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Determinants of entrepreneurial dynamics: The Case of the European Union*

Jelena J. Stanković[1], *Ivana Marjanović*[2], *Sandra Milanović*[3], *Milica Jovanović Vujatović*[4]

Abstract

Since economic theory identifies new enterprises as one of the basic drivers of economic growth, it brings to the forefront the need to understand the existing dynamics of entrepreneurship. Consequently, the identification of the basic entrepreneurship's determinants is a central issue from both a theoretical and a practical point of view in contemporary literature. A better understanding of the factors influencing the dynamics of entrepreneurship is a basic precondition for creating effective policies aimed at encouraging the creation of new companies, and consequently, the creation of new jobs. Therefore, this paper addresses several important issues. From the theoretical standpoint, the role of entrepreneurial determinants in creating a new business is examined. From a practical standpoint, the basic formal institutional factors influencing the birth rate of new companies are analyzed. The analysis was conducted on a sample of European Union countries for the period from 2010 to 2019 using data from the World Bank's Doing Business database, as well as data on business dynamics from the Eurostat database. A panel data regression analysis using the fixed-effects estimation procedure with Driscoll-Kraay standard errors was conducted, and the results

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[1] *Full Professor, University of Niš, Faculty of Economics, Trg kralja Aleksandra Ujedinitelja 11, 18000 Niš, Serbia. Scientific affiliation: mathematics and statistics in economics. Phone: +38118 528655. E-mail: jelena.stankovic@eknfak.ni.ac.rs.*

[2] *Teaching Assistant, University of Niš, Faculty of Economics, Trg kralja Aleksandra Ujedinitelja 11, 18000 Niš, Serbia. Scientific affiliation: mathematics and statistics in economics. Phone: +38118 528655. E-mail: ivana.veselinovic@eknfak.ni.ac.rs.*

[3] *Junior Teaching Assistant, University of Niš, Faculty of Economics, Trg kralja Aleksandra Ujedinitelja 11, 18000 Niš, Serbia. Scientific affiliation: business management. Phone: +38160 0183456. E-mail: sandra.milanovic@eknfak.ni.ac.rs.*

[4] *Junior Teaching Assistant, University of Niš, Faculty of Economics, Trg kralja Aleksandra Ujedinitelja 11, 18000 Niš, Serbia. Scientific affiliation: business management. Phone: +38164 3526666. E-mail: milica.jovanovic@eknfak.ni.ac.rs.*

indicate that the dynamics of new enterprises' foundation are negatively affected by the total tax burden, as well as the cost of property registration, while the amount of initial capital required to open a business has a positive impact. The results of the research can serve as a basis for fine-tuning policies that will facilitate and encourage the creation of new enterprises.

Key words: *enterprise birth rates, formal institutional factors, Doing business, EU countries, panel analysis*

JEL classification: *M13, G30, M21, O52, C33*

1. Introduction

Business entities could be under the influence of factors whose effects are twofold. While one group of factors influences a business' establishing process, another has an effect prolonged throughout the lifetime of a business (Canton et al., 2017). According to Sendra-Pons et al. (2022) these factors represent not only institutional factors and factors such as ones defined in regulatory documents or by government bodies, but also cultural and social constraints. Specifically, the low level of a country's GDP per capita is connected to the higher rates of starting new ventures because people see entrepreneurship as a solution to generate necessary income (Sendra-Pons et al., 2022). On the other hand, entrepreneurship is also driven by an opportunity that an entrepreneur recognizes in some country or area (Cinar et al., 2019; Silva et al., 2022). Silva et al. (2022) marked the level of unemployment, human capital, family earnings, and amount of money invested in research and development as significant indicators of entrepreneurship. Budak et al. (2014) indicate a factor that has a detrimental effect on entrepreneurial activity is the level of corruption in the country.

Even though entrepreneurship is positively connected to economic growth (Opute et al., 2021), there is also an influence of the economic growth of the country on entrepreneurship and on the increase in the number of new firms established. Both lower country risk and greater GDP per capitagdetermine levels of entrepreneurship primarily led by opportunity recognition (Cervelló-Royo et al., 2020). Moreover, an encouraging environment in developed countries triggers their entrepreneurial activities based on innovation and high-level processing product development (Silva et al., 2022). Therefore, policymakers and public administration should create a competitive environment to secure the allocation of resources to successful businesses and foster their resilience to external shocks (Canton et al., 2017). Furthermore, through the new firm establishment, the country decreases its level of unemployment. However, there are examples of countries in which unemployment does not encourage entrepreneurship. The reason may be in social policies and money support that unemployed people geo, and thus, they are not pushed into entrepreneurship (Silva et al., 2022). Besides unemployment, entrepreneurship is also related to production and land prices in regions (Nakamura, 2019).

As previously stated, there are numerous determining factors connected to the entrepreneurial process so the existing research on the topic of entrepreneurship could be grouped as those that examined the influence of factors named 'informal institutions' (Samila and Sorenson, 2017; Zelekha and Dana, 2019), 'formal institutions' (Eberhart et al., 2017; Chowdhury et al., 2019) or even both (Estrin et al., 2013; Fuentelsaz et al. 2019). When it comes to the first group of factors is seen through the lenses of the social and cultural capital influences on entrepreneurial activity. Countries with both significant social capital, especially in the form of trust, and some level of cultural capital certainly have a higher level of entrepreneurship in reality (Zelekha and Dana, 2019). But if these factors or conditions are not met, then formal institutions come to the fore. Actually, it is the interplay between these two groups of determinants that designates the level of achieved entrepreneurial activity in one country (Fuentelsaz et al. 2019). Therefore, this paper aim is to investigate the influence of formal institutional factors such as enforcing contracts costs, total tax and contribution rate, registering property costs, and minimum amount of capital needed for starting a business on the dynamics of enterprises' birth rates in EU countries as a proxy of entrepreneurship in these countries. The main hypothesis of the research is that the formal determinants of entrepreneurial dynamism (i.e., enforcing contract costs, total tax and contribution rate, registering property costs, and minimum amount of capital needed for starting a business) have a negative influence on the enterprises' birth rates in EU countries.

