A NEW ENTREPRENEURIAL MOTIVATIONS PROFILE FOR STARTING NEW BUSINESS BY USING A PANEL DATA ANALYSIS

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Abstract
The paper is based on research that identified and analyzed the effects of the variable context of the period 2011-2019 on the entrepreneur's businesses from 16 states. The database used in this research has been selected from the Global Entrepreneurship Monitor. The data were obtained based on surveys involving adult entrepreneurs. The aim of the research was to identify the characteristics and motivations of entrepreneurs in selected states to start new businesses. The data set includes variables that reflect the entrepreneurial intentions of individuals, their abilities, opportunities, and risks depending on gender. The research was conducted using random and fixed effects models. Within the research methodology, the final analysis model selected explains 95% (R^2) of the variation of TEA (total early-stage entrepreneurial activity). The research results show a high degree of heterogeneity in the profile of entrepreneurs.. Research has shown that fear of failure has positive effects on TEA. During the research, we tested the predictive power of the fixed effects model, and the results showed that it is very accurate. The results of our research contribute to shaping a well-defined profile of the entrepreneur's behavior from different states.
Keywords: *fixed-effects model, entrepreneurship, panel data, forecast error*

1. INTRODUCTION

The term entrepreneurship began to be used by economists in the eighteenth and nineteenth centuries, overlapping with the period of the industrial revolution. Entrepreneurship is perceived as the result of native personal qualities that few people possess. In reality, entrepreneurship consists in the successful initiation of businesses as a result of a set of environmental, personal, and social factors (e.g., Bencsik et al., 2018) that can be developed through education and training (Krisnaresanti et al., 2020). Entrepreneurship is the process by which individuals or groups attract and use a range of resources in order to exploit and use the business opportunities identified in the environment. Entrepreneurship is a person's ability to turn ideas into actions (Fila et al., 2020), global entrepreneurship monitor (gem) defines entrepreneurship as any new business or new venture. The starting of the new business and the next step of owning and managing it is called early-stage entrepreneurial activity, shortly tea. This activity involves innovation (Kovacova and Lăzăroiu, 2021), creativity, risk-taking, the ability to plan and manage projects (Andronie et al., 2021) in order to achieve the proposed objectives.

2. LITERATURE

Therefore, an entrepreneur is an economic agent with an active behavior, who assumes financial risks to develop new projects that bring him profit. A study published by Harvard Business School in November 2017, identifies the personality traits of entrepreneurs are as follows: (1) openness to new experiences - are independent, focused on originality and creativity, easily take risks; (2) conscientiousness - entrepreneurs are oriented on the final goal of the action and always complete the tasks; (3) extraversion - entrepreneurs are

energetic, optimistic, sociable, characterized by a high level of assertiveness and emotional intelligence; (4) agreeableness - entrepreneurs are altruistic, oriented on community development, modest and trustworthy; (5) neuroticism - entrepreneurs are capable of negative emotions and can become sad, anxious, tense under stress.

Entrepreneurship is characterized by a number of traits: inner control in difficult situations, perseverance, planning ability, constructive feedback and analysis in decision making. In general, most business ideas fall into three general categories: (1) services: tourism, painting, decoration, babysitting, housekeeping are just a few examples; (2) trade: retail, wholesale, e-mail order, telephone sale, door-to-door sales; (3) production: when it comes to small businesses, production refers to areas such as handicrafts, clothing, jewellery, small farms, small furniture.

The European Union promotes entrepreneurship and emphasizes the importance of developing a culture based on competitiveness that helps countries' economies (Androniceanu et al., 2022; Androniceanu & Marton, 2021; Androniceanu et al., 2021; Androniceanu, 2020; Bayar et al. 2020; Kinnunen et al., 2019). That is because entrepreneurship is the vehicle through which the economic system is entered (Meyer & Krüger, 2021). Economic growth and the number of jobs in Europe depend on the ability to support the development of entrepreneurial conditions (Lăzăroiu et al., 2021) including economic freedoms and competitiveness of companies (Georgescu et al., 2018, 2020; Georgescu & Kinnunen, 2019; Kinnunen et al., 2022; Haseeb at al. 2019).

