesia.

Although the millennial generation all over the world has one thing in common – familiarity with digital and information technology – individuals from this generation differ distinctively across different countries. For example, the US millennials are called "pragmatic idealists," after distress caused by several terrorist attacks and the realisation that their country's relative power slowly diminishes (Rauch, 2018). On the other hand, Chinese millennials are described as increasingly maverick, inventive, bold, and prepared to alter the world (BBC News, 2019). Furthermore, millennials from developed countries like the UK or Japan may have an indistinct entrepreneurial viewpoint because of sluggish economic progress of their countries. In the same vein, we consider whether it will be possible to see innovative grassroots entrepreneurs from emerging markets like Indonesia, which demonstrate encouraging entrepreneurial atmosphere in the recent decade (Zamrudi & Yulianti, 2020). The Global Entrepreneurship Monitor (GEM) defines three dominant reasons or motives why individuals participate in start-ups (Chadha & Dutta, 2020): *High-expectation Entrepreneurship Activity* (HEA) conveys all start-ups and newly formed businesses, *Opportunity Entrepreneurship Activity* (OEA) gathers individuals who perceive a business opportunity and start a business as one of several possible career options, and *Necessity Entrepreneurship Activity* (NEA) comprises individuals that see entrepreneurship as their last resort and start a business because all other work options are either non-existent or unsatisfactory. Previous research indicated that countries with low per-capita income have high nascent entrepreneurship rates, as do countries with high per-capita income (Erkut, 2016; Gaweł, 2020). Since the emerging market of Indonesia undergoes transition to a developed country, the characteristics and motivations of millennial entrepreneurs to create entrepreneurial start-ups (whether OEA or NEA) must be well understood by policymakers so as to formulate a proper strategy for economic growth through entrepreneurship.

This article aims to highlight our understanding of the millennial entrepreneurial tendency in start-up phase by observing personal characteristics, entrepreneurship characteristics, and collectivist cultural values in places of respondents' residence. We explored the following questions. Why did the participants choose to start the business? How does personality contribute to enhancing entrepreneurial business start-ups among the participants of this study? Do participants in this study possess the necessary characteristics as entrepreneurs? Finally, how are businesses practised in the cultural context of the participants places of residence?

This article contributes to the millennial entrepreneurship literature in three ways. First, it highlights the typical personality traits of millennial entrepreneurs. Second, it identifies the entrepreneurship characteristics of participants, which clarifies whether the motivation of millennial entrepreneurial is opportunity or necessity. Finally, the results will consider some western entrepreneurship theories that are applicable to Asian milieu.

This article is structured in the following way: we will begin by presenting the relevant literature for this study. We will then describe the conceptual and methodological framework, before establishing the analysis of the empirical data. For confirmation, we will use covariance base structural equation modelling (CB-SEM) with the aid of SPSS Amos software. In the final section, we will portray conclusions, limitations, and suggestion for future research.

LITERATURE REVIEW

Below, we present the literature review of research studies focused on personality, cultural value and entrepreneurial characteristics. Despite the fact that meta-analyses reveal that the Big Five personality traits (emotional stability, extraversion, openness to experience, agreeableness, and conscientiousness) forecast business aspiration, forming, and attainment (Antoncic *et al.*, 2015), there is little concurrence about the significance of personality as a predictor of entrepreneurial success or failure (Ko-

non & Kritikos, 2019). This is because the debates on whether entrepreneurs are made or born continues (Viinikainen *et al.*, 2017; López-Núñez *et al.*, 2020). However, given that behaviour transpires in line with an individual's personality, we should believe that individual distinction in entrepreneurship is an expression of an individual's personality. Earlier studies reveal regional dissimilarity in intraindividual entrepreneurial clusters of the Big Five traits (scoring high in extraversion, conscientiousness, and openness to experience and lower in agreeableness and neuroticism), which are to be associated with more compelling geographical entrepreneurial undertakings (Audretsch *et al.*, 2017; Obschonka *et al.*, 2019). Broadening this rationality to entrepreneurial accomplishment, we envisage people scoring higher on personality traits associated with the entrepreneurial behaviour to be more burgeoning entrepreneurs. This is because they will be easier to capture in the expected manner, will perform that way with less sensitive endeavour or pressure, and will remain in high spirit during hard times.

Arranz *et al.* (2019) accentuate that commitment to be an entrepreneur among millennial generation is not only caused by personal factors but also by environmental influences such as government regulations, the country's financial and economic infrastructure, market opening, and numerous socio-cultural strands. Up till now, the Indonesian government supported entrepreneurship, although progress in the matter remains unconvincing. The authorities have initiated various actions to enhance the growth of entrepreneurship by arranging a propitious economic environment, financing, funding plans, tax deductions, and business consultation hubs. Moreover, the government has treated entrepreneurship as a fashion to accelerate the industrial configuration among the coming generation (Prasetyo & Kristanti, 2020).

Looi (2019) affirms that an individualistic culture supports entrepreneurship for it lets an individual do and alter whatever he/she intends irrespective of whether these are organised, probing, or speculative. Further, as noticed by Bogatyreva *et al.* (2019) individuals turn out to be entrepreneurs since they are committed to acknowledged values conflicting with those of their former proprietors. These disputes allure them to be independent and start their own business. In contrast, Indonesia is a collectivistic society where social attachment holds a contributory mantle in several exposures of living. Similar to other South East Asian collectivist countries, business is customarily set up in the patrimonialism tone, where there prevails paternalism, echelons, dependability, mutualism, favouritism, personalism, and patronage (Rajiani & Pypłacz, 2018).

Studies devoted to investigating the factors affecting entrepreneurship suggests that individuals with specific personality traits make their desire to venture a business. Three big five personality traits (conscientiousness, disagreeableness and emotional stability) have a direct relationship with entrepreneurship (Mahmoud *et al.*, 2020). Individual characteristics have been associated with entrepreneurs (Matos & Hall, 2020), and the more commonly observed and cited ones are risk-taking propensity, tolerance for ambiguity, internal locus of control, innovativeness, and independence (Embi *et al.*, 2019; Mujahid *et al.*, 2020; Ndofirepi, 2020). The contribution of values in entrepreneurial undertaking has received proportionately modest concern from scholars. Yet, implicitly or explicitly, the research on entrepreneurship is commonly grounded on such Western values as individualism, rivalry, material acquisition, and a strict work ethic (Erpf *et al.*, 2020). These values are not immanent in several cultures and ethnic communities, which in turns may have insubstantial relevance, in particular, developing economies. Given this reality, understanding the implications of culturally based values for the successful creation and growth of entrepreneurial ventures becomes especially critical.

Several studies have been reported on millennial as employees in the workforce (Liu *et al.*, 2019), but research on millennial as entrepreneurs is very scarce. From this point of view, the main aims of this work are to analyse the prevalence of personality referred as individual characteristics, cultural value and entrepreneurial characteristics on entrepreneurial intentions among Indonesian millennial and to examine if they are supporting or hindering factors when applying to entrepreneurship context. Scrutinizing individual and entrepreneur characteristics by observing which ones are more entrepreneurial than others is crucial to identify potential business leaders whose contributions in kick-starting economy. This mainly is advantageous in Indonesian economies, where the recession in the late 2020s due to Covid-19 pandemic has risen unemployment at new entry levels. Consequently, identifying prospective millennial entrepreneurs is one way towards finding solutions to reduce joblessness (Meyer

& Meyer, 2020). However, previous research has not investigated these two factors in their joint relationship to entrepreneurial inclination. Since most research on entrepreneurship is based on theoretical frameworks established by applying data from Western cultures, little is revealed on the relevance of these frameworks in diverse cultural settings (Erpf *et al.*, 2020). As such, the testing of such frameworks in another location will allow us to produce cross-cultural generalisability. Notably, in this research, cultural characteristics of Banjarese Indonesia are identified based on a differentiating cue hypotheses, which may reveal selected personality and entrepreneurial characteristics as significant predictors of entrepreneurial tendency. Therefore, we assumed the following research hypotheses:

H1: Individual characteristics reflected in typical personality traits significantly influence the entrepreneurial tendency of millennial generation.

H2: Cultural value has a significant effect on the entrepreneurial tendency of millennial generation.

H3: Entrepreneurial characteristics significantly influence the entrepreneurial tendency of millennial generation.

RESEARCH METHODOLOGY

Using a quantitative method, the sample was purposively selected from 551 small business owners in Banjarmasin, born in 1980 or later, which corresponds to the age range of the millennial cohort. The proposed model is shown in Figure 1.

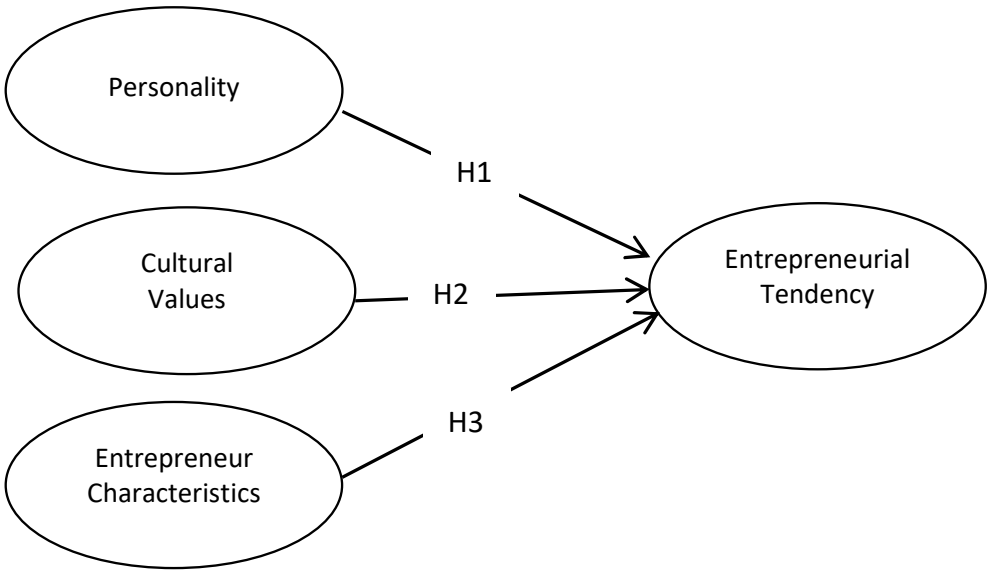

Figure 1. The proposed model of nascent millennial entrepreneurs
Source: own elaboration of Obschonka *et al*., 2019; Bogatyreva *et al*., 2019; Matos & Hall, 2020; Embi *et al*., 2019.

Purposive sampling was employed as it is the most efficient way to study a specific domain of culture (Campbell *et al.*, 2020), in this case mainly Banjarese people are known as devoted entrepreneurs (Rajiani *et al.*, 2019). This research was conducted from November 2019 until May 2020 in the area of Banjarmasin City. The sample was taken based on the willingness of members who joined in a WhatsApp thread for newly established business group for millennials in South Kalimantan, Indonesia.

Instrument development

Individual characteristics were measured with brief Big Five inventories developed by Rammstedt and John (2007): the items are labelled Openness to Experience (P1), Extraversion (P2), Conscientiousness (P3), Agreeableness (P4) and Neuroticism (P5). Cultural beliefs of collectivism/individualism were estimated utilizing a six-item Hofstede's national culture insights (Minkov, 2018): the items are labelled self-interest (CV1), togetherness (CV2), group welfare (CV3), group success (CV4), individual goals

(CV5), group loyalty (CV6). Entrepreneurial characteristics were measured by adopting the work of Mujahid *et al.* (2020) and Ndofirepi (2020): the items are risk-taking propensity (EC1), tolerance for ambiguity (EC2), internal locus of control (EC3), innovativeness (EC4), and independence (EC5). Entrepreneurial tendency was quantified with the Measure of Entrepreneurial Tendencies and Abilities (META), developed by Ahmetoglu *et al.* (2015), which has four dimensions: Entrepreneurial Proactivity (ET1; 'I am quick to spot profitable opportunities'), Entrepreneurial Creativity (ET2; 'In groups, I usually have the most innovative ideas'), Entrepreneurial Opportunism (ET3; 'I try to take advantage of every profitable opportunity I see'), and Entrepreneurial Vision (ET4; 'I want to make a difference in the world'). These items were measured on a five-point Likert scale from 'completely disagree' to 'completely agree,' while structural equation modelling with the assistance of SPSS Amos was used to examine the relationship among the items. Structural equation modelling was employed as this methodology was designed to confirm substantive theory from empirical data. In this research, theory suggests that certain personality traits do not affect other traits and that certain variables of entrepreneurial intention do not load on certain factors, so SEM was best fitted to test the theory.

What SEM includes is a series of statistical procedures allowing the assessment of causal relations among latent variables through a set of observed variables. The relationships or effects displayed in the model are justified through an appropriate comprehensive measurement. Schreiber *et al.* (2006) confirm that the measures enabling justification are mainly Chi-square ($\chi 2$), the Minimum Sample Discrepancy Function ($\chi 2$ /df), the Goodness-of-Fit Index (GFI), the Adjusted Goodness-of-Fit Index (AGFI), the Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA). Factors loading are estimated to ascertain discriminant validity by retaining factors loading of 0.50 or higher in the model (Hair *et al.*, 2020). Cronbach's alpha coefficient was examined to determine reliability, which had to exceed 0.60 (Bonett & Wright, 2015).

However, self-report questionnaires were susceptible to social desirability bias – a tendency of respondents to answer in a more socially tolerable way. To mitigate the problem, Podsakoff *et al.* (2012) recommend the following steps: (*a*) detect one or more likely sources of method bias, (*b*) manipulate them in the design of the study, and (*c*) test if the hypothesised estimates of the relationships among the constructs generalise across conditions. Sources of method bias are detected by observing the most extreme responses (MRS), which are items with the highest loading factor in confirmatory factor analysis (Mishra, 2016). Those items are excluded, and the model is recalculated. When the result displays no significant change in $\chi 2$, $\chi 2$/df, GFI, AGFI, CFI and RMSEA, then it is concluded that there is no social desirability bias.

RESULTS AND DISCUSSION

Respondent' demographic profiles related to gender, age, education, and length in current business are presented in Table 1. Most respondents were male (72.5%), with the majority (52.1%) of respondents being under 30 years old. Furthermore, most respondents received higher education, mostly at college level (45.7%), followed by partly college level (26.3%), and surprisingly 10 respondents (1.8%) possess graduate degrees. At the level of junior high school, the majority of respondents (18.9%) were in vocational/technical schools. Most start-ups are relatively new as the majority of respondents (56.6%) has started their business in less than a year, followed with those who started the business one to two years ago (25.8%). Only 5 respondents (0.9%) kept their business going for more than five years.

The mean of each variable is presented in Table 2. The mean score of respondents' personality equals 14.02 (out of 10-18), as this research considered the mix of higher values of Extraversion, Conscientiousness, and Openness to Experience and lower values of Agreeableness and Neuroticism, which were acknowledged as entrepreneurs' personality across the region. The mean score of cultural value of 27 (out of 14-40) indicated the tendency of respondents towards collectivist types, in which business are set with a patrimonialist tendency. The mean score for entrepreneurial characteristics was 10 (out of 8-12), which denoted the low prevalence of these specific characteristics of entrepre-

neurs among Banjarese Indonesia millennial generation. The mean score for the entrepreneurial tendency of 18 (out of 10-26) indicated the mild direction of the millennial generation in this area to become entrepreneurs.

Table 1. Respondent' profiles

Basic characteristics	N	%
Gender		
Male	400	72.5
Female	151	27.5
Total	551	100
Ages		
>40	10	1.8
35-40	92	16.7
30-34	162	29.4
< 30	287	52.1
Total	551	100
Education		
High School	40	7.3
Vocational/technical	104	18.9
Some college	145	26.3
College	252	45.7
Graduate	10	1.8
Total	551	100
Current business duration		
>5 years	5	0.9
3-4 years	92	16.7
1-2 years	142	25.8
< 1 year	312	56.6
Total	551	100

Source: own study.

Table 2. Descriptive statistics for variables

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Personality	551	10.00	20.00	15	1.833
Cultural Value	551	14.00	40.00	27.00	4.413
Entrepreneurial Characteristics	551	8.00	12.00	10	2.660
Entrepreneurial Tendency	551	10.00	26.00	18.00	1.436

Source: own elaboration based on SEM calculation.

Measurement model in Table 3 evidences that the loading factors are above 0.50, which means that the convergent validity of the instrument is satisfactory. Moreover, Table 3 displays the result of Cronbach's alpha coefficients for the instrument to surpass 0.60, which is the threshold for accepted reliability.

The full specified model of the research is depicted in Figure 2. What SEM demands is for small value of Chi-square statistic ($\chi 2$) and probability (P) to be smaller than 0.05. Although these statistics are usually conveyed in SEM results, they are rarely considered and generally go unnoticed as researchers prefer alternative measurements to evaluate model fit (Alavi *et al.*, 2020).