Given the existing literature on this topic, the paper will bridge the gap in the research that analyses the effects of formal institutional factors on entrepreneurial dynamism, in particular by exploring the influence of access to the financial capital needed for starting a venture that is explored either separately (Henrekson and Sanandaji, 2020) or in combination with many other non-institutional factors (Chowdhury et al., 2019). Except for mentioned theoretical contribution, the paper will develop recommendations for policy-makers to adjust policies and create a favorable business environment for future entrepreneurs. During the decision-making process, investors could under or overestimate the conditions of doing business in some environments (Bardy et al., 2012), and thus the paper results will be indicative in the segment of determining the sign of the factors influencing the business establishment process. The methodological contribution of the study will be observed through the integration of two databases and indicators of business activity into a balanced panel dataset of EU countries' indicators. This study exploited the World Bank database to obtain independent variables. Especially its part created at the same time as the globally accepted indicator, the Doing Business index, which is aimed to access the ease of doing business in one country and shed the light on important indicators of a successful business environment. On the other hand, the Eurostat database's indicator of business birth rate is implemented in this paper as a dependent variable under the influence of four independent variables.

The paper is structured as follows: After the introduction, the second section presents the overview of the contemporary analysis of the ease of doing business in EU countries and the literature review of the existing research on determinants of new enterprise formation. The third part explains the methodology applied for data analysis, while the succeeding part gives an overview of the empirical results and their discussion. Finally, the conclusion is presented in the last part of the paper.

2. Literature review

Whenndeciding on establishing a new business, investors are interested in revealing determining factors of the entrepreneurial ecosystem in which they opt to base their venture. One of the progressive steps made to capture the business environment of 190 countries is the World Banks Doing business index. It should be kept in mind that Doing Business covers 12 areas of business regulation that most often indicate the conditions for small and medium size enterprises' business operations. Ten of these areas – starting a business, building permits, obtaining electricity, registering property, obtaining loans, protecting minority investors, paying taxes, cross-border trade, enforcing contracts, and resolving insolvency – are included in the rankings' calculation measuring while regulations on hiring workers and contracting with the government are not included in the ease of doing business and ranking (Doing Business 2019) (World bank, 2019). One more advantage of this ranking procedure is that assesses the real business environment rather than regulations.

The Doing business index observes five sections of data in order to assess the business environment of the country (World bank, 2020). But the question that arises is how these factors influence the number of new enterprises established. Therefore, procedural aspects of the business foundation named 'formal institutional factors such as enforcing contract costs, total tax and contribution rate, registering property costs, and minimum amount of capital needed for starting a business are considered in this paper. The subsequent table presented an overview of the supporting literature for the proposed research hypothesis (Table 1). Some of the literature sources are derived by following the study of Wurth et al. (2022) on determinants involved in shaping the entrepreneurial ecosystem.

Table 1: Literature review

Source	Methodology	Data source	Variable	Sample	Main findings
Bennett (2021)	Panel data econometric methods	Metropolitan Area Economic Freedom Index; period of 1972-2012 (every 5th year)	Taxation Index	up to 382 US metropolitan statistical areas	The author analyzed three indexes of taxation and revealed that there is a significant positive influence of income tax on the firm entry rate, while sales tax and property tax have a negative influence on the firm entry rate.
Dilli et al. (2018)	Simple OLS regression	Doing Business and Eurostat database; period of 2004-2014	Institutional dimensions such as finance (i.e., paid-in minimum capital); Inter-firm relations (i.e., enforcing contracts)	21 Western developed economies	An influence on enterprise's birth rates in low-technology sectors of the finance-related group of factors is positive in the sample of some Nordic and Mediterranean countries, while it is negative in medium-low-technology sectors in financially restrictive Mediterranean countries. On the other hand, the influence of the reliability of inter-firm institutions in Eastern and Mediterranean countries is negative on the birth rate of high-tech and medium-high-tech enterprises.
Martínez-Fierro et al. (2020)	Correlation and analysis of variance	Global Entrepreneurship Monitor (GEM) and GEM National Expert Survey (NES)	Financing, government policies; Commercial infrastructure	62 GEM countries	In this research total, entrepreneurial activity only negatively correlates with the country's financial environment. Moreover, there is a relationship between the level of economic development and the entrepreneurial ecosystem, so the financial environment as a factor of entrepreneurial activity differs between countries with different levels of economic development.
Levie and Autio (2008)	Panel data econometric methods	GEM and NES; period of 2000-2006	Finance (i.e., various funding options); Regulations (i.e., taxes, and bureaucracy)	54 countries and 232 cases	The researchers revealed only the positive effect of regulations on total entrepreneurial activity in high-income countries.

Source	Methodology	Data source	Variable	Sample	Main findings
Hechavarría, and Ingram (2019)	Panel data econometric methods	GEM and NES; period of 2011-2014	Financial environment, Government policy, taxes, Commercial infrastructure access	75 countries and 403 cases	The study identifies the positive influence of government policy and support on the total entrepreneurial activity (TEA) rates for both men and women entrepreneurs but not of government policy and taxes as a factor, while the same study asses the negative influence of commercial infrastructure access on TEA rates of women but not for men. No influence of the financial environment was identified in this research. During the robustness check, the financial environment shows a negative influence on both male and female TEA rates in factor, efficiency, and innovativeness-driven countries.
Fuentelsaz et al. (2019)	Panel data econometric methods – Tobit model	GEM, Worldwide Governance Indicators; period of 2002-2015	Formal institutions such as quality of government activities, regulations, and law	80 countries and 586 cases	When a total influence of formal institutions (i.e., quality of government sectors concerning the activities and interests of entrepreneurs) on the TEA rate is assessed, the results indicate that when the quality of formal government institutional factors increases, the TEA increases, as well. Consequently, the influence of formal institutions is positive and significant.
Sendra-Pons et al. (2022)	fuzzy-set qualitative comparative analysis (fsQCA)	GEM, Worldwide Governance Indicators; period of 2018-2019	Regulatory requirements to establish an enterprise; governance indicators (i.e., quality of government activities, regulations, and law)	48 countries	In this research, it was confirmed that countries with solid institutional regulations lead by a strong government that created the sense of rule of law and absence of unnecessary administrative procedures have high TEA rates. Moreover, the same countries have positive results in TEA rates if the access to financial resources is lessened.

