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Do Tax Rates Matter for Entrepreneurial Motivations? An Empirical Approach

Valentina Diana Rusu*, Adina Dornean**

Abstract: There are a number of factors that can hinder the path of entrepreneurship development and the literature highlighted the fact that taxes are one of the most important barriers for entrepreneurs. This paper aims at identifying the relationship between tax rates and entrepreneurship and to establish the impact of tax rates on entrepreneurs considering their motivations (necessity, opportunity or improvement-driven opportunity). The research focuses on a sample of 46 countries grouped according to their income level, for a period of eight years (2012-2019). In order to test our hypotheses, we use multiple linear regression based on balanced panel data and we consider, as dependent variables, indicators that measure entrepreneurship and entrepreneurial motivations (early-stage entrepreneurial activity, necessity-driven entrepreneurs, opportunity-driven entrepreneurs, improvement-driven opportunity entrepreneurs, and motivational index). As independent variables, we consider indicators that measure the tax rates supported by entrepreneurs (total tax and contribution rate, profit tax, labor tax and contributions, and other taxes payable by businesses). The results show that tax rates play a key role in fostering the creation of new companies. Moreover, the impact is different, depending on the entrepreneurs' motivations. Entrepreneurs motivated by necessity are positively related to total tax and contribution rate, while those motivated by opportunity are negatively related with this indicator. Therefore, tax rates discourage the entrepreneurs that seek innovation, but they do not affect those that do not have other options to obtain the necessary income for living.

Keywords: tax rate; entrepreneurial motivations; necessity entrepreneurs; opportunity entrepreneurs; panel data analysis.

JEL classification: C33; H25; L26.

* Institute of Interdisciplinary Research, Department of Social Sciences and Humanities, Alexandru Ioan Cuza University of Iasi, Romania; e-mail: *valentinadiana.ig@gmail.com* (corresponding author).
** Faculty of Economics and Business Administration, Department of Finance, Money and Public Administration, Alexandru Ioan Cuza University of Iasi, Romania; e-mail: *amartin@uaic.ro*.

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1. INTRODUCTION

Academics and practitioners agree that entrepreneurship is important for sustainable development. If the entrepreneurs are interested in innovation, are taking advantage of market opportunities and are interested in their continuous development, then positive effects will be generated on economies (Peredo & McLean, 2013; Pathak, 2021).

Knowing the substantial impact that new businesses have on the economy, not only at national level but also at a global level, it is important to understand what motivates entrepreneurs to initiate and to develop a business, both for researchers and policy makers.

Promoting entrepreneurship is an important priority of governments who are interested in implementing policies to stimulate entrepreneurship as a mean to create new employment opportunities, reduce poverty and foster innovation and economic growth (European Commission *et al.*, 2017).

In this context, tax policy is one of the main policies of the governments which affects entrepreneurship in order to maximize its benefits. For some entrepreneurs, the tax burden is considered high and discouraging, so they often resort to tax evasion or avoidance.

With the objective to encourage entrepreneurship, countries around the world attempt to simplify the tax system, to reduce administrative and compliance costs, and targeted reduction in tax rates through provisions and preferential regimes for small and micro businesses. For example, in addition to the mentioned measure, Latvia applies a low corporate income tax rate, favourable to the developing of entrepreneurial activity. Denmark has introduced a number of tax provision aimed at reducing the cost of investments and expenditures in R&D. Similarly, Italy has introduced measures aimed at the improvement of business environment and entrepreneurship, and in particular to facilitate access to finance and to target investment in R&D (European Commission *et al.*, 2017).

Taxation policy is complicated, it includes not only the tax rates, but also refers the taxation base, forms of application (linear, progressive, etc.), allocable subsidies, and so on. Each country has several taxation and tax policy related particularity (e.g. in some countries micro enterprise type start-ups don't pay profit tax, they have tax on revenues; excepted situations from paying labour tax for a given period of time due to new workplace creation, etc.).

Thus, this study investigates only to what extent the overall or total taxation rate influences the level of entrepreneurship in the countries considered in the analysis, but also whether different types of it (total tax, profit tax, labour tax, other taxes payable by businesses) levied on businesses have different influence on the entrepreneurs according to their motivation.

The paper contribution lies in the fact that it was used an extended sample of countries and for a large period of time. Also, the study analysis the impact of tax rates from different points of motivation (necessity, opportunity or improvement-driven opportunity) which were not found in the scanned literature. Considering the entrepreneurial sector's contribution to employment and GDP increases, this study is important also for the policy makers (in this case, for the government who establish the tax rates) that has to encourage and support, even through incentive policies on taxes, the successful implementation of entrepreneurship.

The rest of the paper is organized as follows. Section 2 summarizes the relevant previous literature regarding the determinants of entrepreneurial motivations, in general (conventional entrepreneurship), in different fields of entrepreneurship (environmental and social), focusing especially on the impact of taxes on entrepreneurship. Section 3 explains the data source used, presents the variables and introduces the work hypotheses. This section also describes the

methodology employed to test the work hypotheses. Section 4 is dedicated to the presentation of the main results but also to the presentation of the discussions based on them. Finally, Section 5 concludes and points out the most relevant results and their importance for the policymakers.

2. LITERATURE REVIEW

In order to address the research aim, we review the relevant previous papers which had analysed the determinants of entrepreneurship and then we discuss the most important findings related to the importance of taxes for entrepreneur's motivation to start and grow a business.

There are different factors which determine a person to become entrepreneur. The economists who created the first systematic theories of entrepreneurship stated that people become entrepreneurs for a variety of reasons and one of this reason is to make money and to obtain a financial gain (Knight, 1921; Schumpeter, 1934). The first perspective on entrepreneurship is from Schumpeter's book, The Theory of Economic Development published in 1911 and revised in 1934. Schumpeter (1934) noticed that individuals may launch new ventures out of the "joy of creating" or to establish a "private kingdom." Meanwhile, Knight (1921) observed that the motivations behind the decision to become an entrepreneur are the "prestige of entrepreneurship" and "satisfaction of being one's own boss". Therefore, the traditional views of economists focused on financial drivers of entrepreneurial action.

The Austrian perspective on entrepreneurship emphasizes that firm performance is driven by the firm's ability to take advantage of the disequilibrium recognized (Kirzner, 1973), whereas the Schumpeterian view focusses on firm advantages based on the firm's ability to upset the equilibrium (Schumpeter, 1934). According to Knight, profit – earned by the entrepreneur who makes decisions in an uncertain environment – is the entrepreneur's reward for bearing uninsurable risk.