The justification was that Chi-square statistic ($\chi 2$) and probability (P) were strictly connected to sample size, which meant that the bigger the sample, the smaller the Chi-square statistic and the higher the probability. Hu and Bentler (1999) contend that limits approximate to 0.95 for the Tucker-Lewis Index (TLI), 0.90 for the Norm Fit Index (NFI), 0.90 for the Incremental Fit Index (IFI), and 0.06 for the Root Mean Square Error of Approximation (RMSEA), which sufficiently substantiated the acceptance of a precise fit between our suggested model and data. Other researchers suggest other goodness-of-fit statistics to contain the Minimum Sample Discrepancy Function (CMIN/DF) expected

at ≤ 2.0 (Arbuckle, 2011), the Goodness-of-Fit Index (GFI) approaching 0.90, and the Adjusted Goodness-of-Fit Index (AGFI) close to 0. 90 or higher (Hair *et al.*, 2020). By referring to the tests of χ2 (χ2 = 10.932), probability (P = 0.10), and GFI (0.796), our model cannot represent goodness-of-fit. However, other measurement showed that the model demonstrated permissible robustness in CMIN/DF = 1.203 (expected smaller than 2), AGFI = 0.988 (higher than 0.90), CFI = 1(higher than 0.95), TLI = 0.983 (higher than 0.95), and RMSEA = 0.09 (higher than 0.06).

Table 3. Validity and reliability

Construct	Loading Factors	Cronbach Alpha
P1<---Individual Characteristics	0.673	0.831
P2<--- Individual Characteristics	0.797	0.765
P3<--- Individual Characteristics	0.601	0.783
P4<--- Individual Characteristics	0.785	0.770
P5<--- Individual Characteristics	0.651	0.762
CV1<---Cultural Value	0.631	0.821
CV2<---Cultural Value	0.625	0.803
CV3<---Cultural Value	0.732	0.783
CV4<---Cultural Value	0.721	0.815
CV5<---Cultural Value	0.811	0.792
CV6<---Cultural Value	0.802	0.722
EC1 <---Entrepreneurial Characteristics	0.716	0.675
EC2 <---Entrepreneurial Characteristics	0.642	0.702
EC3 <---Entrepreneurial Characteristics	0.725	0.753
EC4 <---Entrepreneurial Characteristics	0.753	0.776
EC5 <---Entrepreneurial Characteristics	0.730	0.751
ET1 <---Entrepreneurial Tendency	0.784	0.826
ET2 <---Entrepreneurial Tendency	0.721	0.811
ET3 <---Entrepreneurial Tendency	0.710	0.793
ET4 <---Entrepreneurial Tendency	0.740	0.817

Source: own elaboration based on SEM calculation.

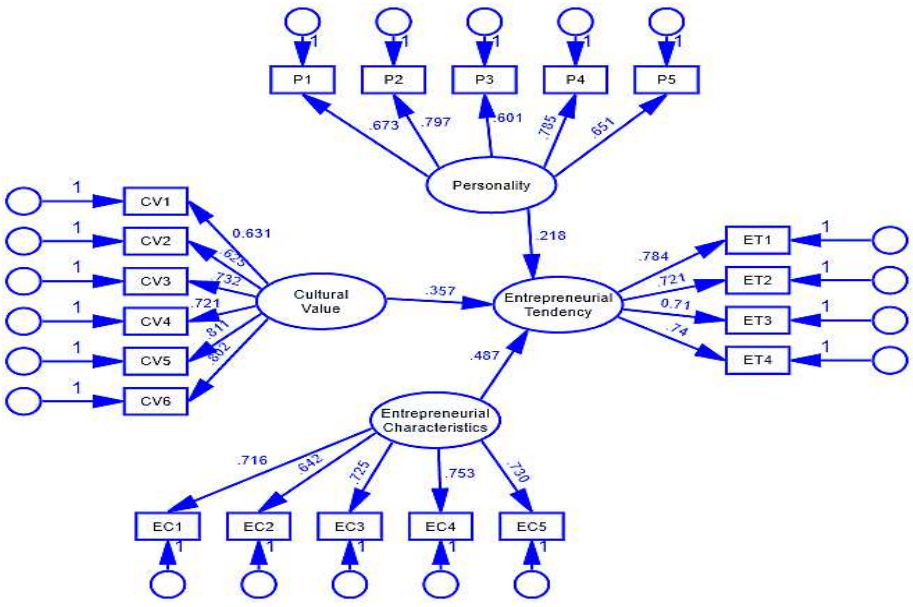

Figure 2. Full model after specification

Note: Measure of fit: RMSEA = 0.091, GFI = 0.796, AGFI = 0.988, CFI = 1, TLI = 0.983, Chi Squared = 15,763, Chi Squared/DF = 1.203, P-value = 0.235

Source: own elaboration based on SEM calculation.

Most extreme responses (MRS) were identified in four items: (a) 'I have few artistic interests,' (b) 'I am generally trusting,' (c) 'group success is more important than individual success,' and (d) 'individuals should only pursue their goals after considering the welfare of the group.' However, after re-calculating the model without these four items, the measure of the fit result remained the same, thus indicating that there is no bias of tendency from respondents to answer the questions in a much more socially acceptable way.

The summary result of structural equation modelling is exhibited in Table 4, which demonstrates that all three hypotheses are accepted.

Table 4. The summary of estimated models

Construct	Estimate	SE	CR	P	Conclusion
Personality -- > Entrepreneurial Tendency	0.218	0.184	2.410	0.005	Significant
Cultural Value -- > Entrepreneurial Tendency	0.357	0.095	2.631	0.002	Significant
Entrepreneurial Characteristics -- > Entrepreneurial Tendency	0.487	0.162	3.511	0.001	Significant

Source: own calculations based on SEM.

The findings supported the notion from developed countries that Big Five traits are related to greater regional entrepreneurial achievement (Audretsch *et al.*, 2017; Obschonka *et al.*, 2019). Although the results revealed that the variable of entrepreneurial characteristics was the most dominant in determining the entrepreneurial tendency, the mean for this variable was the lowest. This confirms the finding that research on entrepreneurship often follows Western individualism values, which are not pervasive in collectivist cultures and ethnic communities like Banjarese Indonesia. Thus, we highlighted the entrepreneurial characteristics in terms of risk-taking propensity, tolerance for ambiguity, locus of control, innovativeness, and independence, which are also found low in a separate study conducted in another province of Indonesia (Herlinawati *et al.*, 2019).

Entrepreneurs are widely credited for resisting more instability, in reality, they are the only ones accountable for their decisions. Li and Ahlstrom (2019) argue that a conceivable motive for the higher risk-taking behaviour stems from entrepreneurs' preference to view business circumstances with more certainty than others and recognise them as "opportunities," while non-entrepreneurs may perceive little possibility in the same circumstances. Therefore, the entrepreneurs can easier accept these "opportunities" compared to less entrepreneurial individuals. Among the South East Asians, risk-taking propensity is not common. Hofstede (2015) reassures that South East Asians, including Indonesians, generally circumvent uncertainty and prefer security. What is natural for Indonesian culture is uncertainty avoidance as it inclines to create anticipated behaviour and does not stand rules violation. The Indonesians practise harmony, distinctive in Indonesian relationships, to minimise risk among individuals. Therefore, the risk-taking propensity is a distinguishing prompt because it is not a typical characteristic among Indonesians. An individual willing to risk and stand firm in the face of uncertainty is more likely to have an entrepreneurial zest compared to the one who avoids from uncertainty. Thus, low risk-taking propensity impedes Indonesian millennial generation to become entrepreneurs.

Entrepreneurs experience an ambiguity that is triggered by the vibrant business world. Besides stumbling blocks and astonishments, an entrepreneurial setting is usually deprived of organisation, structure, and order. Nevertheless, entrepreneurs flourish in ambivalent circumstances. Therefore, entrepreneurs are acknowledged for having a higher tolerance for ambiguity and relish a state of affairs with the absence of structure and procedures (van de Sandt & Mauer, 2019). Similar to risk-taking propensity, the low tolerance of ambiguity hinders Indonesian millennial generation from producing entrepreneurs.

Entrepreneurs commonly show a high internal locus of control (Asante & Affum-Osei, 2019): a belief that they control their own life's events. Thus, when there is a catastrophe, they ascribe them to own conduct (Charoensukmongkol, 2019). In Banjarese Indonesian culture, Islam is a fundamental element in ethnic recognition. All Banjarese Indonesian are Muslim and endorse Islam as the way of life.

Consequently, Islam pervades whole aspects of experience in the realm of values and behaviours (Rajiani *et al.*, 2019). In Islam teachings, the divine law is inflexible and irrevocable; it is hard to find any Banjarese Indonesian go against the absolute value written in the Quran. The ensuing philosophy of *takdir* is the belief that destiny or supernatural power dictates individual aftermath, which is extensively validated. Therefore, given Indonesian's wide-ranging confidence in an external rather than internal locus of control, many estimate that individuals who favour control over their own lives are rarely found among Indonesians. Therefore, the external locus of control hampers the Indonesian millennial generation to produce entrepreneur.

Because entrepreneurs incline to be separated from what is mundane and regular, they frequently initiate new ideas and are more innovative (Mazzarol & Reboud, 2020). Their tolerance towards making mistakes further assists them in solving creativity obstructions (Danish *et al.*, 2019). However, Indonesians are not acknowledged for business innovativeness (Rajiani & Kot, 2018). One reason for that is the paternalistic setting: a well-defined hierarchy, with its explicit roles for each member (Hofstede, 2015), that inhibits creativity and innovation (Lee *et al.*, 2019).

Furthermore, an essential concept to Indonesians is face, which is a measure of social value. The potential loss of face from failure discourages innovativeness. Therefore, in a culture that does not encourage innovativeness, it becomes a differentiating cue that distinguishes entrepreneurial spirit among specific individuals. Thus, innovativeness hampers the Indonesian millennial generation to produce entrepreneurs.

Moreover, entrepreneurs tend to be self-reliant and independent (Kennedy *et al.*, 2020) for they must be able to work on their own and need less social support than non-entrepreneurs. Within the Indonesian setting, dependence on the superior is reflected in the adage "asal bapak senang" – which means "keep fathers happy" – a tendency in which people please the boss for the sake of saving their socio-economic positions (Dick, 2019). *Bapak* means father, but it can also mean a charismatic figure that cares for community members in exchange for loyalty. Given the relationship between independence and entrepreneurship, we expect such independence to be a predictor of entrepreneurial spirit. Thus, dependence hampers the Indonesian millennial generation to produce entrepreneurs.

Summarising, although Indonesian millennial entrepreneurs from the samples in this research run their business, entrepreneurship is not in their hearts and minds. As nascent entrepreneurs, they pursue an opportunity, i.e. a prospect to introduce new products or services, serve new markets, or develop more efficient production methods in a profitable manner or opportunistic behaviours (Rahman *et al.*, 2020). However, before such a venture is practically proven, the opportunity is just a venture idea. In other words, the option they follow is still only perceptual, bolstered by the nascent entrepreneur's personal beliefs about the viability of venturing, which yields to the nascent entrepreneur attempts to achieve success (Busch & Barkema, 2020).

Our findings support Zamrudi and Yulianti (2020) research to identify millennial entrepreneurs among Indonesian university students and reveal the existence of low self-efficacy among the respondents. Initially defined by Bandura (1977) as a belief in one's ability to fulfil actions, self-efficacy can influence one's cognition, self-confidence, courses of action, and perceptions of control. Thus, self-efficacy has become a crucial predictor of success, with higher levels of self-efficacy supporting perseverance and goal achievement in newly established business (Margahana, 2019). Similar to other nascent entrepreneurs, the Indonesian millennial entrepreneur pursues opportunities; these opportunities are uncertain, and not all of these pursuits result in operating businesses. Without characteristics of an entrepreneur, their failure – like that of other nascent entrepreneurs in different regions of Indonesia (Herlinawati *et al.*, 2019; Anggadwita & Palalić, 2020) – can be easily attributed to naïvely pursuing an unfeasible or inoperable opportunity. Indonesian millennial entrepreneurs with sufficient conviction about merits of the pursued opportunity can feel compelled to persist in their venturing efforts towards venture emergence. However, most importantly, their equally skilled counterparts who lose confidence in the opportunity may choose to abandon their goals.

Managerial implications

In light of the economic recession during the Covid-19 pandemic, the cultivating of millennial entrepreneurs to boost the economy is even more precarious. The government may use the crisis as a chance to start new businesses. Still, prospective entrepreneurs should be motivated to take matters into their hands by moulding internal locus of control and not let external motives dictate their actions. Furthermore, rewards to businesses in times of recovery should be accentuated by monetary and security motivations. This is also applicable to the recruiting and training of millennial employees in an entrepreneurial atmosphere. Selection tests grounded on risk-taking propensity and internal locus of control can be used to classify employees better matched to work in an entrepreneurial setting. Such employees can be organised to perform tasks that require entrepreneurial abilities. On the other hand, millennial employees who score average in this characteristic can be assigned to tasks that do not require risk-taking. The matching of task criteria to personality will confirm that the right person is selected for the right job. Moreover, training on how to take more deliberate risks and set internal locus of control can be introduced to cultivate an entrepreneurial spirit among millennial employees.

CONCLUSIONS

The Indonesian millennial generation displays little enthusiasm for entrepreneurship compared to previous generations. This low entrepreneurial activity may be attributed to limited real business exposure, given their young age, and delayed career start that results from the trend to pursue a higher education degree. However, millennials may become an excellent entrepreneurial generation because of their perspicacity as digital citizens in the era of technology-governed business. Given the unique social and historical conditions forming this generational cohort in Indonesia, we must rework present-day Indonesian cultural values as a point of reference for future study in the country.

Empirical insight into western entrepreneurship theory indicates that Indonesian's ability to fit into this framework is problematical. Thus, we may still need to wait a long time before we witness new affluent millennial entrepreneurs from this region. Nevertheless, Indonesia can learn from western entrepreneurship framework by decisively analysing their prospective benefits and unfavourable outcomes and selectively applying only those elements that are applicable to Indonesian society.

One limitation of our research is that we employed a purposive sampling technique strategy to collect information among newly established businesses owned by millennial entrepreneurs, which may have affected the generalisability of outcomes. Another limitation is that cross-sectional quantitative examinations inhibited our ability to reveal comprehensive answers to questions: "why do some people recognise opportunities while others do not?" and "why do some try to develop such opportunities while others do not?".

Future research should examine particular cultural variables that comprise the non-compatibility of Western ideas in the Asian context. Besides the cultural variables of collectivism investigated in the current study, future research should explore high versus low uncertainty avoidance, e.g. in a society with individuals not concerned about risks in the current business affairs – as they are more comfortable with ambiguity and uncertainty (low uncertainty avoidance) – entrepreneurship cannot be incorporated more than in a society with high uncertainty avoidance.

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Conflict of Interest

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Consolidation strategies of small family firms in Poland during the Covid-19 crisis

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ABSTRACT

Objective: The objective of the article is to contribute to research into family businesses by understanding how small family businesses are responding and adapting to the Covid-19 crisis.

Research Design & Methods: The research method is based on a comparative analysis of case studies. To investigate the impact of Covid-19 on small family businesses in Poland, we conducted exploratory studies in 12 entities, based on 29 partially structured interviews with managers of these companies.

Findings: The sudden spread of the Covid-19 pandemic around the world took many lives and caused severe restrictions in social and private life, including the business sector. While almost every firm has been affected by the pandemic crisis, small businesses, dominated by family businesses, are particularly vulnerable to it. Our findings show that the Covid-19 crisis affects all companies and presents a completely new challenge that has so far had no precedent. Small family businesses are not prepared for the prolonged state of uncertainty and tension threatening the continuity of their operations, which particularly endangers financial stability and employee maintenance. In responding to the crisis, small family firms cannot refer to previous experience or developed methods and patterns of operation.

Implications & Recommendations: Small family businesses must quickly adapt their operations to changing conditions, regardless of their size and industry in which they operate. Covid-19 in small family businesses causes changes in their approach to running the business and family life.

Contribution & Value Added: According to our knowledge, this is the first empirical study in Poland on the impact of Covid-19 on small family businesses.

Article type: research article

Keywords: Covid-19; pandemic; small firms; family business; entrepreneurship; crisis

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INTRODUCTION

We are now experiencing an exceptional situation. The unexpected impact of the Covid-19 pandemic has a significant influence on both social and economic life, changing the conditions of functioning of people as well as organizations. The governments of many countries have taken a number of severe restrictions that affected not only the functioning of the society but also national economies (Phelan *et al.*, 2020). Firms must face diverse challenges related to the implementation of the required protection measures as well as decrease of the demand and production and supply chain disruptions (Kraus *et al.*, 2020).

Around the world, small businesses in particular have been severely affected by the effects of Covid-19, many were forced to suspend their operations, and those that continue operating must meet a number of additional health standards and social distancing requirements. These are additional obstacles for small owners to ensure the development of their businesses, when the need for enterprise survival often comes first (Ertel, 2020). Small and medium-sized enterprises (SMEs) are quite sensitive

to a strong economic slowdown resulting from blockades and limitations in demand. SMEs are over-represented in many sectors that are strongly adversely affected by Covid-19. The obvious examples are rising unemployment and the bankruptcy of millions of SMEs worldwide. Forecasting the direction and depth of economic changes is difficult today due to the diverse reactions of countries and the varied course of the pandemic. Obviously, the pandemic causes significant changes in many areas of management. Many companies face serious challenges related to the possibility of continuing their operations, lack of financial resources, supply chain disruptions, and existing limitations in the work of employees (Amore *et al.*, 2020).