Source	Methodology	Data source	Variable	Sample	Main findings
Chowdhury et al. (2019)	Panel data econometric methods	Doing Business Database (2022), GEM, World Development Indicators (WDI), World Economic Forum; period of 2005-2015	Capital availability; Regulations; Government support	70 countries and 626 cases	The authors assess the effect of various formal and informal institutional indicators on the quality and quantity of entrepreneurship. The research sample is combined of developed and developing countries. The panel regression analysis of fixed effect has presented that on quality of entrepreneurship (measured as entrepreneurship productivity) indicators of simplicity to access capital (venture capital and equity) have a positive effect, the tax rate levied to business has a negative effect, the number of procedures compulsory to register property and number of days needed to enforce contract have a positive effect. Oppositely, on the quantity of entrepreneurship defined as a percentage of a new ownership rate of a population between 18-64 years old who have established and managed a business between 3 and 42 months the access to equity has negative and mandatory requirements for registering the property expressed in days has a positive influence.
Chowdhury et al. (2015)	Panel data econometric methods – random effect model	GEM, WDI, Doing Business, World Bank; period 2001-2005	Tax rates; Start-up procedures; Capital disposal	44 countries	The study supports the connotations that taxes are factors with a negative sign, so countries with higher tax rates will show lower rates of entrepreneurship. Secondly, administrative procedures and the availability of capital for entrepreneurial activities could have different influences in the case of start-ups, nascent entrepreneurs, or self-employed persons. In the case of capital, it has a positive influence on start-ups, but a negative to the other two types of entrepreneurial activity.

Source: Authors'presentation

Given literature review support the proposed main research hypothesis:

> H1: *Formal determinants of entrepreneurial dynamism such as enforcing contract costs, total tax and contribution rate, registering property costs, and minimum amount of capital needed for starting a business have a negative influence on the enterprises' birth rates in EU countries.*

The proposed hypothesis will be tested by applying panel data regression analysis and the results will be presented in the succeeding parts of the paper.

3. Methodology

When conducting empirical research, data can usually be classified into three categories: cross-sectional data, time series data, and panel data. The cross-section data category refers to data collected on several units at a given time, the time series data category is a collection of observations over some time concerning several variables, while the panel data category refers to data covering several units over some time. It can be concluded that panel data is a combination of cross-sectional data and time series data. Recently, the use of panel data in empirical research in both developed and developing countries has become increasingly important, on the one hand, due to the need for harmonization of regional policies, while on the other hand the inherent benefits for empirical research are cited as the reason for increased use of panel data (Hsiao, 2007). In particular, the inherent benefits of panel data for empirical analysis include (Baltagi, 2008): (a) an increase in the number of observations provides more sample variability, less collinearity, and more precise inference of model parameters; (b) better coverage of the intricacy of human behavior than cross-sectional or time series data; (c) capturing of the heterogeneity inherent in each individual unit; (d) covering the dynamics of the behavior of economic operators; (e) more accurate forecasts. Therefore, the assessment of the determinants of entrepreneurial dynamics was performed using regression analysis on panel data. Mathematically, the panel data regression model can be formulated as (Baltagi, 2008):

$$y_{it} = \alpha + X'_{it}\beta + u_{it} \quad i = 1, 2, ..., N, \; t = 1, 2, ..., T \tag{1}$$

Wherein:

y_{it} – the value of the dependent variable for the i^{th} observation unit in the period t

α – intercept

X_{it} – i^{th} observation on K explanatory variables in the period t

β – vector of regression parameters

u_{it} – disturbance term, where $u_{it} = \mu_i + v_{it}$, μ_i denotes unobservable individual-specific effect and v_{it} denotes the remainder disturbance.

The effects of unobserved individual-specific effects may either be assumed as random variables or fixed parameters. The former case represents the random effects model, while the latter case represents the fixed effects model.

One of the most important questions when analyzing panel data is whether it is better to use a model with fixed effects or a model with random effects. Various controversies on this topic can be found in the literature, but the conclusion is that there is no single answer and that the choice of adequate model specification depends on the nature of the data. Gujarati (2004) believes that the choice of the model depends on the probability that there is a correlation between individual-specific effects and explanatory variables. Specifically, if there is no probability of a correlation between individual-specific effects and explanatory variables, it is considered better to choose the random effects model. However, in case there is a correlation between individual-specific effects and explanatory variables, it is stated that it is better to use a fixed effects model. The Hausman specification test is used to compare the estimated coefficients obtained with the fixed-effects model and the random-effects model. The null hypothesis in the Hausman specification test is that random error is not correlated with any regressor (independent variable). In the case when the test shows that the null hypothesis should not be rejected, the conclusion is that the random effect estimate is more efficient.

If the test shows that the null hypothesis should be rejected, it can be concluded that the estimate of the random effect is not consistent and that the estimate of the fixed effect is necessary (Wooldridge, 2010). After selecting the appropriate model specification, it is necessary to check the fulfillment of the basic assumptions of panel data models, since they are often violated. Assumption testing means testing the model for the existence of multicollinearity, heteroskedasticity, autocorrelation, and cross-sectional correlation. One of the most important assumptions is the mutual independence of predictor variables. If there is a strong correlation between two independent variables, this can cause a significant problem in the estimated values, and this phenomenon is called multicollinearity. The Variance Inflation Factor test (VIF) can be used to identify the presence of multicollinearity between independent variables. The VIF value greater than 10 indicates the existence of strong multicollinearity. Another important assumption is homoskedasticity. More specifically, homoskedasticity indicates that there is no correlation between random effects and independent variables, while heteroskedasticity occurs when a random error correlates with one of the independent variables. If a random error that is heteroskedastic is treated as homoskedastic, the estimated coefficients obtained by regression will be consistent but will not be effective and the standard error of these estimated values will be biased (Baltagi, 2008). When it comes to testing this assumption, there are many tests, the most commonly used being the Breusch-Pagan test and the modified Wald test foreGroupWise heteroscedasticity. The next test is

related to the examination of autocorrelation. A situation in which the random error of one observation depends on the random error of another observation is called autocorrelation or serial correlation. Autocorrelation can be found most frequently in time series data when observations in a certain time period depend on observations in previous time periods. The presence of autocorrelation results in the inefficiency of the estimated values (Chiulli, 2018). The most frequently used test for the examination of autocorrelation is Wooldridge serial correlation test for panel data. The last test refers to the examination of cross-sectional dependence. Cross-sectional dependence denotes the existence of the correlation of the residuals across entities which causes biased results. One of the commonly used tests to account for the cross-sectional dependence is Pesaran's test.

