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RESEARCH ARTICLE

Analysis of the Relationship Between Entrepreneurship and Trade Openness within the Framework of Quantile Panel Approach: The Case of OECD Countries

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Abstract

This study aims to examine the impact of the trade openness of selected OECD countries on entrepreneurship. There is a general acceptance that the impact of the trade openness of economies on entrepreneurship is positive. In the analysis process, econometric modeling studies were carried out based on the data of the selected OECD countries for the 2006-2020 period. The quantile panel regression technique was used to test the impact of trade openness on entrepreneurship. The quantile panel regression analyses have been carried out with an approach that considers the asymmetric situation between the selected OECD countries. Hence, this approach has been a contribution to the literature. Policy recommendations are presented within the framework of empirical findings. According to the empirical findings, entrepreneurship activities are important in terms of increasing economic performance in the selected OECD countries and show that policies should be implemented in support of entrepreneurship activities. The necessity of considering the impact of the trade openness level on entrepreneurship in determining policies has been revealed. In particular, the fact that the economies assess this issue in the policy development process can be considered a strategic instrument.

Keywords: *Entrepreneurship, Trade Openness, Quantile Panel, Heterogeneity*
Jel Codes: *L26, F10*

*Kantil Panel Yaklaşımı Çerçevesinde Girişimcilik İle Dışa Açıklık Arasındaki İlişkinin Analizi: OECD Ülkeleri Örneği**

Özet

Bu çalışma, seçilen OECD ülkelerinin ticaret açıklığının girişimcilik üzerindeki etkisini incelemeyi amaçlamaktadır. Ekonomilerin ticaret açıklığının girişimcilik üzerindeki etkisinin olumlu olduğuna dair genel bir kabul vardır. Analiz sürecinde, 2006-2020 dönemi için seçilen OECD ülkelerinin verilerine dayanarak ekonometrik modelleme çalışmaları gerçekleştirilmiştir. Ticaret açıklığının girişimcilik üzerindeki etkisini test etmek için kantil panel regresyon tekniği kullanılmıştır. Kantil panel regresyon analizleri, seçilen OECD ülkeleri arasındaki asimetrik durumu göz önünde bulunduran bir yaklaşımla gerçekleştirilmiştir. Bu nedenle, bu yaklaşım literatüre bir katkı olmuştur. Politika önerileri ampirik bulgular çerçevesinde sunulmaktadır. Bu çalışmada elde edilen bulgulara göre, girişimcilik faaliyetlerinin seçilen OECD ülkelerinde ekonomik performansın artırılması açısından önemli olduğu ortaya konmaktadır ve girişimcilik faaliyetlerini destekleyici yönde politikaların uygulanması gerektiğini göstermektedir. Ticari açıklık düzeyinin belirlenmesinde girişimciliğe olan etkilerinin dikkate alınması gerekliliği ortaya konmuştur. Özellikle, ekonomilerin bu konuyu politika geliştirme sürecinde değerlendirmesi stratejik bir araç olarak kabul edilebilir.

Anahtar kelimeler: *Girişimcilik, Dışa Açıklık, Kantil Panel, Heterojenlik*
Jel Kodu: *L26, F10*

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1. INTRODUCTION

With the transition from an industrial society to an information society, the importance of entrepreneurship has increased with significant developments in production, transportation, and management and the acceleration of the global economy (Stoica et al., 2020). It is expressed as entrepreneurs who make the most important contribution to the development and prosperity of an economy (Malecki, 2018). In this context, entrepreneurs play an important role in the development of new products by integrating technological innovations into production processes. The main reason for this is that entrepreneurs are prone to risk and the ability to develop creative approaches in the use of raw materials, capital, and labour, defined as production factors (Khalil, 2019; LêKhang and Thành, 2018).