The Covid-19 pandemic presents an unprecedented challenge also for small family businesses, which are an important part of the market economy. Given their widespread presence in the economy, their role is significant (Filser *et al.*, 2016; Lušňáková *et al.*, 2019). Owners of family businesses, where the Covid-19 pandemic has disrupted operations and often put them on the brink of recession, face uncertainty unlike any other since the two world wars (Pieper, 2020).

Family entrepreneurship is an interesting cognitive example of specific relations between the family and the business it runs. The unique character of these relations makes the functioning and development of this type of firms differ from non-family firms in many areas. Not only business factors are important in the process of managing a family firm but also the interests of the family as a whole and its individual members (Ibrahim *et al.*, 2008). Family firms are assigned a clear specificity, usually including long-term operation optics, the implementation of specific goals, paternalistic attitude towards employees, close ties with the local environment, and a specific policy in the area of human resources. The specificity of family business results from the interpenetration of two spheres – family and business – which makes family firms not only entities with a specific form of ownership but also a separate type of firm. The fundamental feature of family firms is the concentration of ownership and management, and often the lack of separation of ownership and control in the entity. The character of the owner determines to a large extent the strategy and functioning of the family firm. Moreover, the goal of a family business differs significantly from the classic goals of a corporation, in which maximizing the value and rate of return for owners is the basic criterion for assessing the firm (Binz-Astrachan *et al.*, 2018) as well as can impacts its internationalization processes (Głodowska, Pera, & Wach, 2019).

Among family firms are entities of various sizes, but small firms dominate. We can estimate that about two-thirds of firms worldwide are owned, controlled, and managed by families. They provide between 60% and 90% of the global GDP (IFERA, 2003). Family businesses are characterized by considerable diversity, depending on the industry in which they operate and their individual characteristics, but small entities are the most vulnerable to the negative effects of Covid-19 (Carletti *et al.*, 2020).

The challenges of the pandemic and its potential impact on the functioning of small family businesses are the reason that in-depth research on the economic and organizational consequences of the Covid-19 pandemic is needed. There is a lot of information on the impact of the pandemic on the economy in the media and, at the same time, a deficit of reliable research on this subject. Nonetheless, the evaluation of risks and consequences of the pandemic brought about by the spread of SARS-CoV-2 virus should be both multidimensional and highly uncertain (Ragheb, 2020). An important problem is whether the changes in the world likely to be caused by the Covid-19 pandemic in the economy – namely entering the recession phase, the possibility of reversing some of the effects of globalization, the so-called deglobalization, and a drastic growth of the degree of virtualization in the functioning of economies and societies – will affect the functioning of economies and societies (Androniceanu & Tvaronavičienė, 2019). It is likely that the progressing spread of the pandemic will affect all sectors of the economy to different degrees, but the scope of losses is likely to be simultaneously very wide and multi-sectoral. The most vulnerable and therefore most affected sectors seem to be tourism, sport, hotel industry, gastronomy, culture, show business, cinematography, transport, education, and health (Albulescu, 2020; Ratten, 2020a).

We know the characteristics of small family businesses from the extensive literature on the subject and our own empirical research. Family businesses typically combine the economic logic of business strategically, structurally, and culturally with the social and emotional well-being of the owner family. With the speed with which Covid-19 has broken out and the threats it has created for all economic

operators – not to mention the number of severe government restrictions – the current situation requires empirical research on how small family businesses respond to the crisis associated with the pandemic. Thus, the main research question of this article is:

RQ: What general changes caused by the Covid-19 pandemic can be detected in small family businesses?

In this context, we seek first preliminary information on how small family businesses in Poland reacted to the pandemic-induced crisis. The objective of this article is to contribute to research into family businesses by understanding how small family businesses are responding and adapting to the crisis.

The research method is based on the comparative analysis of case studies. The comparative sample consisted of 12 small family businesses in Poland operating in various sectors, and we conducted exploratory research based on 29 partially structured interviews with managers of these companies. Data collection techniques met the criteria of methodological triangulation using two research techniques: interviews with owners and managers and secondary data analysis (websites, strategy, organizational structure).

The structure of the article includes an attempt to present the essence of threats that Covid-19 brings to small businesses and the expected effects of the pandemic. We also indicate the challenges for small businesses to increase the virtualization of workplaces and consider whether the Covid-19 pandemic will impact the increase in globalization or whether it will do just the opposite. Moreover, we point to the very core of family entrepreneurship and its specificity resulting from the dual interaction of subsystems: family and enterprise. We also characterize small family businesses, which are the dominant form of running a business in Poland.

LITERATURE REVIEW

The impact of Covid-19 on the economy and small firms

The media coverage is dominated by suggestions claiming that the coronavirus pandemic will lead to a recession in the economy. This seems a fairly obvious observation resulting from the rising number of infections in most countries, school closings, the promotion of social distancing measures, economic lockdowns, and drastic drops in global stock markets (Ramelli & Wagner, 2020; Pardal *et al.*, 2020; Dias *et al.*, 2020). The subject literature emphasizes that the Covid-19 pandemic – unlike previous crises – has many different dimensions, including economic. However, reliable studies and estimates to predict the scale of the recession are still lacking. Undoubtedly, the impact of the pandemic on the economy will be very significant, considering the scale of the epidemic and the vulnerability of the economy (Korzeb & Niedziółka, 2020). In the corporate sector, the most vulnerable are small businesses, which due to limited financial resources, are least likely to survive the crisis (Leiva-Leon *et al.*, 2020; Żak & Garncarz, 2020). Some economists hoped the effect would be limited mainly to China, but this did not happen. The scale and pace of the pandemic spread has consequences for the entire global economy (Brightman *et al.*, 2020; Ayittey *et al.*, 2020; Khan & Fahad, 2020; Kufel, 2020). It happened in an abrupt, unprecedented manner, and it took on a global dimension within three months (Sapovadia, 2020). Bonaparte (2000) presents three scenarios of economic consequences of the epidemic in the USA, advocating most radical interventions. As a result, Bonaparte recommends a minimum of 500 billion USD for intervention and interest rate cuts by the US Federal Reserve. In the editorial to the first issue of this year's *British Medical Journal*, responding to the coronavirus pandemic, Kickbusch and Leung (2020) draw attention to the decisive reaction of the Chinese authorities in fighting the pandemic, based on political decisions. It is likely that many countries will need strong governance and fast decision-making in the area of health regulations so as to be able to respond to the scale and speed of the pandemic.

Fornaro and Wolf (2020) assume that the shock caused by the coronavirus can not only lead to a supply and demand crisis but also significant adverse changes to employment and productivity. Should this scenario materialize, an intervention will be necessary to save the world economy. This is because agents are pessimistic about future productivity growth (Fetzer *et al.*, 2020). As interest rates are below the zero level, central banks are unable to effectively counteract the economic situation. Employment

and economic activity are both sharply dropping. Firms react by cutting capital expenditures, which has a negative impact on productivity and may consequently lead to a recession. Hence, as shown by the literature review and, more importantly, reports of financial institutions, along with the development of quarantine of the economies of individual countries, they enter the stage of stagnation or even recession. This is likely to be reflected in a global recession.

The crisis related to the Covid-19 pandemic affects the economy as a whole and the functioning of individual firms. There is great uncertainty among entrepreneurs about the future. They are also looking for new strategies to deal with the crisis (Ratten, 2020b). Its impact on small companies can be very serious, as shown by initial studies (Fairle, 2020). So far in business management, such a situation has been unprecedented, so entrepreneurs have no possibility of referring to experience or developed methods and patterns. Small firms are characterized by low resilience and are not prepared for a prolonged state of uncertainty and tension threatening business continuity, which may ultimately lead to the closure of the company. A particular threat to small businesses is the lack of financial stability and retention of employees. Moreover, firms lack knowledge about the possibilities of using the assistance offered by the government (Bartik *et al.*, 2020). In the case of entrepreneurs running family businesses, this situation influences changes in thinking and approach to family life and running a business in order to make companies more resistant to the pandemic.

During the Covid-19 pandemic, the issue of work virtualization gained in importance. A revolution in dominant modes of communication is happening as a result of the rapid spread of the virus. Health security reasons made business, education, and even central and local administration move to online communication. It is a profound change that includes technical infrastructure and software, which shapes new social and cultural patterns. The transition to online communication methods seem to happen at a rapid pace, involving training, motivating, and monitoring of employees.

In business, there is a rapid growth of virtualization processes. New digital tools are introduced more and more widely, and the digital transformation involves a growing number of firms (Rymarczyk, 2021; Leonardi, 2020; Hradecka, 2019; Pini, 2019). It is not just schools and universities that are radically transforming education by moving to online communication, distant modes of providing educational services, and learning management systems. A number of these methods are increasingly used in business activities. Similar processes occur in the area of e-government, where most activities begin to be performed online (Tian *et al.*, 2020). The use of digital technologies appears to be one of the major changes brought about by the Covid-19 pandemic. The opportunities provided by digital technologies are increasingly appreciated in human relations, information flow, and productivity. For many international ventures, the increasing use of digital technologies means greater reach, better coordination and lower costs (Zahra, 2020). The pandemic will result in a rapid and progressive virtualization of economic and social life. When the pandemic ends, the migration of entire sectors of the economy and administration to the network may indeed slow down, but changes in habits, lowered operating costs, and the infrastructure created will leave virtualization stronger than before.

Furthermore, in the case of small firms, the pandemic caused the problem of increasing the scope of work virtualization to become particularly important. In many industries, the use of information technology and online contacts was necessary to run the business. The development of information technologies creates the possibility of introducing new forms of the organization of firms, allowing for the maintenance or increase of competitiveness. Virtualization enables small firms to quickly react to changes and ensure efficient functioning in the market despite pandemic-induced limitations (Kraus *et al.*, 2020; Marona & Tomal, 2020). As a rule, small firms are limited by their resources, which makes it difficult to implement the latest technologies and develop virtualization processes. This translates into a slow implementation of advanced technological solutions. However, the adoption of these solutions, even if they occur involuntarily, shows that their implementation allows for the development of a survival strategy and maintenance of competitive advantage despite disruptions caused by the pandemic. Thus, the digitization of small business operations seems inevitable (Akpan *et al.*, 2020; Kuc-Czarnecka, 2020; Novak, Masner, Vaněk, Šimek, & Hennyeyová, 2020; Sieja & Wach, 2019).

Another noteworthy problem is whether the Covid-19 pandemic will contribute to an increase in globalization or, quite the opposite, it will strengthen deglobalization tendencies. Both options

are possible. The increase in globalization can be explained by the above structural trends. Recession, the virtualization of communication, and the growing need to coordinate epidemiological, health, and medical efforts among countries may force national governments and international organizations to strengthen cooperation on a global scale. On the other hand, deglobalizing tendencies may also gain an advantage (Balsa-Barreiro *et al.*, 2020; Kozlov & Sokolova 2020; He *et al.*, 2020; Hallová, Polakovič, Šilerová, & Slováková, 2019). However, it is already apparent that the pandemic has introduced major changes to the global business environment that will heavily affect companies in the years to come. So far, these include: the destruction of long-term relationships and networks of personal connections, the transformation of global supply chains, and the limitation of the flow of knowledge, technology, and people (Zahra, 2020).

At the present stage of the pandemic's development, national governments clearly play a leading role. They decide in matters of health and public policy regarding the introduction of emergency state (e.g. Slovakia), the division of the country into zones threatened by the pandemic (China, Italy), border closure, forced quarantine, the isolation of citizens, the construction of hospitals, the mobilization of healthcare, the army, and others services. The role of other institutions, such as the World Health Organization, churches, and the European Union is complementary (Androniceanu, 2020). In this sense, governments will generally emerge from the pandemic crisis with greater power compared to the pre-crisis period.

At the current stage of the crisis, different states make their own choices, deciding to choose more radical health and public policies (e.g. China, South Korea, Poland) or actions of a smaller scale (e.g. the UK, USA). Moreover, countries primarily rely on their own healthcare resources and national occupational health and safety systems. If there are no coordinated international actions, we may speak of the absolute domination of the fight against the pandemic at the national level with the use of international experience. Hopefully, the development of work on vaccines and drugs is more international and supported by open access to medical publications on the coronavirus. Therefore, we cannot satisfactorily answer whether the expected effects of the pandemic will deepen globalization or deglobalization.

International business is associated with large firms, but many small businesses operate on international markets by participating in a global network of connections. As a result, they enjoy many benefits due to the elimination of limitations resulting from economies of scale. More and more often they cooperate with entities in other countries, and often even on other continents (Foghani *et al.*, 2017). The Covid-19 pandemic could lead to the cessation of operations in international markets as the barriers associated with the imposed restrictions may be too great for a small company to overcome.

The essence of family entrepreneurship

Entrepreneurship is one of the key forces shaping the economy (Chowdhury *et al.*, 2019; Zajkowski & Domańska, 2019). It is the vehicle through which the economic system is introduced (Meyer & Krüger, 2021), which is why one underlines the role of higher education in shaping entrepreneurial competencies (Solesvik, 2019). The phenomenon of entrepreneurship is extremely diverse and perceived in various contexts. One of its areas is family entrepreneurship, which is the oldest and most natural form of entrepreneurship, recorded in all cultures and historical periods (Gasson *et al.*, 1988; Obloj, 2019). It also provides an example that many business entities are created by family members and use their human, physical, and financial resources (Aldrich & Ruef, 2006). A characteristic feature of family entrepreneurship is a strong relationship with one or more families, which determines both the functioning and firms' directions of development (Ben Moussa & Kerkeni, 2021). Most family businesses belong to SMEs, which is also an important factor influencing their development process (Cristiano, 2017).

A common feature of family businesses is the constant and multi-faceted relationship between the business and the owner family. Astrachan (2003) recognizes that the family is a critical variable that allows for understanding the essence of a family business. Handler (1989) identifies the key factors that distinguish a family business: the concentration of ownership in the hands of family members, participation in management, and the involvement of more than one generation in running the business. The uniqueness of family firms is visible in their operation, where there is a combination of economic goals, the implementation of owner family's goals and the multigenerational perspective of creating the value of an enterprise (Sułkowski *et al.*, 2018).

In family firms, there is a dual interaction of two subsystems: family and enterprise. This situation significantly affects management style and directions of its development (Moss *et al.*, 2014). Moreover, it causes decisions and actions to reflect the assumption – which is not formally stated – about maintaining the constant participation of the family in running the company and striving to pass the business on to the next generation (Lumpkin & Brigham, 2011). The participation of the family in the functioning and creation of directions for the development of a firm is a medium that is not subject to fashions and changing trends of universal values (Wilson *et al.*, 2014). Besides, these firms have lower threats of negative internal relationship development, like discrimination and inequality with appropriate losses in performance (Bilan, Mishchuk, Samoliuk, & Mishchuk, 2020). The participation of the family also allows family businesses to create strategic orientations aimed at creating a competitive advantage manifested in the long-term development of basic competences and the development of organizational culture and relations with stakeholders (Miller & Le Breton-Miller, 2006). These relations positively contribute to the corporate social responsibility maintenance and development (Çera, Belas, Marousek, & Çera, 2020), along with employer brand strengthening (Bite & Konczos-Szombathelyi, 2020). Strategic orientation must also include the owners' family's concern for intergenerational continuity and consider socio-emotional factors that affect the development of the entity (Gómez-Mejía *et al.*, 2007).

A specific distinguishing feature of family entrepreneurship is intergenerational succession, which allows for the continuity of company operations thanks to its transfer to the next generation of the owner family. It is perceived as a process of transferring ownership and management from the current generation to younger successors (Bertschi-Michel *et al.*, 2019). However, differences among family businesses include both current activities, strategic orientation and behaviour, competitive advantage shaping, and approach to creating material resources (Hoy, 2014). Like all other economic entities, family firms must adapt to changes happening on the market and face new challenges affecting their functioning and strategy in order to ensure business continuity and development. The progressing globalization means that family firms' strategic orientation should focus on introducing innovations that allow them to adapt to market requirements and internationalization (Steinerowska-Streb & Głód, 2020; Wach, 2017; Głodowska, Pera, & Wach, 2019). Some researchers observed that family firms internationalize faster than other firms (Maciejewski & Wach, 2019). Furthermore, the family nature of these firms means that they are subject to a number of processes typical only for them, including the combination of ownership, management, and succession.

Due to the multifaceted connection of the family and business system, scholars pay increasingly more attention to the theoretical complexity of research issues and the need for an appropriate methodological approach in empirical research (Wilson *et al.*, 2014). In this context, family involvement in running a business resulted in a number of paradoxes that are evident in ownership, management, and financing (Sharma *et al.*, 2014).

Characteristics of small family businesses in Poland

The intensive development of family entrepreneurship in Poland is one of the effects of the emergence of a free market economy in Poland and the creation of opportunities for the development of private businesses (Bednarz *et al.*, 2017). The political and economic changes initiated in 1989 allowed many to freely initiate and develop private economic activity (Sułkowski & Marjański, 2015). This period saw unprecedented economic growth, making Poland an attractive emerging market in Central and Eastern Europe (Klonowski *et al.*, 2008). Currently, Polish economy in many areas is comparable to countries with a stable market economy. The enterprise sector generates 75% of gross domestic product, of which SME companies generate approximately 48% and micro-enterprises approximately 30%. The analysis of Eurostat data indicates that the share of the SME sector in Poland is at a similar level to the average for the European Union countries (PARP 2020). A representative survey of family businesses from the SME sector allows establishing that they constitute approximately 80% of all SMEs that operate in Poland (Sułkowski *et al.*, 2009).