Entrepreneurship creates new businesses, (Godany et al., 2021) opens new markets and encourages the acquisition of new skills. The most important sources of job creation are small and medium enterprises (Kowo et al, 2019; Grondys et al., 2021; Siekelova et al. 2020; Borocki et al. 2019; Mura & Hajduová, 2021; Muangmee et al., 2021; Sroka & Meyer, 2021). They positively influence the labour market due to the steep development of new jobs (Lăzăroiu and Harrison, 2021) with high innovative potential (Hu et al., 2019) and consequently growing demand for skilled employees (Bilan et al., 2020; Stacho et al., 2019). Therefore, the objective of the European Commission is to encourage citizens to become entrepreneurs and to create conditions for them to be able to open and grow their own business (Tamulevičienė & Androniceanu, 2020; Slávik et al., 2021). 37% of European citizens would like to have their own business, a smaller percentage than in the United States and China, where 51% of citizens want to become entrepreneurs. The challenges for the Europeans' willingness to start businesses include:

(i) the education system should provide the necessary foundations for an entrepreneurial career;

(ii) difficult access to finance and markets;

(iii) difficulty in transferring business; (iv) fear of "punitive" sanctions in case of failure;

(iv) cumbersome administrative procedures.

There are various EU funds available for start-ups. Some examples are the COSME, InnovFin, Creative Europe, EaSI (Program for Employment and Social Innovation, ESI (European Structural and Investment Funds), European Investment Bank and European Investment Fund programs. The European Commission's Startup Europe Club initiative is very useful for those who want to find out what EU funds are right for their needs and want to look for funding opportunities. Furthermore, the Startup Europe Partnership platform helps entrepreneurs who want to expand and develop their business.

According to the report published by the World Economic Forum, "Europe's Hidden Entrepreneurs: Entrepreneurial Employee Activity and Competitiveness in Europe", Romania is in the Top 10 of the countries in Europe with the most intense entrepreneurial activity. The report analyzed a form of entrepreneurship that goes beyond the usual start-up - "intrapreneurship" - a term that refers to the involvement of employees in the implementation of new ideas in the company in which they work, an activity called EEA. According to the report, entrepreneurs in Europe often choose to start new projects while working for their employers. The report compares entrepreneurial activity within organizations with start-ups called TEA ("total early-stage entrepreneurial activity") in the graphs below. In Europe, a higher proportion of entrepreneurial activity is manifested through the EEA than anywhere else in the world: 40% of entrepreneurs are EEA entrepreneurs, compared to 29% in the US.

Entrepreneurship is a process that includes several stages:

(1) *Identifying the opportunity*. The opportunity can be triggered by the possibility of obtaining a good or service faster, more efficiently or at a higher quality. At the same time, it can be influenced by various factors, such as: (a) changes in the structure of an industrial sector or a market; (b) changes in demographics or buying and consuming behaviors; (c) lifestyle changes at the target group level; (d) the emergence of new technologies.

The business idea must respond to a need in the market, to differentiate itself from the competition (Wallace and Lăzăroiu, 2021), to cover the marketing mix, which refers to a product or service, price, promotion, distribution, to be an idea that can be applied over time. useful, to be sustainable.

(2) *Identifying the necessary resources.* Resources differ depending on the profile and size of the business, but most often include primarily the entrepreneur or business developer, his time, labor, logistics of distribution methods, raw materials, financial resources, locations, licenses, machinery and equipment and share capital (Nicolescu et al, 2020; Haque at al., 2019).

(3) *Obtaining and using the necessary resources.* The entrepreneur must focus on ensuring the long-term financing of the current activity. As a general rule, entrepreneurs use mainly four categories of financiers of their new business ideas: family, friends or business angels, banks and non-reimbursable funds, the most current and profitable source.

(4) *Business implementation and management.* Leadership is an important component of entrepreneurship and the more efficiently a business uses the resources at its disposal, the better it obtains results that differentiate it in the market. Effective business management involves leadership vision by using the results obtained to grow the business and attack new profitable markets (Çera et al. 2020).

Regardless of the specifics of the company, the field in which it operates or the profit figure, it is influenced by certain factors that represent real challenges that leave their mark, positively or negatively. The factors that influence entrepreneurship are of several types:

(i) *Legislative-normative factors.* These factors are controlled by the Romanian state, its institutions and the regulations of the European Union. Directly targets laws, acts, government ordinances, special provisions or other draft laws that influence the entrepreneurial environment.