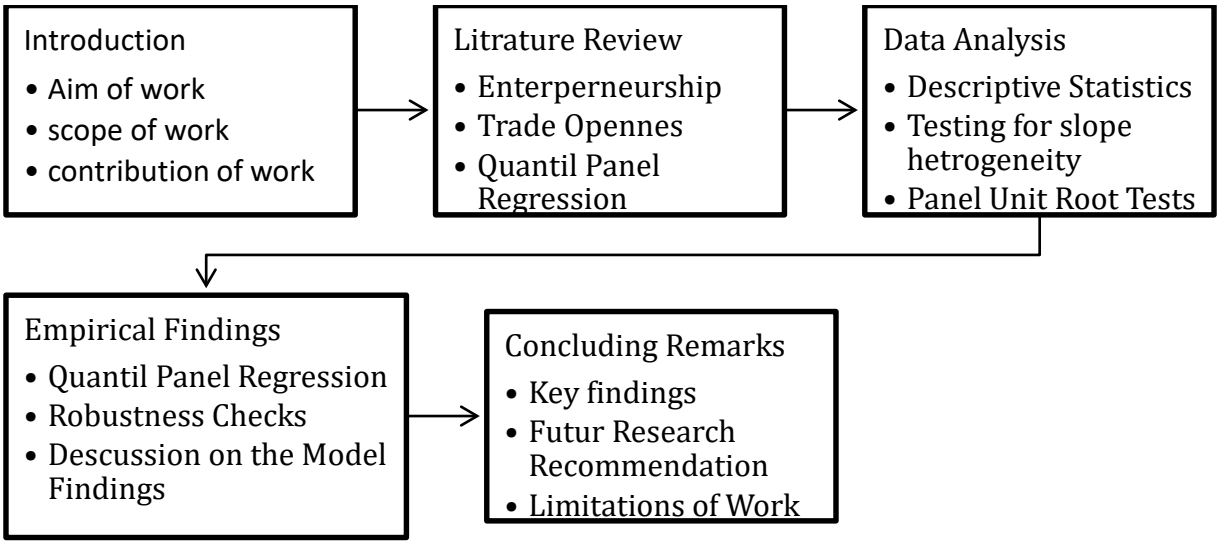
Countries should closely follow technological innovations to maintain and improve their economic power and prosperity in the global competitive environment (Porter, 1990; Pradhan et al., 2020). In such a competitive environment, those who can integrate innovations into work processes and new products and services are defined as entrepreneurs (Schumpeter, 1976; Fischer ve Nijkamp, 2009). Therefore, the speed of a country's economic development is possible with not only its available resources but also with the support of an entrepreneurial approach based on the knowledge and creativity that will be applied to practice in an economy. It is a fact that entrepreneurs can increase the economic resource uses of countries by establishing new businesses and thus contribute to creating employment and increasing income and prosperity with different and new applications in various industries (LêKhang and Thành, 2018). Entrepreneurs make a significant contribution to the industries and national economies where they operate.

This importance of entrepreneurship is due to its positive effect on economic growth through business opportunities and innovation. So, in a constant innovation process; Entrepreneurs as individuals who abandon the old ones and engage in more effective and new ways and methods, are one of the most important actors of economic growth as individuals who trigger the creative destruction process (Stoica et al., 2020). New ideas and projects cannot turn into innovation without an entrepreneurial individual and thus competitive advantage. In other words, new ideas and projects turn into economic value only when they come together with entrepreneurship (Schumpeter, 1976; Fischer ve Nijkamp, 2009; Şahin, 2018).

Gross Domestic Product (GDP) is considered the best measure of economic performance, and this can be defined as "the value of final goods and services produced using production factors within the borders of a country in a period, calculated at market prices" (Prasetyo and Kistanti, 2020; Rusu and Roman, 2017). To ensure the continuity of economic growth, savings, new capital investments, human capital investments, and new technologies must be operative. The increase in savings will allow the investments in new capital goods to increase, causing the capital stock to grow, in this way, the amount of capital per unit labour will increase, and unit labour will become more productive. Likewise, investments in human capital, which means talent and knowledge, will ensure the advancement of both productivity and technology. Finding new technologies and implementing new products will also bring increased efficiency and production. Therefore, the contribution of these elements to economic growth will be extremely high. Along with these factors that constitute the main sources of economic growth, other factors determine growth. Many studies have discussed the factors affecting economic growth (Kaur and Bains, 2013; Doran et al., 2018; Khalil, 2019; Altınışık and Gülen, 2020; Pradhan et al., 2020). Trade openness is taken as one of the most influential factors of economic growth (Şahin, 2018; Khalil, 2019). Trade openness generally indicates the ratio of foreign trade volume, which shows the sum of imports and exports, to national income. In this regard, the higher this ratio is, the more open the country's economy is to the global economy. There is a strong and positive relationship between economic growth and trade openness. Trade openness increases the total factor productivity of the country's economies by using more efficient production

techniques, increasing real income per capita. In this respect, the impact of trade openness on entrepreneurship is analysed with novel econometric techniques in this work for the selected OECD countries to contribute literature. The organization of the work is given in Figure 1 as follows:

Figure 1: The Organization of the work



Source: Prepared by the Authors.