The development of the market system in Poland was an impulse to establish family businesses. The development of family businesses is a phenomenon of Polish entrepreneurship and has become one of the key successes of the Polish economy. The dominant environment for the functioning of

these entities is the SME sector. The activity of Polish family businesses has a positive effect on the stability of economic and social development. They have a significant share in both the creation of GDP and a large number of stable jobs. The specific features of family businesses are also increasingly appreciated, such as ethical operation, teamwork skills development, building community and loyalty, but also the ability to combine professional and family life (Marjański & Sułkowski, 2019).

We conducted research programs in 2009-2010, 2014-2016, and 2017-2018, which allowed for the collection of many observations that enable the identification of Polish small family firms' specificity and the directions of their development. We applied quantitative and qualitative approach in the research conducted in 2009-2010. In subsequent studies, we employed a qualitative approach (in-depth interviews and case studies). Research samples included: n = 1,280 family and non-family entities in 2009-2010; n = 10 family businesses in 2014-2016; and twice n = 20 companies families in 2017-2018.

The first of the studies was also the first representative study aimed at obtaining data on the share of Polish family firms in the SME sector and in the creation of GDP and jobs. Thanks to the research, we could establish many specific features of Polish small family businesses. In terms of structural features – such as the scope of activity, the number of employees, the turnover or scope of investments – family businesses do not differ significantly from non-family SMEs. On the other hand, the specificity of the surveyed family businesses is visible in the sphere of values, organizational culture, the level of trust, social capital, strategy, the hierarchy of goals, and also in the approach to using the family's financial and material resources. It was also important to determine whether – regardless of the type of activity – family businesses have common features influencing the shaping of their system of values, identity, organizational culture, and family social capital. An important finding was the fact that the premise of being a family business was emphasized in different ways in the surveyed companies (Sułkowski *et al.*, 2009).

In subsequent studies, we used qualitative methods. In 2014-2016, we studied the phenomenon of social capital in family SMEs. We wanted to find out why low social capital in Poland positively correlates with the creation and development of family SMEs and why the high level of family social capital stimulates the development of family SMEs. The key research methods were in-depth interview and participant observation. During this research, we encountered problems related to getting the respondents to reflect and establish communication with the researcher. Thanks to the achievement of the research goal, we learned about important and complex issues related to family social capital. The nature of the social capital of family SMEs in Poland motivates the families to achieve success together with the simultaneous limitation of showing family emotions in the firm. Integration, common value systems, trust, and knowledge sharing result from the high level of social capital in the surveyed firms (Marjański *et al.*, 2019). The conclusions from the study indicate that a high level of social capital significantly stimulates the development and facilitates the company's recovery from a crisis situation. The respondents indicated that the owner family takes steps to get the company out of the crisis and, if necessary, reduces the collection of funds from the company to the absolute minimum or even transfers private savings to the company.

The 2017-2018 study attempted to identify the specificity of strategic orientation and the influence of family character on its development. The results indicate a crucial influence of family character on the shaping of strategic orientation and that the family character of the company is an important strategic factor that increases the firm's and the owner family's chances of success. Moreover, thanks to the family character of the company, valuable and scarce human resources are gained – based on trust – but also valuable material and financial resources. Familism also influenced the easier development of knowledge resources and care for the company's reputation (Marjański, 2018).

In the same period, we conducted a study aimed at obtaining knowledge about the influence of the family factor on the strategy of small family firms. Family character is a key factor influencing the functioning, development, and creation of family business strategies. Many studies increasingly focus on the role of the social system, such as the family and its impact on the functioning of the firm. In all the surveyed firms, we identified the significant influence of family factor on the shape of strategy, which we considered to be an important strategic factor leading to success in dimensions of business and owner family. Moreover, we noticed that the firm strategy combines the goals of

the firm and the goals of the family. Familism enables the use of valuable human resources, social capital based on trust, along with material and financial resources in the process of creating and implementing strategies. Issues related to planning and implementing the succession process were indicated as an important element of strategy. Considering the influence of family factor in the strategy of a small firm run by a family may allow family SMEs harmonize values of the enterprise and the family (Marjański & Sułkowski, 2018).

RESEARCH METHODOLOGY

A characteristic feature of family entrepreneurship is the area in which relations and family goals meet with relationships and features characteristic of the firm. Thus, obtaining in-depth knowledge about the functioning of family businesses is difficult. In many cases, family business managers consciously or unconsciously limit the role of factors related to the family nature of the business they run, limiting their role only to economic aspects. Therefore, thanks to the use of qualitative methods, some cases of research on family firms allow us to obtain information of interest to us because they offer explanations for posed questions, along with opinions and motives exploration, including those that are unconscious or deeply emotional.

Accounting for the unstructured type of the research problem, we decided to use qualitative methods in the study. The research methodology was based on 12 case studies of small family businesses from Poland. Small firms that declared themselves to be family firms were invited to the research. The research method based on a comparative analysis of case studies. A comparative sample consisted of 12 small family businesses in Poland operating in various sectors. We conducted exploratory research based on 29 partially structured interviews with owners and management. Thus, we could observe both similarities and differences in individual cases. Data analysis was performed immediately after each interview, until we concluded that further data collection brought no new insights.

Data collection techniques met criteria of methodological triangulation by the use of two research techniques: interviews with owners and managers and secondary data analysis (websites, strategy, organizational structure). As a result, we could obtain information related to the impact of the Covid-19 pandemic on the functioning of a small family business. The structure of the sample, the date of the study, and the acronym of the researcher are presented in Table 1 below. Due to the need to maintain social distancing, the interviews were conducted by phone and with the use of Microsoft Teams software. The interviews were recorded upon consent of the respondents and then transcribed.

Table 1. Characteristics of the research sample

Code	Year of establishment	Employment	Sector	Methods	Time Researcher
FB01	1973	12	Production of wooden windows and doors	Interviews (2)	2020.06 LS
FB02	1997	27	Masonry	Interviews (3)	2020.06 AM
FB03	1996	48	Bakery	Interviews (3)	2020.07 AM
FB04	1992	45	Butchery	Interviews (2)	2000.06 AM
FB05	2005	35	Construction wholesale	Interviews (2)	2020.07 AM
FB06	1999	5	Hairdresser's	Interviews (2)	2020.07 LS
FB07	1991	42	Small arms production	Interviews (3)	2020.07 AM
FB08	1996	15	Accounting office	Interviews (2)	2020.07 AM
FB09	1978	25	Digital technique studio	Interviews (3)	2020.06 LS
FB10	1974	10	Furniture production	Interviews (2)	2020.07 LS
FB11	1989	48	Men's suit production	Interviews (3)	2020.07 AM
FB12	2007	22	Hotel	Interviews (2)	2020.07 LS

Source: own study.

In the study, we sought an answer to what general changes caused by the Covid-19 pandemic can be detected in small family businesses? During the study, we developed the research question into the following areas:

RQ1: How did the Covid-19 pandemic affect your business and what perspectives do you have? Are the company's financial resources sufficient? Have you used government assistance?

RQ2: Has the pandemic reduced or increased the demand for your products or services? Have there been any changes to the company's product offer? How is the company doing in the economic slowdown? Is there a need to change the business model?

RQ3: Has the pandemic affected sales to foreign markets? Has it limited the possibilities of obtaining raw materials from domestic and foreign markets? Will the company operate on the domestic market only in the event of export restrictions?

RQ4: Has the pandemic influenced the introduction or increase of remote work and firm digitization? What are your plans for the future?

RQ5: How has the pandemic affected the situation of employees in the company? Was there a need to dismiss employees or shorten working time?

RQ6: What are the relations between the company and the owner family during the pandemic? Does the emotional relationship of the family with the firm facilitate or hinder the management of the Covid-19 crisis? Does the ownership of the owner family in the functioning of the company over time increase its chances of escaping the Covid-19 pandemic unscathed?

RESULTS AND DISCUSSION

The conducted research confirmed our previous experience that small family businesses may show several limitations related to the examined firms based on primary sources. In the current pandemic situation, it was particularly difficult to contact entrepreneurs and obtain their consent to conduct the study. Let us note that much of the information was disclosed by the respondents reluctantly because they considered it related to gaining a competitive advantage or know-how. The diversified level of respondents' involvement contributed to the qualitative differentiation of the research material.

In the study, we took into account the specificity of small firms resulting from their limited size and low degree of formalization, along with the fact that the surveyed firms found themselves for the first time in a pandemic situation that impacted their functioning. We realized that we must consider the sensitive area of relationship between the company and the family, along with the emotional relationship between the owner family and the firm they control. However, we know that only the use of in-depth methods would give us a chance to reach the key processes related to the Covid-19 outbreak in the surveyed companies. At the stage of conceptualizing the research project, we did not adopt any hypotheses but instead formulated general research questions that we developed in the cognitive process. Thanks to the adopted research methodology, we could establish good relations with the respondents. The interviews meetings were characterized by openness and authenticity, which allowed for a low degree of formalization. It seems that the choice of qualitative methods in the family business research allows for an in-depth and detailed understanding of the complexity of the studied phenomena and allows us to create case studies on the basis of which we could analyse the opinions of our respondents.

The crisis triggered by the Covid-19 pandemic was in each case a challenge for small family businesses. A challenge they never faced before. The pandemic has caused many serious restrictions in the functioning of both businesses and the families that manage them. In a crisis situation, companies seek strategies that allow them to adapt to the conditions resulting from the pandemic, and at the same time, they seek an enhanced exit in the long term. The crisis clearly triggered a series of unplanned

changes. The surveyed companies observed an increase in the level of virtualization and an increase in the cohesion within the company.

RQ1: How did the Covid-19 pandemic affect your business and what perspectives do you have? Are the company's financial resources sufficient? Have you used government assistance?

The interviews show that not all companies have been affected by the Covid-19 pandemic equally. Restrictions imposed by the government also had various negative effects on the studied companies. We also noticed that with the size of the firm, the issue of maintaining financial liquidity was more articulated. Three companies – FB2, FB3, and FB5 – were found to be sufficiently liquid to endure the pandemic. In the remaining ones, measures have been initiated or implemented to reduce fixed costs and obtain government aid. However, the examined small family businesses were not prepared for a prolonged state of uncertainty that may limit their activities.

RQ2: Has the pandemic reduced or increased the demand for your products or services? Have there been any changes to the company's product offer? How is the company doing in the economic slowdown? Is there a need to change the business model?

In the examined small family firms, the reduction in demand did not apply to only two entities: FB3 and FB5. The remaining firms were affected by demand constraints to a varying extent. Companies FB6 and FB12 had to temporarily cease their activities because the government restricted their activities. Company FB11 that produces suits ceased production as shopping centres were closed and there was no outlet for the products. Two companies changed their product offer: FB 11 started sewing masks and coveralls for healthcare workers while FB9, due to the decline in orders for advertising materials, introduced protective helmets to its offer. These changes to the business model were short-lived, and after the reasons for the limitation in business subsided, both returned to the core business. Changes in the business model in the long-term perspective in the surveyed companies were not planned, but the managers predicted that in the event of a major economic slowdown, such actions would have to be undertaken.

RQ3: Has the pandemic affected sales to foreign markets? Has it limited the possibilities of obtaining raw materials from domestic and foreign markets? Will the company operate on the domestic market only in the event of export restrictions?

Among the surveyed companies, only four companies – FB 1, FB5, FB7, and FB11 – conducted export activities. In the initial period of the Covid-19 pandemic, FB7 was unable to ship supplies to the USA due to flight bans. None of the mentioned companies intended to withdraw from export activity if it were possible to continue. In the initial period, most surveyed companies experienced problems with the supply of raw materials and components for production.

RQ4: Has the pandemic influenced the introduction or increase of remote work and firm digitization? What are your plans for the future?

RQ5: How has the pandemic affected the situation of employees in the company? Was there a need to dismiss employees or shorten working time?

In only one company, FB10, three employees left. In other companies, the approach was that it is necessary to maintain a team as it was a valuable firm resource. Any decision to lay off employees was treated as a last resort. The family nature of the company had a positive effect on relations with employees. Five small family businesses interviewed – FB6, FB8, FB9, FB 11, and FB12 – used reduced working hours. In most of the surveyed companies, communication with employees was strengthened by informing them about the current situation. Companies FB1, FB2, FB7 and FB 11 paid attention to the high solidarity and commitment of employees to the company's affairs, which manifested in the motivation and willingness to jointly face the Covid-19 pandemic. In FB 12, employees showed understanding for the actions taken to secure the company's liquidity and survival.

RQ6: What are the relations between the company and the owner family during the pandemic? Does the emotional relationship of the family with the firm facilitate or hinder the management of the Covid-19 crisis? Does the ownership of the owner family in the functioning of the company over time increase its chances of escaping the Covid-19 pandemic unscathed?

During the pandemic, the surveyed firms focused on getting the firm through the crisis. Family members involved in running the business were willing to sacrifice short-term gains for the long-term survival of the business. In five cases – FB1, FB6, FB10, FB11, and FB 12 – owners' personal financial resources were mobilized to ensure the continuous operation of the firm. We may conclude that the emotional relationship of the family with the company during the crisis positively influenced the involvement of family members and increased the company's resistance to the difficulties caused by the Covid-19 pandemic. Having one decision-making centre and a low degree of formalization, small family businesses can react quickly and decisively to the current pandemic situation.

CONCLUSIONS

Our article presents the first study related to the impact of the Covid-19 pandemic on small family businesses in Poland. The Covid-19 crisis poses a difficult challenge for small family businesses. Each company has been affected to some extent by the effects of the pandemic. These companies must quickly adapt to the new reality. It is certain that the crisis does not affect all firms equally. Our analysis shows that small family businesses use different approaches to deal with this crisis situation. What is important is the industry, which determines the extent to which a company is affected by the pandemic. Moreover, the scale of business activity plays a significant role in this regard.

Considering family businesses' specifics, there is a visible consolidation of family members in the drive to lead the company through the Covid-19 pandemic and to preserve the business for the next generation. The emotional relationship of the family with the company during a crisis positively influences the involvement of family members and increases the company's resistance to the difficulties caused by the Covid-19 pandemic. Let us note that the examined small family firms are not prepared for the prolonged state of uncertainty and tension threatening the continuity of their operations, and the lack of financial stability is a particular threat.

There is also a visible concern for keeping employees. Most of the companies surveyed did not have enough cash at the onset of the pandemic. However, they used government assistance and financial resources accumulated by family members. None of the companies plan to declare bankruptcy and lay off employees. However, it seems that the Covid-19 pandemic will bring about lasting changes in the functioning of small family businesses in Poland.

It is evident that the Covid-19 pandemic became a catalyst for the level of work virtualization and digital transformation that facilitates contact with customers and suppliers. In a crisis situation, small family businesses must look for new ways to use their key competences and expand their business models in line with emerging opportunities.

The results of the research indicate that the goal of a small family business is not only to survive the crisis but also to emerge from it stronger. The multigenerational perspective of running a business is an encouragement to face the challenge of the Covid-19 pandemic.

The Covid-19 pandemic is bound to become the subject of many interesting studies in the future, seeking answers to what its effects are and how it influences the functioning and development of small businesses. The article only pinpoints the threads of the pandemic-induced recession, the virtualization of the economy and society, effective support policies, and the pandemic's impact on globalization. There is no doubt that what we direly require in the era of entrepreneurial economy (Sieja & Wach, 2019) is public support for entrepreneurial education (Nowiński *et al.*, 2020; Wach & Bilan, 2021). Naturally, the limitation of the article is its speculative nature as it basically relies on the literature about the social, economic, and cultural effects of the pandemic's development. We are aware of

our study's limitations resulting from the limited size of the research sample and the meagre possibilities of inference. Our qualitative study provides only preliminary findings from the examination of twelve small family businesses from Poland. However, it did allow us to present a more accurate picture of reality, especially when the reality of the pandemic, which is to be diagnosed in more detail. In this context, we hope our work will usher in new research on how small family businesses can deal with the Covid-19 pandemic.

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Intra-industry trade and implications of the European Union-Japan Economic Partnership Agreement from the perspective of the automotive industry

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ABSTRACT

Objective: The objective of the article is to identify patterns of intra-industry trade between the European Union (EU) and Japan in the automotive industry and to provide implications of key provisions of the EU-Japan Economic Partnership Agreement (EPA) for this sector.

Research Design & Methods: We conducted an analysis of intra-industry trade disaggregated into 65 six-digit HS tariff codes using the UN Comtrade database.

Findings: Our results confirm the potential of intra-industry trade in the automotive industry, reflected by its increasing volume, as well as the role of high-quality vertical intra-industry trade (VIIT). From the perspective of the EU, it is important to stress the improvement of the trade balance with Japan in the automotive industry and the rising position of Japan as an EU trade partner. Trade liberalisation under the EU-Japan EPA, including both tariff and non-tariff measures, may contribute to the further expansion of the EU-Japan bilateral trade in the automotive industry. However, mid- and long-term trends in intra-industry flows, including their horizontal and vertical patterns, depend on the industry's competitiveness and corresponding quality and cost differences.

Implications & Recommendations: The authors studied regulatory implications of the EU-Japan EPA for the automotive industry, including sectoral Annexes and Appendix of the EPA. The authors pointed to theoretical and empirical objections in the research process, related mostly to the degree of the disaggregation of statistics and the choice of trade nomenclature. The necessity of further research was stressed at the disaggregated country-country level to eliminate distortions of data on the IIT patterns and verify the relevance of country- and industry-specific determinants of trade, including FDI. Detailed studies of implications of the EU-Japan EPA should be undertaken in one year, when regulatory frameworks of the EU-UK and UK-Japan trade relations will be finally agreed upon and formalised.