(ii) *Social factors*. These factors are represented by the relationship with suppliers, customers (possible and current), state organizations, potential collaborators, and business partners. Regarding the internal social factors with a determining role in the activity of a company, the employees have the greatest impact (Ciobanu et al., 2019). Belas et al. (2020) based on 822 SMEs from Czech and Slovak business environment said, that the owner (manager) of the company should regularly evaluate the performance of its subordinates and motivate them to innovate in work processes. Čepel (2019) on base the perception and attitudes of 632 Czech and Slovak entrepreneurs said, that the family environment motivates them to do business and helps them with their entrepreneurial activities.

(iii) *Financial factors.* Loans, European funds, and government loans can be part of the financial factors.

(iv) *Technological factors.* These factors refer to the technological evolution and to the power of adapting the business to the new technologies. Depending on the specifics of the company, these factors can influence a company's productivity.

(v) *Political factors.* These primary factors underlie the development of the entrepreneurial environment, because the political regime decisively influences the appearance or development of the entrepreneurial environment in a certain country or geographical area.

(vi) *Macroeconomic factors.* These global factors include events in the world's strong economies, the policy of states that have a monopoly on a particular market, conflicts, wars, agreements on the movement of goods or the latest discoveries in the field.

When the TEA and EEA entrepreneurship are combined, a surprising list of the most entrepreneurial countries in Europe is discovered. The Baltic countries are very entrepreneurial, and Romania is also in the top 10 of the

most entrepreneurial countries in Europe, a top in which Germany and France, two of the largest economies in Europe, do not qualify.

We will apply the fixed effect model for panel data for 16 world countries for the period 2011-2019, studying the determinants of TEA using Global Entrepreneurship Monitor database for the estimation of entrepreneurial activity conducted by their survey methodology.

Several papers dealt with the panel data approach to entrepreneurship and its determinants. Sadraoui and Ammari (2017) study the impact of entrepreneurship and business freedom on economic growth for a panel data of developing countries for 2004-2017. A conclusion of the study is that the entrepreneurial activities for working males have no impact on economic growth, while business freedom and entrepreneurial activities for working females and business freedom have a positive significant influence.

Rusu and Dornean (2019) apply panel data regression models for EU countries for 2011-2017 and find that competitiveness is positively correlated with innovation rate and FDI, while negatively correlated with taxes, costs and job creation. Konstantinos and Karkalakis (2015) build a panel VAR model for 30 OECD countries for 1970-2011 considering entrepreneurship, unemployment and economic growth. They estimate each of the three VAR equations with GMM estimators.

Katekhaye et al. (2019) study the Indian agricultural entrepreneurial activities and find that the motivation of a rural entrepreneur to start a business depends on his education and income. Meyer and Meyer (2020) analyze the causality between entrepreneurial intent, TEA, established business ownership and GDP per capita for a five-country panel dataset by FMOLS and DOLS.

Kinnunen and Georgescu (2020) apply multiple correspondence analysis in order to categorize 49 world countries according to 27 variables. Secondly, in that paper, neural networks are used to find the model performance for each TEA category. Paper by Kinnunen et al. (2022) applies fuzzy time series and the vector error correction model VEC to investigate the micro and meso level factors having the greatest impact on entrepreneurial activity during 2011-2019 and report 1-3-year lagged effects of conditions and motivations on TEA.

With regard to the literature, our work has a significant contribution because it identifies and analyzes the changes that have taken place in entrepreneurship over a long period of time. There are studies in the literature that punctually analyze certain changes. Our paper contains the results of a dynamic analysis over a period of 10 years. These scientific results are distinguished both by the method of data processing and by the consistency and relevance of the results obtained.

Data variables are defined and research methodology with the applied models are described in section 3. The Fixed and Random Effects models are put under tests and the model outcome with the prediction ability are presented in section 4. Section 5 concludes the paper with discussion of results together with the limitations of this study and the suggestions for some possible future research directions.

3. DATA AND RESEARCH METHODOLOGY

The 16 countries included in the study are: Brazil, Chile, Colombia, Croatia, Germany, Greece, Iran, Ireland, Poland, Slovakia, Slovenia, Spain, Sweden, Switzerland, Taiwan and UK. The data has been collected from global entrepreneurship monitor (gem), whose survey experts conduct adult population surveys (aps) in over 60 countries worldwide.

All countries and variables from the GEM database, which are available for years 2011-2019, are selected based on the requirements for the proper time-series analysis. In Table 1, the indicators with their definitions, average values and standard deviations are presented.