1.1 Aim and Scope of Work

Considering the increasing importance of entrepreneurship in countries that prioritize stable growth and economic development in a competitive environment, this study aims to reveal the interaction between trade openness and entrepreneurship. Trade openness is a leading indicator of economic growth and is a common way of monitoring the economic performance of countries. In the analysis process, econometric modelling studies were carried out based on the data of the selected OECD countries for the 2006-2020 period. The quantile panel regression technique was used to test the impact of trade openness on entrepreneurship.

1.2 Contribution of Work

Analysis was made based on the quantile panel regression method. This method considers the asymmetry of the selected OECD countries regarding trade openness and entrepreneurship implementations. The asymmetry of the distribution is captured in quantile panel regression based on modeling the quantiles independently of distributional assumptions conditional on the data (i.e., Q(Y|X)). In this respect, this work attempts to contribute to the literature within the framework of the novel method applied, the countries examined, and the empirical findings obtained.

2. LITERATURE REVIEW

To clarify the main hypothesis addressed in this study, a literature review was carried out in three main areas. The first two of these were namely, “trade openness” and “entrepreneurship” and these concepts were examined to determine the theoretical basis and conceptual framework. As an approach, a scan was made from oldest to newest in the literature to give the “big picture”. Thirdly, “quantile panel regression” was examined to determine the method used correctly and appropriately. Therefore, the literature review to determine the method considers the newest methods, techniques, and approaches in the applied literature. Care was taken to ensure that the econometric approach, tests, and codes used were value-added and contributed to the literature. In this context, the appropriate works from the literature obtained were summarized below based on the critical review approach.

2.1. Literature on Entrepreneurship

Entrepreneurship is defined in the literature as follows: working for oneself rather than working for someone else for a wage/salary (Global Entrepreneurship Institute, 2024; Tolbert et al., 2011).

It is possible to promote private ownership by developing entrepreneurship in a country and at the same time if entrepreneurial skills are encouraged, it creates employment, helps diversify economic activities, and contributes significantly to exports and trade.

The first contribution in the literature on the concept of entrepreneurship was put forward by French economist Richard Cantillon in 1755. This author emphasized how important entrepreneurship is for an economy. According to Cantillon, an entrepreneur is the person who receives a product and takes risks at a certain price (Nguyen, et al., 2021). Institutions, human capital and entrepreneurship density. Journal of the Knowledge Economy, 12(3), 1270–1293, doi: 10.1007/s13132-020-00666-w.. An entrepreneur is a factor that contributes to the realization of production by bringing together labour, capital, and land (Kaur ve Bains, 2013:32; Altınışık ve Külen, 2020:278). In his study, this author discussed entrepreneurship mostly with the dimension of uncertainty. According to Cantillon, entrepreneurs buy and/or produce inputs to sell at a price that has not yet been determined. Hence, the main feature of entrepreneurs is that they must survive with an uncertain income. If this is adapted to current market conditions, Cantillon was the first to describe entrepreneurship in terms of risk and uncertainty (Khalil, 2019: 12; LêKhang and Thành, 2018:357-358).

Jean Baptiste Say, one of the thinkers who followed this author, brought a holistic approach to entrepreneurship in 1845. According to his approach, entrepreneurs are people who work to produce commercial products and are responsible for bringing together production factors consisting of natural resources and capital. Say's definition, which is used even today, the managerial responsibilities of the entrepreneur are brought to the fore (Jean Baptiste Say Institute, 2022). However, it is important not to confuse managers with entrepreneurs (Sahlman and Stevenson 1991).

Entrepreneurship is included in Schumpeter's work on Economic Development Theory (1912), which places the entrepreneur at the centre of the capitalist development process. When evaluated from this perspective, the effects of entrepreneurial activities that disrupt a system and create profit opportunities emerge. Entrepreneurs are therefore responsible for innovations through new products, new services, new sources of supply, new methods, and new forms of organization (Maritz et al., 2020; Setini et al., 2020). Therefore, as the development of the private sector in an economy becomes increasingly important for economic growth, entrepreneurs begin to be viewed from a more "capitalist perspective". In other words, entrepreneurship is one of the main "driving forces" that leads the transition to a market economy (Global Entrepreneurship Institute, 2024; Tolbert et al., 2011; McGrath, 2003; Oviatt et al., 2005).

There are many analyses in the literature that focus on entrepreneurship, entrepreneurs, and entrepreneurial activities and discuss these concepts from different perspectives (Scholman et al., 2015; Peprah and Adekoya, 2020; Sigue, 2020). This research focuses mostly on developed countries rather than developing countries due to the lack of statistical data on developing countries.

