



The role of entrepreneurship in different economic phases

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1. Introduction

In recent decades, economic growth has become one of the main objectives of economic policy because of its positive effect. Higher economic growth means, among other things, more goods and services, less unemployment and ultimately greater welfare for the economy. Consequently, a large amount of literature seeking to determine the most influential variables on economic growth to design an appropriate economic policy has been produced.

A series of measures have to be taken to reach and maintain this growth phase over time (Nissan, Galindo Martín, & Méndez Picazo, 2011; Rodrik, 2005). Several variables have been considered, especially after improving the available statistical information. This means that a more complete study including quantitative variables, such as human capital (e.g., Capelleras, Contín-Pilart, Larraza-Kintana, & Martín-Sánchez, 2019; Nasiri & Hamelin, 2018) and public expenditures (e.g., Aschauer, 1989; Sasmal & Sasmal, 2016) but also and qualitative variables, such as the income distribution (e.g., Breen & García-Peñalosa, 2005; Neves, Afonso, & Silva, 2016), corruption (e.g., Ciešlik & Goczek, 2018; Mo, 2001), and institutions (e.g., Boudreaux, Nikolaev, & Klein, 2019; Galindo-Martín, Méndez-Picazo, & Castaño-Martínez, 2020; Urbano, Turró, & Aparicio, 2019), can be conducted, leading to a better understanding of the growth dynamics.

Special attention has been paid to entrepreneurship as one of these variables. Schumpeter (1934, 1947) indicated the relevant role that the entrepreneur plays and the positive consequences for economic growth, which is due to the innovation that the entrepreneur introduces in the production process. In this sense, there is extensive literature that analyses the relationship between entrepreneurship and economic growth (for example, Acs, Audretsch, Braunerhjelm, & Carlsson, 2012; Audretsch, 2005; Audretsch & Keilbach, 2004a, b; Castaño, Méndez, & Galindo, 2016; Galindo & Méndez, 2014; Méndez-Picazo, Galindo-Martín, & Ribeiro-Soriano, 2012; Stoica, Roman, & Rusu, 2020). Two main variables that influence entrepreneurship have been considered: institutions (e.g., Acemoglu, 2003; Acs, Estrin, Mickiewicz, & Szerb, 2018; Bosma, Content, Sanders, & Stam, 2018; Boudreaux et al., 2019;

Elert & Henrekson, 2017; Galindo-Martín et al., 2020; Urbano, Turró, et al., 2019) and innovations (e.g., Betts, Laud, & Kretinin, 2018; Chowdhury, Audretsch, & Belitski, 2019; Galindo & Méndez-Picazo, 2013, Galindo & Méndez, 2014; Malerba & McKelvey, 2019; Medeiros, Marques, Galvão, & Braga, 2020; Schmitz, Urbano, Dandolini, de Souza, & Guerrero, 2017). However, a third variable can also be considered – the social climate. Following the Schumpeterian perspective (Schumpeter, 1934), it refers to the sociological, economic and institutional environment in which the entrepreneur develops his activity. An adequate social climate would stimulate entrepreneurs to develop business activity (Castaño et al., 2016).

However, there are no studies that analyse the behaviour of these relationships in the different economic phases (expansions and crises) of economies, which would allow us to focus on the relationship between entrepreneurship and economic growth in each phase of the economic cycle in order to design suitable economic measures to continue expanding economic growth.

The objective of the paper is to analyse the role that entrepreneurship has played in a group of OECD countries considering the three phases or periods that their economies have gone through: expansion, crisis and subsequent recovery. Two aspects have been considered. First, the relationship between entrepreneurship and economic growth, taking into account the factors that influence entrepreneurial activity, is considered. Three factors have been considered: institutions, the social climate and innovation. Second, the different phases that the economies have gone through are considered. Fifteen OECD countries and three periods have been considered: a) prior to the economic crisis, 2004–2006; b) the economic crisis, 2008–2010; and c) the post-crisis economic recovery, 2014–2016.