Contribution & Value Added: The automotive industry is an important contributor to employment, GDP and R&D expenditures for both the EU and Japan. Therefore, trends in intra-industry trade and the EPA's implications in this sector deserve attention and in-depth analysis. To the best of our knowledge, there has been no such industry-level analysis of the EU-Japan EPA so far. The authors considered consequences of Brexit for the automotive industry, including various scenarios of the future EU-UK and Japan-UK trade relations.

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INTRODUCTION

The European Union-Japan Economic Partnership Agreement (EPA) was signed on 17 July 2018 in Tokyo (Japan) and entered into force on 1 February 2019. It was notified by the World Trade Organisation (WTO) on 14 January 2019 under Article 24 of General Agreement on Tariffs and Trade (GATT) and

Article 5 of General Agreement on Trade in Services (GATS), as it covers trade in both goods and services. The EPA eliminates 97% of customs duties on EU imports to Japan, amounting to more than USD 1 billion every year. According to the European Commission (2019) estimations, full implementation of the EPA will increase annual trade between the EU and Japan by USD 36 billion.

As a manifestation of mega-regionalism, the EPA constitutes the world's largest trade bloc so far, accounting for 27.34% of global GDP and 36.32% of global exports in 2019 and inhabited by over 572 million people (World Bank Database, 2020). The bloc contains five of the seven major advanced economies in the world (G7), i.e. Japan, Germany, United Kingdom[1], France and Italy. Merchandise trade between the EU and Japan amounted to USD 157.3 billion in 2019, with EU exports to Japan totalling USD 74.9 billion and imports of USD 82.4 billion. Japan is the second-largest trade partner of the EU in Asia (after China), while the EU is the largest foreign investor in Japan. In 2019, the EU's foreign direct investment (FDI) in Japan amounted to USD 6.86 billion, which is the second-highest amount since 2010. On the other hand, Japan's investment in the EU reached USD 72.74 billion in 2019, the highest amount since 2010, accounting for 29% of total outward FDI flows from Japan (Statista, 2020; Statista, 2020a).

As argued by Bobowski (2017, pp. 25-26), the EPA affords both the EU and Japan "an opportunity to set multilateral rules of trade in the 21st century and challenge the hegemonic ambitions of the United States and China at both the regional and global stage." The former President of the European Commission, Jean-Claude Juncker, called the EU-Japan EPA a "(…) *a message to the world about the future of open and fair trade"* (EC, 2019). US President Donald Trump and his administration were obvious addressees of this statement. On 23 January 2017, the newly elected president had signed an executive order withdrawing the United States from the Trans-Pacific Partnership (TPP) agreement, claiming that the agreement was a threat to the domestic economy, industry and labour market. This act represented a symbolic retreat from trade policy defined by multilateralism and mega-regionalism in favour of nationalism and protectionism under the slogan "America first." Moreover, the so-called Paris climate agreement signed on 12 December 2015 in Paris, from which Trump also decided to withdraw his country, became a subject of special commitments under the EU-Japan Strategic Partnership Agreement (SPA).

The main objective of this article is to identify patterns of intra-industry trade between the European Union (EU) and Japan in the automotive industry and to provide implications of the EU-Japan EPA's key provisions for this sector. The automotive industry is an important contributor to employment, GDP and R&D expenditures for both the EU and Japan. Therefore, trends in intra-industry trade and the EPA's implications in this sector deserve attention and in-depth analysis. To the best of our knowledge, there has been no such an industry-level analysis of the EU-Japan EPA so far. Most of empirical analyses of the EU-Japan bilateral trade liberalisation focus on the EPA's effects on the EU as a whole, i.e. Sunesen, Francois, and Thelle (2010), Francois, Manchin, and Norberg (2011), or at the industry-level of individual EU member states and Japan, i.e. Ambroziak (2017), Felbermayr, Kimura, Okubo, Steininger, and Yalcin (2017). The importance of intra-industry trade in the EU-Japan bilateral trade was taken into account for the first time by Benz and Yalcin (2015), however, the authors adopted a CGE model at the aggregated level of data.

The EPA consists of 23 chapters and annexes. Annexes 2-C, 3-B and Appendix 3-B-1 contain provisions addressing the automotive industry. In addition to regulations dedicated to trade in goods and services, the agreement covers rules of origin, government procurement, intellectual property, capital movements, subsidies, state-owned enterprises, dispute settlement, sustainable development, and small and medium-sized enterprises, among other areas.

In addition to the EPA, the EU-Japan SPA was signed on 17 July 2018 to establish a legal framework for strategic cooperation in such fields as democracy promotion and human rights; peace and security; combatting terrorism; chemical, biological, radiological and nuclear risk mitigation; development policy; economic, financial and industrial cooperation; transport; climate change; energy and science,

[1] According to a *note verbale* from the EU (WT/LET/1462) dated 27 January 2020, the United Kingdom was treated as an EU member for the purposes of executing international agreements until the end of the transition period, i.e. 31 December 2020. The Withdrawal Agreement concluded under Article 50 of the Treaty of the EU assumed that the EU law – with few exceptions – still applied to and in the UK.

technology and innovation. Furthermore, the EU and Japan are currently negotiating the Investment Protection Agreement (IPA) which provides investor-state and state-state dispute settlement mechanisms (ISDS and SSDS).

The EPA (in force), SPA (pending ratification) and IPA (under negotiation) co-create a legal framework covering political and sectoral cooperation and the joint activities of the EU and Japan in the face of regional and global challenges (EC, 2019). By strengthening bilateral economic and political ties, the EU-Japan EPA and SPA enhance the institutionalisation of the security community of the EU and members of the Democratic Security Diamond (Kuźnar & Menkes, 2019, p. 9).

The novelty of this article is to adopt the perspective of the automotive industry to identify the patterns of the EU-Japan intra-industry trade disaggregated into six-digit HS codes, as well as to discuss key provisions of the EU-Japan EPA and their implications. Therefore, this article will seek for the answer to the following research questions:

RQ1: What were the trends in respect of the shares of the automotive industry in total trade between the EU and Japan in recent period?

RQ2: What were the patterns of intra-industry trade in the automotive industry between the EU and Japan in recent period?

RQ3: What are the implications of the EU-Japan EPA's key provisions for the automotive industry in the EU and Japan?

This article proceeds as follows. Section 2 reviews the literature on intra-industry trade and empirical studies on the EU-Japan EPA published to date. Section 3 describes the automotive industry in the EU and Japan, including recent statistics. Section 4 describes our research methodology and examines the patterns of intra-industry trade in the automotive industry, including motor vehicles and their parts and equipment, using the UN Comtrade database. Section 5 presents and discusses the study's results. This section is followed by our conclusions.

LITERATURE REVIEW

Intra-industry trade

Intra-industry trade, considered as simultaneous exports and imports within the same tariff codes or product groups, was recognised as a newly emerging phenomenon in the early 1960s. Numerous trade theorists, including Kojima (1964), Linder (1961) and Posner (1961), highlighted that trade between developed countries with similar income levels and development, including goods of similar factor endowment, increased as a share of total world turnover. Due to the inadequacy of explanations for this phenomenon provided by, among others, the Heckscher-Ohlin-Samuelson (HOS) paradigm and Leontief analysis, demand- and supply-side theories of intra-industry trade emerged.

The conceptualisation of intra-industry trade from the demand-side perspective was advanced by, among others, Lancaster (1980), Linder (1961) and Helpman (1981). From the supply side, Helpman (1981), Krugman (1981) and Helpman and Krugman (1985) made key contributions. The demand-side theories stressed the importance of the diversification of consumer preferences and tastes, linking an increase in intra-industry trade with countries' rising income. In turn, these factors influence purchasing decisions and stimulate demand for more unique and specific goods. The progressive homogenisation of consumer preferences and tastes across countries at similar development and income levels has been recognised as a source of international trade in varieties of the same products (Bobowski, 2018). From the supply-side perspective, intra-industry trade results from manufacturing capabilities in the field of product differentiation. Helpman and Krugman (1985) argued that a higher average income per capita is related to a higher capital-labour endowment ratio. This, in turn, enhances a country's intra-industry specialisation, as capital-intensive industries deliver more differentiated outputs (Bergstrand, 1990). According to theories on both the demand and supply sides, trade in differentiated products takes place mainly between countries at similar levels of income, development and factor endowments.

Horizontal intra-industry trade models were introduced by Krugman (1979; 1981), Dixit and Norman (1980), Lancaster (1980), Helpman (1981) and Bergstrand (1990), including assumptions of horizontal differentiation of products and increasing returns of scale. Mora (2002) noted several prerequisites of those models, including high income, monopolistic market competition, similar levels of economic development and relative factor endowments, diversified consumer preferences and products of similar quality but different attributes. The increasing volume of intra-industry trade between developed and developing countries inspired some authors to model vertical intra-industry trade. Falvey (1981) and Falvey and Kierzkowski (1987) analysed intra-industry trade in vertically differentiated products, with the assumption of constant returns of scale in line with the theorem of Heckscher-Ohlin-Samuelson.

While the horizontal share of total intra-industry trade is generally understood to increase with the similarity of factor endowments between countries, vertical intra-industry trade is fuelled by their divergence. Therefore, as Hellvin (1996) argued, vertical intra-industry trade involves countries at diversified levels of income per capita, while horizontal trade involves countries at similar levels. In the latter case, horizontal product differentiation and economies of scale play an important role. Price competition between manufacturers (when offsetting net transportation costs) makes the trade in homogenous goods socially profitable (Kierzkowski, 1996). Brander (1981) and Williamson and Milner (1991) highlighted the potential of such trade between countries with similar income levels, technological development, factor endowments and consumer preferences.

Empirical analyses of intra-industry trade have been conducted since the 1960s by authors including Verdoorn (1960), Kojima (1964), Balassa (1966), Grubel and Lloyd (1971) and Greenaway and Milner (1981; 1983). Greenaway (1983; 1984) and Balassa (1986) established databases of intra-industry trade. Grubel and Lloyd (1975) recognised preference diversity instead of relative factor endowments as a trigger of intra-industry trade. Dixit and Stiglitz (1977) addressed the assumptions of monopolistic competition and consumers' product variety preferences in their studies on intra-industry trade. The authors recognised product differentiation through the prism of increasing returns of scale, as in the case of Lancaster (1979). However, the latter examined product differentiation as a source of demand at the aggregate level. Dixit and Stiglitz (1977) and Lancaster (1979) also shared assumptions of non-competitive reasons for diversified consumer preferences and imperfect competition (Kierzkowski, 1984).

The European Union-Japan EPA

Several authors have investigated the economic and strategic impact of the EU-Japan EPA. De Prado (2017) considered the long-term impact of the EU-Japan EPA and SPA, stating that the mutual convergence and adjustment of economic models and security paradigms are critical to building a more comprehensive and substantial partnership. Felbermayr *et al.* (2017) analysed the EU-Japan EPA using the static, general equilibrium trade model to assess the sectoral value-added impacts in both the EU and Japan. The authors confirmed that gains will be asymmetrically distributed across the sectors and countries, making pharmaceutical, food and automotive industries the largest beneficiaries, with special regard to enterprises operating in Germany, France, the United Kingdom and the Netherlands. Bobowski (2017) studied the implications of the EU-Japan EPA, recognising economic gains in the fields of trade and investment that may translate into job creation, technology transfer, rising productivity and improved social welfare in the EU, while also pointing out marginal social and environmental concerns. Ambroziak (2017) studied the impact of the EU-Japan EPA on trade in agricultural products in Poland, recognizing opportunities in respect of export growth. Suzuki (2017) found that the stance of civil society organisations (CSOs) toward the EU-Japan EPA was relatively mild, contrary to other mega-regional agreements such as CETA or TTIP, mostly due to its 'old-fashioned' agenda and the lower importance of Japan in the EU's international trade in comparison to its North American partners.

Felbermayr (2018) conducted a quantitative analysis of the EU-Japan EPA, employing a generalised variant of the Eaton-Kortum model. The authors identified no relevant side effects for the third countries, while the largest gains were expected due to reductions in the costs of non-tariff barriers. Danks (2018) studied the EU-Japan EPA and SPA through the prism of the strategic doctrine of Japan, referred to as Abe's Doctrine, concluding that both agreements serve to reinforce the rules-based, liberal inter-

national order and to modify Japan's domestic norms. According to the European Commission's Directorate-General for Trade (2018) estimates, the EPA will increase the EU exports to Japan by EUR 14 billion, and from Japan to the EU by EUR 22 billion. Przeździecka, Górska, Kuźnar, and Menkes (2019) used the CGE model to investigate the impact of the elimination of customs duties under the EU-Japan EPA for the Polish economy, highlighting prospective gains for producers of meat and animal products. Grübler, Reiter and Stehrer (2019), adopting a structural gravity model, estimated mid-term effects of the EU-Japan EPA on the real GDP of the EU and Japan, indicating a considerable positive impact on mid- and high-tech industries, except for CEE countries. Kuźnar and Menkes (2019a) confirmed the significance of the EU-Japan EPA and SPA rooted in the community of values. The authors noted endogenous and exogenous determinants of the agreements, such as the economic and political potentials of the parties, as well as the turbulent international environment that began with the isolationist policies of the US administration under Trump. Kirchner and Dorussen (2020) discussed the agreements from the perspective of security cooperation, stressing the importance of the EU-Japan EPA and SPA as platforms to address regional and global challenges. Gilson (2020) performed an in-depth analysis of the EU-Japan economic and political relations that paved the way to the EPA and SPA during the crisis of multilateralism in international relations.

In the empirical part, the authors attempt to verify two hypotheses:

H1: Trade liberalization under the EU-Japan EPA, including both tariff and non-tariff measures, may contribute to the further expansion of the EU-Japan bilateral trade in the automotive industry.

H2: Mid- and long-term trends in intra-industry trade, including their horizontal and vertical patterns, depend on the competitiveness of the automotive industry and corresponding quality and cost differences.

RESEARCH METHODOLOGY

A point of reference in the quantitative analysis of intra-industry trade is the Grubel-Lloyd (GL) index, employed in recent studies conducted by, among others, Baccini and Dür (2018), Baccini, Dür, and Elsig (2018), Bobowski (2018), Bagchi and Bhattacharyya (2019), Anderer, Dür, and Lechner (2020), Zarbà, Chinnici, and D'Amico (2020) and Jošić and Žmuk (2020). Abd-el-Rahman (1984) is considered a pioneer of research on intra-industry trade, assuming decomposition into a horizontal and vertical pattern with the use of export and import unit values, further popularised due to research conducted by Greenaway, Hine, and Milner (1994).

In this article we concentrate on the automotive industry, which is important in terms of GDP, employment and R&D in both the EU and Japan. In this industry there is a potential for intra-industry trade in both horizontal and vertical patterns due to the decomposition of motor vehicles into various parts and components. This decomposition, in turn, enhances the fragmentation and spatial dispersion of production processes. Automotive manufacturing is characterised by high technology and long value chains, as well as the involvement of multinational enterprises (MNEs).

The analytical part of the article consists of three stages using each of the UN Comtrade databases. In the first stage of the analysis, we studied bilateral trade in goods between the EU-28 (as the statistical analysis covers the period 2010-2019, the UK is considered as the member of the EU) and Japan in the years 2010-2019, disaggregating them into two- and four-digit HS codes to identify statistically relevant codes. In the second stage, we disaggregated trade flows into six-digit HS codes to identify dominant codes in the automotive industry selected as the case study. In the third stage of the analysis, we calculated Grubel-Lloyd and Balassa indexes to indicate the dominant patterns of intra-industry trade in each of the selected six-digit codes in the automotive industry over the whole ten-year period, including disaggregation to high- and low-quality vertical intra-industry trade.

To analyse the patterns of intra-industry trade in the automotive industry, we selected 65 six-digit HS codes classified into 15 groups (Table 1).

Table 1. The six-digit HS codes selected for analysis of the automotive industry

Group of codes	Six-digit HS codes	Group of codes	Six-digit HS codes
I Rubber	401110, 401120, 401220, 401290, 401310	II Glass	700711, 700721, 700910
III Metal	830120, 830230	IV Engines	840731, 840732, 840733, 840734, 840790, 840820
V Engine parts	840991, 840999, 841330, 842123, 842131, 842542	VI Machinery	848310, 848320, 848330, 848340, 848350, 848360, 848390
VII Electric	850710, 850720, 850730, 850740, 850780, 851220, 851230, 851240, 851290, 851829, 852721, 852729, 853921, 853929, 854430	VIII Chassis fitted	870600
IX Vehicle bodies	870710	X Vehicle parts	870810, 870821, 870829
XI Transmissions	870840	XII Vehicles	870850, 870870, 870880, 870891, 870892, 870893, 870894, 870899
XIII Clocks	910400	XIV Seats	940120, 940190
XV Automobiles	870321, 870322, 870323, 870324, 870331, 870332, 870333, 870390		

Source: original compilation based on the UN Comtrade Database (2020).