2.2. Literature on Trade Openness

According to Grossman (1984), if trade is opened in an economy, this leads to a decrease in the price of industrial goods. As a result, fewer people choose to become entrepreneurs due to falling commodity prices. In fact, increasing the trade openness of an economy reduces the attractiveness of entrepreneurship relative to paid work, thus resulting in a decrease in the supply of entrepreneurs in that economy. When evaluated from this perspective, as the rate of openness of the economy increases, the attractiveness of entrepreneurship decreases compared to paid work (Sheikh et al.,

2020). Accordingly, this results in a decrease in the supply of entrepreneurs (Scholman et al., 2015). Additionally, opening up to foreign direct investment also harms domestic entrepreneurship. Therefore, in this context, domestic entrepreneurship is overshadowed by international trade (Tirole, 1988; Oyama et al., 2011).

Within the framework of studies conducted in the literature, the effect of trade openness on entrepreneurship is unclear (Sautet 2013). The main reason for this is that, on the one hand, trade openness offers increased opportunities to new entrepreneurs as it provides them with access to wider product and input markets, while on the other hand, trade openness between countries increases the intensity of competition, reduces incentives, and increases barriers to entry for potential entrepreneurs (Peprah and Adekoya, 2020).

It has been observed that the number of studies based on trade openness is low in the literature (Amin et al., 2021; Rahman et al., 2021; Scholman et al., 2015; Sheikh et al., 2020). In this respect, our study aims to contribute to the literature based on new tests and techniques. The impact of trade openness on entrepreneurship is analyzed based on the quantile panel regression technique, a new approach for the selected OECD countries. The main reason for using "Quantile Panel Regression (QPR)" and the advantages it provides are explained below.

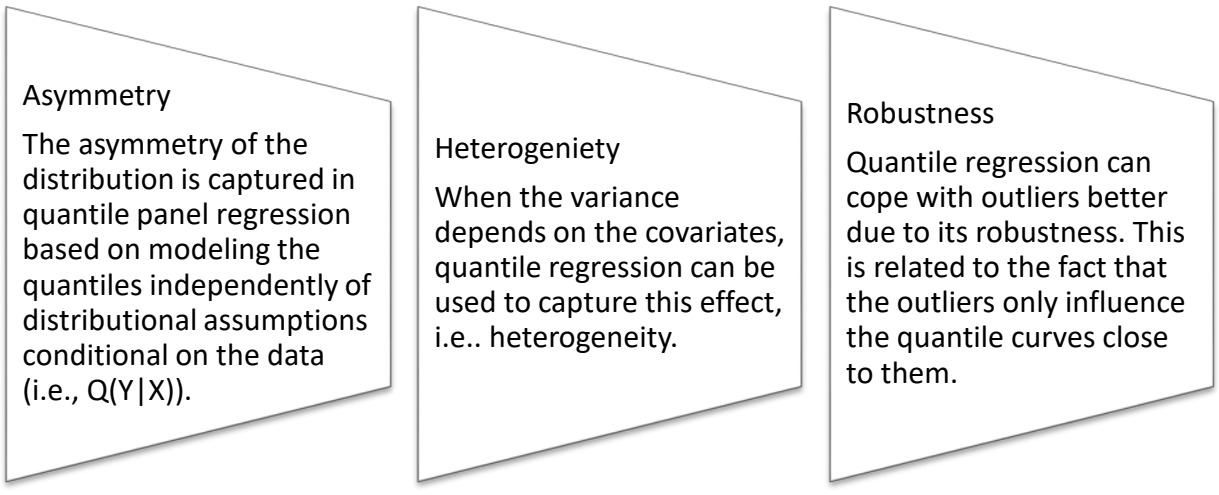
2.3. Literature on Quantile Panel Regression

Quantile regression is an estimation technique developed to estimate covariate effects of different quantities. Through this method, it can be used to estimate the effects on the data under consideration at any quantile of the distribution (Galvao, 2008). Therefore, it provides a more informative regression picture than known least squares methods. Koenker and Bassett (1978) extended the standard regression by proposing the quantile regression (Canay, 2011).

2.4. The Advantages of Quantile Panel Regression

Quantile regression model is applied in this study and the advantage for choosing this model is summarized in Figure 2. The quantile regression method allows a researcher to account for "unobserved heterogeneity" and "heterogeneous covariate effects". At the same time, the availability of panel data potentially allows a researcher to include "fixed effects" to control for some "unobserved covariates" (Koenker, 2004; Koenker, 2005; Geraci and Bottai, 2007, Abrevaya and Dahl, 2008; Galvao, 2008; Rosen, 2009; Lamarche, 2010).