The dependent variable is Total early-stage entrepreneurial activity (TEA), i.e., V1 in Table 1. Indicators V2-V9 are the independent variables.

The data units are percentages (%) of respondents of 18-64-year-old population, except for Female/male TEA, the unit is a percentage of all 18-64-year-old females as entrepreneurs divided the corresponding percentage of males as entrepreneurs (i.e., %/%).

TABLE 1 - VARIABLE DEFINITIONS AND DESCRIPTIVE STATISTICS

Variable	Definition	Average	Std.dev.
V1	Total early-stage entrepreneurial activity (TEA), *% of the population (18-64-year-old) who are either a nascent entrepreneur or owner-manager of a new business*	10.719	6.142
V2	Perceived opportunities, *% of the population who see good opportunities to start a firm*	39.607	17.215
V3	Perceived capabilities, *% of the population who believe they have the required skills and knowledge to start a business*	48.713	9.783
V4	Fear of failure rate, *% of the population who indicate that fear of failure would prevent them from setting up a business*	36.905	7.225
V5	Entrepreneurial intentions, *% of the population who are latent entrepreneurs and who intend to start a business within 3 years*	18.941	14.073
V6	Established business ownership, *% of the population who are currently an owner-manager of an established (running more than 42 months) business*	8.331	3.534
V7	Female/male TEA, *% of the population who are either a nascent entrepreneur or owner-manager of a 'new business', divided by the equivalent % for their male counterparts*	62.229	17.177
V8	High job creation expectation, *% of the population involved in TEA who expect to create 6 or more jobs in 5 years*	24.774	11.685
V9	Business services sector, *% of the population involved in TEA in the sector of business services (incl. information and communication, financial intermediation and real estate, professional services, or administrative services)*	23.811	8.865

Source: Author's research with definitions from https://www.gemconsortium.org/wiki/1154

From Table 1, we note that on average, 10.7% of 18-64-old-population respondents are counted as early-stage entrepreneurs (V1) and the greatest share of respondents, 48.7%. perceive themselves capable (V3) as entrepreneurs, while 39.6% have identified good opportunities to start a business in the area, where they live, with 24.8% expecting to be able to create 6 or more jobs in next 5 years (V8), while 36.9% report fearing the failure in their possible entrepreneurial activity. The other shares are smaller (except the ration of Female-male entrepreneur percentages (V7), 62.2, implying that greater share of females start new businesses than of males.

Figure 1 shows the box plots of all indicators for each country. Table 1 showed that the greatest variation during 2011-2019 is seen in the indicators of Perceived opportunities (V2), Female/male TEA (V7) and Entrepreneurial conditions, while the smallest deviations were seen in Established business ownership (V6) and the dependent variable, TEA (V1).

The box plots show the data for individual countries: Perceived opportunities (V2) vary the most in Poland, Slovenia and Ireland and Female/male TEA (V7) deviates the most in Switzerland, Poland, Greece, and Colombia. The highest level of early-stage entrepreneurial activity (TEA) takes place in Latin American countries of Chile, Colombia, and Brazil. Also, Iran shows higher TEA shares than Europe, which is lead by Slovakia, Ireland, and Croatia.