4. Empirical data and analysis

To determine the link between entrepreneurial dynamics and the indicators of the business condition indicators, data obtained from the Doing Business database published by the World Bank and the Eurostat database were used. The Doing business database provides objective measures of business regulations and their enforcement across economies (Doing Business, 2022). Data were obtained for the period from 2010 to 2019. As a proxy of entrepreneurial dynamics, the birth rate (BirthRate) of the company was used, while as indicators of business conditions, enforcing contracts costs (EnforcingContracts), total tax and contribution rate (TotalTax), registering property costs (RegisteringProperty) and minimum amount of capital needed for starting a business (StartingCapital) were used. The enterprise birth rate represents the number of births as a percentage of the population of active enterprises. The enforcing contracts indicator indicates the quality of court proceedings, assessing whether each economy has implemented a range of suitable practices that endorse quality and efficiency in the court system (World Bank, 2022). The total rate of taxes and contributions indicates the size of the company's tax liabilities in a specific economy. Registering property costs indicate the cost required by the enterprise to register the asset expressed as a percentage of the value of the asset, while the minimum amount of capital represents the amount of capital needed for starting a business expressed as a percentage of income per capita. Descriptive statistics of the variables are presented in Table 1 in Appendix. The results of descriptive statistics indicate that there is significant variability of the StartingCapital variable observed both in one country and in the panel.

In order to evaluate the determinants that affect the entrepreneurial, regression analysis is performed on panel data, and the following model is estimated:

$$BirthRate_{it} = \beta_0 + \beta_1 EnforcingContracts_{it} + \beta_2 TotalTax_{it} + \\ + \beta_3 RegisteringProperty_{it} + \beta_4 StartingCapital_{it} + \varepsilon_{it} \quad (2)$$

wherein

$\beta_0, \beta_1, ..., \beta_4$ − intercept and slope coefficients

ε_{it} − disturbance term, $i = 1, \ldots,27$, $t = 1, \ldots,10$.

In order to assess the adequate model specification, the Hausman test specification was applied, and the results of the Hausman test are in favor of the model with fixed effects (Table 2 in Appendix). To examine the validity of the model, assumptions related to multicollinearity, heteroskedasticity, autocorrelation, and serial correlation were further analyzed. The values of all variance inflation factor values are less than 10 (Table 3 in Appendix) which indicates that there is no multicollinearity of explanatory variables. The results of the Wald test for theeGroupWise heteroscedasticity in the fixed effect regression model indicate that the model suffers from heteroscedasticity (Table 4 in Appendix). The results of the Pesaran's test of cross-sectional independence indicate the existence of cross-sectional dependence (Table 5 in the Appendix). The results of Wooldridge's test for autocorrelation in panel data indicate the existence of autocorrelation (Table 6 in Appendix).

Taking into account the conducted tests, the fixed effect regression with the Driscoll-Kraay standard errors was performed (Table 2). Driscoll and Kraay (1998) offer *"a nonparametric covariance matrix estimator which produces heteroscedasticity consistent standard errors that are robust to very general forms of spatial and temporal dependence"* (Hoechle, 2007: 2). Although the estimation procedure is initially based on a large T assumption, Driscoll and Kraay (1998) prove that even for very short time dimensions the estimator is consistent. In addition, it has been shown that for models in which the cross-sectional dimension is relatively larger than the time dimension this approach is more appropriate than alternative approaches (Zhang and Lin, 2012; Knight, 2014).

Table 2: Regression with Driscoll-Kraay standard errors

BirthRate	Coefficient	Std. Err.	t	P>|t|	95% Conf. Interval	
EnforcingContracts	.0164169	.0325704	0.50	0.626	-.0572623	.0900962
TotalTax	-.0392726	.0124833	-3.15	0.012	-.0675119	-.0110334
RegisteringProperty	-.3264175	.1199226	-2.72	0.024	-.5977013	-.0551336
StartingCapital	.0173934	.0056477	3.08	0.013	.0046174	.0301694
_cons	12.8924	.5392985	23.91	0.000	11.67242	14.11238

Source: Authors' calculation

Research results indicate an influence of various formal indicators on the dynamics of new enterprises in EU countries. The enterprise birth rate is negatively affected by the total tax burden, as well as the cost of property registration, while the amount of initial capital required to open a business has a positive impact. The effect of enforcing contracts cost has no significant influence on the dependent variable. Therefore, the research hypothesis is confirmed in the part where it was proposed that two of four formal institutional determinants have a negative influence on the dependent variable. On the other hand, the hypothesis is not supported when it comes to the influence of stating capital on the new business dynamism which was positive, and the effect of enforcing contract cost was not confirmed to be significant.

5. Results and discussion

Based on the conducted regression analysis, the main determinants of the companies' birth rates were identified. They can represent a good starting point for creating guidelines for policymakers. In addition, to verify the obtained results, after the discussion and implications, a robustness analysis was performed.

5.1. Discussion and implications

The study findings present central determinants of the entrepreneurship ecosystem in the EU. Firstly, the results concerning the effect of the total tax burden imposed on the newly formed enterprises are in the line with the previous research of Chowdhury et al. (2019) that identified the effect of commercial tax in the inverted U-shape on the quantity of entrepreneurship. Also, the entrepreneurship rate in developing is rather resilient to commercial tax changes than in developed countries. On the other hand, Chowdhury et al. (2015) found that the total tax rate has a trifold influence on entrepreneurship. Start-up firms face the negative effect of tax rates increase, self-employment is under the positive influence of tax rates, while for nascent entrepreneurship the influence is not confirmed. Undoubtedly, determining tax rates affects business operations by collecting a part of revenue and thus decreasing the profit margin as compensation for high-risk investments by the entrepreneur. The literature does not confirm the direct effect of tax reduction on business dynamism, but the indirect effect of tax reduction especially in tax levied on profit is proven to promote entrepreneurship and generates business value (Sedlacek, et al., 2019). Therefore, the tax systems should provide incentives for newly established businesses in order to motivate entrepreneurs and thus boost the rate of new firms' establishment. In this situation, the government and its positive attitudes toward entrepreneurship and the economic growth that it produces comes to the fore. Secondly, registering property cost as a determining factor with a