Section 2 shows the theoretical frame of these relationships. Section 3 will carry out the empirical analysis for fifteen OECD countries and estimate a structural equation model (SEM) in each of the periods considered. The statistical technique was chosen because it allows the relationships between multiple dependent and independent constructs to be simultaneously, systematically and completely assessed and it allows for exploratory studies when there is no prior consolidated

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theory. In addition, to estimate this SEM model, the partial least squares (PLS) will be used in order to work with latent and observable variables, with small samples and with second-generation data (Hair, Risher, Sarstedt, & Ringle, 2019; Rigdon, Sarstedt, & Ringle, 2017; Sarstedt, Bengart, Shaltoni, & Lehmann, 2018). Finally, section 4 presents the main conclusions.

2. Factors that enhance entrepreneurship and economic growth

The crisis suffered by the countries at the end of the last decade has led to the emergence of several studies that attempt to determine the variables that foster economic growth in order to maintain or increase welfare. According to researchers, entrepreneurship is one of the key factors that promote economic growth. In general terms, it is necessary that people use their funds to create and develop new firms and set up businesses while assuming the inevitable risks in this process (Audretsch & Keilbach, 2004a; Audretsch, Keilbach, & Lehmann, 2006; Castaño-Martínez, Méndez-Picazo, & Galindo-Martín, 2015; Wilson, Wright, & Kacer, 2018).

Given these circumstances, we will have two groups of measures once the relationship between entrepreneurship and economic growth is established (Galindo-Martín et al., 2020; Nissan, Galindo Martín, & Méndez Picazo, 2011; Rodrik, 2005). The first group includes measures creating an adequate environment in order to exploit the yields and the positive effects derived from the investment process. Different variables can be contemplated: innovations, tax policy, credit policy, etc. The second group includes measures sustaining economic growth, which implies the creation of appropriate institutions, the essential purpose of which is to promote market activity that mitigates or eliminates economic shocks (Acemoglu, Johnson, & Robinson, 2001). In this second area, we could include defending property rights, the rule of law, the ease of access to credit, etc.

Considering these two groups, it is possible to determine the factors that would act on entrepreneurship to generate the right environment for growth, as well as those variables for long-term entrepreneurship that would allow such growth to be sustained over time. Regarding the first group of measures, innovations and the social climate are the two variables that would be considered. Regarding the second group, institutions would be the variable to consider.

With regards to the relationship between innovations and entrepreneurship, Schumpeter (1947) emphasizes the essential role that innovations and the entrepreneur play in the process of economic growth. The importance of innovations in business activity is highlighted by Drucker (1998), who points out that innovations are at the heart of entrepreneurial activity since entrepreneurs are responsible for introducing innovations into the production process. In this sense, we must also bear in mind that, thanks to the introduction of innovations into entrepreneurial activity, other entrepreneurs could be encouraged to develop their activity and even to introduce more innovations (Bagheri, Mitchelmore, Bamiatzi, & Nikolopoulos, 2019).

The social climate is the second variable to consider in this group. This concept was introduced by Schumpeter (1934) to refer to the sociological, economic and institutional environment in which the entrepreneur develops or wants to carry out his activity. If the social climate is adequate, economic agents would be stimulated to develop a business activity, which would have a positive impact on economic growth (Galindo & Méndez, 2014).

The factors that influence this social climate could be divided into two groups: economic and institutional. In the first group, depending on the behaviour of some variables or objectives, economic factors may cause more or less social tensions that would make the climate more negative. Two main factors could be included in this group. The first is unemployment. Higher unemployment would increase social tensions, and so fiscal measures will be designed to benefit the situation, leading to tax increases that will discourage entrepreneurial activity. Conversely, less employment would change the reasons that

entrepreneurs have to carry out their activity: they would carry out activity by necessity instead of seeking an opportunity. This means that when the economic conditions change and the level of unemployment decreases, an important number of these entrepreneurs will abandon their situation to become employees. Second, the Human Development Index (HDI), an indicator developed by the United Nations Development Program (UNDP) that groups the three characteristics of health (measured according to life expectancy at birth), education (measured by the adult literacy rate) and wealth (measured by GDP per capita), can be considered within this group. A higher HDI would imply that there is a more favourable environment for fewer social tensions since health, education and wealth would be better.