Considerable modern research on entrepreneurship and entrepreneurial motivation had been written (Shane *et al.*, 2003; Hessels *et al.*, 2008; Block & Koellinger, 2009; Block & Sandner, 2009; Edelman *et al.*, 2010; Carsrud & Brännback, 2011; Dunkelberg *et al.*, 2013; Vidal-Suñé & Lopez-Panisello, 2013; Wood *et al.*, 2014; Stephan *et al.*, 2015a; Van der Zwan *et al.*, 2016; Hörisch *et al.*, 2017; Rusu & Roman, 2018; Murnieks *et al.*, 2020; Nițu-Antonie *et al.*, 2022). The papers of Carsrud and Brännback (2011), Stephan *et al.* (2015b) and Murnieks *et al.* (2020) are organized as reviews of different papers investigating the entrepreneurial motivation. Doing these reviews, they showed that there is an important number of papers analysing the motivational factors who count for entrepreneurship, but even so there are necessary more studies which have to respond to the question of "have we learned anything at all about entrepreneurs?" (Carsrud & Brännback, 2011). Stephan *et al.* (2015a) reviewed 51 relevant papers for this topic, published over the period of 2008-2013, by differentiating individual drivers of entrepreneurial motivation from contextual drivers. Individual drivers are factors related to the entrepreneur and his/her business, such as gender, age, education, ethnicity, personality differences and resources. The contextual drivers refer to regional and national characteristics including macro-economic variables (GDP), formal institutions (such as welfare systems and property rights), and informal institutions/national culture.

Murnieks *et al.* (2020) analysed the entrepreneurs' motivations on different phases of business development (initiation, growth, and exit) by reviewing 71 relevant papers and summarizing the findings of each study included in the sample. In the first phase, initiation of a business, economic motivation has been the most heavily studied driver of venture initiation

activity, intrinsic motives, pro-social motives, and entrepreneurial passion also stimulate behaviour during this phase. In the growth phase of new ventures, economic, intrinsic, identity congruence, social, and entrepreneurial passion motives are prominent drivers of venture growth in addition to playing a similar role in venture initiation. In the exit phase of the entrepreneurial process, the studies are scarcer and researchers have studied extrinsic, intrinsic, and identity-congruence motives.

In another study regarding entrepreneurial motivation focused on 18 European Union countries, the authors (Rusu & Roman, 2018) highlighted that the macroeconomic factors which reflect the economic conditions (the level of economic development of a country, the total tax rate, the unemployment rates, the inflation rates and the access to financial resources) from an EU country and also the perceptual indicators (fear of failure, entrepreneurial intentions, perceived capabilities, and opportunities) are important determinants of entrepreneurial motivation. Using data for the period 2002-2015 and applying six panel data regression models, the authors (Rusu & Roman, 2018) confirmed their hypotheses. With regard to the tax rate, which is important for the present study, Rusu and Roman (2018) found that the total tax rate in the analysed countries exert a negative influence on total entrepreneurial activity (TEA) and necessity driven entrepreneurs (European Commission *et al.*), which means that tax rate is negatively related to the entrepreneurial activity.

Reynolds *et al.* (1999) introduced the concept of opportunity and necessity entrepreneurship, which was mentioned in the Global Entrepreneurship Monitor. Opportunity entrepreneurship reflects "voluntary nature of participation in order to take advantage of a business opportunity" for personal interest, whereas necessity entrepreneurship exists when there are "no better choices for work" (Reynolds *et al.*, 1999) and in this case the entrepreneurship is often the best "but not necessarily the preferred option" (Reynolds *et al.*, 1999). Starting from this distinction between opportunity and necessity entrepreneurs there are many studies which investigated opportunity and necessity motivations (Levie & Autio, 2008; Block & Sandner, 2009; Edelman *et al.*, 2010; Valdez & Richardson, 2013; Amorós & Bosma, 2014; Stephan *et al.*, 2015b; Angulo-Guerrero *et al.*, 2017; Amorós *et al.*, 2019). In his review, Stephan *et al.* (2015a) found that resource-poor contexts are related to necessity-motivated, increase-wealth to opportunity-motivated and socially-motivated to early-stage entrepreneurship, whilst independence-motivated entrepreneurship and growth ambitions tend to be more common in resource-rich context. His findings are important for our study in which the sample of the considered countries is grouped by their income level.

Also, there are different factors which can determine entrepreneurial' orientation depending on the entrepreneurship type (conventional, social and environmental).

There are studies which investigates these determinants in different fields such as for environmentally oriented entrepreneurs. In this case, we mention the paper of Hörisch *et al.* (2017), where the authors statistically investigated the determinants of environmental orientation of entrepreneurial activity. Using a multilevel analysis, they found that environmental entrepreneurship is influenced by different determinants than conventional entrepreneurship and social entrepreneurship. If in the case of those two types of entrepreneurship, age and education are important variables, there is not the case of environmental entrepreneurship. For stimulating environmental entrepreneurial activity in OECD countries, they highlighted the importance of environmental taxes levels, which should be lower and adapted to every country economic context. Another important finding was that

a business-friendly context has a positive impact not only on environmental entrepreneurship but also on conventional one.

With the objective to alleviate social problems such as poverty, discrimination, or exclusion, social entrepreneurship become more important nowadays and it seems to be more efficient in developing countries than it is in the developed countries (Estrin *et al.*, 2013; Engelke *et al.*, 2016). In their paper, Estrin *et al.* (2013) investigated the relationship between social and commercial entrepreneurship, with a special focus on social entrepreneurship. Applying multilevel modelling to population-representative samples in 47 countries and using data from 2009 collected by the Global Entrepreneurship Monitor, they demonstrated that social entrepreneurship measured by the indicator „Country prevalence rate of young and established social entrepreneur" (Estrin *et al.*, 2013) (% of the adult population indicating that they are currently owner-managing a social enterprise) is facilitated by strong property rights and low government activism, results confirmed also by the results of Stephan *et al.* (2015b). Also, Estrin *et al.* (2013) found that social entrepreneurship attract people who are not typical commercial entrepreneurs, notably women (Stephan *et al.*, 2015a) and the more highly educated. In the light of this findings, they highlighted that social entrepreneurship could increase the diversity of those engaged in entrepreneurship in a nation. Another important finding regarding the determinants of social entrepreneurship consisted in the fact that social entrepreneurship builds social capital, especially through cooperative norms; an informal institution. The importance of formal and informal institutions in supporting social entrepreneurship was showed also by other scholars analysing the phenomenon of social entrepreneurship and its determinants (Stephan *et al.*, 2015b).

An important contribution to the social entrepreneurship literature is the paper of Blaga (2020) who explored entrepreneurial motivation and determined five motivations (extrinsic, intrinsic, and complex motivations; employment status; and start-up capital) that play a significant role in social entrepreneurship intention. In his research, Blaga (2020) used an exploratory and inductive analysis of the literature across four schools of thought (economics, sociology, psychology and management) for establishing which motivational factors play the most influential role in social entrepreneurship. Another important result of his work consisted in developing a theoretical model of social entrepreneurial motivation. This theoretical model regarding the relationship between the independent variables (motivations) and the dependent variable (social entrepreneurship intention) was tested in his recent research (Blaga, 2021). Blaga (2021) found that all variables have a positive effect on social entrepreneurship, but even more important is that his study tested for the first time the "complex motivation"(Blaga, 2021) which had a positive impact on social entrepreneurship up to the level that intrinsic and extrinsic motivation, become non-significant.

Even the above papers investigated different types of entrepreneurship, our paper focuses on traditional entrepreneurship. Thus, a best-known definition is offered by Global Entrepreneurship Monitor (GEM) who defines entrepreneurship as "any attempt at new business or new venture creation, such as self-employment, a new business organization, or the expansion of an existing business, by an individual, a team of individuals, or an established business" (Reynolds *et al.*, 1999). According to the Organization for Economic Cooperation and Development (OECD, 2012), entrepreneurship is a "phenomenon that manifests itself throughout the economy and in many different forms with many different outcomes, and these outcomes are not always related to the creation of financial wealth". At European Union level, The European Commission sees entrepreneurship "as acting upon opportunities and ideas and

transforming them into value for others, which can be financial, cultural, or social" (European Commission, 2016).

