



Size of government and entrepreneurship. Analysis of three groups of countries with different economic development

Tamaño del Estado y emprendimiento. Análisis de tres grupos de países con diferente nivel de desarrollo económico

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Abstract

This study analyzes the impact of the "size of government" in entrepreneurial activity for countries with different levels of economical development. It have been used the variables "size of government" of the economic freedom indices released by the Economic Freedom Network (2000-2009) and by The Heritage Foundation (2000-2011), and the variables of "entrepreneurship" released by the Global Entrepreneurship Monitor. Furthermore, the same analysis has been carried out grouping the countries by development level, following the classification elaborated by the World Economic Forum. Statistical analyses of correlations have shown that the "size of government" is related to entrepreneurship. The variables "Size of Government: Expenditures, Taxes and Enterprises" and "Government Size" have revealed a positive correlation with the total, opportunity and necessity entrepreneurial activity indices for the economies based on efficiency and innovation, thus less taxes on income and lower government spending, increase the entrepreneurship of the country. In "factor driven economies", there is no relationship between the size of government and entrepreneurship.

Keywords: size of government, government spending, entrepreneurship, institutions.



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Resumen

Este estudio analiza el impacto del “tamaño del Estado” en la actividad emprendedora en países con diferente nivel de desarrollo económico. Se han utilizado las variables “tamaño del gobierno” del índice de libertad económica elaborado por The Economic Freedom Network (2000-2009) y por The Heritage Foundation (2000-2011) y las variables sobre emprendimiento confeccionadas por The Global Entrepreneurship Monitor. Además, se ha realizado el mismo análisis agrupando los países según el nivel de desarrollo económico, siguiendo la clasificación elaborada por The World Economic Forum. El análisis estadístico ha mostrado que el “tamaño del gobierno” está relacionado con el emprendimiento. Las variables “Tamaño del Gobierno: Gastos, Impuestos y Empresas” y “Tamaño del Gobierno” han revelado una correlación positiva con el índice de actividad emprendedora total, por oportunidad y por necesidad para aquellas economías basadas en la eficiencia y en la innovación, y por consiguiente, menos impuestos a las rentas y menores gastos gubernamentales incrementarán la actividad emprendedora de un país. Para los países con economías basadas en factores no existe relación entre el tamaño del gobierno y la creación de empresas.

Palabras clave: tamaño del gobierno, gasto gubernamental, emprendimiento, instituciones.

1. Introduction

One of the most important problems, that the public sector economy is currently suffering, especially in Europe, is the excessive growth of government spending, which has led a large number of countries to situations of deficits that are putting in difficult circumstances not only the economies of the countries, but also the whole European Union. Faced with this situation, it is being taken restrictive measures for public spending trying to contain the deficit and promote again economic growth. This has reopened once again the classic debate on the dimension that the states should have and its involvement in economic life.

Economic theory, according to the keynesian approach suggests that a clear relationship exists between government spending and economic growth, since the spending level in the economy determines the level of production and employment. This link has been studied by several authors (Barro, 1991; Levine & Renelt, 1992; Barro & Sala, 1995; Durlauf, Quah, & Street, 1998; Temple, 1999) among others, but it does not seem to have consensus on its effects (Barro, 1991; Barro & Sala, 1995), so for some authors, a large public sector may cause inefficiencies in economic system, while for others, it would be a driving force behind the economic growth.

The reality is that the weight of the public sector in the economy has increased in the last century. This is evidenced by the significant increase in public spending that has occurred in different countries. Thus, from 1913 to 1990 in Switzerland the weight of the public sector has had an increase from 14% to 34%, in United Kingdom from 12% to 40% and, in USA, from 8% to 33% (Tanzi & Schuknecht, 1997).

From a broader perspective, that does not speak only of “size of government”, it seems to exist more and more consensus in the literature, in which institutions determine economic development (Acemoglu, Johnson, & Robinson, 2005; North, 2005; Rodrik, 2007, 2008). Furthermore, institutional quality defines entrepreneurial activity (Baumol, 1990; Audretsch, Thurik, Verheul, & Wennekers, 2002; Hall & Sobel, 2008), which in turn, has a strong impact on economic develop-

ment (Acs, Audretsch, & Evans, 1994; Reynolds, Hay, & Camp, 1999; Wennekers, Stel, Thurik, & Reynolds, 2005).

Institutional quality can be reflected through various institutional dimensions. Economic freedom is one of them (Aixalá & Fabro, 2007). In this regard, it is understood that a society will be economically free, if individuals have freedom and right to work, produce, consume and invest in any way, according to rule of law, and the state protects and respects this freedom (Miller, Holmes, Kim, Markheim, Roberts, & Walsh, 2009).

At the empirical level, institutional quality can be measured through several indicators. In all indicators of economic freedom, one of the main components that assess the economic freedom index is the size of public sector in terms of spending, taxes and enterprises.

However, there is still a debate in the literature which has not clarified if it is more convenient for entrepreneurship that the size of government is higher or lower. Because of this it is necessary to continue to provide empirical evidence in this field, especially if different countries are at different stages of economic development, which can claim different size of government.

The aim of this paper is to prove whether the size of government, as one of the fundamentals of economic freedom, is related to entrepreneurship and, whether this relationship is different for three groups of countries grouped according to their economic development.