In the case of institutional factors, it is necessary to consider that, in addition to influencing the entrepreneur, since one of the actions of institutions is to provide adequate incentives to entrepreneurs so that they can develop and expand their activity (Bosma et al., 2018; Dilli, Elert, & Herrmann, 2018), basically through the rule of law and protecting private property, the institutions would also favour this social climate by providing the appropriate framework for economic agents when developing their business and non-business activities. The reduction of the economic shocks supposes that the expectations of the economic agents improve, thereby reducing social tensions.

Finally, in order to complete the analysis, it is also necessary to consider that institutions not only could enhance entrepreneurship activity but could also enhance economic growth (Bosma et al., 2018; Przeworski & Limongi, 1993; Sirowy & Inkeles, 1990). Institutions establish the incentives and the rules that economic agents must follow in order to develop their activity (Acemoglu, Johnson, & Robinson, 2005, pp. 386–387). Depending on the design of these rules, economic agents will have more facilities or more restrictions to stimulate their activity and economic relationships, as well as to improve expectations or to reduce uncertainty. In this sense, some studies consider that institutions can favour the achievement of economic results through the distribution of the resources derived from their activity (Alam, Uddin, & Yazdifar, 2019; Elert & Henrekson, 2017).

In this way, we could also set a relationship among institutions, entrepreneurship and economic growth (Acs et al., 2018; Bosma et al., 2018; Galindo-Martín et al., 2020; Urbano, Aparicio, & Audretsch, 2019), which would mean that the institutions would foster sustained growth over time, directly and indirectly, through entrepreneurship.

Usually, these relationships have been analysed for a more or less extensive period of time, regardless of the economic phase of the country. That is, it can be assumed that in an economic expansionary period, the behaviour and/or the weights of the variables in the relationships considered may vary compared to those in an economic slowdown.

For this reason, the analysis of the relationships among institutions, social climate, innovations, entrepreneurship and growth in three periods is carried out considering the following hypothesis.

H1 There is a positive relationship between innovations and entrepreneurship.

Entrepreneurs introduce innovations in their production processes to expand their activity, considering the existing uncertainty and the risks they face. As a result, this encourages other entrepreneurs to imitate them, thereby generating new innovations (Autio, Kenney, Mustar, Siegel, & Wright, 2014; Drucker, 1998). Therefore, it is expected that there is a positive relationship between innovation and entrepreneurship, but this will be greater in expansionary phases since in R&D expenditures are usually lower in recessionary phases.

H2 There is a positive relationship between the social climate and entrepreneurship.

A suitable social climate is necessary to stimulate entrepreneurial

activity and to encourage economic agents to create new businesses. Presumably, in less expansionary times, there are greater social tensions, which mean that there is a lower predisposition to undertake entrepreneurial activities. In addition, in these phases, there will be more entrepreneurs by necessity (Evans & Leighton, 1989; Thompson, 2011). In phases with economic crises, entrepreneurs by necessity who are encouraged to create businesses primarily due to involuntary job loss or to the shortage of vacancies that occur with rising unemployment emerge (Roche & Conti, 2018), the number of which will be reduced due to their interest in carrying out their activity disappearing when the phase of the economic cycle changes.

H3 There is a relationship between institutions and the social climate.

The appropriate environment and reforms introduced by institutions would positively affect the labour market with beneficial effects on employment, which would reduce social tensions. In addition, they can improve the training of economic agents, which would allow them not only to facilitate the introduction of new technologies but also to take advantage of the technological advances that are taking place, which would positively affect one of the indicators included in the Human Development Index, specifically, education. All this would have a positive effect on the social climate.

H4 Institutions affect growth directly and indirectly through entrepreneurship.

Institutions establish the rules and the conditions in which entrepreneurial activity will be developed. If such an environment is not adequate and property rights are not secured, entrepreneurs will be more willing to place their resources in safe places, such as land, precious metals, etc., than in creating new business activities (Autio et al., 2014; Tomaszewski, 2018).

In turn, institutions also have a direct effect on economic growth since economic activity is enhanced through the reforms introduced and the standards developed to establish the behavioural patterns of economic agents and markets. Likewise, the distribution of the economic resources obtained by the institutions would encourage growth (Alam et al., 2019; Elert & Henrekson, 2017).

H5 There is a direct relationship between entrepreneurship and economic growth.