It is not important only the entrepreneurial intention to start a business or the entrepreneurial motivation, but also the performance of the activity and its determinants. Considering the contribution of entrepreneurship to economics and social development, Le Trinh (2019) analysed in his paper factors such as government policy, financial capital, cultural factors, social factors, and human capital that influence the start-up performance of SMEs in Danang City, Vietnam. In order to find how people may start their business and factors that affect their businesses, Le Trinh (2019) applied structural equation modelling using partial least squares (PLS-SEM) on 320 SMEs in Vietnam, from June 2018 to August 2018. His results support the conclusion that for a sustainable start-up, the government should apply suitable legal policies, including incentive policies on taxes in the first 3-5 years, when new businesses are established. Moreover, he recommended that governments should assist incentive loans to boost SMEs and to invest in education programs which promote entrepreneurial culture.

To understand more deeply how taxes can affect the decision of an individual to start a business we have analysed several researches dedicated to the study of the relationship between tax policy and entrepreneurial motivation. Total tax rate as an indicator of tax policy is considered and important macroeconomic indicator that might influence entrepreneurs and the decision of an individual to entry in a business. Thus, (Djankov *et al.* (2010); Vidal-Suñé and Lopez-Panisello (2013); Salman (2014)) have shown that high taxes influence negatively the entrepreneurship because are an obstacle for creating new businesses and can inhibit the entrepreneurial process. Han *et al.* (2022) have also shown that tax and infrastructure competition can harm local investment and the profitability of local firms. And pointed out that tax harmonization is not always beneficial to local businesses.

In this context, an extensive and recent study is that performed by Bruce *et al.* (2020) who reviewed the existing empirical literature in this area. After reviewing an important number of studies which have analysed different types of taxes (personal income taxes, corporate income taxes, sale taxes and other taxes) focusing on national and sub-national studies on USA and also on international studies, they found contradictory results regarding the impact of tax policies on entrepreneurial activity: some studies indicated that tax rates affect positively the entrepreneurial activity, other found a negative influence or no significance. In their work, Watson and Kaeding (2019) arrived to the same conclusion that tax rates have both positive and negative effect on entrepreneurial activity. From a theoretic point of view, taxes can both encourage and discourage entrepreneurial activity, depending how are applied (Hansson, 2012; Watson & Kaeding, 2019): if tax law allows the deductibility of losses, this encourages entrepreneurship, while the application of a progressive tax rate structure decrease the profit of successful entrepreneurs. In their opinion (Bruce *et al.*, 2020), the diversity of the results is explained by different data and time period, different definitions and measures of tax policies and entrepreneurial activity and also different econometric models.

Also, studying the impact of taxes on entrepreneurship for the case of US, Watson and Kaeding (2019), highlighted the fact that taxes are one of the most important barriers for entrepreneurs and recommended as solution to stimulate the entrepreneurial activity on short and medium term to change tax policy. In that sense, establishing a neutral tax code would increase incentives to work, save, and invest for all in the economy, including entrepreneurs. According to Watson and Kaeding (2019), the entrepreneurs are influenced in their decision to enter an industry, invest, and engage in risk-taking through two channels: the tax rates on their

income and the structure of the tax code—for example, how the tax code treats losses and capital investments. Both the corporate tax rate and the individual income tax rate affect negatively the level of entrepreneurship. In order to increase firm entry rates, lowering corporate income tax and reducing the marginal tax rates on individual income (in a progressive system) could be the solution. On the other hand, if personal income tax rates are higher than corporate income tax rates, some entrepreneurs with losses may decide to change organizational form ex-post to offset other income tax liability. Can (2021) pointed out that reducing personal income tax rates increases overall self-employment activity. He also emphasizes the need of analyzing the relation between tax policy and entrepreneurship by taking into account that different types of entrepreneurs might respond differently to the taxation policy. This affirmation is sustained by his results which showed that higher personal income tax rates encourage incorporated entrepreneurship but discourage unincorporated entrepreneurship.

A similar, extensive and complex research, to that of Bruce *et al.* (2020) was conducted at European Union level by European Commission *et al.* (2017). Regarding the impact of taxation on the decision to start a new business, the most important determinants, according to the results, are represented by the degree of progressivity, the treatment of losses and the differential tax treatment of employee's vis-a-vis self-employed.

If taxes are higher on wage employment than on self-employment, people should prefer to engage in self-employment, boosting entrepreneurial entry (Clingingsmith & Shane, 2015). Clingingsmith and Shane (2015) investigated only the impact of individual income tax policy on entrepreneurship. Similar to the previous mentioned studies on the impact of corporate tax rate on entrepreneurship, the findings are contradictory and there is no consensus that might inhibit or encourage an individual to start a new business because of different employed methodologies. Clingingsmith and Shane (2015) concluded, after analysing the literature, that for the policy makers who pursue to promote the entrepreneurial activity, it is probably better "to find ways of addressing this population directly through targeted policies, rather than through the blunt instrument of individual income tax rates that affect nearly everyone".

In addition, several studies have investigated the impact of tax policy on entrepreneurship in several countries. In Russia, fiscal stimulus measures introduced in the period from 1998 to 2008 had a positive effect on the level of development of entrepreneurship in the Russian Federation (Shakirova & Kurochkina, 2017).

The use of fiscal policy measures by the Bangladeshi government, such as tax rebate, tax relief for investments and investors revealed the importance of governments policies to encourage the entrepreneurial sector (Hoque, 2018) that increase job creation, eradicate poverty and enhance human capital development.

Another recent study (Haddadzadeh Hendou, 2019) investigated the impact of government tax policies on the performance of small and medium enterprises of West Azerbaijan, considering the mediating role of entrepreneurial orientation. In his paper, Haddadzadeh Hendou (2019) conducted a descriptive study on 1126 SMEs managers of West Azerbaijan province and he found a positive and significant relationship, through entrepreneurial orientation, between the tax policy and the financial performance of the SME of West Azerbaijan province. Implementing tax policies which are not costly and complex for companies will improve the financial performance of SMEs. Also, the study of Haddadzadeh Hendou (2019) showed that the government's tax policies affect the entrepreneurial orientation of SMEs in West Azerbaijan.

Taking into account the literature on taxation and entrepreneurship, analysed above, we assume that entrepreneurship might increase if taxation is more business friendly and also that this factor is depending by the economic development of countries. Therefore, the first research hypothesis of our study is:

H1*: Taxation is influencing entrepreneurial motivations.*

Contrary to the above studies, earlier research conducted by Hansson (2012) in Sweden showed that both average and marginal income tax rates negatively affect the decision to become self-employed. The results obtained by Hansson (2012) were contradictory to those obtained in a previous study (Gentry & Hubbard, 2000) focused on data available for US households over the period 1979–1992. Gentry and Hubbard (2000) investigated the impact of tax rates and, in particular, tax progressivity on the decision to become an entrepreneur and his results highlighted that less progressive tax rates determine a significant increase in entrepreneurial entry. The contradictory results obtained in Sweden and USA was explained by Hansson (2012) by the differences between the Swedish and US tax structure, because the latter encourages risk-taking and tax-driven self-employment. Differences between countries were also obtained by other studies, for example the study conducted by Granda-Carvajal and García-Callejas (2022) found that personal income taxation, in developing countries, plays no significant role on self-employment, while for the developed countries the results are mixed.