To do this, it has been used the variables of the “size of government” extracted from the Economic Freedom of the World (EFW) index published by the Economic Freedom Network and the Index of Economic Freedom (IEF) published by The Heritage Foundation, as well as several variables about “entrepreneurial activity” developed by the Global Entrepreneurship Monitor (GEM). Furthermore, countries have been grouped following the classification done in the Global Competitiveness Report elaborated by the World Economic Forum.

The main contribution is to provide empirical evidence of the relationship between the size of government and the entrepreneurial activity; either is motivated by the use of an opportunity or due to the need in developed or developing countries. This evidence corroborates previous studies (Sobel *et al.*, 2007; Bjørnskov & Foss, 2008; Nyström, 2008; Aidis *et al.*, 2010), that link a large public sector to greater inefficiencies in economy and lesser productive entrepreneurial activities. Our study improves previous analyzes because it has a greater number of cases and a longer time horizon. In addition, finding a strong relationship between the size of government and entrepreneurship through two measurements from different institutions, the robustness of the results is higher.

After this introduction, in a second point, it is developed a review of the literature on institutions, economic freedom, government size and entrepreneurship. In the third and fourth point, it is described the methodology used and the results obtained are displayed, respectively. Finally, the results are discussed, the conclusions are presented, as well as the limitations of the study and the possible future researches.

2. Review of literature

2.1. Institutions and entrepreneurship

Institutions refer to the different factors or mechanisms designed by the society to conduct relations or human behaviour. Thus, institutions are the rules and restrictive regulations that guide society, conditioning and leading the framework of relations that occur in it (North, 1990). Two types of institutions can be appreciated. On one hand, there are informal institutions, which encompass the ideas, beliefs, attitudes and values of the people, becoming part of the society's culture. On the other hand, there are formal institutions (laws, property rights, government procedures), which include political (and legal) rules, economic rules and contracts. Political rules, in general, establish the hierarchical structure of government's system, its basic decision's structure and the explicit characteristics of control of the government's program. Economic rules define property rights, that is, the set of rights over the use and the income from the property and the ability to transfer an asset or a resource. Economic rules define property rights, that is, the set of rights over the use and the income from the property and the ability to transfer an asset or a resource. Contracts contain specific provisions for a particular agreement in exchange (North 1990, p. 47).

Increasingly, literature on economic growth recognizes the importance of institutions (Acemoglu *et al.*, 2005; North, 2005; Rodrik, Subramanian, & Trebbi, 2005). Institutions affect long-term economic performance, since the current institutional framework determines, by means of the structure of incentives and opportunities, the actions

of the different actors in society (North, 2005). Thus, the future entrepreneurs and their companies, as if they were economic agents, will be seen limited their actions by this institutional structure. The appearance and development of new businesses will be affected by the game rules (property rights, business law, incorporation procedures, ideas, cultural beliefs, gender, attitudes toward the employer, etc.).

Hall and Sobel (2008) mention that the clear definition of the rules reduces uncertainty and makes that institutional transaction costs are lower, what allows to do more profitable some exchanges and to increase the potential number thereof. The provision of efficient incentives and the increase of the certainty will increase institutional quality and the production's potential of an economy (Boettke & Coyne, 2003).

These and many other investigations have helped to disseminate a broad consensus on the idea that the quality of institutions, not only is one of the main factors to consider in the debate on economic growth (Straface & Page, 2009), but also influences entrepreneurial activity (Baumol, 1990; Audretsch *et al.*, 2002).

One of the first authors to point out the relationship between institutions and entrepreneurship is Baumol (1990), who along with Johnson, Kaufmann, and Shleifer (1997), show how the presence of weak institutions causes that employers undertake fewer projects or focus on unproductive activities. Audretsch, Thurik, Verheul, and Wennekers (2002) show how institutional factors determine entrepreneurship, while Hall and Sobel (2008, p. 89) state that "differences in institutional quality help to explain differences in entrepreneurial activity." For his part, Sobel (2008) argues that institutional quality promotes the entrepreneurial process, which in turn creates income and wealth.

Scott (1995) considers the institutional environment on the basis of three dimensions (cognitive, normative and regulatory) that provide stability and meaning to social behavior, facilitating or hindering, through the created incentives, taking advantage of opportunities and entrepreneurship (Busenitz *et al.*, 2000). The regulatory dimension refers to laws, regulations, policies and government programs, so that governments can act specifically on it to promote entrepreneurship (Busenitz *et al.*, 2000).

Therefore, in order to get a productive entrepreneurial activity, it will be required an appropriate institutional framework (Baumol, 1990; Powell, 2008) which promotes the security of property rights, contract enforcement, encouragement of entrepreneurship, the integration into the global economy, macroeconomic stability, the management of risk assumption by financial intermediaries, social insurance, the security supply networks or the promotion of giving account (Rodrik, 2008, p. 1).

2.2. Economic freedom

Institutional quality has three different institutional dimensions. Economic freedom is one of them (Aixalá & Fabro, 2007).

Depending on the existence of this institutional framework, so it will be the level of economic freedom existing in a country. The greater the degree of economic freedom in a society, the greater the level of income and growth, taking place a recurrent situation which in turn causes further improvements in economic freedom. Institutions and policies are coherent with economic freedom when they provide an infrastructure for voluntary exchange, protect individuals and their property (Gwartney, Lawson, & Hall, 2009). Those societies that have greater economic freedom will be those which have a more favorable position for the development of a more effective and democratic government. A sustained commitment to economic freedom is essential to foster economic development and prosperity (Miller, Holmes, Kim, Markheim, Roberts, & Walsh, 2010).