The quantitative analysis of intra-industry trade in the automotive industry in the years 2010-2019 was performed using the Grubel-Lloyd Index according to the following formula (Grubel & Lloyd, 1971):

$$GL_i = \frac{(x_i + m_i) - |x_i - m_i|}{x_i + m_i} = 1 - \frac{|x_i - m_i|}{x_i + m_i} \qquad (1)$$

$$0 \leq GL_i \leq 1$$

where:

x_i - the export value of industry i;
m_i - the import value of industry i;

When the GL index equals 1, it indicates a perfect balance between the imports and exports. On the other hand, a GL index of 0 indicates no intra-industry trade, which makes a given industry either import- or export-competing, but never both. The higher the GL index, the higher the share of intra-industry trade in total trade.

Trade regionalism may serve as a trigger of inter-industrial reallocation. As a result, competitive industries expand, whereas those that are non-competitive erode.

Greenaway, Hine, and Milner (1994) transformed the Grubel-Lloyd index from formula (1), distinguishing between horizontal and vertical patterns of intra-industry trade (2). In the latter case, however, additional disaggregation with respect to the relative quality of export of a given product compared to its import is made.

$$GL_i = 1 - \frac{\left|x_i^h - m_i^h\right| + \left|x_i^{vl} - m_i^{vl}\right| + \left|x_i^{vh} - m_i^{vh}\right|}{x_i + m_i} \qquad (2)$$

where:

x_i^h - the export value of the horizontal pattern of industry i;
m_i^h - the import value of the horizontal pattern of industry i;
x_i^{vl} - the export value of the low-quality vertical pattern of industry i;
m_i^{vl} - the import value of the low-quality vertical pattern of industry l;
x_i^{vh} - the export value of the high-quality vertical pattern of industry l;
m_i^{vh} - the import value of the high-quality vertical pattern of industry i;

We adapted the Balassa index to measure horizontal and vertical intra-industry trade (HIIT and VIIT) indexes (3).

$$HB = \frac{\sum_{i=1}^{N_1}[(x_i + m_i) - |x_i - m_i|]}{\sum_{i=1}^{N}(x_i + m_i)}, \quad VB = \frac{\sum_{i=1}^{N_2}[(x_i + m_i) - |x_i - m_i|]}{\sum_{i=1}^{N}(x_i + m_i)} \tag{3}$$

where N_1 indicates six-digit codes of industry *i* that exhibit HIIT, N_2 indicates six-digit codes of industry *i* that exhibit VIIT and *N* indicates a total number of six-digit codes of industry *i*, according to the following equation: $B_i = HB_i + VB_i$

Our analysis involves HIIT and VIIT measures as established by Fontagné and Freudenberg (1997). The horizontal pattern of intra-industry trade is recognised as dominant when the similarity criterion is met. Then, the differences between the unit values of exports (UV_i^x) and imports (UV_i^m) are small (4).

$$\frac{1}{(1+\acute{\alpha})} \leq \frac{UV_i^x}{UV_i^m} \leq 1 + \acute{\alpha} \tag{4}$$

To differentiate the product quality, we calculated export and import unit values (5)(6):

$$UV_i^x = \frac{x_i}{Qx_i} \tag{5}$$

$$UV_i^m = \frac{m_i}{Qm_i} \tag{6}$$

where Qx_i is the quantity of exports of industry *i* and Qm_i is the quantity of imports of industry *i.*

The vertical pattern of intra-industry trade involves either higher quality exports compared to the corresponding imports, which translates into a significantly higher unit value of exports than imports (7), or lower quality exports compared to corresponding imports, which translates into significantly lower unit values of exports than imports (8).

$$\frac{UV_i^x}{UV_i^m} < \frac{1}{(1+\acute{\alpha})} \tag{7}$$

$$\frac{UV_i^x}{UV_i^m} > 1 + \acute{\alpha} \tag{8}$$

Formally, UV_i^x is the unit value of the exports of industry *i* at the six-digit level, and UV_i^m is the unit value of the imports of industry *i* at the six-digit level. Both 0.85 and 1.15 thresholds result in the adoption of a dispersion factor $\acute{\alpha}$ equal to 0.15 (whereas some authors select 0.25). In the case of the vertical differentiation of products, low-quality vertical products are traded when the relative unit value of the exports-to-imports ratio is lower than $(1 - \acute{\alpha})$, or 0.85, whereas trade in high-quality vertical products results in a relative unit value of exports-to-imports ratio higher than $(1 + \acute{\alpha})$, or 1.15.

RESULTS AND DİSCUSSİON

The automotive industry in the EU and Japan

The automotive industry contributes significantly to the economies of the EU and Japan. In 2019, the automotive industry in the EU and Japan accounted for 6.1 and 8.2% of total jobs, respectively, 28 and 24.5% of total private R&D expenditures, and 7 and 12% of GDP (Table 2).

Table 2. The automotive industry in the economies of the EU and Japan, 2019

Country	Employment (millions of employees)	Share of total employment (%)	R&D expenditures (billions of USD)	Share of total private R&D expenditures (%)	Share of GDP (%)
EU	13.8	6.1	57.4	28	7
Japan	5.46	8.2	27.66	24.5	12

Source: original compilation based on ACEA (2020); JAMA (2020).

The EU and Japan each play an important role in the global automotive industry. Both national industries comprise significant shares of the total volume and value of production and international trade in autos and their parts and equipment, with special regard to passenger cars. According to data

provided by the European Automobile Manufacturers' Association (ACEA), which combine commercial vehicle production in Japan and the Republic of Korea, in 2019, the combined production of passenger cars in the EU and Japan amounted to 23.96 million units (32.33% of the global volume); the countries produced 4.2 million units of (primarily light) commercial vehicles (22.46% of the global volume). The shares of commercial vehicles of all types (light, medium and heavy) of total motor vehicle production were comparable in the EU and Japan in 2019: 14.6 and 14.1%, respectively (ACEA, 2020; JAMA, 2019).

Japan is the home country to such car brands as Toyota, Suzuki, Honda, Daihatsu, Nissan, Mazda and Mitsubishi, while the EU has produced Volkswagen, Renault, Peugeot, Citroën, Volvo, BMW and Mercedes. In 2019, among the top ten auto brands in terms of the global market share, three were Japanese – Toyota (10.24%), Honda (5.46%) and Nissan (5.15%) – and three were from the EU: Volkswagen (7.59%), Mercedes (2.94%) and BMW (2.62%; Statista, 2020b). The annual reports published by ACEA provide abundant data on the automotive industry, including production volume, trade and investments. According to the available data, in 2014-2017 the global production volume of passenger cars increased by 10.89% to 79.88 million units. However, the volume declined over the two subsequent years by 7.23% to 74.11 million units (Table 3). Importantly, the EU-28's share of global volume increased over the last two years to 21.28% and is thus slightly below its 2015 peak. The highest volume of production in the EU, 16.93 million units, was recorded in 2016.

Table 3. Production of passenger cars in the EU and Japan in units (share in the global volume, %), 2014-2019

Country	2014	2015	2016	2017	2018	2019
EU	14 952696 (20.76)	16 030126 (21.77)	16 925471 (21.74)	16 493027 (20.65)	16 644609 (21.04)	15 769041 (21.28)
Germany	5 446423 (7.56)	5 532675 (7.51)	5 746808 (7.38)	5 448171 (6.82)	5 120409 (6.47)	4 661328 (6.29)
Spain	1851828 (2.57)	2175612 (2.95)	2354117 (3.02)	2197064 (2.75)	2168877 (2.74)	2175909 (2.94)
United Kingdom	1 529233 (2.12)	1 588631 (2.16)	1 722698 (2.21)	1 677594 (2.1)	1 519440 (1.92)	1 303135 (1.76)
France	1455160 (2.02)	1504913 (2.04)	1565951 (2.01)	1661499 (2.08)	1772641 (2.24)	1675198 (2.26)
Czech Republic	1 131247 (1.57)	1 225861 (1.66)	1 344182 (1.73)	1 397916 (1.75)	1 437396 (1.82)	1 427563 (1.93)
Japan	8169024 (11.34)	7759655 (10.54)	7762054 (9.97)	8218436 (10.29)	8214183 (10.38)	8187935 (11.05)
China	17 473310 (24.26)	18 977727 (25.77)	22 555454 (28.98)	23 638856 (29.59)	22 726556 (28,72)	20 675662 (27.9)
United States	9041649 (12.55)	9260326 (12.58)	9127015 (11.73)	8030633 (10.05)	8028375 (10.15)	7452191 (10.06)
World	72 039656 (100.0)	73 637407 (100.0)	77 839234 (100.0)	79 884806 (100.0)	79 126247 (100.0)	74 107368 (100.0)

Source: original compilation based on ACEA (2016, pp. 8-10); ACEA (2017, pp. 14-16); ACEA (2018, pp. 11-13); ACEA (2019, pp. 12-14); ACEA (2020, pp. 9-11).

Among the EU member states, Germany maintained its leading position as a manufacturer of passenger cars. However, German production volume trended downward since 2017, falling to 4.66 million units in 2019 (the production share declined from 7.38 to 6.29%). Moreover, the share of Germany in the global production volume gradually decreased through the study period irrespective of the upward trend in German production between 2014 and 2016. Spain, the second-largest producer of passenger cars in the EU, recorded a comparable share of 3% of the global volume in years 2015-2016 and 2019, with the strongest upward trend in production volume in the period 2014-2015 (by more than 320 thousand units). The United Kingdom occupied the third position among EU producers until 2017, with a downward trend in terms of the share in the global volume of production since 2016 (production volume dropped by more than 400 thousand units in three years). In

2018 it lost its position in favour of France (2.24% share in the global volume of production), and a year later was also overtaken by the Czech Republic (1.93%).

Japan's share in the global volume of passenger car production decreased by 0.29% over the study period. However, the number of units manufactured in the years 2014 and 2017-2019 were comparable and varied from 8.17 to 8.21 million. The EU and Japan's The combined share of the EU and Japan in the global volume of production did not change considerably between 2014 and 2019, increasing by 0.23%, with the lowest score recorded in 2017 (30.94) and the highest in 2019 (32.33).

Importantly, the share of China, the leading global manufacturer, increased considerably between 2014 and 2017 to 29.59%. China's share declined slightly over the next two years to 27.9%, which translated into a reduction of 2.96 million units (meanwhile, the combined EU-Japan volume of production decreased by over 750 thousand units). In 2014, the EU-Japanese share exceeded that of China by 7.84% or 5.65 million units, and five years later, by 4.43% or 3.28 million units.

The top export markets for EU passenger cars in terms of value in the study period were the United States and China. Japan constantly improved its position through the years and occupied the third position since 2017, with cars valued more than USD 8 billion exported annually from the EU (Table 4). In terms of the number of units exported, the United States maintained its leading position in the period 2014-2019. However, both China and Japan were ranked at lower positions in the first three years when compared to their export rank in terms of value. With more than 263 thousand passenger cars, Japan was the third-largest export market for the EU only in 2019. Interestingly, between 2014 and 2019, the number of EU passenger cars exported to China declined by over 149 thousand units (to less than 460 thousand) with a downward trend since 2017, while in the case of Japan there was a slight upward trend in the period 2014-2018 and a small decline a year later.

Meanwhile, Japan maintained its position as the largest import market of EU passenger cars in terms of value with an upward trend over the whole period. Increasing from USD 6.6 billion to USD 11.7 billion, Japan expanded its advantage over the United States, the second-largest import market. In terms of volume, Japan was ranked second after Turkey. Moreover, Japan recorded an upward trend over the whole period, while imports from Turkey slightly diminished after 2017. As a consequence, while the EU imported 145 thousand more passenger cars from Turkey than from Japan in 2017, two years later the difference in favour of Turkey diminished to only 4 thousand units.

The volume of overseas vehicle production by Japan increased since 2010 by 43.18% to 18.9 million units in 2019. Of these units, 1.22 million were manufactured in the EU (10.85 million in Asia, 4.4 million in North America and 1.75 million in Latin America). As Tsukamoto (2006) pointed out, while Japan produces high-technology automotive parts on its own, several Southeast Asian locations compose a complementary production network. For instance, Thailand manufactures diesel engines, steering columns and finished cars; the Philippines manufactures transmissions and front-wheel drive shafts; Malaysia produces engine computers and steering links and Indonesia builds gasoline engines and transmissions.

Among the ten best-selling automotive producers in Japan in 2019, there were only native brands. The European brands Mercedes Benz, Volkswagen and BMW were ranked 11th, 13th and 15th, respectively (Bekker, 2020).

From the perspective of the EU, Japan is neither among the top ten export nor import partners in trade in commercial vehicles (light commercial vehicles up to five tonnes and commercial vehicles over five tonnes, including buses and coaches). Therefore, this article focuses on passenger cars. As passenger cars account for more than 85% of the total motor vehicle production in both the EU and Japan, the impact of the EPA is likely more tangible on this area of the industry.

According to the ACEA's data, there are 298 automotive assembly and engine production plants in Europe, of which 196 are located in the EU and the United Kingdom. The countries with the most automotive plants are Germany (42), France (31), the United Kingdom (30), Italy (23), Spain (17) and Poland (16). Most of the 91 EU plants producing cars are located in Germany (25), France (13) and Italy (11). Of the 55 plants producing automotive engines, 12 are located in Germany, eight in Italy, six in Poland and five in Sweden (ACEA, 2020). Importantly, ACEA does not include information on smaller-sized suppliers and producers of automotive parts, as well as plants specialising in manufacturing non-engine parts.

Table 4. Top five destinations for EU exports and imports of passenger cars in value and volume, 2014-2019

2014		2015		2016		2017		2018		2019	
Exports in value (millions of USD)											
United States	29779	United States	40466	United States	37721	United States	38344	United States	37242	United States	37631
China	23492	China	17948	China	19741	China	22337	China	22311	China	21734
Switzerland	6375	Switzerland	7620	Switzerland	7772	Japan	8172	Japan	8408	Japan	8247
Turkey	5133	Turkey	7454	Japan	7340	Switzerland	7432	Switzerland	7044	Switzerland	7494
Republic of Korea	4693	Japan	6465	Turkey	7333	Turkey	6544	Republic of Korea	6965	Republic of Korea	6131
Exports in volume											
United States	998520	United States	1 223025	United States	1 170634	United States	1 176841	United States	1 154784	United States	1 040770
Turkey	372753	Turkey	531726	Turkey	534181	China	575286	China	543643	China	459623
China	608912	China	469755	China	531336	Turkey	466575	Turkey	290627	Japan	263057
Switzerland	270741	Switzerland	303127	Switzerland	282473	Japan	281749	Japan	285434	Switzerland	258195
Japan	236833	Japan	247837	Japan	279197	Switzerland	275097	Switzerland	261982	Turkey	224240
Imports in value (millions of USD)											
Japan	6685	Japan	7719	Japan	9142	Japan	9709	Japan	9902	Japan	11695
United States	4911	United States	6944	United States	7230	Turkey	8579	Turkey	8802	United States	9424
Turkey	4363	Turkey	5056	Turkey	6414	Republic of Korea	6585	Republic of Korea	7180	Turkey	8916
Republic of Korea	4009	Republic of Korea	4330	Republic of Korea	4812	United States	6420	United States	5539	Republic of Korea	7866
South Africa	1208	South Africa	2400	Mexico	2212	Mexico	4723	Mexico	5248	Mexico	4963
Imports in volume											
Turkey	472768	Turkey	526499	Turkey	646119	Turkey	789502	Turkey	784937	Turkey	764703
Japan	438638	Japan	479795	Japan	577704	Japan	644695	Japan	679524	Japan	760717
Republic of Korea	347842	Republic of Korea	374769	Republic of Korea	402935	Republic of Korea	519136	Republic of Korea	540732	Republic of Korea	537341
United States	235009	United States	242027	United States	254806	Morocco	240908	Morocco	283622	United States	358044
Morocco	152588	Morocco	169822	Morocco	196738	Mexico	235533	United States	267515	Morocco	292148

Source: original compilation based on: ACEA (2016, pp. 12-13); ACEA (2017, pp. 18-19); ACEA (2018, pp. 15-16); ACEA (2019, pp. 16-17); ACEA (2020, pp. 13-14).

Table 5 presents the key locations of Japanese manufacturers of passenger cars and engines in the EU and the United Kingdom. Toyota Motor Europe produces engines in Poland, France and the United Kingdom; light commercial vehicles in Portugal and passenger cars in France and the Czech Republic. In this last case, the engines are produced under a joint venture with PSA (Toyota Peugeot Citroën Automobile – TPCA). The Nissan Motor Company produces engines and passenger cars in the United Kingdom and Spain, in the latter country light commercial vehicles are manufactured as well. Honda produces engines and passenger cars in the United Kingdom, while Suzuki produces passenger cars in Hungary.

Table 5. Automotive plants of Japanese companies in the EU and the United Kingdom, 2020

Company	Location	Specialisation	Brand(s)
Toyota Motor Europe	Deeside, United Kingdom	engines	Toyota
Toyota Motor Europe	Onnaing (Valenciennes), France	engines and passenger cars	Toyota
Toyota Motor Europe	Walbrzych, Poland	engines	Toyota
Toyota Motor Europe	Jelcz-Laskowice, Poland	engines	Toyota
Toyota Motor Europe	Ovar, Portugal	light commercial vehicles	Toyota
TPCA Toyota Motor Corp – PSA	Kolin, Czech Republic	passenger cars	Citroën
Nissan Motor Company	Sunderland, United Kingdom	engines and passenger cars	Nissan, Nissan Electric
Nissan Motor Company	Barcelona, Spain	engines, passenger cars and light commercial vehicles	Nissan, Renault
Honda	Swindon, United Kingdom	engines and passenger cars	Honda
Suzuki	Esztergom, Hungary	passenger cars	Suzuki

Source: original compilation based on ACEA (2020a).