Figure 2: The Advantages of Quantile Regression



Source: Prepared by the Authors based on literature.

Quantile panel data can be used for introducing dependence between the regressors and the random coefficients and weakening the assumption of comonotonicity among the variables. In this way, this approach enables the structure of allowable dependence between different coefficients (Graham, 2015). With the help of the quantile panel regression model, it is possible to obtain sufficient results for researchers, unlike standard regression which only measures the conditional mean. In this respect, quantile panel regression is good at justifying the "conditional distribution" by investigating the interconnection between variables at the upper and lower levels (Canay, 2011).

2.5. Quantile Panel Regression Model and Parameter Estimation Process

In terms of the related literature, it has been observed that if entrepreneurship is sustained by providing value-added products and services, trade openness has a positive impact (Altınışık and Külen, 2020; Amin et al., 2021). Trade Openness is described in the literature as the total of exports and imports divided by the gross national product (exports + imports / GNP).

As a mathematical expression;

$$Entrepreneurship\ (YO) = f((X+M)/Y)) \quad (1)$$

Where YO, *X, M* and *Y* stands for *entrepreneurship*, *export, import,* and *income* respectively and represents the relationship between the two, i.e. *Entrepreneurship* and *Trade Openness*.

The sensitivity of entrepreneurship in response to the variables in question can be measured by taking the natural logarithm of both sides of the Equation 1, which can be written as follows:

$$ln\ (Entrepreneurship) = alpha_0 + alpha_1\ ln\ ((X+M)/Y) \quad (2)$$

In our work, Trade Openness (FO) can be expressed mathematically as

$$Ln\ (Trade\ Openness) = ln\ (X+M) - ln(Y) \quad (3)$$

The $alpha_1$ parameter of this variable is positive when trade openness affects entrepreneurship more than economic growth. On the other hand, a negative sign of $alpha_1$ indicates a tendency for growth to be against trade openness. Although the model appears to be univariate, it has been estimated as parsimoniously as possible (Dilanchiev and Sekreter, 2015; Doran et al., 2018). The empirical method used in evaluating the relationship between economic growth and trade openness may yield different results. Therefore, this study provides new information that contributes to the existing literature.

3. DATA ANALYSIS

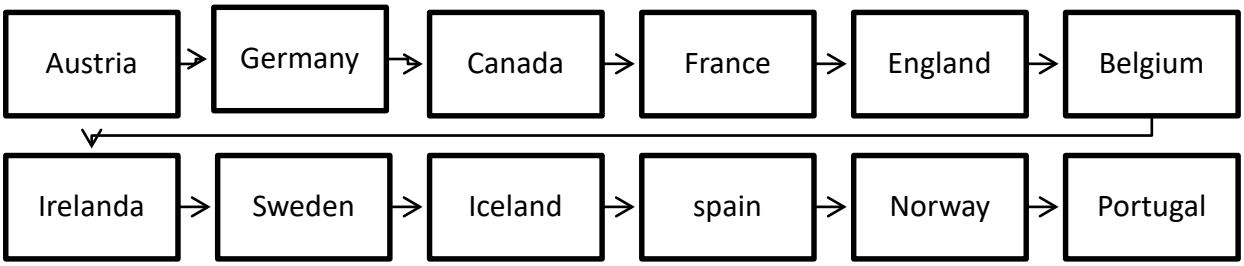
3.1. Data

The data is taken from the World Bank, OECD, and GEDI for 2006-2020. We try to include all OECD countries, unfortunately, due to missing data we selected 12 countries to achieve a balanced panel data as shown in Figure 3.

Since we have limited data, we prefer 2 variables as indicators of Trade Openness and Entrepreneurship for our analysis to increase the performance of the tests for the next steps. There are two variables in the analysis as follows:

1. *Trade Openness (FO):* Trade openness is expressed as the ratio of trade to GDP (Dilanchiev and Sekreter, 2015). This is calculated for the selected OECD Countries.
2. *Entrepreneurship (YO):* It is obtained from GEDI, an index containing information about the entrepreneurship ecosystem of countries (GEDI, 2024).

Figure 3: Data-The Selected OECD Countries List



Source: Prepared by the Authors.