In this sense, Kreft and Sobel (2005) establish that the states with more economic freedom have higher levels of entrepreneurship and economic growth, while Campbell and Rogers (2007) found that economic freedom has a strong positive relationship with net business formation, and Hall and Sobel (2008) provide empirical evidence that entrepreneurial activity is the link between economic growth and economic freedom. Similarly, Sobel (2008, p. 645) states: "It is the institutional structure as measured by economic freedom, however that promotes productive, wealth-generating entrepreneurial activity which is the source of economic growth".

Consequently, economic freedom involves not only economic growth and progress for individuals, but also to the values and public goods that individuals are looking for society. Institutions should absorb these postulates, since they encourage entrepreneurial activity and disperse economic power and decision taking over the different sectors of economy (Miller *et al.*, 2010). In an economically free society, individuals would be free and entitled to work, produce, consume and invest in any way, with their freedom at once both protected and respected by the state. Some minimal coercion is necessary for the citizens of a community to defend themselves and promote the evolution of the society and their institutions (Gwartney *et al.*, 2009).

2.3. Size of Government and entrepreneurship

The construct of economic freedom is usually treated as a compound construct that includes the "size of government", the "access to sound money", the "freedom to trade internationally", etc. When we talk about size of government we refer to the degree of government intervention in the

economy through their own consumption, the reallocation through transfers and subsidies, investment and government enterprises, marginal tax rates, etc. There are several reasons why we should expect to find a link between the size of a government and entrepreneurship (Nyström, 2008).

High government spending can generate enough resources to maintain strong institutions, what could reduce barriers to business entry, such as fragile property rights or eliminating incentives for corruption of underpaid government employees. It can also create new barriers to entrepreneurship, having lower budgetary constraints in government spending that lead to create the conditions for which politicians who do not believe in social welfare dominate the government and make difficult the productive activity (Aidis, Estrin, & Mickiewicz, 2010).

Anyway, if the public sector is very large, it may reduce the market options of potential entrepreneurs. In service sectors such as health, education, elderly or children care, etc., public activities may have a bearing on fewer opportunities to promote private entrepreneurship. On the other hand, generous systems of social security or various public services reduces the incentives to become an entrepreneur, especially by necessity, but also to generate individual wealth that can then influence the entrepreneurial activity (Henrekson, 2005). In addition, taxes and social security provision may discourage the entrepreneurial entry through its impact on the expected return and opportunity cost. Also, the high and increasing marginal tax level may hinder the motivation of entrepreneurs by opportunity by affecting their potential earnings expectations (Parker, 2004).

If certain sectors, industries or activities, such as the certification of certain trades, are being exploited by the public sector, entrepreneurship is reduced. Also, if entrepreneurs invest only small amounts of capital in the opening of their business, they will be giving little sign of commitment to the company to potential outside investors.

Finally, the tax rate can have two contradictory effects on the choice of becoming an entrepreneur. On the one hand, high taxes in a large state sector can serve as a deterrent to become an entrepreneur (Parker, 2004). On the other hand, the company can be used as a strategy to evade taxes. High taxes on income will motivate people to become entrepreneurs, since the self-employment gives greater flexibility to obtain and conceal income (Hall & Sobel, 2008), what has a dominant effect on the research results (Bruce, 2000, 2002). As for the empirical evidences, Sobel, Clark, and Lee (2007) studied the relationship between the index of economic freedom and the entrepreneurial activity rate of the GEM project. Their findings conclude with a strong correlation, especially between government size and the rate of entrepreneurial activity. For his part, Bjornskov and Foss (2008) using identical data sources obtained, as result, that a large

public sector tends to decrease entrepreneurship. Koellinger and Minnitti (2009) also provide empirical evidence that high unemployment benefits are negatively related to nascent entrepreneurs. Entrepreneurs, by opportunity and by necessity, as well as innovators and imitators had less tendency to engage in business activities in developed countries that had high unemployment benefits. Moreover, Aidis, Estrin, and Mickiewicz (2010) find that business entry is inversely related to the size of government.

3. Methodology

3.1. Data source and variables

Data used in this study were obtained from three different sources. Data concerning the index of total entrepreneurial activity (TEA) cover the period between 2000 and 2011, and are extracted from the GEM Project. Its main purpose is to study the relationship between entrepreneurship and economic growth. It is a comparative and cross project and, currently the largest research project in entrepreneurship, both for its global scale and its results (Reynolds, Camp, Bygrave, Autio, & Hay, 2002). The GEM Project defines “business function” as “any attempt to create a new business, including self-employment, a new business or the expansion of an existing business, process that may be initiated by one or several individuals, independently or within an operating business” (Reynolds *et al.* 1999, p. 3).

The variables TEA, TEA by opportunity and TEA by necessity have also been obtained from these reports. Data of each country are usually obtained through a telephone survey of a representative sample (2000 people) of the adult population.

Economic Freedom data published by Economic Freedom Network¹ cover the period from 1995 to 2009, and were released for the first time in the year 1996.

Economic Freedom data published by The Heritage Foundation² cover the period from 1995 to 2011.

Aixalá and Fabro (2007) approximately mention thirty two different institutional indicators, of which are generally used the index of Economic Freedom of the World released by the Economic Freedom Network and the Heritage Foundation’s index. For this reason have been selected these two indices.

Table 1 shows the distribution per year and number of countries of the indices analyzed in this article.