There are very few examples of collaboration between the EU and Japanese automotive enterprises in Japan so far. These include Mitsubishi Motors-Daimler AG in Kanagawa (Fuso trucks and buses) and Renault-Nissan Motor Company-Mitsubishi Motors in Okasaki (passenger cars). The Mitsubishi Fuso Truck and Bus Corporation was established in 2003, and its headquarters were relocated from Tokyo to Kanagawa three years later. Daimler AG currently holds 89.29% of the company shares, while Mitsubishi Motors remains a minor shareholder. The second alliance was formed in 1999 by Renault and Nissan. The former owns 43% of shares in Nissan, while Nissan owns 15% of shares in Renault and 34% of shares in Mitsubishi, which joined this alliance in 2016 (Warner, 2019).

Intra-industry trade and the EPA

Japan is the seventh-largest trade partner of the EU and the second-largest in Asia, after China. Total trade between the EU and Japan amounted to, on average, USD 147.7 billion annually in the years 2010-2019, with the highest level recorded in 2011 (USD 165.1 billion). Trade volume followed a downward trend until 2015 (falling to USD 127.9 billion) and an upward trend from then until 2019 (reaching USD 157.2 billion). The EU-28-Japan trade in goods has traditionally been marked by a deficit on the EU side, and this rule was confirmed in the study period. However, Japan's surplus diminished through the years from USD 31.42 billion in 2010 to USD 7.44 billion in 2019, mainly due to an increase in the EU exports, accompanied by a slight decrease in imports from Japan (Figure 1). In 2013-2015, EU-28-Japan trade relations were the closest to balance, with the deficit on the EU side ranging from USD 4.25-4.89 billion. Importantly, since 2015, there was an upward trend in the value of the EU exports to Japan, with the highest level recorded in 2019 (USD 74.9 billion), while imports from Japan reached a peak in 2011 (USD 97.83 billion).

The EU-28-Japan trade in goods was dominated by the same five two-digit HS codes through the whole study period: 84 (nuclear reactors, boilers, machinery and mechanical appliances; parts thereof), 87 (vehicles other than railway or tramway rolling stock, and parts and accessories thereof), 90 (optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; parts and accessories thereof) in exports and imports, as well as 30 (pharmaceutical products) in exports and 85 (electrical machinery and equipment and parts thereof; sound

recorders and reproducers, television image and sound recorders and reproducers and parts and accessories of such articles) in imports (Table 6).

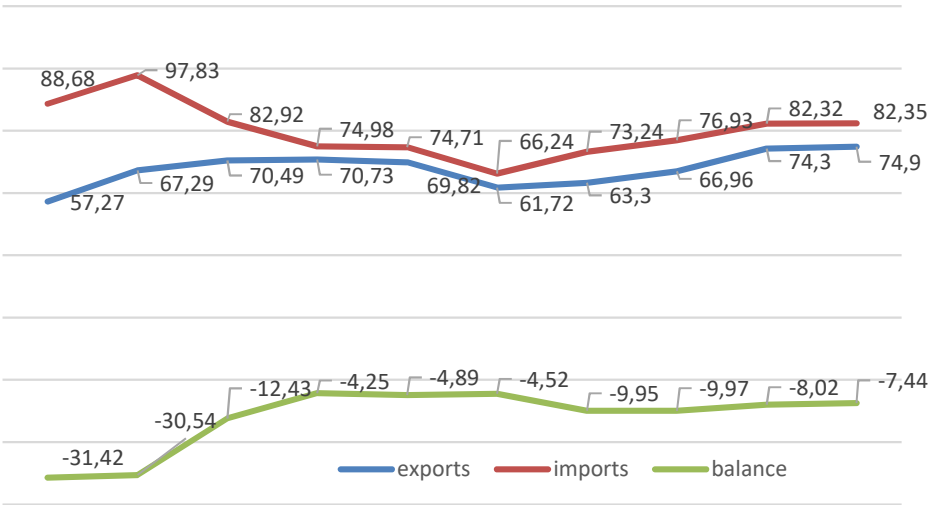

Figure 1. The EU-28-Japan trade in goods in total, 2010-2019 (billions of USD)
Source: original calculations based on the UN Comtrade Database (2020).

Table 6. The dominant two-digit HS codes in the EU-28-Japan trade in goods, 2010-2019 (USD)

Exports				Imports			
HS code	**Nominal value**	**HS code**	**Nominal value**	**HS code**	**Nominal value**	**HS code**	**Nominal value**
2010		2011		2010		2011	
87	7 009 963345	87	9 185 990649	84	22 737 915097	84	26 079 341717
30	6 992 880218	84	8 551 226177	85	17 944 099189	87	18 726 014407
84	6 984 719172	30	8 467 465659	87	17 216 635429	85	18 303 209486
90	5 666 338359	90	5 993 610403	90	7 147 428198	90	8 040 135823
2012		2013		2012		2013	
87	10 288 120301	87	10 883 096042	84	22 734 999861	84	21 182 712399
30	9 406 647768	30	9 604 654452	87	15 646 472845	87	14 323 386027
84	8 163 252641	84	8 512 127352	85	15 304 482723	85	13 782 774292
90	6 701 633767	90	6 346 029413	90	7 172 500324	90	6 413 810228
2014		2015		2014		2015	
87	10 548 050945	30	9 851 618348	84	21 403 105419	84	17 712 889137
84	9 612 750220	87	9 301 188707	87	14 428 308195	87	13 860 681861
30	8 518 700043	84	8 332 827726	85	13 475 159594	85	11 455 219116
90	6 255 456551	90	5 285 050284	90	6 474 115380	90	5 699 975894
2016		2017		2016		2017	
87	10 348 260552	87	11 744 678044	84	17 719 669574	84	19 515 698153
30	9 387 257061	84	9 001 775055	87	16 400 856678	87	17 579 284487
84	8 207 640207	30	8 926 128405	85	11749 820640	85	12 426 305527
90	5 668 231397	90	6 117 792554	90	5 827 897489	90	6 065 120001
2018		2019		2018		2019	
87	12 640 990324	87	11 636 062000	84	20 918 926530	87	20 391 060044
84	10 463 441064	84	10 104 553916	87	19 025 040542	84	19 521 640031
30	9 925 093046	30	9 844 985853	85	13 471 104894	85	12 680 551151
90	6 730420187	90	6 624 348704	90	6 565 945578	90	6 511 100152

Source: original calculations based on the UN Comtrade Database (2020).

Disaggregation into four-digit HS codes indicated the prevalence of 8703 (motor cars and other motor vehicles principally designed for the transport of fewer than 10 persons, including station wagons and racing cars, excluding motor vehicles) and 8708 (parts and accessories for tractors, motor vehicles for the

transport of 10 or more persons, motor cars and other motor vehicles principally designed for the transport of persons, motor vehicles for the transport of goods and special-purpose motor vehicles) in exports and imports, except for year 2014 in the case of exports (Table 7). However, the four-digit HS codes of Chapter 84 differed in the case of exports and imports. For exports, 8408 (compression-ignition internal combustion piston engine; diesel or semi-diesel engine) and 8411 (turbojets, turbopropellers and other gas turbines) dominated. For imports, 8429 (self-propelled bulldozers, angledozers, graders, levellers, scrapers, mechanical shovels, excavators, shovel loaders, tamping machines and roadrollers) and 8443 (printing machinery, parts and components thereof) were the most common codes.

Table 7. The dominant four-digit HS codes in the EU-28-Japan trade in goods, 2010-2019 (millions of USD)

Exports				Imports			
HS code	**Nominal value**	**HS code**	**Nominal value**	**HS code**	**Nominal value**	**HS code**	**Nominal value**
2010		**2011**		**2010**		**2011**	
8703	5094.2	8703	7084.95	8703	10026.61	8703	10442.75
8708	1390.57	8708	1482.39	8708	4428.37	8708	5484.18
8411	715.69	8411	978.17	8471	1525.95	8414	2004.51
8486	611.06	8486	964.44	8407	1081.4	8429	1609.23
2012		**2013**		**2012**		**2013**	
8703	8108.5	8703	8502.88	8703	8068.59	8703	7850.6
8708	1470.62	8708	1640.6	8708	5039.41	8708	4285.64
8411	1201.61	8411	1582.37	8443	4462.99	8443	4217.87
8408	721.04	8408	635.28	8414	1661.99	8411	1646.39
2014		**2015**		**2014**		**2015**	
8703	7960.14	8703	7165	8703	8861.24	8703	8570.17
8411	1813.19	8708	1505.52	8708	3380.1	8708	3326.49
8708	1811.75	8411	1401.91	8429	1838.61	8429	1596.66
8408	922.28	8408	914.69	8411	1703.77	8411	1281.3
2016		**2017**		**2016**		**2017**	
8703	8119.13	8703	9243.74	8703	10136.87	8703	10959.51
8708	1529.02	8708	1753.57	8708	4231.75	8708	4361.77
8408	944.26	8408	855.21	8443	2354.25	8443	2305.69
8479	411.28	8486	416.17	8429	1606	8429	1978.46
2018		**2019**		**2018**		**2019**	
8703	9915.28	8703	9233.75	8703	11707.03	8703	13092.79
8708	1929.06	8708	1553.74	8708	4684.36	8708	4674.79
8408	729.1	8411	1802.31	8429	2462.08	8429	2565.27
8486	623.28	8408	729.94	8443	2190.84	8443	1874.9

Source: original calculations based on the UN Comtrade Database (2020).

The GL index in the automotive industry reached the highest level (0.71) in 2011. In the years 2014-2017, it steadily declined to 0.46. However, the VIIT index was the highest (0.66) in 2014, reaching its lowest level (0.46) in 2019 (Table 9). Therefore, our industry-level analysis revealed a downward trend in GL and VIIT since 2014 (Table 9). This suggests a slight decrease in the share of intra-industry trade in total trade between the EU and Japan, as well as the increasing dominance of VIIT through the studied decade. Still, our calculations have important limitations due to the aggregation of trade data at the level of the EU, in line with previous studies by, among others, Gabrisch and Segnana (2003). VIIT values ranging between 0.46-0.66 might wrongly suggest that EU exports are of relatively lower quality, but this is not supported by trade patterns at the product level. Across the whole study period, the horizontal pattern of intra-industry trade was recorded as dominant 57 times (9.83% of total cases). We removed seven six-digit HS codes from further analysis due to incomplete data, which made the precise estimation of the GL, VIIT and HIIT indexes impossible. Both in 2010 and 2014 HIIT was dominant for nine six-digit codes; in 2011 and 2013 it was dominant for seven codes. HIIT dominated only three codes in 2018 and two in 2019. Across the whole decade, the 870891 code (radiators and parts

thereof) recorded a dominant horizontal pattern of intra-industry trade seven times; 854430 (wiring sets), 840999 (parts of piston engines) and 401110 (pneumatic tyres) recorded such a pattern four times and 700910 (mirrors), 851230 (electrical equipment), 870850 (drive axles), 870331 and 870390 (passenger motor vehicles) recorded a dominant horizontal pattern three times. For 33 of the 58 selected six-digit HS codes there was no single year with a dominant horizontal pattern (Table 10).

Table 8. The dominant six-digit HS codes and nominal values of the EU-28-Japan trade in the automotive industry as a share of total trade, 2010-2019 (USD, %)

Variables	Total trade	Automotive industry		
	Nominal value	Nominal value	% of total	Dominant six-digit HS codes
Ex10	57 266 328890	7 766 017038	13.56	870323, 870324
Im10	88 683 972599	18 945 570628	21.36	870332, 870323
Ex11	67 293 562296	10 064 398106	14.96	870323, 870324
Im11	97 834 161208	21 424 627820	21.90	870332, 870323
Ex12	70 486 236640	11 103 945609	15.75	870323, 870324
Im12	82 917 047735	17 554 277718	21.17	870332, 870323
Ex13	70 728 980083	11 739 249299	16.60	870323, 870324
Im13	74 975 542155	15 748 906777	21.01	870332, 870323
Ex14	69 818 135572	11 702 812081	16.76	870323, 870324
Im14	74 712 751419	15 838 414614	21.20	870332, 870323
Ex15	61 723 935939	10 357 427612	16.78	870323, 870324
Im15	66 242 015204	14 984 830276	22.62	870323, 870332
Ex16	63 296 260107	11 476 881124	18.13	870323, 870324
Im16	73 243 935224	17 583 345011	24.01	870323, 870332
Ex17	66 958 354262	12 442 239412	18.58	870323, 870332
Im17	76 927 696001	16 361 377173	21.27	870323, 870332
Ex18	74 304 337029	13 016 796151	17.52	870323, 870332
Im18	82 323 499049	16 998 109723	20.65	870323, 870322
Ex19	74 903 753410	12 012 388233	16.04	870323, 870332
Im19	82 346 289356	16 689 005679	20.27	870323, 870322

Source: original calculations based on the UN Comtrade Database (2020).

Table 9. The Grubel-Lloyd (GL), horizontal and vertical intra-industry trade (HIIT, VIIT) indexes of the automotive industry in the EU-28-Japan trade, 2010-2019

Years	GL	VIIT	HIIT
2010	0.62891	0.53106	0.95197
2011	0.71186	0.64668	0.93196
2012	0.62026	0.61966	0.98679
2013	0.67489	0.65518	0.95053
2014	0.68049	0.66163	0.96677
2015	0.6561	0.59741	0.97133
2016	0.57288	0.57257	0.97742
2017	0.57258	0.57182	0.96399
2018	0.50097	0.50077	0.96479
2019	0.4565	0.45602	0.96835

Source: original calculations based on the UN Comtrade Database (2020).

High-quality VIIT, characterised by a relative unit value of export-to-import ratio higher than 1.15 (marked with italics in Table 10), dominated each year for 22 of the 58 studied codes and was recorded 415 times in total (71.55% of total cases). Low-quality VIIT was recorded 108 times. It is worth mentioning that in 2019 high-quality VIIT was the dominant pattern of trade for 47 of the 58 studied codes, the highest proportion of high-quality VIIT codes recorded. The second-highest result was recorded in 2016 (43 codes), while the number of codes ranged mostly between 39-40 in the remaining years.

Table 10. The dominant patterns of intra-industry trade in the automotive industry in the EU-28-Japan trade in the years 2010-2019

Six-digit HS code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Six-digit HS code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
401110	VIIT	VIIT	VIIT	HIIT	VIIT	VIIT	HIIT	HIIT	HIIT	VIIT	852729	*VIIT*	*VIIT*	*VIIT*	*VIIT*	VIIT	VIIT	VIIT	VIIT	*VIIT*	*VIIT*
401120	VIIT	VIIT	VIIT	*VIIT*	VIIT	VIIT	VIIT	VIIT	VIIT	VIIT	853921	VIIT	VIIT	VIIT	VIIT	VIIT	VIIT	VIIT	VIIT	VIIT	VIIT
401220	VIIT	VIIT	VIIT	*VIIT*	VIIT	VIIT	HIIT	*VIIT*	VIIT	*VIIT*	853929	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*
401290	VIIT	VIIT	HIIT	VIIT	HIIT	*VIIT*	*VIIT*	VIIT	VIIT	*VIIT*	854430	*VIIT*	*VIIT*	*VIIT*	*VIIT*	HIIT	HIIT	HIIT	HIIT	*VIIT*	*VIIT*
401310	VIIT	VIIT	*VIIT*	VIIT	HIIT	*VIIT*	VIIT	VIIT	*VIIT*	*VIIT*	870600	VIIT	VIIT	VIIT	VIIT	VIIT	VIIT	VIIT	VIIT	VIIT	VIIT
700711	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	VIIT	VIIT	*VIIT*	870710	*VIIT*	*VIIT*	*VIIT*	VIIT	*VIIT*	VIIT	VIIT	VIIT	VIIT	VIIT
700721	*VIIT*	*VIIT*	*VIIT*	HIIT	*VIIT*	*VIIT*	*VIIT*	*VIIT*	HIIT	*VIIT*	870810	*VIIT*	*VIIT*	*VIIT*	*VIIT*	HIIT	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*
700910	HIIT	HIIT	VIIT	VIIT	VIIT	VIIT	*VIIT*	HIIT	*VIIT*	VIIT	870821	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*
830120	VIIT	HIIT	VIIT	HIIT	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	870829	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*
830230	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	870840	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*
840731	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	870850	HIIT	HIIT	HIIT	VIIT	VIIT	VIIT	VIIT	VIIT	VIIT	VIIT
840732	HIIT	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	VIIT	*VIIT*	*VIIT*	870870	HIIT	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*
840733	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	870880	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*
840734	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	VIIT	*VIIT*	870891	HIIT	VIIT	HIIT	HIIT	HIIT	HIIT	*VIIT*	*VIIT*	HIIT	HIIT
840790	VIIT	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	870892	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*
840820	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	870893	HIIT	HIIT	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*
840991	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	870894	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*
840999	*VIIT*	*VIIT*	*VIIT*	*VIIT*	HIIT	HIIT	VIIT	HIIT	VIIT	HIIT	870899	*VIIT*	*VIIT*	HIIT	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*
841330	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	910400	*VIIT*	VIIT	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*
842542	*VIIT*	HIIT	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	940120	HIIT	*VIIT*	VIIT	VIIT	*VIIT*	VIIT	*VIIT*	*VIIT*	*VIIT*	*VIIT*
848390	*VIIT*	*VIIT*	*VIIT*	HIIT	HIIT	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	940190	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*
850710	*VIIT*	VIIT	VIIT	VIIT	VIIT	VIIT	VIIT	VIIT	VIIT	*VIIT*	870321	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*
850730	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	VIIT	*VIIT*	*VIIT*	*VIIT*	870322	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*
850740	*VIIT*	*VIIT*	VIIT	HIIT	*VIIT*	VIIT	VIIT	*VIIT*	*VIIT*	VIIT	870323	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*
850780	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	870324	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*
851230	*VIIT*	*VIIT*	*VIIT*	*VIIT*	HIIT	HIIT	HIIT	*VIIT*	*VIIT*	*VIIT*	870331	*VIIT*	*VIIT*	*VIIT*	HIIT	HIIT	HIIT	*VIIT*	*VIIT*	*VIIT*	*VIIT*
851290	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	870332	HIIT	HIIT	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*
851829	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	870333	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*	*VIIT*
852721	VIIT	*VIIT*	HIIT	VIIT	*VIIT*	*VIIT*	*VIIT*	HIIT	VIIT	VIIT	870390	HIIT	HIIT	VIIT	VIIT	*VIIT*	HIIT	*VIIT*	VIIT	VIIT	*VIIT*

Source: original compilation based on the UN Comtrade Database (2020).