Therefore, starting from this, we also propose to test if taxation influences entrepreneurial motivations differently for different countries. The second hypothesis is:

H2*: The relationship between taxation and entrepreneurial motivations depends on the level of development of countries.*

The negative relationship between taxes and entrepreneurship is also empirically evidenced by Bilan and Roman (2020) who conducted a study on the EU 28 countries over the period 2006-2018. Using a panel-data linear regression model, Bilan and Roman (2020) found that an increase in tax rates strongly discourages new firms from entering into the market, confirming the findings of previous empirical studies on the effects of tax policy on entrepreneurial activities. Comparing with previous studies, Bilan and Roman (2020) examined not only the relationship between tax rates and entrepreneurship, but also the relationship between tax administrative burden and entrepreneurship (less investigated) and showed that both tax rates and tax administrative burden play a key role in stimulating the creation of new companies.

Regarding the impact of income tax on entrepreneurship, Keuschnigg and Nielsen (2003) suggests that higher and progressive taxation delays entrepreneurship. The negative link between higher tax rates and entrepreneurship has been studied from 1944 by Domar and Musgrave (1944) and later, Gentry and Hubbard (2000) emphasized that the effect of higher taxes and progressivity on entry into entrepreneurship could be ambiguous or even positive when the government allows full offset of losses. In this context, the empirical evidence on the impact of taxation on entry into entrepreneurship arrived to mixed conclusions. Some of the conducted researches found that higher tax rates tend to discourage entrepreneurship (Long, 1982; Blau, 1987; Bacher & Brülhart, 2013); other studies showed positive relationships between tax rates and entrepreneurial activity (Cowling & Mitchell, 1997; Robson, 1998); and the third group of studies are less conclusive and present mixed results

(Bruce, 2000; Gentry & Hubbard, 2000; Carroll *et al.*, 2001; Bruce, 2002; Cullen & Gordon, 2007; Bruce & Deskins, 2012; Baliamoune-Lutz & Garello, 2014).

Resuming, taxation and entrepreneurship have been the research topic of an important number of studies across the world. Reviewing the findings, it is clear that taxes are an important determinant of entrepreneurship, and next we provide empirical evidence on how the total taxation rate and different tyes of it (total tax, profit tax, labour tax, other taxes payable by businesses) affect entrepreneurship in different countries across the world, according to their development level.

3. METHODOLOGY

The aim of the present paper is to identify the impact of tax rates on entrepreneurship and the relationship between tax rates and entrepreneurial motivations, considering the important role of entrepreneurship for economic development and to formulate possible solutions for stimulating entrepreneurial activity.

In order to test the research hypotheses, this study uses a sample of 46 world countries. The period considered for the empirical investigation it covers eight years, between 2012 and 2019. The choice of the sample of countries and also the period of analysis was conditioned by the availability of data.

Given that the data set combines time series and cross-section, an estimation of a balanced panel data will be pursued in order to study the effects of a set of explanatory variables on the motivations of entrepreneurs. Thus, in order to observe how taxes and fees charged to businesses are correlated with the motivation of entrepreneurs it is used the multiple linear regression method adapted to panel data, drawing inspiration from the models used by Amorós and Bosma (2014) and Angulo-Guerrero *et al.* (2017).

The general equation of the model is as follows:

$$y_{it} = \beta_1 tax_{it} + \beta_2 control_{it} + \mu_{it} \quad (1)$$

where: *i* represents the country and *t* is the time (2012…2019); y_{it}: represents the dependent variable measuring entrepreneurial motivations; tax_{it}: represents the indicators considered for expressing the tax policy; $control_{it}$: the control variables; β_1, β_2: are the coefficients; μit: the error term.

For measuring the entrepreneurial motivations, it is used a set of indicators offered by Global Entrepreneurship Monitor Reports (Xavier *et al.*, 2013; Amorós & Bosma, 2014; Singer *et al.*, 2015; Kelley *et al.*, 2016; GEM, 2017, 2018; Bosma & Kelley, 2019; Bosma *et al.*, 2020). Thus, the first indicator is represented by the total early stage entrepreneurial activity, and after that, the different motivations of the entrepreneurs: necessity, opportunity, improvement. Another indicator considered is the motivational index.

In order to quantify empirically the taxes, were considered a series of indicators that measure the taxes and duties applied to enterprises: total tax and contribution rate, profit tax, labour tax and contributions, other taxes payable by businesses. The definition of this indicators, and their abbreviations are presented in Table no. 1. The model also included two control variables: GDP growth and unemployment rate.

Table no. 1 – Description of the variables included in the econometric model

Variables	Abbreviations (Measures)	Definition
		Dependent variables
Early-stage entrepreneurial activity	TEA (%)	Percentage of 18-64 population who are either a nascent entrepreneur (in the phase of stating a new business) or owner-manager of a new business (42 months after the birth of the firm).
Necessity-driven entrepreneurs	NDE (% of TEA)	Percentage of TEA which are pushed into starting a business because they have no other options for work.
Opportunity-driven entrepreneurs	ODE (% of TEA)	Percentage of TEA which are pulled to entrepreneurship by opportunity and because they desire independence or to increase their income, as opposed to finding no other option for work.
Improvement-driven opportunity entrepreneurs	IDE (% of TEA)	Those opportunity-driven entrepreneurs who sought to either earn more money or be more independent, as opposed to maintain income.
Motivational index	MI	Percentage of those involved in TEA that are improvement-driven opportunity motivated, divided by the percentage of TEA that is necessity-motivated.
		Independent variables
Total tax and contribution rate	Totaltax (% of profit)	The amount of taxes and mandatory contributions payable by businesses after accounting for allowable deductions and exemptions as a share of commercial profits. Taxes withheld (such as personal income tax) or collected and remitted to tax authorities (such as value added taxes, sales taxes or goods and service taxes) are excluded.
Profit tax	Profit (% of commercial profits)	The amount of taxes on profits paid by the business.
Labor tax and contributions	Labour (% of commercial profits)	The amount of taxes and mandatory contributions on labour paid by the business.
Other taxes payable by businesses	Other (% of commercial profits)	Include the amounts paid for property taxes, turnover taxes, and other small taxes such as municipal fees and vehicle and fuel taxes.
		Control variables
GDP growth	GDP (annual %)	GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.
Unemployment	Unempl (% of total labour force)	The share of the labour force that is without work, but available for and seeking employment.

Source: authors own elaboration after data from GEM (2021) and World Bank (2021)

The world countries included in the sample were classified and analysed in line to their level of economic development, in order to conduct a comparative analysis. Thus, the countries were grouped according to the World Economic Situation and Prospects 2020 Report, realized by the UNCTAD (United Nations, 2020).

This report realizes a classification of countries according to the level of GNI per capita in June 2019. The grouping of countries according to the mentioned criterion is presented in Table no. 2. According to Table no. 2, the sample of countries includes 46 countries, from which 29 are high income countries, 13 upper middle income countries and 4 lower middle income countries.