GEM project data are matched year to year with those published by Economic Freedom Network and The Heritage Foundation, eliminating all countries that do not have any of data. Thereafter, annual data are merged to obtain the set of data which cover the period from 2002 to 2009 for the Economic Freedom Network and the period from 2002 to 2011 for The Heritage Foundation in order to verify the results obtained in the statistical analysis carried out year to year. There are no data of the entrepreneurial activity index by opportunity and by necessity for the years 2000 and 2001, and for this reason, the set of data do not cover the whole study period.

Total Entrepreneurial Activity index (variable TEA)

Aggregated variable at national level that is interpreted as the percentage of population between 18 and 64 years who claims to be involved in any kind of entrepreneurship (including self-employment) that does not exceed 42 months of activity.

Total Entrepreneurial Activity index by opportunity (variable TEAOPP)

Population between 18 and 64 years who claims to be involved in any kind of entrepreneurship (including self-employment) that does not exceed 42 months of activity, due to use of a business opportunity.

Total Entrepreneurial Activity index by necessity (variable TEANEC)

Population between 18 and 64 years who claims to be involved in any kind of entrepreneurship (including self-employment) that does not exceed 42 months of activity, due to necessity.

Size of Government

This variable will be analyzed in two ways, through two indicators of freedom, namely, the Index of Economic Freedom in the World prepared by the Economic Freedom Network

Table 1. Distribution of cases for the analyzed variables. Number of countries between 2000 and 2011

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
TEA	20	29	37	31	34	35	42	42	43	54	58	56
EFW	123	123	123	127	130	141	141	141	141	141	-	-
IEF	155	157	157	155	155	157	157	157	179	179	179	179

Source: data for TEA are obtained from the GEM reports. Data for EFW are from the Economic Freedom Network reports and data for Gov’t Size comes from the Heritage Foundation reports.

1. Data are available on the web address of the institute, at <http://www.freetheworld.org/release.html>.

2. Data are available on the web address of the foundation, at <http://www.heritage.org/index/Download.aspx>.

and the Index of Economic Freedom by The Heritage Foundation. Both indices measure the political and institutional consistency with economic freedom through five and ten major areas, respectively, with a scale of 1-10, where higher values correspond to higher levels of economic freedom.

The Index of Economic Freedom of the World is made up of 54 variables, which encompass five areas of economic freedom: size of government, legal structure and security of property rights, access to sound money, freedom to trade internationally and regulation of credit, labor and business. The index of Economic Freedom published by The Heritage Foundation is made up of 100 variables which encompass 10 areas of economic freedom: business freedom, trade freedom, fiscal freedom, government spending, monetary freedom, investment freedom, financial freedom, property rights, freedom from corruption, and labor freedom. Due to the high number of variables, it have been described five variables corresponding to the area “size of government” for both indices. In conclusion, for identical reasons, it have been only explained the variables that have statistical consistence according to our model.

Table 2 expresses the variables included in both indices in the empirical study.

Size of Government: Expenditures, Taxes and Enterprises (Size Gov)

The four components of “size of government” indicate the extent to which countries rely on the political process to allocate resources and goods and services. When government spending increases relative to spending by individuals, households, and businesses, government decision-making is substituted for personal choice and economic freedom is reduced. Therefore, countries with low levels of government spending as a share of the total, a smaller government enterprise sector, and lower marginal tax rates earn the highest ratings in this area.

In order to measure the size of government, as defined by EFW, the four variables, which made it up, have been used:

General government consumption spending as a percentage of total consumption (variable *EFWA1*): when government consumption is a larger share of the total, political choice is substituted for personal choice (Gwartney *et al.* 2009, p. 6).

Transfers and subsidies as a percentage of GDP (variable *EFWA2*): similarly, when governments tax some people in order to provide transfer to others, they reduce the freedom of individuals to keep what they earn (Gwartney *et al.* 2009, p. 6).

Government enterprises and investment (*EFWA3*): this area measures the extent to which countries use private rather than government enterprises to produce goods and services. Government firms play by rules that are different from those to which private enterprises are subject. They are not dependent on consumers for their revenue or on investors for capital. They often operate in protected markets. Thus, economic freedom is reduced as government enterprises produce a larger share of total output (Gwartney *et al.* 2009, p. 6).

Top marginal tax rate (*EFWA4*): is based on the top marginal income tax rate and the top marginal income and payroll tax rate and the income threshold at which these rates begin to apply. High marginal tax rates that apply at relatively low income levels are also indicative of reliance upon government. Such rates deny individuals the fruits of their labor. Thus, countries with high marginal tax rates and low income thresholds are rated lower (Gwartney *et al.* 2009, p. 6).

Government Size (Gov't Size)

Excessive government spending is a problem for economic freedom in terms of income generation and in terms of expenditure. Government spending is often justified in terms of “public goods” provided efficiently by the state rather than the market. The isolation of the government from market discipline leads to inefficiency, bureaucracy and reduced productivity. The degree of interest of a government for private resources affects both economic freedom and economic growth (Miller *et al.*, 2010).

Economic development stage

Economic development is captured by the classification developed by Schwab, Porter and Sachs (2002). This rating is stated on the Global Competitiveness Report prepared by the World Economic Forum.