We use pooled OLS and fixed/random effects estimators. The pooled OLS estimator assumes that the cross-sectional units are identical, therefore heterogeneity is ignored. Fixed effects estimator assumes the unobserved heterogeneity across the cross-sectional units. The Hausman test (Hausman, 1978) compares the random effects and the fixed effects estimator. The null hypothesis of the Hausman test for endogeneity is that the random effects estimator is preferred, while the alternative hypothesis is that the fixed effects estimator is preferred. If the p-value of the statistical test is less than the critical value, then the null hypothesis is rejected and the fixed effects model is accepted. Equivalently, the null hypothesis asserts that the random effects δ_i are independent of regressors.
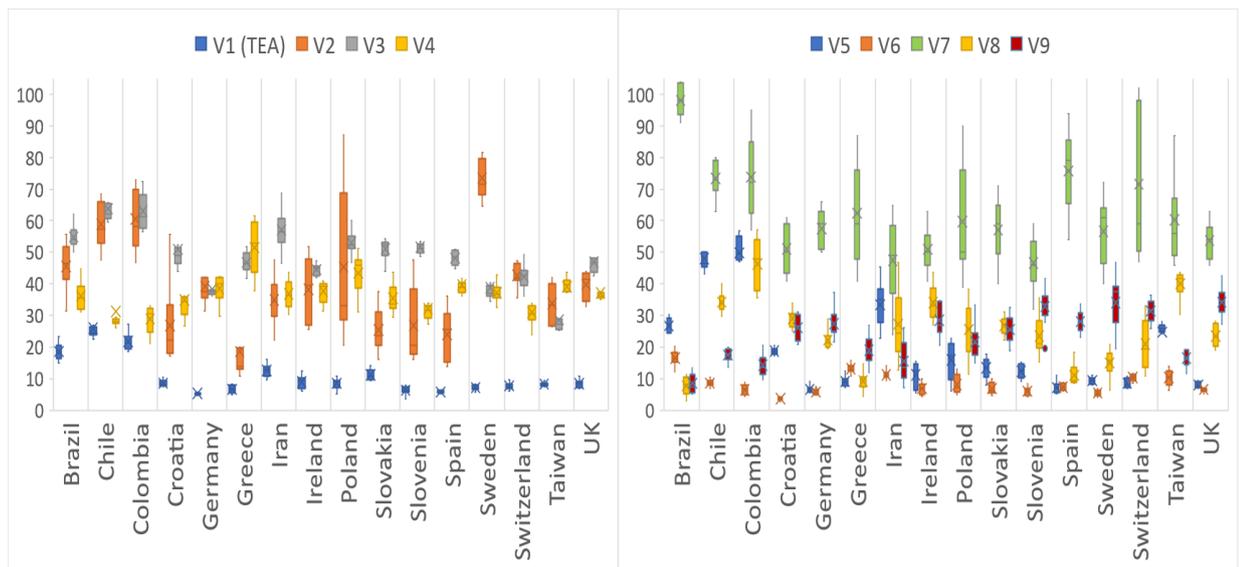
FIGURE 1 - BOX PLOTS OF INDICATORS IN 2010-2019
Source: Authors (2021)

The panel data model to be estimated has the form of the following equation (1):

$$V1_{i,t} = a_1 + a_2 V2_{i,t} + a_3 V3_{i,t} + a_4 V4_{i,t} + a_5 V5_{i,t} + a_6 V6_{i,t} +$$
$$a_7 V7_{i,t} + a_8 V8_{i,t} + a_9 V9_{i,t} + \delta_i + \varepsilon_{i,t}$$

(1)

where $a_i, i = 1,...,9$ are the coefficients to be estimated, δ_i are (fixed or random) specific effects for the cross-sectional units, and $\varepsilon_{i,t}$ is the residual term, $i = 1,...,T, t = 1,...,T$, i=country index, t=time index. T is the number of periods (9 years: 2011-2019) and N= the number of countries (16). δ_i are country-specific intercepts that express heterogeneity across countries (Hank et al., 2020).

4. RESULTS AND ANALYSIS

By means of Redundant Fixed Effects Tests, we will compare the pooled OLS regression (POLS) and a panel model (Baltagi, 2014). The null hypothesis of the Redundant Fixed Effects Tests is that POLS is preferred, while the alternative hypothesis is that fixed effects estimator is preferred. Since both probabilities in Table 2 are less than 0.05, the null hypothesis is rejected, and fixed effects estimator is preferred.

TABLE 2 - SUMMARY OF THE REDUNDANT FIXED EFFECTS TEST

Effects test	Statistic	d.f.	Prob.
Cross-section F	17.048386	-15,120	0.0000
Cross-section Chi-square	164.356969	15	0.0000

Source: Authors (2021)

The next step is to decide between FEM and random effects model (REM) by Hausman test. The null hypothesis of the Hausman test is that REM is preferred, while the alternative hypothesis is that FEM is preferred. The null hypothesis of the Hausman test asserts in other words that the errors are not correlated with the regressors (Torres-Reyna, 2010). The p-value of the Hausman test is 0.0063<0.05 (Table 3), therefore, one rejects the null hypothesis and decides that FEM is the appropriate model. Find definitions of variables V1-V9 definitions in Table 1.