Table no. 2 – The classification of countries according to the level of GNI per capita in June 2019

High income countries			Upper middle income countries	Lower middle income countries
Australia	Ireland	Portugal	Argentina	Egypt
Canada	Israel	Slovak Republic	Brazil	India
Chile	Italy	Slovenia	China	Indonesia
Croatia	Japan	Spain	Colombia	Morocco
Estonia	Latvia	Sweden	Ecuador	
Finland	Luxembourg	Switzerland	Guatemala	
France	Netherlands	United Kingdom	Iran	
Germany	Norway	United States	Malaysia	
Greece	Panama	Uruguay	Mexico	
Hungary	Poland		Peru	
			Russian Federation	
			South Africa	
			Thailand	

Source: authors own elaboration after data from United Nations (2020)

For performing the panel data analysis, first, the variables were tested for stationarity, for the existence of a unit root. None of the variables included in the study turned out to have a united root. Following, was performed the descriptive statistics of all the variables included in the model, and also the correlation matrix. From the correlation matrix resulted a strong correlation only between total tax and contribution rate and other taxes payable by business, but this was expected, because the total indicator includes these taxes in its component. Therefore, were ran separate models for the indicator that measures total tax and separately for the other indicators that express taxation. For testing the hypothesis formulated above, were run the multiple panel data regression models. The econometric analysis was carried out with the help of Eviews 10 software.

4. RESULTS AND DISCUSSIONS

The summary of the descriptive statistics (see Table no. 3) shows that early stage entrepreneurs have the highest values (36.7%) in Chile (2019) and the lowest values (2.8%) in Italy (2019). The variables measuring the motivation of entrepreneurs vary significantly across countries and time. The entrepreneurs motivated by necessity have higher percentages (47.6%) in Egypt (2019) and the lowest percentage (3.54%) in Norway (2014). The entrepreneurs motivated by opportunity have higher values (90.9%) in Poland (2018) and the lowest values (39.1%) in India (2017). Improvement driven opportunity entrepreneurs have the highest standard deviation and vary between a minimum of 18.4% in Italy (2013) and a maximum of 76.3% in United States (2017). Motivational index varies between a minimum of 2.8% in Chile (2016) and a maximum of 19.5% in Norway (in 2014). Thus, the motivation of entrepreneurs to open a business depends on the country in which these entrepreneurs are located but also on the period in which the decision is made.

Table no. 3 – Descriptive statistics of the variables

Variable	Mean	Max.	Min.	Std. Dev.	Obs.
Early-stage entrepreneurial activity (TEA)	11.935	36.700	2.800	6.602	322
Necessity-driven entrepreneurs	22.598	47.600	3.540	9.951	286
Opportunity-driven entrepreneurs	73.743	90.900	39.100	9.510	204
Improvement- driven opportunity entrepreneurs	49.395	76.300	18.400	12.330	286
Motivational index	11.935	19.500	2.800	6.602	322
Total tax and contribution rate	43.615	137.600	18.400	17.112	316
Profit tax	16.111	28.600	0.000	7.371	316
Labour tax and contributions	22.389	54.000	3.800	11.513	316
Other taxes payable by businesses	5.189	108.200	0.000	13.478	316
GDP growth	2.527	25.176	-7.444	2.835	322
Unemployment	7.976	28.470	0.210	5.391	322

Source: authors own calculations

From the independent variables, the highest variation is registered for the total tax and contribution rate, which varies between a minimum of 18.4% in Croatia (2014) and a maximum of 137.6% in Argentina (2015). Other taxes payable by businesses also vary significantly between countries and across time, from a minimum of 0 in Norway (2013-2015) and a maximum of 108.2% in Argentina (2015). Labour tax and contributions vary between a minimum of 3.8% in Chile (2012-2013) and a maximum of 54% in France (2014). Profit tax has the lowest variation, between a minimum of 0 in Argentina (2013-2015) and a maximum of 28.6% in Thailand (2012).

These results show that in the sample are both countries which have friendly tax rates to businesses and also countries where business taxes are a burden and discourage firms to enter into the market. This is one of the reasons for the decision to divide the sample of countries into groups according to their level of economic development.

Table no. 4 compares the means of the indicators for each group of countries. Early stage entrepreneurial activity is higher in upper middle countries, followed by lower income and high income countries. The result is similar with that of Bampoky *et al.* (2013), which showed that middle income countries have, on average, more entrepreneurs than high income countries. Our findings also suggest an inverse U-shape relationship between entrepreneurship and the income of countries. This means that when the income is increasing, the TEA rate will also increase, but up to a threshold point after which the relationship becomes negative. Thus, when countries improve their income level, will determine higher entrepreneurial activity up to a point where further economic development does not imply higher business activity (Rodrigues Brás & Soukiazis, 2019).

The mean values obtained for the indicators measuring the motivation to become entrepreneurs highlighted that the necessity motivated entrepreneurs have higher percentages in lower middle income countries, while opportunity and improvement motivated entrepreneurs have higher percentages in high income countries. This is because individuals from the poorest countries are driven by poverty and survival, lacking work options. In developed countries usually, the main motivations for starting a business are opportunity and innovation. Therefore, if the poverty is higher, predominates the necessity entrepreneurship (Raynolds *et al.*, 2001; Rosa *et al.*, 2006).

Motivational index has the highest mean values in high income countries. This is because this index reflects the improvement motivated entrepreneurs reported to necessity ones. And this ratio is the highest in high income countries.

Table no. 4 – Comparing indicators means by groups of countries

Variable	High income countries	Upper middle income countries	Lower middle income countries
Early-stage entrepreneurial activity (TEA)	9.951359	**16.63380**	10.96250
Necessity-driven entrepreneurs	19.45357	27.42747	**30.76333**
Opportunity-driven entrepreneurs	**76.39992**	70.52379	65.22444
Improvement- driven opportunity entrepreneurs	**51.604**	47.978	35.851
Motivational index	**3.564063**	2.255172	1.333333
Total tax and contribution rate	39.77206	**52.18409**	44.86667
Profit tax	14.74461	18.14545	**20.27500**
Labour tax and contributions	**22.74412**	22.22727	19.97083
Other taxes payable by businesses	2.282353	**12.08636**	4.616667

Source: authors own calculations

The mean values for the indicators considered in the analysis vary across group of countries, emphasizing the significant difference that are registered between these groups as regarding entrepreneurship but also tax rates. As regards total tax and contribution rate it has the highest mean value in upper middle income countries, followed by lower middle income countries. The lowest value is registered in high income countries. According to Ortiz-Ospina and Roser (2016), the available long-run data shows that in the process of development, countries have increased the levels of taxation, while at the same time changing the patterns of taxation, mainly by providing an increasing emphasis on broader tax bases. With other words, countries rely on higher tax revenues resulting from higher incomes or profits and less from rising tax rates. Also, Ortiz-Ospina and Roser (2016) highlighted the fact that the time series show that highest income countries have had relatively stable levels of tax revenues in the last decade; while trends and patterns are less clear across the developing countries. In many cases, especially among upper-middle income countries, tax revenues have been going up consistently, which might be an explanation for our results. Other aspect that must be considered is that the amount of collected taxes depends on compliance and efficiency of tax collection mechanisms.