Factor Driven Stage: these economies are primarily based on primary or extractive sector and consider the production factors (essentially human capital) as elements with the ability of improving productivity and competitiveness. These countries are unable to maintain the institutional conditions

Table 2. Exogenous variables of the Index of Economic Freedom of the World and the Heritage Foundation

<i>Size of Government</i>	<i>Indices</i>	<i>Subarea</i>
It indicates the degree to which a country is based on personal choice (and markets), or a policy planning. Countries with smaller government are top-rated.	The Index of Economic Freedom of the World (Size Gov)	EFWA1. General government consumption (% total)
		EFWA2. Transfers and subsidies as a percentage of GDP
		EFWA3. Government enterprises and investment
		EFWA4. Top marginal tax rate
The index of Economic Freedom of the Heritage Foundation (Gov't Size)	General government consumption spending as a percentage of total consumption. Transfers and subsidies as a percentage of GDP. Government enterprises and investment. Top marginal tax rate	

Source: EFW indicators are from the Economic Freedom Network and Gov't Size indicator comes from the Heritage Foundation.

necessary for the creation of highly productive companies, and as a consequence, population is bound to create their own activity, being the necessity its main motivation for setting up a company.

Efficiency Driven Stage: at this stage, the economies of scale are the driving force of economic development. The entrepreneurial level decreases due to the emergence of large companies that concentrate the labor force. The productive sectors start to provide jobs. The necessity-motivated activities are reduced at this stage.

Innovation Driven Stage: economies based on the production of new goods and services (pioneering and sophisticated productions). The offer in the service sector is expanded and the firm size is no longer a requirement to compete. As a result, the entrepreneurial level grows motivated by the use of opportunities.

The economic phases will be used to frame each country in the corresponding stage. Correlations are made for each of the economic stages in order to check if our model ratios contrasts are raised.

We have chosen to undertake an analysis of correlation, because we try to find out the intensity or strength of the relationship between two or more variables, not causality. This type of analysis is suitable for our research because it used to be done in the context of a retrospective or observational study, as in our case. Besides, the correlation analysis is preferable to be reserved to generate hypotheses rather than to check them, because of that we have not raised hypothesis in this paper.

The areas of the economic freedom index “Size of Government: Expenditures, Taxes and Enterprises” published by the Economic Freedom Network from the year 2000 to the year 2009, and “Government Size” published by The Heritage Foundation from the year 2000 to the year 2011, have been confronted statistically with the index that marks the entrepreneurial activity in a country in order to assess and quantify the existence of a relationship between both indices.

Annual data of the entrepreneurial activity index (total, by opportunity and by necessity) will be compared with annual

data of the aforementioned areas, or if they had, with its components. Similarly, countries will be grouped following the classification done by the World Economic Forum in the Global Competitiveness Report and it will be carried out the same statistical data analysis.

4. Results

4.1. Economic Freedom of the World

Results shown in Table 3 explain the relationship obtained between the different components of the area “Size of Government: Expenditures, Taxes and Enterprises” and the TEA index.

The correlation analysis results have shown that the variables EFWA1 and EFWA2 are positive associated with the TEA index in most years. These first two components are indicators of the size of the government, indicating that the lower the government spending relative to total expenditure of a country and the lower the percentage, relative to GDP, of subsidies and transfers faced by a government, the higher the total entrepreneurial activity index.

The third component, EFWA3, measures how a country uses government enterprises and investment to produce goods and services. This variable is negatively associated with the TEA index only in two years. This result shows that this variable has no special influence on the increase or decrease in new companies.

The fourth variable, EFWA4, has shown a positive association in half of the years. The application of high marginal tax rates at low income levels indicates that the size of the government is greater, and therefore, individuals are deprived of the results of their work. The lower the marginal tax rates applied, the lower the size of government, and as a consequence, the higher the rate of entrepreneurship.

Data for the period from the year 2002 to the year 2009 have been merged in order to have a larger number of cases and verify the results obtained previously. The results have shown a significant relationship for all components of this area. Based on the results, countries with lower public spending with respect to total expenditure and lower

Table 3. Relationship between the area “Size of Government: Expenditures, Taxes and Enterprises” and the TEA index

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2002-2009
Cases	17	17	24	24	28	29	36	34	34	43	280
EFWA1	0,327	0,428	0,526**	0,455*	0,462*	0,311	0,489**	0,429*	0,552**	0,532**	0,459**
EFWA2	0,385	0,394	0,514**	0,405*	0,660**	0,637**	0,573**	0,667**	0,672**	0,580**	0,559**
EFWA3	0,479	0,390	0,224	-0,004	-0,526**	-0,172	-0,263	-0,310	-0,376*	-0,271	-0,303**
EFWA4	0,355	0,077	0,236	0,228	0,476**	0,389*	0,408*	0,408*	0,526**	0,254	0,396**

* Indicates significance at 0,05%. ** Indicates significance at 0,01%.

Source: Authors' calculations. Data for TEA are obtained from the annual GEM reports. Data for EFW come from the Economic Freedom Network reports.

marginal tax rates will be those that have greater rates of entrepreneurship.

Table 4 presents the results of correlation analysis between the different components of the area "Size of Government: Expenditures, Taxes, and Enterprises" and the opportunity-motivated TEA index. The first two elements of this area of the economic freedom are strong and positive associated with the TEA index by opportunity. Except for the years 2002 and 2003, the other years analyzed have shown that the smaller the size of government, the greater the number of entrepreneurs who have started a business as a result of the use of an opportunity. Specifically, the variable that has the greater significance is that which measures the percentage of subsidies and transfers with respect to GDP spent by governments.