TABLE 3 - SUMMARY OF THE HAUSMAN TEST

Test Summary		Chi-Sq. statistic	Chi-Sq. d.f.	Prob.
Cross-section random		21.348183	8	**0.0063**
Cross-section random effects test comparisons				
Variable	Fixed	Random	Var(Diff.)	Prob.
V2	-0.017770	-0.005714	0.000025	**0.0160**
V3	0.155241	0.169802	0.000175	0.2707
V4	0.074412	0.027079	2.748010	**0.0008**
V5	0.120381	0.039828	3.022534	**0.0019**
V6	0.140194	0.089251	1.570779	0.5854
V7	-0.344299	1.290894	-0.266714	0.0955
V8	-0.024031	0.02821	-0.851839	0.7779
V9	-0.097408	0.029855	-3.262667	0.3292

Source: Authors (2021)

According to Table 4, FEM is statistically significant (R^2=0.94), and the model fits perfectly to the dataset. Adjusted R^2 is 0.93, which means that about 93% of TEA variation is explained by the independent variables. Durbin Watson statistics are 1.78, close to 2, indicative of uncorrelated errors.

The found fixed effects can be justified by the country-specific aspects, which were seen pretty stable over time. One can see that V3, V4, V5, and V9 are statistically significant at a 5% significance level

A 1% increase in Perceived capabilities leads to an increase of 0.16% in TEA. A 1% increase in fear of failure rate leads to an increase of 0.07% in TEA. A 1% increase in Entrepreneurial intentions leads to an increase of 0.12% in TEA. A 1% increase in the services of the business sector leads to a 0.09% decrease in TEA. These correlations are in accordance with economic theory.

The other regressors including Perceived opportunities, Established business ownership, Female/male TEA, and High job creation expectation are not statistically significant under the Fixed Effects Model.

TABLE 4 - SUMMARY OF FEM DETERMINANTS OF TEA

Variable	Coefficient	Std. error	t-statistic	Prob.
C	0.795259	2.057964	0.386430	0.6999
V2	-0.017770	0.014810	-1.199907	0.2325
V3	**0.155241**	**0.033310**	**4.660502**	**0.0000**
V4	**0.074412**	**0.027079**	**2.748010**	**0.0069**
V5	**0.120381**	**0.039828**	**3.022534**	**0.0031**
V6	0.140194	0.089251	1.570779	0.1189
V7	-0.344299	1.290894	-0.266714	0.7901
V8	-0.024031	0.028210	-0.851839	0.3960
V9	**-0.097408**	**0.029855**	**-3.262667**	**0.0014**
Cross-section fixed (dummy variables)				
Root MSE	1.424810	R-squared		0.946182
Mean dependent var	10.71896	Adjusted R-squared		0.935867
S.D. dependent var	6.163205	S.E. of regression		1.560801
Akaike info criterion	3.879287	Sum squared resid		292.3318
Schwarz criterion	4.374256	Log likelihood		-255.3086
Hannan-Quinn criter.	4.080414	F-statistic		91.72788
Durbin-Watson stat	1.781169	Prob(F-statistic)		0.000000

Source: Authors (2021)

Next, we forecast the TEA for 2020 and 2021 (cf. Figure 2).

Root Mean Squared Error (RMSE) and Mean Absolute Error (MAE) are the most commonly used measurements although they depend on the measurement scale of the data used, and can only be used to compare forecast models for the same data. The RMSE is the standard deviation of the forecasted errors, i.e. the difference between the actual and forecasted values. The lower its value, the better the model prediction. MAE is also expected to be as low as possible for the best prediction model.

The Theil Inequality coefficient measures the accuracy with which the forecast was made and takes values from 0 to 1, value 0 indicating a perfect prediction. In this case Theil Inequality coefficient equals 0.057860, pointing out good forecast accuracy.
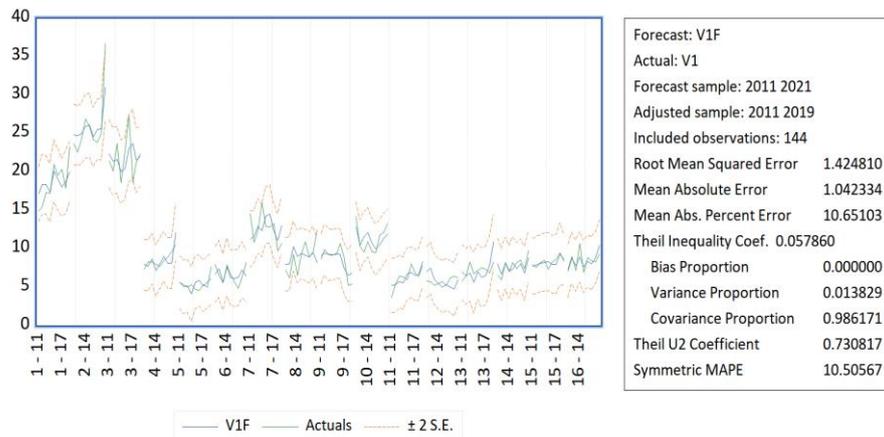