The logarithmic forms of the variables are used in the model, i.e., lFO, lYO respectively. The size and power are evaluated at a level of 5%. The quantile regression for panel data method is used (Canay, 2011). Pesaran and Yamagata (2008) find that an increase in the number of regressors leads to lower performance of the tests. In this respect, the empirical findings are given in the below section.

4. EMPIRICAL FINDINGS

The analysis and tests are executed in Stata 17 program. Firstly, the data is explained and then, the descriptive statistics, panel unit root test results, and the slope heterogeneity test results are given before we start the detailed analysis and robustness checks. Secondly, quantile panel regression analysis is conducted, and empirical findings are presented in the following tables.

4.1. Descriptive Statistics

These two variables are not normal based on the descriptive statistics and JB Test results as given in Table 1. This is the initial finding for the heterogeneity.

Table 1: Descriptive Statistics of Data

	Girişimcilik Göstergesi (IYO-)	Ticari Açıklık Göstergesi (LFO)
Mean	6.294	-0,236
Median	4.740	-0,353
Maxsimum	18.105	0,926
Minimum	1.194	-0,903
Std. Dev.	4.085	0,4168
Skewness	0,932	0,949
Kurtosıs	3.006	3.387
Jarque-Bera	26.070	28.187
Probability	2.182 e-06	7.569e-07
Sum	1133.092	-42.648
Sum Sq.Dev.	2988.120	31.100
Observation	180	180

As next step, the kernel density estimates of variables are given in Figure 4a and Figure 4b. These two variables are not normal based on the Density Estimates and JB Test Results. This supports the initial finding for the heterogeneity explained above.

Figure 4a: The Density Estimate of Entrepreneurship of OECD Countries 2006-2020

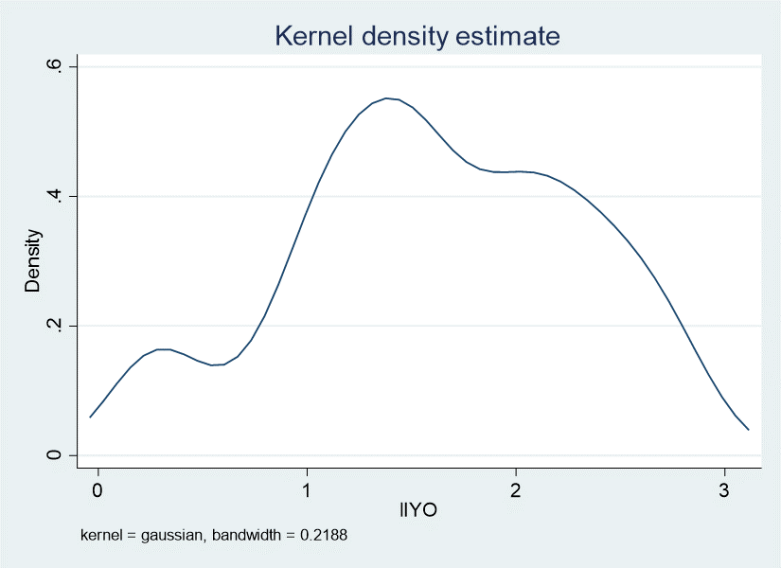
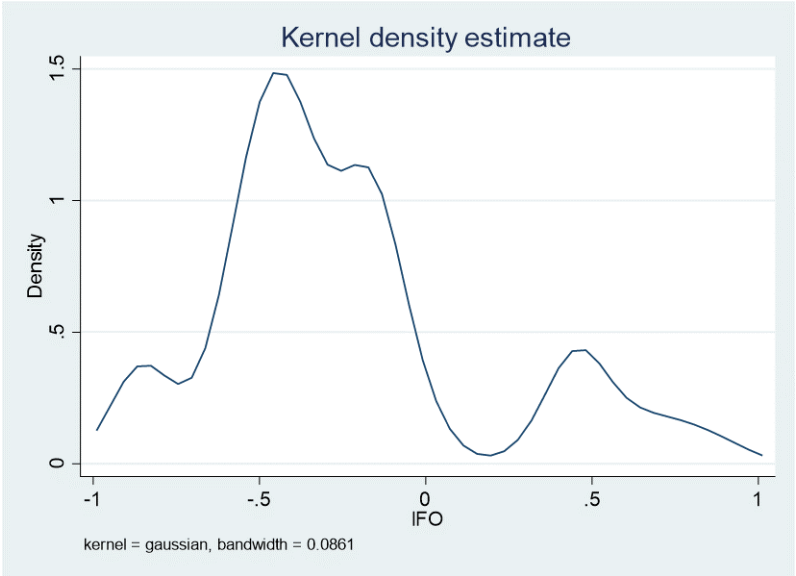


Figure 4b: The Density Estimate of Trade Openness of OECD Countries 2006-2020



4.2. Testing for slope heterogeneity

Panel data analysis provides significant advantages to researchers compared to traditional regression analyses. However, it is necessary to test the heterogeneity of the slope. Failure to perform the necessary heterogeneity tests in this regard may lead to biased results (Baltagi, 2013).