The analysis of the third variable has shown similar results to those obtained for the total entrepreneurial activity index, as it has been obtained a negative relationship in the same two years. The greater or lesser number of government companies in a country has not been a determining factor for those individuals who find an opportunity to set up a new company.

The results of the correlation analysis for the fourth variable, *EFWA4*, have also presented great similarities with those of the previous table. Except for the year 2005, data have shown the same relationship and level of significance than those obtained for the total entrepreneurial activity index. The lower the top marginal tax rates, the greater the value of the opportunity-motivated TEA index.

When data are merged from the year 2002 to the year 2009, the results have shown a significant relationship for each element in this area. Based on the results, in countries with

lower government spending relative to total spending and lower marginal tax rates, the entrepreneurial activity will be greater due to the use of opportunities in markets.

Table 5 show data for the correlation analysis between the components of the area "Size of Government: Expenditures, Taxes and Enterprises" and the necessity-motivated TEA index.

The results are very similar to the previously shown. It has been obtained, again, a positive relationship for the first two components of this area. Thus, the smaller the size of government, the greater the number of individuals that are obligated to set up a company due to a need. This time, the variable that has shown greater significance is that which measures the public spending with respect to total expenditure of a country, and therefore, this variable is that which determines the value of the necessity-motivated TEA index in a higher percentage.

The third component, *EFWA3*, has been this time negative associated for only one year. As in previous analysis, the greater or lesser number of government companies in a country is not a factor that inhibits the start of a new business by those entrepreneurs who do it by necessity.

It is especially remarkable the result obtained for the variable *EFWA4*, because although it has shown a significant relationship in previous analysis, this time hardly appears as a factor fostering entrepreneurship. It has been obtained a positive association only the years 2004 and 2008. Therefore, marginal tax rates do not arise as determinant of entrepreneurship when a business is set up by necessity.

When data are merged for the period the years from 2002 to 2009, the results have shown a significant relationship again

Table 4. Relationship between the area "Size of Government: Expenditures, Taxes and Enterprises" and the opportunity-motivated TEA index

Year	2002	2003	2004	2005	2006	2007	2008	2009	2002-2009
Cases	24	24	28	29	36	34	34	43	280
<i>EFWA1</i>	0,391	0,354	0,407*	0,230	0,449**	0,406*	0,560**	0,549**	0,415**
<i>EFWA2</i>	0,456*	0,376	0,664**	0,526**	0,557**	0,681**	0,667**	0,576**	0,549**
<i>EFWA3</i>	0,105	-0,074	-0,543**	-0,121	-0,216	-0,294	-0,366*	-0,234	-0,277**
<i>EFWA4</i>	0,180	0,247	0,457*	0,347	0,420*	0,441**	0,573**	0,294	0,401**

* Indicates significance at 0,05%. ** Indicates significance at 0,01%.

Source: Authors' calculations. Data for TEA are obtained from the annual GEM reports. Data for EFW come from the Economic Freedom Network reports.

Table 5. Relationship between the area "Size of Government: Expenditures, Taxes and Enterprises" and the necessity-motivated TEA index

Year	2002	2003	2004	2005	2006	2007	2008	2009	2002-2009
Cases	24	24	28	29	36	34	34	43	280
<i>EFWA1</i>	0,529**	0,512*	0,535**	0,351	0,494**	0,429*	0,458**	0,466**	0,464**
<i>EFWA2</i>	0,398	0,363	0,574**	0,583**	0,506**	0,536**	0,558**	0,522**	0,467**
<i>EFWA3</i>	0,326	0,127	-0,395*	-0,193	-0,298	-0,315	-0,301	-0,260	-0,282**
<i>EFWA4</i>	0,241	0,274	0,477**	0,275	0,314	0,296	0,343*	0,191	0,316**

* Indicates significance at 0,05%. ** Indicates significance at 0,01%.

Source: Authors' calculations. Data for TEA are obtained from the annual GEM reports. Data for EFW come from the Economic Freedom Network reports.

for each element of this area. The necessity-motivated TEA index will reach greater values when countries apply low marginal tax rates and achieve low levels of government spending.

4.2. Index of Economic Freedom

Table 6 shows the results obtained by analyzing the relationship between the area “Government Size” of the Index of Economic Freedom published by The Heritage Foundation and the TEA index, the TEA index by opportunity and by necessity. The study period covers the years between 2000 and 2011.

The variable *Gov’t Size* has shown a positive relationship in most years of the study period, reaching its maximum value in the year 2007 with a total of 0,650. These results indicate that the TEA index is strongly correlated with the size of government.

The results obtained for the correlations analysis between this variable and the opportunity-motivated and necessity-motivate TEA index are very close to the results discussed in the previous paragraph. The only year that this variable has not appeared as determinant of the TEA index by opportunity and by necessity is the year 2010, as with the TEA index. As before, the highest values for the indices of entrepreneurial activity by opportunity and by necessity have been reached in the year 2007.

Data have been merged for the period 2002-2011 and the results of the analysis have corroborated the results obtained year to year.

4.3. Factor Driven Economies

Table 7 shows the results of the correlation analysis between the entrepreneurial activity indices and those published by The Economic Freedom Network and The Heritage Foundation for those countries that are grouped as “Factor Driven Economies”. Data used in the analysis cover the period between the years 2002 and 2009 for the index developed by the Economic Freedom Network and between 2002 and 2011 for the index developed by The Heritage Foundation.