The literature has shown the positive relationship between both variables (for example, Acs et al., 2012; Audretsch, 2005; Audretsch & Keilbach, 2004a, b; Castaño et al., 2016; Galindo & Méndez, 2014; Méndez-Picazo et al., 2012; Stoica et al., 2020), and so entrepreneurship can be considered to be another factor promoting the economic growth of a country.

3. Empirical analysis considering recent economic phases

3.1. Methods and data

In this section, empirical analysis is carried out to verify the theoretical relationships described above. Three periods have been chosen: a) prior to the economic crisis, 2004–2006; b) the economic crisis, 2008–2010; and c) the post-crisis economic recovery, 2014–2016. The sample includes fifteen OECD countries: Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom and the United States.

To determine the three periods of the empirical analysis, we have considered the evolution of the GDP per capita growth rate, following the works of Christiano, Eichenbaum, and Trabandt (2015), Duran and Ferreira-Lopes (2017), and Martin and Philippon (2017). The year 2008

is the beginning of the so-called recent Great Recession (Duran & Ferreira-Lopes, 2017; Martin & Philippon, 2017). Following these approaches, three periods have been considered: 1. The 2004–2006 period is an expansionary period because the GDPpc rates are positive; 2. The 2008–2010 period represents the period of the economic crisis because its GDPpc growth rates are negative or close to zero economic growth; and 3. The 2014–2016 period presenting a positive GDPpc rate, which is considered a period of economic expansion.

The latent variables allow us to work with theoretical concepts (in some cases abstract concepts) that are not observable, as in this case. These constructs could be measured with several indicators by means of the structural equation model (SEM). This approach has several advantages allowing the following: (i) viewing the relationships between multiple dependent and independent constructions simultaneously, systematically and completely; (ii) combining formative and reflexive variables; (iii) calculating measurement errors; and (iv) refuting the a priori theory with hypotheses and data (Barclay, Higgins, & Thompson, 1995; Fornell, 1982; Gefen, Straub, & Bodeau, 2000). There are two approaches to the design of structural models: covariance and the partial least squares (PLS).

The second type is chosen to contrast the theoretical relationships previously analysed since the second generations of multivariate techniques allow the introduction of latent variables with several indicators, which are more appropriate when the sample size is small, the model is complex and causal, and multivariate normality is not required; and produce consistent parameter estimates (Barclay et al., 1995; Tenenhaus, 1998). In addition, they are used in social sciences to carry out exploratory studies when there are complex relationships between the variables and the aim is to explore theoretical extensions of established theories (Hair et al., 2019; Rigdon et al., 2017; Sarstedt et al., 2018).

The estimate was made using the partial least squares method (PLS) with the SmartPLS 3 program (www.smartpls.de). Each sample consists of 45 records, and this small sample is suitable for a Partial Least Squares estimate (Hair, Hult, Ringle, & Sarstedt, 2016).

The indicators that define each of the latent variables are listed below (see also Table 1):

- a) “Economic growth” is determined by two indicators: GDP per capita, which is based on purchasing power parity (PPP) and converted to constant 2011 international dollars (EGI); and GDP per person employed, which is the gross domestic product (GDP) divided by the total employment in the economy based on purchasing power parity (PPP) and converted to constant 2011 international dollars (EG2) (World Bank, 2019a).
- b) “Entrepreneurial activity” is measured by a single indicator called “Total Entrepreneurial Activity” (TEA). TEA is a survey item of the Global Entrepreneurship Monitor (GEM). This indicator measures entrepreneurial activity. Since the GEM considers adult active entrepreneurs (from 18 to 64 years old) who are immersed in the start-up process of a company and are owner-managers of a part or the whole company, also including self-employment. This indicator includes the three motivations to undertake entrepreneurship that the GEM survey considers: 1. “Entrepreneurship by opportunity”, that is, taking advantage of a business opportunity; 2. “Entrepreneurship by necessity”, which is when the entrepreneur intends to create his own position before the lack of other work alternatives; and 3. “Entrepreneurship for other reasons”, which includes entrepreneurship for other reasons and intermediate situations between the previous two (Kelley, Singer, & Herrington, 2012, p.13).
- c) “Innovation” has been calculated based on two indicators: the patent applications submitted by residents (PATR) and those submitted by non-residents (PATNR) (World Bank, 2019a). These patent applications are the worldwide patent applications filed through the Patent Cooperation Treaty procedure or any national patent office.