Table 2: Key Features of the Slope Heterogeneity Tests

1.Test	2.Test	3.Test	4.Test
• Delta test • Pesaran and Yamagata (2008) • Standard form	• HAC durability test • Blomquist and Westerlund (2013) • Kernel function approach	• CSD durability test • Chudik, Pesaran and Tosetti (2011) • Weak and strong form exogenous regressors	• Bias adjusted LM test • Pesaran, Ullah and Yamagata (2008) • Error cross-section independence

Source: Bersvendsen and Ditzen, 2021.

In this study, for this reason, the slope heterogeneity tests in the literature were applied in four different types namely 1. Delta Test (Pesaran and Yamagata, 2008), 2. HAC Robust Test (Blomquist and Westerlund, 2013), 3. CSD Robust Test (Chudik, Pesaran, and Tosetti, 2011), 4. Bias-adjusted LM Test (Pesaran, Ullah and Yamagata, 2008). Key features of these tests are summarized in Table 2. The slope heterogeneity test results are shown in the Table 3a and Table 3b respectively.

Table 3a: The Slope Heterogeneity Tests Results

Test	**Variables**			
	lYO	**Prob.**	**lFO**	**Prob.**
CD	11.476	0.000	11.464	0.000

%95 Confidence interval

Table 3b: The Slope Heterogeneity Tests Results

Test	**Parameters**	**Prob.**
Delta	3.550	0.000
Delta adj	3.970	0.000

%95 Confidence interval

According to the findings obtained as a result of the Table3a and Table 3b.

H0: There is cross-sectional independence.

H1: There is cross-sectional dependence.

The test results indicate the existence of heterogeneous slop, and we reject the null hypothesis as "slope coefficients are homogenous". Probability values less than 0.05 indicate this. The economic meaning of this result is that it provides information that the entrepreneurship of countries has an impact on each other and may have a spillover effect. In addition, it is seen that the trade openness variable also creates an interaction between countries and impacts each other.

Panel Unit Root analysis is performed after the cross-sectional dependency test, depending on the effect in question. The response of the series to shocks over time is analyzed. The result regarding this test is presented in the below section.

4.3. Panel Unit Root Test

Panel data, also called "longitudinal data" or "cross-sectional time series data". In this respect, multiple units are observed at two or more periods in panel data (Zhao, 2013). Panel data form provides two types of information namely the "cross-sectional information" and the "time series information". The first one is reflected in the differences between units, and the second one is reflected in the changes within units over time. Therefore, testing and estimation techniques based on panel data allow us to take advantage of this valuable information (Pesaran, 2007).

It is important to check the existence of unit roots in the panel data before proceeding with the next steps. It is a fact that the presence of unit roots may lead to the misinterpretation of empirical results (Ng and Perron, 2005). It should be noted that adding the cross-section dimension to the time series dimension is advantageous in improving the power in testing for nonstationary and cointegration. However, the cross-section dimension may cause a "cross-section dependency" problem (Pesaran, 2007; Zhao, 2013).

Table 4: The panel unit root test results- Entrepreneurship (lYO) &Trade Openness (lFO) with Constant and Trend

	Pesaran's CADF		**CIPS**	
Variables	**constant**	**constant & trend**	**constant**	**constant & trend**
LIYO	-1.908	-2.020	-2.127	-2.209
LFO	-2.429	-2.368	-1.668	-1.612

%95 Confidence interval

We use panel unit root test approach of Karavias and Tzavalis (2014).

H0: All panel time series are unit root processes.

H1: Some or all of the panel time series are stationary processes.

The panel unit root test results are given in Table 4-Enterprenurship (lYO) and Trade Openness (lFO) respectively. In the Table 4 above, there is a unit root in the horizontal section and also in the panel. The test results provide information that shocks permanently affect the series. In addition, there will be variation in parameters based on tail effects in the analysis due to the presence of unit roots in both the horizontal section and the panel.