negative sign of the effect is a signal for policy-makers that in order to achieve an increase of established firms they should ensure an entrepreneurial ecosystem free of unnecessary bureaucracy and procedures. Similarly, Levie and Autio (2008) revealed that the regulatory environment assessed as not consuming when it comes to time and money positively influences entrepreneurial activity. It implies that if the country has strict business regulations, it will have a negative effect on investments and capital creation (Canton et al., 2017). Public administration influences business from the very beginning to the end of the lifecycle. Specifically, in the research of Sendra-Pons et al. (2022) countries with the rule of law and simple procedures for business creation have higher rates of entrepreneurship. Thirdly, in this paper, it was discovered the positive effect of capital required at the very beginning of the business establishment procedure on the enterprise birth rate. However, it is not unexpected to have this outcome because higher levels of capital mean that fewer have an opportunity to form their business and will do so only if are sure of its success (Silva et al., 2022). Even though this result is opposite to expectations made while defining the research model, it is not without the support in the literature. The study of Dilli et al. (2018) indicates that depending on the level of the geographical grouping, some countries face a positive influence of demanded starting capital on the firm birth rate (i.e., Nordic and Mediterranean countries). The results of the same study also indicate that the positive effect of capital requirements and other financial constraints is present in low-tech enterprises' birth rates, while high-tech firms' birth rates are increased if the financial constraints are not so restrictive. Therefore, if the countries are devoted to an increase in high-tech enterprises number the financial requirements should be lessened. Lastly, no influence of enforcing contract costs was noted in this study. On the other hand, research conducted by Dilli et al. (2018) found its negative influence on the business birth rates while the study of Fuentelsaz et al. (2019) showed a positive influence of all formal institutional factors among such as enforcing contract cost on the total entrepreneurial activity. According to Chowdhury et al. (2019), bankruptcy law is an important factor for entrepreneurs in developing countries because protects their interests when needed. Sendra-Pons et al. (2022) stipulate that rule of law brings higher entrepreneurial activity rates but the absence of it hinders entrepreneurship in the country. Nevertheless, the current study did not confirm any of the previously identified effects thus indicating that the enterprise birth rate depends more on the costs of starting a business rather than ending it. What is more, only indecisive future entrepreneurs could potentially base their decision-making process of starting a business on the facts such as enforcing contract cost, time of court procedures, and similar (Chowdhury et al., 2019).

5.2. Robustness analysis

Since the issue of endogeneity is particularly relevant in the context of panel data regression models in order to perform a robustness check the procedure proposed

by Chowdhury et al. (2015) was performed. The robustness procedure is based on the estimation of the regression model with the lagged independent variables. The results are presented in Table 3.

Table 3: Dynamic regression results

BirthRate	Coefficient	Std. Err.	t	P>|t|	95% Conf. Interval	
L.EnforcingContracts	-0.0362445	0.0617323	-0.59	0.573	-.1785994	.1061105
L.TotalTax	-0.0007383	.0167433	-0.04	0.966	-.0393485	.0378719
L.RegisteringProperty	0.1578213	.1424026	1.11	0.300	-.1705597	.4862022
L.StartingCapital	.02628	.0027084	9.70	0.000	.0200343	.0325257
_cons	10.30355	1.061165	9.71	0.000	7.856495	12.7506

Source: Authors' calculation

The obtained results partially support the results of the fixed-effects model with the Driscol-Kraay standard errors and prove that the amount of capital required to start a business is indeed an important determinant of business birth rates, confirming the positive sign of this variable.

6. Conclusions

It is more than obvious that there are significant differences between EU countries in terms of business environment conditions. These deviations are preventing EU countries' convergence when it comes to entrepreneurship. Therefore, there is a need for policy changes in order to improve the conditions for establishing a new company. With this in mind, the authors conducted the analysis and partially confirmed the research hypothesis that formal institutional factors negatively influence enterprise birth rates in EU countries. The paper contributes to the literature in the field of entrepreneurship by confirming the direction of influence of two determinants, and pointing out that the influence of tax cost and registering property cost is assessed as negative. Additionally, the conducted research offered the new results that shed the light on the positive influence of starting capital requested for business establishment, and on the factor of enforcing contract cost that is found to be without the influence on the enterprise birth rate. From the methodological point of view, the study merged two databases and showed that Doing business indicators as a measure of the business environment can be regressed not only to the total entrepreneurial activity but also to the business performance indicators such as enterprise birth rate. Future research should encompass other indicators of the business ecosystem such as market size, characteristics of the financial market, security, stability and etc. in order to assess

both the influence of the business environment and the potential for increasing entrepreneurial activity. Given the obtained positive effect of starting capital on the dependent variable, and since the EU is formed of diverse entities and there is a need to analyze it separately so this opinion could be perceived as a paper limitation and an opportunity for further analysis. In addition, another limitation of the conducted research can be observed in the small sample size, specifically in the short time dimension, and future research can be focused on the inclusion of more time periods. Also, by including years after 2019, it is possible to analyze the impact of the coronavirus pandemic on the birth rate of new companies. Nevertheless, the paper offers valuable insights for policymakers who should undertake activities to diminish the effects of tax and administration costs and to stimulate entrepreneurship and economic growth in the country, while the rule of law is of secondary importance for future entrepreneurial activity.

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References

Baltagi, B. H. (2008) *Econometric analysis of panel data*, John Wiley & Sons Ltd., Chichester.

Bardy, R., Drew, S., Kennedy, T. F. (2012) "Foreign Investment and Ethics: How to contribute to Social Responsibility by Doing Business in Less-developed countries", *Journal of Business Ethics*, Vol. 106, pp. 267–282, http://dx.doi.org/10.1007/s10551-011-0994-7.

Bennett, D. L. (2021) "Local Institutional Heterogeneity & Firm Dynamism: Decomposing the Metropolitan Economic Freedom Indeks", *Small Business Economics*, Vol. 57, pp. 493–511, https://doi.org/10.1007/s11187-020-00322-2.

Budak, J., Rajh, E. (2014) "Corruption as an Obstacle for Doing Business in the Western Balkans: A business Sector Perspective", *International Small Business Journal*, Vol. 32, No. 2, pp. 140–157, http://dx.doi.org/10.1177/0266242613498882.

Canton, E., Petrucci, M. (2017) "Ease of Doing Business in the Euro Area", *Quarterly Report on the Euro Area (QREA)*, Vol. 16, No. 2, pp. 21–29.

Cervelló-Royo, R. et al. (2020) "Sustainable Development, Economic and Financial Factors, that Influence the Opportunity-driven Entrepreneurship. An fsQCA Approach", *Journal of Business Research*, Vol. 115, pp. 393–402, https://doi.org/10.1016/j.jbusres.2019.10.031.