However, as stressed by Gabrisch and Segnana (2003), interpreting VIIT only through the prism of quality differences, as in the models of Falvey (1981), Falvey and Kierzkowski (1985) and Shaked and Sutton (1984), could be misleading in some cases. Gabrisch and Segnana (2003) argued that a relative unit value higher than 1.15 may result in either a quality advantage or cost disadvantage for the exports of a given country. Such cost disadvantages reflect itrade deficit of the industry, which is accompanied by a higher unit value of export in comparison to the corresponding imports; this may be the case for the EU-Japan automotive trade (Table 8). However, such cost disadvantages tend to shrink over time as value chains are fragmented and relocated, for instance, from Western to Central Eastern European countries. The downward trend in the EU trade deficit with Japan in the automotive industry, which reflects higher export dynamics as compared to imports in recent years, may lead to a hypothetical situation in which the industry records a trade surplus due to the higher export than import prices resulting from a quality advantage.

Regulatory implications of the EU-Japan EPA for the automotive industry

As a consequence of the implementation of the EPA, all exports of vehicles, their parts and equipment from the EU to Japan and from Japan to the EU are duty-free, except for leather parts of seats used in vehicles (940190). The tariff duty for the EU's leather parts amounts to 3.8%, and the duty for Japanese products is 3.1%. Both duties, however, will be gradually eliminated by 1 April 2028 (EU-Japan Centre for Industrial Cooperation 2020; Japan Customs, 2020).

Annexes 2-C, 3-B and Appendix 3-B-1 of the EU-Japan EPA provide a set of regulations dedicated to the automotive industry. Annex 2-C addresses trade in motor vehicles and their parts and equipment regulated by the 1958 Agreement concerning the Adoption of Harmonised Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts or the 1998 Agreement concerning the Establishing of Global Technical Regulations for Wheeled Vehicles, Equipment and Parts. According to Article 3 of Annex 2-C, the main objectives of this Annex are (1) the promotion of safe, environmentally friendly, energy-efficient motor vehicles, parts and equipment; (2) the facilitation of trade and improvement of market access between the EU and Japan; (3) the harmonisation of standards and requirements according to the World Forum for Harmonisation of Vehicle Regulations, including the mutual recognition of type approvals granted under UN Regulations; and (4) the achievement of regulatory convergence by implementing the UN Regulations and Global Technical Regulation in line with the 1998 Agreement (MOFA, 2019). Under the EPA's special provisions concerning vehicles and their parts under Annex 2-C, the EU and Japan declared mutual recognition of type approval certificates without additional testing, certification or documentation. Following the same international standards will significantly reduce the time and costs required for each country to enter the other's automotive market. Importantly, a limited number of hydrogen-fuelled vehicles manufactured in the EU can access the Japanese market without the necessity of any modifications. However, some currently binding material restrictions are discussed in phase 2 of GTR13, adopted in June 2013, which addresses hydrogen and fuel cell vehicles.

An accelerated settlement procedure applies to any dispute over domestic regulatory procedures. This stipulates that the consultation period cannot exceed 15 days, the preparation of an interim report by the appointed panel cannot exceed 60 days from the day of its establishment, the final report must be ready no later than 15 days after the interim report is issued and complaints should be addressed within a reasonable period up to 90 days after the publication of the final report. Also, if there is no satisfactory response or compensation upon request, the complaining party can suspend any obligations, including reducing or eliminating customs duties for the products under dispute.

Annex 3-B and Appendix 3-B-1 concern rules of origin for trade in vehicles and their parts and equipment. The EPA relies on a self-certification system, which means that the supplier's declaration of origin may be delivered by a supplier in Japan to a producer in Japan to determine the originating status of the product of four-digit HS codes 8407, 8408, 8701 and 8708. There is also a clause of bilateral cumulation, which allows for treating materials originating in Japan as originating in the EU and vice versa if those products serve as materials in production processes in the other country.

For selected four-digit HS codes in the automotive industry, the thresholds of product-specific rules of origin are determined for Ex-Works (EXW) and Free on Board (FOB) commercial terms, to be used interchangeably (Table 11). In most cases, MaxNOM/RVC thresholds are decreased/increased by 10% after three or five years from the day of the EPA's entry into force. The sole exception is HS code 8703; for this code, MaxNOM/RVC thresholds are decreased/increased by 5% twice, three and six years after the day of the EPA's entry into force.

Table 11. Thresholds of product-specific rules of origin for vehicles and their parts according to Appendix 3-B-1

Four-digit HS code	MaxNOM[a] (EXW)	RVC[b] (FOB)	Four-digit HS code	MaxNOM (EXW)	RVC (FOB)
8407	60% (1-3)[c] 50% (4-)	45% (1-3) 55% (4-)	8408	60% (1-3) 50% (4-)	45% (1-3) 55% (4-)
8703	55% (1-3) 50% (4-6) 45% (7-)	50% (1-3) 55% (4-6) 60% (7-)	8706	55% (1-5) 45% (6-)	50% (1-5) 60% (6-)
8707	55% (1-5) 45% (6-)	50% (1-5) 60% (6-)	8708[d]	60% (1-3) 50% (4-)	45% (1-3) 55% (4-)

[a] The maximum value of non-originating materials.
[b] The regional value content.
[c] Numbers in the brackets indicate years after the day of the EPA's entry into force according to the following formula: beginning of year – end of year.
[d] For this four-digit HS code, the rule of change of tariff heading (CTH) applies.
Source: original compilation based on the European Commis¬sion's Directorate-General for Trade (2018a).

There is also an innovative solution of claiming preferential tariff treatment by importers relying on the "importer's knowledge." The product-specific rules of origin applicable to six-digit HS codes 870321 and 870390 are determined by referring to the production processes of selected automotive parts. These parts comprise materials classified under six-digit HS codes 700711, 700721, 870710, 870810, 870829 and 870850, originating in the place where those processes are performed, i.e. in the EU or Japan. There is also a possibility of considering materials of four-digit HS codes 8407, 8544 and 8708 originating in the third country as originating materials if there is a free trade agreement (FTA) signed between a given third country and the EU or Japan or any arrangement on the administrative cooperation in this field.

The automotive industry and Brexit

The withdrawal of the United Kingdom from the European Union as a result of the referendum on 23 June 2016, colloquially termed 'Brexit,' is a source of serious concern for the automotive industry both in the EU and Japan. Approximately one-third of the EU's automotive exports were directed to the UK every year, while over half of the UK's exports were destined for the EU. As argued by Dorussen (2019), since the mid-1980s, Japan had perceived the UK as a gateway to the markets of continental Europe and the second-most important location for FDI after the United States. Over 1.000 Japanese enterprises established affiliates in the UK, and more than 15% of all entities from that country operate in the EU member states, with the employment of over 140 thousand workers. Around half of all motor vehicles manufactured in the UK are Japanese, and most of these are sold to the EU countries. The UK's favourable business environment and investment climate, as well as the highly competitive financial services market of London attracted Japanese automotive enterprises for decades. However, these advantages have eroded since Brexit. For instance, Nissan cancelled further investment in its manufacturing facilities in that country, while electronic enterprises Sony and Panasonic decided to relocate their headquarters to the Netherlands.

Reestablishing customs borders between the UK and the EU creates the risk of charging duties twice, first on automotive parts imported from the EU and again on final products exported to the EU after assembly within integrated value chains. Another challenge is a change in customs clearance procedures, including the removal of the mutual recognition of authorised economic operators (AEO) and the diversification of the rules of origin after Brexit. These factors would impact the costs of logistics operations and the international competitiveness of automotive businesses.

Until the end of 2020, the EU and the UK were engaged in a transition period to determine their future rules of trade. With no EU-UK FTA until 31 December, bilateral trade in 2021 would be conducted under non-preferential WTO rules, which implied the imposition of tariffs of 10% on cars and up to 22% on vans and trucks. In such a case, according to estimations by ACEA (2020b), combined the EU- and the UK-based automotive production would be reduced by more than 3 million units by 2025, translating to losses of EUR 57.7 billion and 52.8 billion on the EU and UK side, respectively.

Ultimately, on 31 December 2020, the content of the Trade and Cooperation Agreement (TCA) between the EU and the UK was published, although its application from January 1, 2021 is, in light of the declarations of the representatives of the European Commission, temporary. The Free Trade Agreement provides for duty-free trade and no quota for all product ranges that meet the rules of origin.

Technical aspects of trade in motor vehicles, their parts and equipment are described in Annex TBT-1 of the above-mentioned TCA. In particular, reference was made to the obligations arising from the 1958 and 1998 multilateral agreements, alike in the case of Annexes 2-C, 3-B and Annex 3-B-1 of the EU-Japan EPA. At the same time, actions aimed at regulatory convergence in the area of applying international standards for production and trade in the automotive industry assortment were declared. Certification based on the UN Universal International Whole Vehicle Type Approval (U-IWVTA) was used as a benchmark, including vehicle parts and equipment. Moreover, the Annex TBT-1 stipulates that neither party has the authority to restrict market access to an assortment with hitherto unknown properties and technical parameters for which there are no indications of a threat to public health, safety and the natural environment (European Union, 2020).

It is worth noting, however, that representatives of ACEA, in their official position, pointed out that the conclusion of the agreement did not eliminate the uncertainty and risk related to the implementation of new administrative procedures in connection with the restoration of the customs border between the EU and the UK. The fact that the content of the agreement consisting of more than 1.5 thousand pages was in fact published a few hours before its entry into force was, on the one hand, welcomed with relief and, on the other hand, with great caution.

The EU-UK FTA addresses numerous concerns over Brexit from the perspective of both European and Japanese automotive enterprises. The key aspects of future EU-UK trade relations include (in addition to the aforementioned tariffs) the simplification of customs procedures and the principle of cumulation of origin. The last aspect is significant when considering the specificity of the automotive industry and the resulting division of labour between the EU and the UK in manufacturing automotive parts and equipment.

From Japan's perspective, it is also crucial to maintain the status of the EU citizens in the British labour market employed in the automotive industry and to keep this labour market as open and liberal as possible under the new legal conditions. Considering the role of London as the European financial services centre, there is an expectation that financial regulations in the UK and the EU will converge in the mid- and long-term. It is also expected that the single passporting system will be maintained to avoid the duplication of registry procedures for Japanese financial institutions or their relocation to continental Europe.

Given that Japanese automotive enterprises operate across the EU and the UK, including MNEs and small and medium-sized suppliers and subcontractors, they expect to benefit from the free flows of services between the UK and the EU. These flows include those provided by shared services centres as well as from the movement of capital, e.g. tax exemption, for dividends transferred among associated enterprises. Preserving the recognition and mutually binding status of all licenses issued in favour of Japanese enterprises in the UK and the EU is another priority. Finally, it is important to maintain a homogenous regime of the protection of intellectual property rights and information in the UK and the EU, including the free transfer of data as well as a uniform system of standards and certification addressing motor vehicles to avoid the escalation of R&D and administrative costs of businesses.

Another option would be the accession of the UK to the Comprehensive and Progressive Agreement on Trans-Pacific Partnership (CPTPP). The CPTPP is a mega-regional trade agreement signed by eleven countries of the Asia-Pacific region, including Japan, Australia, Brunei Darussalam, Canada, Chile, Malaysia, Mexico, New Zealand, Peru, Singapore and Viet Nam on 8 March 2018 in Santiago (Chile). In early 2018, the British Department of International Trade officially considered CPTPP membership as an opportunity to enter new export markets after Brexit, which was welcomed favourably by Japan's former

Prime Minister Shinzō Abe. On 11 September 2020, after three months of talks, the UK-Japan Comprehensive Economic Partnership Agreement (CEPA) was officially accepted by International Trade Secretary Liz Truss and Japan's Foreign Minister Motegi Toshimitsu (Department for International Trade, 2020). According to declarations, CEPA goes beyond the EU-Japan EPA on a limited range of issues, including cutting-edge digital and data provisions to be established in line with the CPTPP approach. Some of Japan's automotive parts are expected to benefit from the streamlined regulatory procedures and faster tariff reduction than under the EU-Japan EPA when entering the UK market to provide support for Japanese investors residing in Britain. EU-originated automotive parts exported from the UK to Japan will be considered as the UK-originated under CEPA under the principle of cumulation of origin; however, with no EU-UK trade deal in place, the treatment of the UK-originated goods consisting of Japan's parts in the EU would be fairly uncertain. Importantly, the UK-Japan CEPA involves a commitment to launch CPTPP accession talks by the British government, starting with bilateral negotiations with Australia, Canada and New Zealand. From Japan's economic perspective, however, the attractiveness of the UK came down to free and open access to the EU market. Thus, Japanese enterprises may not necessarily benefit and appreciate possible future British membership in the CPTPP.

Considering the concerns that some analysts have expressed about the EU automotive market concerning the imposition of strong competitive pressure from Japanese manufacturers, Garnsey (2019) stressed that, contrary to predictions, the entry into force of the EU-Republic of Korea FTA did not boost imports of motor vehicles to the EU. Instead, the agreement tripled exports of the EU-originated cars to the Republic of Korea in the years 2011-2015 to more than USD 6 billion. Thus, the automotive industry contributed considerably to the increase in the total trade volume between the EU and the Republic of Korea, which grew by 55% in the five-year study period.

CONCLUSIONS

An analysis of intra-industry trade between the EU and Japan, with reference to the implications of the establishment of the EPA, was challenged by theoretical and empirical objections, as well as regulatory uncertainty. Firstly, the results of studies on intra-industry trade depend on the degree of disaggregation of statistics and the choice of trade nomenclature. We conducted research relying on six-digit HS codes to address product differentiation as the assumption of intra-industry trade theory. Secondly, the automotive industry faces significant challenges due to Brexit and its consequences, including the regulatory frameworks of the future EU-UK and UK-Japan trade relations.

The dominance of intra-industry trade in total trade between the EU and Japan was indicated in line with studies by Benz and Yalcin (2015). Statistical analysis made by the authors confirmed the potential of intra-industry trade in the automotive industry, reflected by its increasing volume as well as the role of high-quality VIIT. HIIT played an increasingly marginal role in total IIT in the study period, which indicates the rising importance of the diversity of factor endowments across the countries involved in the manufacturing of motor vehicles and their parts and equipment. As long as differences in income, technological development, resource base and consumer preferences impact IIT in the automotive industry between the EU and Japan, the vertical differentiation of products will be dominant. Therefore, the fragmentation of value chains and relocation of automotive parts manufacturing and assembly to CEE on the one side, and Southeast Asian countries on the other, along with the concept of the product-quality cycle, serve as a trigger of VIIT. This is in line with studies by Aturupane, Djankov and Hoeckman (1999), who pointed out the relevance of industry-specific determinants such as FDI for VIIT.

From the perspective of the EU, it is important to stress an improvement of the trade balance in the automotive industry with Japan and the rising position of Japan as a trade partner of the EU. Trade liberalisation under the EU-Japan EPA, concerning both tariff and non-tariff measures, may contribute to the further expansion of the EU-Japan bilateral trade in the automotive industry. However, mid- and long-term trends in intra-industry flows, including their horizontal and vertical patterns, depend on the competitiveness of the industry, resulting from quality and cost differences. Regulatory conver-

gence and standards harmonisation are important aspects of EPA that reduce time and costs for businesses, including the promotion of safe, energy-efficient and environmentally friendly automotive manufacturing, mutual recognition of approval certificates and the principle of cumulation of origin.

Given the limitations of this study, further research should disaggregate analysis at the product level to the country-country axis to eliminate distortions of data on the IIT patterns and verify the relevance of country- and industry-specific determinants of trade, including FDI. Furthermore, detailed studies of implications of the EU-Japan EPA should be undertaken in one year, when regulatory frameworks of the EU-UK and UK-Japan trade relations will be finally agreed upon and formalised.

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Conflict of Interest

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