In terms of the analysis in question, the parameters must be heterogeneous. For this purpose, it was tested whether the parameters were homogeneous or not. According to the results of the analysis, it was rejected that the parameters were homogeneous among the variables. The relevant test results are presented in the Table 3a and Table3b.

Probability values in the delta test being less than 0.05 indicate the result in question. All the test results in the above tables provide support for the use of the quantile panel regression approach based on the relationship between variables. In this respect, quantile panel regression analysis is preferred, and the empirical findings are given in the below section.

4.4. Quantile Panel Regression

The quantile panel regression results are presented in Table 5. In this respect, the estimation at low quantiles is statistically significant and positive.

Table 5: The Quantile Panel Regression of Entrepreneurship and Trade Openness

Varibles	**0.25Q**	**0.50Q**	**0.75Q**	**0.95Q**
IFO-IYO	0.573 (0.018)	0.4154 (0.032)	2.687 (0.302)	-0.066 (0.990)

%95 Confidence interval

This indicates the positive impact of trade openness on entrepreneurship in certain economic conditions, i.e. when there is low trade openness level in an economy. The estimation at high quantiles is not statistically significant but the sign of the coefficient is negative.

This reveals that the high level of trade openness can discourage entrepreneurship. In this respect, the discussion and the policy implications are given in the below section based on the literature.

4.5. Discussion

The relationship between entrepreneurship and trade openness is significant at low quantiles (0,25 & 0.50) and insignificant at high quantiles (0,75 & 0.95). Accordingly, increasing trade openness negatively affects entrepreneurship in the selected OECD countries. This situation is similar to the findings in the literature (Amin et al., 2021; Rahman et al., 2021; Scholman et al., 2015; Sheikh et al., 2020).

According to the findings, it can be stated that trade openness has positive effects on entrepreneurship in emerging economies based on the low quantile (0,25 & 0.50) estimates. On the other hand, domestic entrepreneurship is crowded out by international trade when the trade openness is high which is shown at high quantiles (0,75 & 0.95) estimates in Table 5.

These results indicate that certain infrastructure must be established for entrepreneurial activities, which are seen as one of the important determinants of economic growth, to create positive effects. A better economic welfare, that is, a better functioning governance structure and financial system and the development of capital markets, is of great importance to support entrepreneurial activities. Therefore, if it is aimed to develop innovations and create value-added production through entrepreneurship, the necessary improvements must be made by investing in these areas specified by the state considering the trade openness level (Amin et al., 2021; Rahman et al., 2021; Scholman et al., 2015; Sheikh et al., 2020).

The relationship between economic growth and entrepreneurship is closely tied to a country's competitiveness. The impact of competitive and efficient growth on entrepreneurship is related to the country's openness to trade. If a country has positive economic growth, then it generally has a trade-oriented strategy, which can increase entrepreneurship (Dilanchiev and Sekreter, 2015; Doran et al., 2018). Conversely, if a country has an anti-trade attitude, it may hinder entrepreneurship. Overall, economic growth can promote entrepreneurship by fostering competitiveness and efficient use of resources, which can be facilitated by openness to the outside world (Global Entrepreneurship Institute, 2024). These findings are supported by the quantile values in our model. In summary, economic growth can enhance entrepreneurship by enabling greater efficiency and productivity in resource allocation (Sheikh et al., 2020).

5. CONCLUSION

In conclusion, it is seen that trade openness has a positive effect on entrepreneurship at values below the median but does not have this effect above the median. Although there is statistical insignificance at high quantile values, the fact that the sign turns negative is important information that should be considered in the analysis in question. This is critical for the policy establishment process of the countries to achieve their targets.

There is a potential to contribute to the development and growth of entrepreneurs in economies with trade openness. In economies with trade openness, entrepreneurs have access to a wider range of products and services and support an efficient resource allocation environment. However, according to the findings, it has been determined that if the level of trade openness exceeds a certain rate, the positive effects disappear and negative effects occur by suppressing entrepreneurship. Hence, these empirical findings are important for the policy development process to execute the right strategy at the right level of trade openness.

In the theoretical part, the mathematical representation of the parameter of trade openness is presented as ln((X+M)-ln(Y)). Considering the OECD countries and period under discussion, it can be argued that the effectiveness of economic growth policies on entrepreneurship can vary depending on the country's development level. In developed countries, the impact of economic growth on entrepreneurship may be negative or ineffective. However, in developing countries, economic growth can have a positive effect on entrepreneurship within the context of the variable considered.

It would be reliable for economies to establish entrepreneurship policies with an approach appropriate to the level of trade openness and to take into account the negative effects when the trade openness rate increases.

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