Chiulli, R. M. (2018) *Quantitative analysis: An introduction*, Routledge.

Chowdhury, F., Terjesen, S., Audretsch, D. (2015) "Varieties of Entrepreneurship: Institutional Drivers Across Entrepreneurial Activity and Country", *European Journal of Law and Economics,* Vol. 40, pp. 121–148, https://doi.org/10.1007/s10657-014-9464-x.

Chowdhury, F., Audretsch, D. B., Belitski, M. (2019) "Institutions and Entrepreneurship quality", *Entrepreneurship Theory and Practice*, Vol. 43, No. 1, pp. 51–81. http://dx.doi.org/10.1177/1042258718780431.

Cinar, E. M., Hienkel, T., Horwitz, W. (2019) "Comparative Entrepreneurship Factors Between North Mediterranean and North African Countries: A Regression Tree Analysis", *The Quarterly Review of Economics and Finance*, Vol. 73, pp. 88–94, https://doi.org/10.1016/j.qref.2018.07.009.

Dilli, S., Elert, N., Herrmann, A. M. (2018) "Varieties of Entrepreneurship: Exploring the Institutional Foundations of Different Entrepreneurship Types Through 'Varieties-of-Capitalism' Arguments", *Small Business Economics*, Vol. 51, pp. 293–320, https://doi.org/10.1007/s11187-018-0002-z.

Doing Business (2022) *Database*, Available at: <https://databank.worldbank.org/source/doing-business> [Accessed: May 15, 2022].

Driscoll, J. C., Kraay, A. C. (1998) "Consistent Covariance Matrix Estimation With Spatially Dependent Panel Data", *The Review of economics and statistics*, Vol. 80, No. 4, pp. 549–560.

Eberhart, R. N., Eesley, C. E., Eisenhardt, K. M. (2017) "Failure is an Option: Institutional Change, Entrepreneurial Risk, and New Firm Growth", *Organization Science*, Vol. 28, No. 1, pp. 93–112, http://dx.doi.org/10.1287/orsc.2017.1110.

Estrin, S., Mickiewicz, T., Stephan, U. (2013) "Entrepreneurship, Social Capital, and Institutions: Social and Commercial Entrepreneurship Across Nations", *Entrepreneurship theory and practice*, Vol. 37, No. 3, pp. 479–504, http://dx.doi.org/10.1111/etap.12019.

Fuentelsaz, L., González, C., Maicas, J. P. (2019) "Formal Institutions and Opportunity Entrepreneurship. The Contingent Role of Informal institutions", *BRQ Business Research Quarterly*, Vol. 22, No. 1, pp. 5–24, http://dx.doi.org/10.1016/j.brq.2018.06.002.

Gujarati, D. N. (2004) *Basic Econometrics,* 4th Edition, McGraw-Hill Companies, New York, NY, USA.

Hechavarría, D. M., Ingram, A. E. (2019) "Entrepreneurial Ecosystem Conditions and Gendered National-level Entrepreneurial Activity: A 14-year Panel Study of GEM", *Small Business Economics*, Vol. 53, pp. 431–458, https://doi.org/10.1007/s11187-018-9994-7.

Henrekson, M., Sanandaji, T. (2020) "Measuring Entrepreneurship: Do Established Metrics Capture Schumpeterian Entrepreneurship?", *Entrepreneurship Theory and Practice*, Vol. 44, No. 4, pp. 733–760, http://dx.doi.org/10.1177/1042258719844500.

Hoechle, D. (2007) "Robust Standard Errors for Panel Regressions with Cross-sectional Dependence ", *The stata journal*, Vol. 7, No. 3, pp. 281–312, https://doi.org/10.1177/1536867X0700700301.

Hsiao, C. (2007) "Panel Data Analysis—Advantages and Challenges", *Test*, Vol. 16, pp. 1–22.

Knight, K. W. (2014) "Temporal Variation in the Relationship Between Environmental Demands and Well-being: A Panel Analysis of Developed and Less-developed Countries", *Population and Environment*, Vol. 36, pp. 32–47.

Levie, J., Autio, E. (2008) "A Theoretical Grounding and Test of the GEM Model", *Small Business Economics,* Vol. 31, pp. 235–263, https://doi.org/10.1007/s11187-008-9136-8.

Martínez-Fierro, S., Biedma-Ferrer, J. M., Ruiz-Navarro, J. (2020) "Impact of High-growth Start-ups on Entrepreneurial Environment Based on the Level of National Economic Development", *Business Strategy and the Environment*, Vol. 29, No. 3, pp. 1007–1020, https://doi.org/10.1002/bse.2413.

Nakamura, H. (2019) "Relationship Among Land Price, Entrepreneurship, the Environment, Economics, and Social Factors in the Value Assessment of Japanese Cities", *Journal of Cleaner Production*, Vol. 217, pp. 144–152, https://doi.org/10.1016/j.jclepro.2019.01.201.

Opute, A. P., et al. (2021) "Steering Sustainable Economic Growth: Entrepreneurial Ecosystem Approach", *Journal of Entrepreneurship and Innovation in Emerging Economies*, Vol. 7, No. 2, pp. 216–245, https://doi.org/10.1177/23939575211024384.

Samila, S., Sorenson, O. (2017) "Community and Capital in Entrepreneurship and Economic Growth", *American Sociological Review*, Vol. 82, No. 4, pp. 770–795, https://doi.org/10.1177/0003122417711699.

Sedlacek, P., Sterk, V. (2019) "Reviving American Entrepreneurship? Tax Reform and Business Dynamism", *Journal of Monetary Economics*, Vol. 105, pp. 94–108, https://doi.org/10.1016/j.jmoneco.2019.04.009.

Sendra-Pons, P., Comeig, I., Mas-Tur, A. (2022) "Institutional Factors Affecting Entrepreneurship: A QCA analysis", *European Research on Management and Business Economics*, Vol. 28, No. 3, https://doi.org/10.1016/j.iedeen.2021.100187.

Silva, P. M., Moutinho, V. F., Moreira, A. C. (2022) "Do Social and Economic Factors Affect the Technical Efficiency in Entrepreneurship Activities? Evidence from European Countries Using a Two-stage DEA Model", *Socio-Economic Planning Sciences*, Vol. 82, https://doi.org/10.1016/j.seps.2022.101314.