The main feature of the economies of these countries is that they rely exclusively on basic factors of production, such as natural resources, favourable climatic conditions or low-skilled labor that is moreover abundant and cheap. In the results obtained for these nations it can be seen that the size of government is not a determinant factor in entrepreneurship. Only the variable *EFWA4*, corresponding to the maximum marginal tax rates applied, shows a significant relationship for the necessity-motivated TEA index. The variable *Gov’t Size* does not appear as a determinant of entrepreneurial activity.

Table 6. Relationship between the area Government Size and the entrepreneurial activity indices

Year	Cases	TEA	TEAOPP	TEANEC
2000	20	0,387	-	-
2001	29	0,475**	-	-
2002	37	0,525**	0,384*	0,575**
2003	29	0,510**	0,441*	0,551**
2004	34	0,501**	0,470**	0,503**
2005	33	0,513**	0,454**	0,469**
2006	40	0,498**	0,466**	0,450**
2007	38	0,650**	0,610**	0,634**
2008	43	0,576**	0,552**	0,542**
2009	53	0,506**	0,518**	0,449**
2010	56	0,164	0,109	0,207
2011	55	0,556**	0,501**	0,506**
2002-2011	418	0,459**	0,411**	0,458**

* Indicates significance at 0,05%. ** Indicates significance at 0,01%

Source: Authors’ calculations. Data for TEA are obtained from the annual GEM reports. Data for EFW come from the Economic Freedom Network reports.

Table 7. Relationship between the area Government Size and the entrepreneurial activity index of countries grouped as “Factor Driven Economies”

FDE	Economic Freedom Network 2002 - 2009				Heritage Foundation 2002 - 2011
	EFWA1	EFWA2	EFWA3	EFWA4	Gov’t Size
Variable					
Cases	23	23	23	23	48
TEA	0,174	-0,116	0,106	-0,375	-0,022
TEAOPP	0,181	-0,212	0,200	-0,307	-0,029
TEANEC	0,141	-0,003	0,163	-0,414*	0,023

* Indicates significance at 0,05%. ** Indicates significance at 0,01%

Source: Authors’ calculations. Data for TEA are obtained from the annual GEM reports. Data for EFW come from the Economic Freedom Network reports.

4.4. Efficiency Driven Economies

Table 8 presents the results for the countries belonging to the group “Efficiency Driven Economies”. The economies of these countries still have competitive advantages in the cost of the basic factors, although the introduction of mechanisms specialized in the creation of factors, such as educational institutions and research institutes allow them to advance in these advantages. The main feature of this stage is that governments invest in more modern and efficient production processes.

The results indicate that the component *EFWA3*, which measures the production of goods by government companies, has not shown a significant relationship with none of the TEA indices. The necessity-motivate TEA index has not shown a significant relationship for the variable *EFW1*. Looking at the values obtained for this group of countries, it can be seen that the opportunity-motivated TEA index is that which has reached the higher values, and therefore, this

Table 8. Relationship between the area Government Size and the entrepreneurial activity index of countries grouped as "Efficiency Driven Economies"

EDE	Economic Freedom Network 2002 - 2009				Heritage Foundation 2002 - 2011
	EFWA1	EFWA2	EFWA3	EFWA4	Gov't Size
Cases	102	102	102	102	148
TEA	0,296**	0,526**	-0,152	0,468**	0,456**
TEAOPP	0,366**	0,566**	-0,166	0,488**	0,432**
TEANEC	0,114	0,375**	-0,090	0,368**	0,397**

* Indicates significance at 0,05%. ** Indicates significance at 0,01%.

Source: Authors' calculations. Data for TEA are obtained from the annual GEM reports. Data for EFW are from the Economic Freedom Network reports and data for Gov't Size comes from the Heritage Foundation reports

Table 9. Relationship between the area Government Size and the entrepreneurial activity index of countries grouped as "Innovation Driven Economies"

IDE	Economic Freedom Network 2002 - 2009				Heritage Foundation 2002 - 2011
	EFWA1	EFWA2	EFWA3	EFWA4	Gov't Size
Cases	155	155	155	155	222
TEA	0,211**	0,502**	-0,103	0,244**	0,290**
TEAOPP	0,160*	0,490**	-0,088	0,227**	0,235**
TEANEC	0,409**	0,270**	-0,027	0,208**	0,370**

* Indicates significance at 0,05%. ** Indicates significance at 0,01%.

Source: Authors' calculations. Data for TEA are obtained from the annual GEM reports. Data for EFW are from the Economic Freedom Network reports and data for Gov't Size comes from the Heritage Foundation reports.

is the index which is explained in a higher percentage by means of this area of the economic freedom index.

4.5. Innovation Driven Economies

Table 9 shows the results of the countries whose economies have been grouped as "Innovation Driven Economies". At this stage, governments and businesses acquire and improve not only technology but also create it. There are no advantage over the cost of products or services, which encourages innovation and the advance on the design and the technology of these products and processes. These countries have high-skilled individuals and advanced technology.

For these countries, the variable which measures government companies and investment has not arisen as determinant factor that increases or decreases the value of the entrepreneurial activity indices. In these countries, the necessity-motivated TEA index is better explained by the component which measures government spending relative to total expenditure, and the opportunity-motivated TEA index is better explained by the component that measures the percentage, relative to GDP, of subsidies and transfers spent by a government.