Profit tax is the highest in lower income countries and the lowest in high income countries. As the development of the country decreases, there is an increase in the amount of the profit tax paid by businesses. If the income is lower the overall profit tax is higher.

Labour tax and contributions are higher in high income countries, and as the country's development decreases, so does this tax. But the differences are not very big between groups of countries. These differences can be generated by specific aspects that occur in each group of countries, such as: higher statutory rates, higher employer social security contributions and/or reductions in employee social security contributions.

Other taxes payable by businesses are higher in upper middle income taxes, and the lowest in high income countries. The difference between upper middle income countries and the others is significant.

The correlation matrix of the variables shows that there exists correlation between total tax and contribution rate and the components broken down by categories of taxes perceived

on businesses. Thus, separate regression models are run, first considering total tax and contribution rate as independent variable and then considering the other indicators measuring tax policy as independent variable.

The results of the first model applied are summarised in Table no. 5. Necessity motivated entrepreneurs resulted to be positively and statistically significant related to total tax and contribution rate. Opportunity and improvement motivated entrepreneurs and also motivational index resulted to be negatively and statistically significant related to total tax and contribution rate. Paying taxes discourages the entrepreneurs that wish to profit from opportunities and increase their profits. At the same time, even if the total tax paid by the businesses increases, the entrepreneurs motivated by necessity will continue to enter entrepreneurship, because having no other options to work, they consider this the optimal option to obtain the necessary incomes for living. Total early stage entrepreneurial activity did not result to be significantly related with total tax and contribution rate.

Table no. 5 – The relationship between tax policy and entrepreneurial motivations

Dependent variable	TEA	NDE	ODE	IDE	MI
Total tax and contribution rate	0.008	**0.093*** **	**-0.096*** **	**-0.088*** **	**-0.018*** **
	(0.013)	**(0.011)**	**(0.006)**	**(0.021)**	**(0.001)**
GDP growth	0.101	0.446	-0.364	**-0.749*** **	**-0.117*** **
	(0.200)	(0.188)	(0.234)	**(0.253)**	**(0.039)**
Unemployment	**-0.353*** **	**0.574*** **	**-0.424*** **	**-1.053*** **	**-0.138*** **
	(0.040)	**(0.064)**	**(0.077)**	**(0.080)**	**(0.017)**
Intercept	**14.512*** **	**12.588*** **	**82.353*** **	**63.783*** **	**5.231*** **
	(1.162)	**(0.910)**	**(1.392)**	**(1.327)**	**(0.308)**
Obs.	316	280	204	280	204
R-squared	0.093	0.117	0.089	0.215	0.123
R-squared adjusted	0.084	0.107	0.075	0.203	0.110
F-statistic	10.718***	12.219***	6.518***	24.898***	9.365***

Note: *, ** and *** represents significant values at 1%, 5% respectively 10%.
Standard error in parenthesis
Source: authors own elaboration

As regards control variables, GDP growth resulted to have a negative relation with improvement motivated entrepreneurs and motivational index. The relationship between economic development and entrepreneurial activity is negative because, because when the economy becomes more developed, fewer people will be interested in pursuing entrepreneurial activity (Acs *et al.*, 2008).

Unemployment rate resulted to have a negative relation with total entrepreneurial activity and the variables that express the motivation of entrepreneurs related to following opportunity and innovation, and a positive relation with necessity motivated entrepreneurs. This result is in line with the findings of other studies (Vidal-Suñé & Lopez-Panisello, 2013; Fuentelsaz *et al.*, 2015; Amorós *et al.*, 2019) and it can be explained by the fact that those entrepreneurs who are motivated by the pursuit of opportunities are negatively influenced by the increase of unemployment because this increase is usually associated with a reduction or stagnation of the process of development of the economy and implicitly with less opportunities for entrepreneurs. At the same time, higher unemployment rates stimulate

entrepreneurs motivated by necessity to engage in entrepreneurial activities having no other option for work (Rusu & Roman, 2019).

The values of R-squared adjusted vary between 8% and 20% showing that total tax and contribution rate explain a small part of the variation in entrepreneurship and entrepreneurial motivations. This is also shown by the high values of the intercept, which emphasizes that there are other factors with significant influence on entrepreneurial motivations, in addition to taxation. This result was expected because as other studies have shown there are also many factors that influence the motivation of entrepreneurs. However, the purpose of our study, to show that tax rates significantly influences entrepreneurial motivations, was achieved. Furthermore, the values for R-squared and R-squared adjusted which are close to each other and the significant values for F statistically show us that the model is good. Thus, the first hypothesis which states that taxation has a significant relationship with entrepreneurial motivations, is confirmed.

In the analysis broken down by components of taxation (see Table no. 6), we notice that the profit tax turned out to have a positive relationship with TEA. Labour tax and contribution resulted to have a positive relationship with NEA and a negative relationship with TEA, ODE, IDE and motivational index. Other taxes payable by business resulted to have a positive relation with TEA and NEA and a negative relation with ODE, IDE and motivational index. The results can be explained by the fact that more successful businesses see higher taxes as discouraging because cut into their profits (Audretsch *et al.*, 2021).

Table no. 6 – The relationship between category of taxes and entrepreneurial motivations

Dependent variable	TEA	NDE	ODE	IDE	MI
Profit tax	**0.109*** **	0.030	-0.039	-0.079	-0.010
	(0.019)	(0.064)	(0.065)	(0.062)	(0.013)
Labour tax and contributions	**-0.142*** **	**0.108*** **	**-0.156*** **	**-0.155*** **	**-0.015** **
	(0.013)	**(0.029)**	**(0.026)**	**(0.036)**	**(0.006)**
Other taxes payable by businesses	**0.095*** **	**0.081*** **	**-0.060*** **	**-0.048** **	**-0.020*** **
	(0.018)	**(0.011)**	**(0.014)**	**(0.025)**	**(0.002)**
GDP growth	0.094	**0.445** **	-0.334	**-0.752*** **	**-0.116*** **
	(0.173)	**(0.189)**	(0.213)	**(0.079)**	**(0.038)**
Unemployment	**-0.260*** **	**0.550*** **	**-0.381*** **	**-1.014*** **	**-0.138*** **
	(0.043)	**(0.058)**	**(0.080)**	**(0.079)**	**(0.014)**
Intercept	**14.742*** **	**13.512*** **	**82.128*** **	**64.600*** **	**5.041*** **
	(0.893)	**(1.528)**	**(1.572)**	**(1.997)**	**(0.085)**
Obs.	316	280	204	280	204
R-squared	0.198	0.119	0.098	0.217	0.124
R-squared adjusted	0.185	0.103	0.076	0.205	0.101
F-statistic	15.347***	7.472***	4.347***	15.257***	5.609***

Note: *, ** and *** represents significant values at 1%, 5% respectively 10%.
Standard error in parenthesis
Source: authors own elaboration

Thus, findings from Table no. 6 confirm once again the first Hypothesis (H1) that taxes and duties imposed on businesses have a significant influence on entrepreneurship but also on the motivation of entrepreneurs. The results for R squared but also for statistical F, and intercept show us the same things as in the previous model.