Wooldridge, J. M. (2010) *Econometric analysis of cross section and panel data*, MIT press.

World Bank (2019) "Doing Business 2019"*, World Bank*, Washington, Available at: <https://www.doingbusiness.org/content/dam/doingBusiness/media/Annual-Reports/English/DB2019-report_web-version.pdf> [Accessed: May 5, 2022].

World Bank (2020) "Doing Business 2020", *World Bank*, Washington, Available at: <http://documents1.worldbank.org/curated/en/688761571934946384/pdf/Doing-Business-2020-Comparing-Business-Regulation-in-190-Economies.pdf> [Accessed: May 5, 2022].

World Bank (2022) *Enforcing contracts indicator*, Available at: <https://olc.worldbank.org/content/enforcing-contracts-indicator-what-it-measures-why-it-matters-what-are-results-and-good-0> [Accessed: May 20, 2022].

Wurth, B., Stam, E., Spigel, B. (2022) "Toward an Entrepreneurial Ecosystem Research Program", *Entrepreneurship Theory and Practice*, Vol. 46, No. 3, pp. 729–778, https://doi.org/10.1177/1042258721998948.

Zelekha, Y., Dana, L. P. (2019) "Social Capital Versus Cultural Capital Determinants of Entrepreneurship: An Empirical Study of the African Continent", *The Journal of Entrepreneurship*, Vol. 28, No. 2, pp. 250–269, http://dx.doi.org/10.1177/0971355719851900.

Zhang, C., Lin, Y. (2012) „Panel Estimation for Urbanization, Energy Consumption and CO2 Emissions: A Regional Analysis in China", *Energy policy*, Vol. 49, pp. 488–498, https://doi.org/10.1016/j.enpol.2012.06.048.

Determinante poduzetničke dinamike: slučaj Europske unije

Jelena J. Stanković[1], *Ivana Marjanović*[2], *Sandra Milanović*[3], *Milica Jovanović Vujatović*[4]

Sažetak

Budući da ekonomska teorija identificira nova poduzeća kao jedan od osnovnih pokretača gospodarskog rasta, ona u prvi plan stavlja potrebu razumijevanja postojeće dinamike poduzetništva. Stoga je identifikacija temeljnih odrednica poduzetništva središnje pitanje kako s teorijskog tako i s praktičnog stajališta u suvremenoj literaturi. Bolje razumijevanje čimbenika koji utječu na dinamiku poduzetništva osnovni je preduvjet za kreiranje učinkovitih politika usmjerenih na poticanje stvaranja novih poduzeća, a posljedično i otvaranja novih radnih mjesta. Stoga se ovaj rad bavi nekoliko važnih pitanja. S teorijskog stajališta ispituje se uloga poduzetničkih odrednica u stvaranju novog posla. S praktičnog stajališta analiziraju se osnovni formalni institucionalni čimbenici koji utječu na natalitet novih poduzeća. Analiza je provedena na uzorku zemalja Europske unije za razdoblje od 2010. do 2019. godine korištenjem podataka iz Doing Business baze podataka Svjetske banke, kao i podataka o poslovnoj dinamici iz baze podataka Eurostata. Provedena je regresijska analiza panel podataka primjenom Driscoll-Kraayeve procedure procjene sa standardnim pogreškama, a rezultati pokazuju da na dinamiku osnivanja novih poduzeća negativno utječu ukupno porezno opterećenje, kao i trošak uknjižbe vlasništva, dok iznos početnog kapitala potreban za otvaranje poduzeća ima pozitivan učinak. Rezultati istraživanja mogu poslužiti kao osnova za fino ugađanje politika koje će olakšati i potaknuti stvaranje novih poduzeća.

Ključne riječi: *stopa osnivanja poduzeća, formalni institucionalni faktori, Doing Business, zemlje EU, panel analiza*

JEL klasifikacija: *M13, G30, M21, O52, C33*

[1] *Redovni Profesor, Univerzitet u Nišu, Ekonomski fakultet, Trg kralja Aleksandra Ujedinitelja 11, 18000 Niš, Srbija. Znanstveni interes: matematika i statistika u ekonomiji. Tel.: +38118 528655. E-mail: jelena.stankovic@eknfak.ni.ac.rs.*

[2] *Asistent, Univerzitet u Nišu, Ekonomski fakultet, Trg kralja Aleksandra Ujedinitelja 11, 18000 Niš, Srbija. Znanstveni interes: matematika i statistika u ekonomiji. Tel.: +38118 528655. E-mail: ivana.veselinovic@eknfak.ni.ac.rs.*

[3] *Saradnik u nastavi, Univerzitet u Nišu, Ekonomski fakultet, Trg kralja Aleksandra Ujedinitelja 11, 18000 Niš, Srbija. Znanstveni interes: poslovno upravljanje. Tel.: +38160 0183456. E-mail: sandra.milanovic@eknfak.ni.ac.rs.*

[4] *Saradnik u nastavi, Univerzitet u Nišu, Ekonomski fakultet, Trg kralja Aleksandra Ujedinitelja 11, 18000 Niš, Srbija. Znanstveni interes: poslovno upravljanje. Tel.: +38164 3526666. E-mail: milica.jovanovic@eknfak.ni.ac.rs.*