FIGURE 2 - TEA FORECAST FOR 2020-2021
Source: Authors (2021)

Bias Proportion indicates how far away the average prediction is from the average of the real data. Variance Proportion shows how far the variance of the forecast series is from that of the actual series. Covariance Proportion shows non-systematic prediction errors. The sum of the three proportions is 1. For good quality of forecasting, the first two proportions should be as small as possible, and the covariance proportion should be larger. In our case, the Bias Proportion is 0, the Variance Proportion is 0.013829. Symmetric Mean Absolute Percentage Error (sMAPE) measures the accuracy of the forecast on the basis of percentage errors and has a good value, 10.50%.

Hence, we conclude that the TEA forecast for 2020-2121 for the panel of 16 countries is very accurate.

5. CONCLUSIONS

This paper explored the effects of attitudes on total early-stage entrepreneurial activity (TEA). The data was obtained from the Global Entrepreneurship Monitor's Adult Population Surveys (APS) on the characteristics and motivations of individuals to start new businesses.

The dataset consisted, e.g., of individuals' entrepreneurial intentions, their perceived capabilities, opportunities, and risks as well as the share of female-male entrepreneurs. The time-series for 16 European and Latin American countries together with Taiwan and Iran covered the period 2011-2019. All countries with long enough time-series data were included. The research methodology tested Random and Fixed Effects Models. The REM hypothesis was rejected. The acceptance of FEM is more plausible since the cross-sections are countries and the omitted effects are fixed in nature, not random. The latter model became selected leading to a model explaining 94.6% (R^2) of the variation in TEA, as a result of the Hausman test.

The results of the rather heterogeneous sample of countries showed that when individuals recognize their own capabilities to start and run businesses, they also have entrepreneurial intentions, which both have great significant positive effects on the early-stage entrepreneurial activity with regression coefficients of 0.16 and

0.12, respectively. Interestingly, fear of failure, which may prevent individuals to start a business, had also positive effects on TEA with a coefficient of 0.07. This suggests that fear of failure goes hand-in-hand with the willingness to start new businesses. The larger the relative size of the business services sector, instead, had a negative effect on TEA. Further, testing the predictive power of the obtained Fixed Effects Model demonstrated it is highly accurate. Perceived opportunities, established business ownership, female/male TEA, and high job creation expectations were statistically insignificant. A dynamic AR model of Kinnunen and team (2022) suggested that perceived opportunities affect negatively in one year, but after two years the effect is positive both for perceived opportunities and established businesses. While Meyer and Meyer (2020) found that TEA together with established business ownership were significant drivers of GDP, while the entrepreneurial intention was not significant, our results suggest that the last one is important through its effect on TEA but the effect of established businesses may be direct as our results didn't find it significant contributor through TEA.

Some limitations of this research can be noted. Firstly, while, all countries from GEM database with available data for 9 years of consecutive *entrepreneurial motivations and attitudes* data were included, the generalization of results may not apply to other countries of the world; secondly, *entrepreneurial conditions* data were not considered; and, thirdly, our data consisted in mainly European and few Latin American countries, which have rather a different attitude on entrepreneurship. Hence, we may get somewhat different results, possibly more statistically significant variables affecting TEA if we restrict the analysis only for European countries, for instance. Fourthly, the time-series analysis was restricted to long-run effects shown by the FEM model, while autoregressive (AR) time-series modeling could reveal yearly effects. Fifthly, the error autocorrelation which frequently appears in OLS-based panel models can be corrected by dynamic models. Then, consistent estimators are Arellano and Bond (1991) or Arellano and Bover (1995) estimators. For other future research possibilities, countries may be clustered by their *motivations, attitudes,* and *entrepreneurial conditions*, which were not considered in this study, when time-series analysis may reveal a different set of indicators driving entrepreneurship, e.g., in Europe and Latin America, or simply, only European countries can be taken under analysis. Also, this research will be continued with the application of alternative panel data models, such as GMM estimators and quantile regression analysis. An alternative approach to time series forecast could be the use of neural networks (Hanck et al., 2020).

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