When the analysis of the relationship between total tax and contribution rate was performed according to the groups of the countries (see Table no. 7) the results show that there

are not significant differences between the groups of countries in terms of total tax and contribution rate effects on entrepreneurial motivations. Thus, the results are similar to those obtained in Table no. 5 for the entire sample of countries. Entrepreneurs motivated by necessity are positively and significantly related to the total tax and contribution rate regardless of the group of countries they come from. Thus, it is shown that these entrepreneurs, having no other options to procure the necessary income, will decide to enter the entrepreneurship even if the taxes imposed on the enterprises are high. On the other hand, entrepreneurs motivated by opportunity are negatively related to the total tax and contribution rate, because the taxes lead to reductions in their profits and discourage the entrepreneurs. These findings are valid regardless of the group of countries from which the entrepreneurs come.

The only difference obtained is for the variable TEA, which appears to be negatively and significantly related to total tax and contribution rate, showing that entrepreneurs, especially those at the beginning of the road, are generally discouraged by the taxes and fees that their businesses have to pay. These results are in line with other findings from the literature (Klapper *et al.*, 2006; Vidal-Suñé & Lopez-Panisello, 2013; Ferede, 2021).

Values for adjusted R squared range from 5.5% to 51.8%, with lower values in upper middle income countries and higher values in lower middle income countries. Thus, we can say that between 5% and 51% of the variation of the number of entrepreneurs, with different motivations, can be explained by the variation registered at the level of the total tax rate for enterprises. The small differences between R squared and R squared adjusted but also the statistically significant values for F-statistic show us that the chosen models are suitable and validated.

Table no. 8 presents a more in-depth analyses broken down both by groups of countries and by types of taxes imposed on businesses. Significant differences appear here. Thus, profit tax resulted to be positively related to TEA from upper middle income countries and negatively related to TEA from lower middle income countries. Those with above average incomes are not negatively influenced by the profit tax when they want to start a new business or when they do something innovative, because usually this category of entrepreneurs benefits from support or facilities from public authorities.

In countries with lower average incomes, there are also facilities for start-ups, but it turns out that the size of the profit tax is important when making the decision to start an activity.

Also, for all the groups of countries profit tax resulted to be negatively related with NDE. A positive relationship resulted for profit tax and ODE and MI for all groups of countries. IDE and profit tax are positively related only for upper and lower middle income countries.

Another component of corporate taxation, labour tax and contributions resulted to be negatively related to TEA and IDE for all the countries. Regarding the other variables that measure the motivation of entrepreneurs, the results are divided. Labour tax is negatively related to NDE for high income countries, and positively for upper and lower middle income countries. For the case of MI the signs are opposite to those of NDE. Labour tax is negatively related to ODE for upper and lower middle income countries. Thus, entrepreneurs in all countries are discouraged by high rates of labour tax and contributions.

In terms of motivation, there are differences between groups of countries, with the entrepreneurs in more developed countries being influenced differently by the labour tax compared to those in less developed countries. Entrepreneurs motivated by opportunity and improvement in upper and lower middle income countries are negatively influenced by high values of labour tax and contributions, while those motivated by necessity decide to enter the business even if these taxes are high.

Table no. 7 – The relationship between tax policy and entrepreneurial motivations by groups of countries

Groups	High income countries					Upper middle income countries					Lower middle income countries				
Dependent variable	TEA	NDE	ODE	IDE	MI	TEA	NDE	ODE	IDE	MI	TEA	NDE	ODE	IDE	MI
Total tax and contribution rate	0.008	**0.093*** **	**-0.096*** **	**-0.088*** **	**-0.018*** **	-0.033	**0.028***	**-0.043** **	**-0.059*** **	**-0.012*** **	**-0.253** **	**0.260** **	**-0.473*** **	**-0.253** **	**-0.011***
	(0.013)	**(0.011)**	**(0.006)**	**(0.021)**	**(0.001)**	(0.025)	**(0.015)**	**(0.019)**	**(0.017)**	**(0.003)**	**(0.105)**	**(0.118)**	**(0.130)**	**(0.105)**	**(0.005)**
GDP growth	0.101	**0.446** **	**-0.364**	**-0.749*** **	**-0.117*** **	-0.102	**-0.411***	0.282	-0.109	0.015	0.436	**1.661** **	**-2.295** **	0.436	**-0.140*** **
	(0.200)	**(0.188)**	**(0.234)**	**(0.253)**	**(0.039)**	(0.190)	**(0.230)**	(0.191)	(0.280)	(0.024)	(0.677)	**(0.772)**	**(1.013)**	(0.677)	**(0.036)**
Unemployment	**-0.353*** **	**0.574*** **	**-0.424*** **	**-1.053*** **	**-0.138*** **	**-0.416*** **	**0.273*** **	**-0.211*** **	**-0.747*** **	**-0.078*** **	-0.286	**1.648*** **	**-1.513*** **	-0.286	**-0.115*** **
	(0.040)	**(0.064)**	**(0.007)**	**(0.080)**	**(0.017)**	**(0.042)**	**(0.024)**	**(0.048)**	**(0.086)**	**(0.014)**	(0.456)	**(0.267)**	**(0.314)**	(0.456)	**(0.007)**
Intercept	**14.512*** **	**12.588*** **	**82.353*** **	**63.783*** **	**5.231*** **	**21.932*** **	**25.024*** **	**73.581*** **	56.827***	**3.417*** **	**22.284*** **	-1.540	**19.486*** **	**22.284*** **	**3.417*** **
	(1.162)	**(0.910)**	**(1.392)**	**(1.327)**	**(0.308)**	**(1.909)**	**(1.367)**	**(1.766)**	(1.431)	**(0.432)**	**(6.085)**	(4.504)	**(7.252)**	**(6.085)**	**(0.345)**
Obs.	316	280	204	280	204	88	79	58	79	58	24	21	18	24	18
R-squared	0.093	0.117	0.089	0.212	0.123	0.125	0.074	0.055	0.165	0.133	0.361	0.419	0.383	0.361	0.518
R-squared adjusted	0.084	0.107	0.075	0.203	0.110	0.093	0.037	0.003	0.131	0.084	0.265	0.316	0.251	0.265	0.414
F-statistic	10.718***	12.219***	6.158***	24.828***	9.365***	4.003***	2.005**	1.064**	4.951***	2.764**	3.768**	4.086**	2.900*	3.768***	5.016***

Note: *, ** and *** represents significant values at 1%, 5% respectively 10%. Standard error in parenthesis
Source: authors own elaboration

Table no. 8 – The relationship between category of taxes and entrepreneurial motivations by groups of countries