Appendices

Table 1: Descriptive statistics of variables for the countries and for the panel

Country	Descriptive statistics	BirthRate	Enforcing-Contracts	TotalTax	Registering-Property	Starting-Capital
Austria	Mean	7.12444	20.48889	51.63333	4.57778	34.00000
	STD	0.54058	0.10541	0.41231	0.04410	19.98725
	CV	0.07588	0.00514	0.00799	0.00963	0.58786
Belgium	Mean	6.35333	17.80000	57.66667	12.70000	18.16667
	STD	0.53066	0.15000	1.06536	0.00000	1.01735
	CV	0.08352	0.00843	0.01847	0.00000	0.05600
Bulgaria	Mean	11.87111	18.60000	27.61111	2.93333	2.30000
	STD	0.61825	0.00000	1.11181	0.07071	6.90000
	CV	0.05208	0.00000	0.04027	0.02411	3.00000
Croatia	Mean	8.85571	14.23333	20.44444	4.88889	13.27778
	STD	0.86927	1.45000	1.02848	0.33333	0.42361
	CV	0.09816	0.10187	0.05031	0.06818	0.03190
Cyprus	Mean	6.60000	16.40000	22.31111	10.10000	0.00000
	STD	2.33920	0.00000	1.17733	0.94207	0.00000
	CV	0.35442	0.00000	0.05277	0.09327	
Czech Republic	Mean	9.27111	33.80000	46.00000	3.55556	16.81111
	STD	1.08913	0.00000	0.41533	0.52705	15.95450
	CV	0.11748	0.00000	0.00903	0.14823	0.94905
Denmark	Mean	11.10222	23.30000	25.57778	0.60000	21.54444
	STD	0.54710	0.00000	1.40159	0.00000	8.37065
	CV	0.04928	0.00000	0.05480	0.00000	0.38853
Estonia	Mean	11.30778	20.81111	51.80000	0.48889	20.47778
	STD	0.71880	1.77302	6.29047	0.03333	3.58845
	CV	0.06357	0.08520	0.12144	0.06818	0.17524
Finland	Mean	8.23889	15.55556	40.28889	4.00000	7.02222
	STD	1.30550	1.27878	2.97802	0.00000	0.43237
	CV	0.15846	0.08221	0.07392	0.00000	0.06157
France	Mean	10.39000	17.40000	67.37778	6.36667	0.00000
	STD	1.05648	0.00000	2.90507	0.52915	0.00000
	CV	0.10168	0.00000	0.04312	0.08311	
Germany	Mean	12.51778	8.86667	29.21111	2.93333	10.50000
	STD	1.05008	0.40000	2.24246	0.63246	2.82179
	CV	0.08389	0.04511	0.07677	0.21561	0.26874

Country	Descriptive statistics	BirthRate	Enforcing-Contracts	TotalTax	Registering-Property	Starting-Capital
Greece	Mean	4.68250	22.40000	47.78889	7.85556	10.10000
	STD	0.31320	0.00000	2.94595	3.80300	12.00187
	CV	0.06689	0.00000	0.06165	0.48412	1.18830
Hungary	Mean	10.65222	15.00000	50.04444	5.66667	26.65556
	STD	1.46756	0.00000	3.52601	2.00000	20.19964
	CV	0.13777	0.00000	0.07046	0.35294	0.75780
Italy	Mean	7.09667	27.51111	64.00000	4.44444	5.46667
	STD	0.32315	3.14819	6.28967	0.05270	5.18748
	CV	0.04554	0.11443	0.09828	0.01186	0.94893
Latvia	Mean	15.68000	23.10000	36.16667	2.00000	3.34444
	STD	2.24647	0.00000	0.95656	0.00000	6.65002
	CV	0.14327	0.00000	0.02645	0.00000	1.98838
Lithuania	Mean	21.47667	23.60000	43.11111	0.80000	23.13333
	STD	2.57984	0.00000	0.82529	0.00000	11.34383
	CV	0.12012	0.00000	0.01914	0.00000	0.49037
Luxembourg	Mean	6.95500	24.00000	28.86667	0.30000	25.90000
	STD	0.24419	0.00000	0.20616	0.00000	0.84705
	CV	0.03511	0.00000	0.00714	0.00000	0.03270
Ireland	Mean	9.45444	9.70000	20.30000	10.12222	21.02222
	STD	0.36070	0.00000	0.35355	0.04410	1.77467
	CV	0.03815	0.00000	0.01742	0.00436	0.08442
Malta	Mean	9.34444	21.50000	42.12857	8.94286	1.45556
	STD	4.25810	0.00000	1.17716	4.32892	0.16667
	CV	0.45568	0.00000	0.02794	0.48406	0.11450
Netherlands	Mean	10.07889	24.01111	39.70000	6.10000	22.40000
	STD	0.51319	0.22048	0.82916	0.00000	26.57725
	CV	0.05092	0.00918	0.02089	0.00000	1.18648
Poland	Mean	12.51000	19.22222	40.51111	0.36667	12.76667
	STD	0.66675	0.21082	0.65849	0.07071	1.64317
	CV	0.05330	0.01097	0.01625	0.19285	0.12871
Portugal	Mean	14.38444	16.75556	41.60000	7.32222	7.51111
	STD	1.64718	0.42164	1.14018	0.04410	14.90515
	CV	0.11451	0.02516	0.02741	0.00602	1.98441
Romania	Mean	11.52111	25.80000	42.74444	1.52222	0.72222
	STD	2.05742	0.00000	1.80562	0.13017	0.13944
	CV	0.17858	0.00000	0.04224	0.08551	0.19308

Country	Descriptive statistics	BirthRate	Enforcing-Contracts	TotalTax	Registering-Property	Starting-Capital
Slovak Republic	Mean	13.02222	29.45556	49.27778	0.00000	20.02222
	STD	2.93390	3.35898	0.77746	0.00000	2.17473
	CV	0.22530	0.11404	0.01578		0.10862
Slovenia	Mean	10.77111	12.70000	32.28889	2.21111	42.88889
	STD	0.97413	0.00000	1.66692	0.03333	1.81414
	CV	0.09044	0.00000	0.05163	0.01508	0.04230
Spain	Mean	10.73500	33.64444	33.28889	2.71111	1.94444
	STD	1.01116	4.22880	3.03622	0.03333	2.91895
	CV	0.09419	0.12569	0.09121	0.01230	1.50118
Sweden	Mean	7.10778	30.93333	50.96667	4.01111	14.54444
	STD	0.53478	0.40000	1.86011	0.57325	5.35750
	CV	0.07524	0.01293	0.03650	0.14291	0.36835
Panel	Mean	10.54084	20.96679	40.71381	4.31604	13.75000
	STD	3.61031	6.61623	12.49751	3.52972	14.03069
	CV	0.34251	0.31556	0.30696	0.81781	1.02041

Source: Authors' calculation

Table 2: The Hausman test results

	Chi-Square Statistic	Probability
Ho: difference in coefficients not systematic	42.30	0.0000

Source: Authors' calculation

Table 3: Variance inflation factor values

Variable	VIF
EnforcingContracts	1.17
StartingCapital	1.10
RegisteringProperty	1.09
TotalTax	1.05

Source: Authors' calculation

Table 4: Results of the modified Wald test

Chi Square	Probability
3711.43	0.0000

Source: Authors' calculation

Table 5: Pesaran's test of cross-sectional independence

Value	Probability
4.456	0.0000

Source: Authors' calculation

Table 6: Wooldridge test for autocorrelation in panel data

Value	Probability
534.548	0.000

Source: Authors' calculation