5. Discussion and conclusions

In the results published in the present study the areas "Size of Government: Expenditures, Taxes and Enterprises" and "Government Size" have shown a positive correlation with the three indices of entrepreneurial activity. It can be concluded that the smaller the charges applied to the income and the lower the government spending, the greater entrepreneurial activity in a country. This study is consistent with Sobel *et al.* (2007), Nyström (2008) and Aidis *et al.* (2010). Moreover, this study extends those of these authors because is greater both the number of cases and the time period used in the analysis. Statistical analysis of correlations has proved that the "size of government" is related to entrepreneurship through the analysis of an index that is published by two different institutions and that allows to prove the robustness of results.

The results presented suggest that differences in this area of the institutional framework help to explain differences in entrepreneurship. Formal institutions, measured in this case as "size of government", have a significant impact on levels of entrepreneurial activity, which corroborates previous studies whereby a better institutional quality determines entrepreneurial activity (Baumol, 1990; Audretsch *et al.*, 2002).

According to the study, a first step in the process of promoting entrepreneurial activity should be the improvement of the balance between the government spending (through transfers, subsidies, investment...) and economic inputs through marginal tax rates.

Institutions and their development are presented as the determining factors in the influence of the environment to achieve an increase in entrepreneurial activity, since differences in institutional quality help to explain differences in entrepreneurial activity (Hall & Sobel, 2008). This growth will lead to a reduction of uncertainty as a result of a greater number of companies, that means more job security, economic stability, etc. It is expected that this situation, in turn, contributes to economic development and to increase economic freedom, what ultimately allows achieving the levels of prosperity and the degree of stability that require societies from those nations which had shown the highest rates of entrepreneurial activity and lower rates of economic freedom. These statements coincide with Sobel (2008) whereby institutional quality promotes the entrepreneurial process, which in turn creates income and wealth. The countries with the most economic freedom also have higher rates of long-term economic growth and are more prosperous than are those with less economic freedom (O'Driscoll, Kirkpatrick, & Holmes, 2001).

There is empirical evidence that entrepreneurial activity varies across stages of economic development (Acs & Szerb,

2007), and this stage will depend on the development level of institutions.

In underdeveloped countries, the lack of employment prospects is high and institutions have not been developed yet. There is an absence of transfers, subsidies and public investment. A way out of this situation is the creation of a business or the self-employment. The absence of statistical significance for these countries points a small government sector out and that entrepreneurs are not influenced by government spending, as a large public sector should be preceded by economic growth (Heckelman, 2000) and, therefore, by entrepreneurship.

In developing countries, a small government sector promotes the emergence of new entrepreneurs. The association with opportunity-based entrepreneurship is particularly strong with data of the Economic Freedom Network (Larroulet & Couyoumdjian, 2009). It does not arise as factor that encourages the emergence of new entrepreneurs in these countries the use of private companies rather than government enterprises to produce goods and services, as these usually operate in protected markets.

A positive effect on entrepreneurial activity, and therefore, on economic growth is found for highly developed countries for this area of economic freedom (Acs & Szerb, 2007). In these nations, the smaller government spending, transfer, subsidies and marginal tax rates, the greater the entrepreneurial activity. Government enterprises and investment are not related to the entrepreneurial activity indices. Countries that get a high score in economic freedom for this variable are those whose economies are not dominated by government enterprises and public investment. In these countries, markets are not protected by government, and therefore, entrepreneurs do not find any obstacles in markets when creating a new company.

Finally, considering the possible practical applications that can be derived from the research, we should mention that our study provides empirical evidence of the inverse relationship between the size of government and entrepreneurship, but only for efficiency driven economies and innovation driven economies, so that we agree with the literature that supports this approach. Especially, this relationship is confirmed for the percentage of government consumption in transfers and subsidies and marginal tax rates. However, in both types of economies it has not been found evidence that government enterprises or government investment are related to entrepreneurship. Aspect that will be analyzed.

In factor-driven economies, institutions need to be strengthened and a process of centralization of state (Acemoglu & Robinson, 2012) occurs before the size of the public sector can influence on the entrepreneurship.

6. Limitations and future researches

The main limitation of this study has been the small number of countries for which data about entrepreneurial activity are available, although the increase in recent years has been substantial. This has been the cause of having merged data from different years, achieving a greater number of cases, even when the period of study has been reduced.

In addition to the above mentioned, the evolution over time in the design of the indices of economic freedom originates that not all years have an equal number of areas and subindices. The index published by the Economic Freedom Network has been the subject of prolonged debate with the affirmation that it measures several aspects that are only weakly associated with each other (De Haan, Lundstrom, & Sturm, 2006) and the index published by The Heritage Foundation is also criticized due to the ideological bias (Aixalá & Fabro, 2007). The correlation analysis suggest that the four components of the area "Size of Government: Expenditures, Taxes and Enterprises" are sufficiently differentiated to allow estimation of different effects (Bjørnskov & Foss, 2010). While there is consensus on the addition of certain aspects (trade policy, property rights, foreign capital flow, financial activity), the biggest debate focuses on emphasizing the construction of the components 'size of government' and "monetary stability". In particular, the Economic Freedom Network and The Heritage Foundation consider more negative a large public sector and the monetary instability than the other components (Aixalá & Fabro, 2007).

Future researches of this study should include the same statistical analysis for the other areas of the economic freedom indices, deeper statistical analyzes that delve into the results, as well as a differentiation according to gender for entrepreneurial activity data.

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