Groups	High income countries					Upper middle income countries					Lower middle income countries				
Dependent variable	TEA	NDE	ODE	IDE	MI	TEA	NDE	ODE	IDE	MI	TEA	NDE	ODE	IDE	MI
Profit tax	-0.025	**-0.164*** **	**0.174** **	-0.079	**0.030***	**0.370*** **	**-0.637*** **	**0.538*** **	**0.859*** **	**0.088*** **	**-0.356** **	**-0.092*** **	**1.489*** **	**1.168*** **	**0.062*** **
	(0.018)	**(0.060)**	**(0.069)**	(0.062)	**(0.016)**	**(0.095)**	**(0.170)**	**(0.129)**	**(0.206)**	**(0.019)**	**(0.149)**	**(0.250)**	**(0.166)**	**(0.323)**	**(0.002)**
Labor tax and contributions	**-0.199*** **	**-0.080*** **	0.038	**-0.155*** **	**0.029*** **	**-0.109*** **	**0.194*** **	**-0.252*** **	**-0.195*** **	**-0.040*** **	**-0.490*** **	**1.269***	**-1.306** **	**-0.376*** **	**-0.059** **
	(0.023)	**(0.019)**	(0.024)	**(0.036)**	**(0.009)**	**(0.028)**	**(0.061)**	**(0.028)**	**(0.044)**	**(0.009)**	**(0.160)**	**(0.606)**	**(0.477)**	**(0.105)**	**(0.019)**
Other taxes payable by businesses	**0.383*** **	**0.162***	0.155	**-0.046***	**-0.106***	**0.075*** **	**-0.171*** **	**0.152*** **	**0.182*** **	**0.018*** **	0.099	**0.697***	**-2.409** **	-0.607	**-0.064** **
	(0.070)	**(0.097)**	(0.192)	**(0.025)**	**(0.054)**	**(0.025)**	**(0.042)**	**(0.544)**	**(0.045)**	**(0.005)**	(0.256)	**(0.382)**	**(1.017)**	(0.397)	**(0.029)**
GDP growth	0.179	**0.315** **	-0.030	**-0.752*** **	**-0.095*** **	-0.067	**-0.516*** **	**0.586*** **	-0.015	**0.060***	-0.088	-0.895	4.150	0.208	0.075
	(0.147)	**(0.135)**	(0.077)	**(0.246)**	**(0.035)**	(0.153)	**(0.138)**	**(0.214)**	(0.265)	**(0.035)**	(0.888)	(0.930)	(2.544)	(0.971)	(0.092)
Unemployment	-0.018	**0.884*** **	**-0.601*** **	**-1.014*** **	**-0.238*** **	**-0.469*** **	**0.350*** **	**-0.277*** **	**-0.836*** **	**-0.089*** **	-0.071	-1.305	2.068	0.379	0.041
	(0.040)	**(0.089)**	**(0.158)**	**(0.079)**	**(0.024)**	**(0.039)**	**(0.025)**	**(0.049)**	**(0.068)**	**(0.014)**	(0.577)	(1.392)	(1.193)	(0.285)	(0.042)
Intercept	**13.767*** **	**14.888*** **	**77.602*** **	**64.600*** **	**4.882*** **	**15.260*** **	**35.717*** **	**65.015*** **	**40.446** **	**1.811*** **	**28.501*** **	**35.875*** **	**34.348**	**18.233***	0.807
	(0.952)	**(1.477)**	**(1.399)**	**(1.997)**	**(0.254)**	**(2.438)**	**(4.492)**	**(3.498)**	**(4.309)**	**(0.424)**	**(8.339)**	**(11.143)**	**(17.993)***	**(10.046)**	(0.668)
Obs.	204	180	128	280	128	88	79	58	79	58	24	21	18	21	18
R-squared	0.237	0.258	0.174	0.217	0.186	0.243	0.322	0.324	0.379	0.336	0.392	0.636	0.682	0.574	0.760
R-squared adjusted	0.218	0.237	0.140	0.203	0.153	0.196	0.276	0.279	0.336	0.272	0.223	0.515	0.549	0.432	0.660
F-statistic	12.333***	12.124***	5.164***	15.257***	5.607***	5.265***	6.956***	5.414***	8.924***	5.275***	2.322**	5.250***	5.149***	4.050**	7.602***

Note: *, ** and *** represents significant values at 1%, 5% respectively 10%. Standard error in parenthesis
Source: authors own elaboration

Other taxes payable by businesses resulted to be positively related to TEA in high income countries and upper middle income countries, to NDE in high income countries and lower middle income countries, and with ODE, IDE and MI in upper middle income countries. On the other hand, appear negatively related with NDE in upper middle income countries, with ODE in lower middle income countries, with IDE in high income countries and with MI in high and lower middle income countries. These results confirm hypothesis H2.

Values for adjusted R squared range from 17% to 76%, with lower values in high income countries and higher values in lower middle income countries. Thus, we can say that between 17% and 76% of the variation of the number of entrepreneurs, with different motivations, can be explained by the variation registered in the tax's levels supported by enterprises. The small differences between R squared and R squared adjusted but also the statistically significant values for F-statistic show us that the chosen models are suitable and validated.

5. CONCLUSIONS

The aim of the paper was to investigate if taxation, specifically the tax rates impacts entrepreneurship on a sample of 46 world countries grouped into three categories according to the GNI level per capita (in June 2019). For this purpose, we used panel data models for a period of eight years (2012-2019) for which data was available. We investigate the impact of a set of variables measuring the taxes applied to the firms on the dependent variables that measure the motivations of entrepreneurs. Also, to assure the accuracy of the results, two control variables were included, namely the economic growth rate and unemployment rate, which the literature indicates as important determinants of entrepreneurship.

One important result consists in the fact that tax rates affects the decision of individuals to become entrepreneurs, which is in line with the results obtained in previous empirical studies (Djankov *et al.*, 2010; Vidal-Suñé & Lopez-Panisello, 2013; Salman, 2014; European Commission *et al.*, 2017; Watson & Kaeding, 2019; Bilan & Roman, 2020). The results showed that the motivations of entrepreneurs are closely related to the level of economic development of countries. Another finding consists in the fact that the tax rates are significantly related with the motivation of entrepreneurs. In this case we cannot compare the results of the present research with the results of previous studies because there are no studies that applied this approach to study the impact of tax rates on entrepreneur's motivations (necessity-driven, opportunity-driven, improvement-driven opportunity and motivational index). Also, the way in which entrepreneurs perceive the influence of tax rates depends on the country they come from, on the characteristics of the economic and business environment, which implicitly determines them and their motivation to enter into business. These findings are in line with those of Bruce *et al.* (2020), and could be useful to policymakers, concerned with supporting and encouraging entrepreneurship and especially entrepreneurs interested in innovation and development. They could adapt fiscal policy to help these categories of entrepreneurs which might have positive effects on economies. Also, depending on entrepreneurial motivation, the policy makers can consider different forms of support by the type of entrepreneurship they want to prioritize.

In this context, the recommendations for the policymakers is to adopt favourable measures for entrepreneurship (tax incentives, a decrease of the marginal rates if it is applied a progressive taxation regime, R&D tax credits and allowances etc.) which will contribute to job creation, economic growth and increase of innovation.

Therefore, this paper contributes to the expansion of the literature in the field by providing evidence on the correlation between tax rates and entrepreneurship motivation, on an extended sample of countries, classified according to their income level and for a large period of time.

Besides the important findings, the paper also presents some limitations. First, the data regarding entrepreneurial variables were restricted to the variables included in the GEM Reports. Secondly, the availability of data for the indicators and the period considered determined us to limit the number of analysed countries to only 46.

Further research could extend the analysis by considering a model that takes into account a system of rates (progressive or proportional) in the analysed countries. Moreover, other elements of taxation could be considered, such as deductions or fiscal facilities. The present paper focused on traditional entrepreneurship, but the impact of tax rates on different types of entrepreneurial fields (social entrepreneurship, environmental entrepreneurship) could also be studied.

ORCID

Valentina Diana Rusu http://orcid.org/0000-0002-5974-9150
Adina Dornean http://orcid.org/0000-0002-8009-4961

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