Table 1
Constructs and indicators.

Constructs	Indicators
Economic Growth	<ul style="list-style-type: none"> ● GDP per capita, PPP (constant 2011 international \$) (EG1) (World Bank, 2019a). ● GDP per person employed (constant 2011 PPP \$) (EG2) (World Bank, 2019a).
Entrepreneurship Innovation	<ul style="list-style-type: none"> ● Total early-stage Entrepreneurial Activity (TEA) (Global Entrepreneurship Monitor (GEM), 2019) ● Patent applications, residents (PATR) (World Bank, 2019a) ● Patent applications, non-residents (PATNR) (World Bank, 2019a)
R&D	<ul style="list-style-type: none"> ● R&D expenditures by the business enterprise sector (RDE) (Eurostat Database, 2019) ● R&D expenditures by the government sector (RDG) (Eurostat Database, 2019)
Social Climate	<ul style="list-style-type: none"> ● Human Development Index (1-HDI) (United Nations Development Programme UNDP, 2019). ● Unemployment total (% total labour force) (U) (World Bank, 2019a)
Institutions	<ul style="list-style-type: none"> ● Economic Freedom Index (EF) (Heritage Foundation, 2019). ● Government Effectiveness (GE) (World Bank, 2019b). ● Rule of Law (RL) (World Bank, 2019b) ● Starting a Business (SB) (World Bank, 2019c)

- d) “R&D” includes two indicators from the Eurostat Database (2019): R & D expenditures by the business enterprise sector (RDE) and R&D expenditures by the government sector (RDG) as a percentage of gross domestic product.
- e) “Social Climate” is based on unemployment rate (U) from the World Bank (2019a) and (1-HDI). One is subtracted from the HDI indicator to achieve a coherent construct. The Human Development Index (HDI) is a statistical index that measures a country’s overall social and economic achievement. The social and economic dimensions of a country are based on a long and healthy life, being knowledgeable and having a decent standard of living. The HDI is the geometric mean of the normalized indices for each of the three dimensions. The values range from 0 to 1, where 0 corresponds to the lowest rank and 1 to the highest rank. Therefore, if “1-HDI” is calculated, then the countries with the highest value of this new variable would correspond to those with less HDI, normally leading to higher unemployment rates.
- f) “Institutions”. Measuring and studying the effects of institutions on economic growth and entrepreneurial activity is becoming a typical approach, which has led to the appearance of several approaches for measuring the quality of institutions. In this study, we focused on four indicators from different sources to set this variable:
- EF is an index that measures economic freedom based on 12 quantitative and qualitative aspects. These factors are divided into four broad categories: the first category is the “rule of law” of the group, which includes property rights, government integrity, and judicial effectiveness; the second category is “government size”, and it considers government expenses, fiscal burden, and fiscal health; the third category involves “regulatory efficiency” consisting of labour freedom and monetary freedom; and the last category, “open markets”, includes commercial freedom, investment freedom, and financial freedom. Each of the twelve economic freedoms within this group is rated on a scale from 0 to 100 (Heritage Foundation, 2019).
 - GE collects the perceptions of the quality of public service, the quality of civil service and the degree of political pressure independence, the quality of policy formulation and implementation, and the governments commitment to such policies. The values range between 0 and 100, where 0 corresponds to the lowest rank and 100 to the highest rank (World Bank, 2019b).
 - RL measures the perceptions of trust and to what extent agents accept the rules of society, as well as the quality of contract execution, property rights, the police and the courts. It also considers the likelihood of committing crimes. The indicator has values from 0 to 100, with the lowest being 0 and the highest being 100 (World Bank, 2019b).
 - SB measures all the regulations that entrepreneurs have to comply with in order to start their business activity (e.g., authorizations, licenses, permits, etc.). Specifically, SB includes the scores for each of the component indicators: the procedures, time, and costs for an

entrepreneur to start and formally operate a business, as well as the minimum paid-in capital requirement.

3.2. Results

The structural equation modelling consists of two elements (Henseler, Ringle, & Sarstedt, 2015; Henseler, Ringle, & Sinkovics, 2009): (a) the structural model or inner model represents the constructs (circles) or latent variables and the relationship between exogenous and endogenous variables, and (b) the measurement models or outer models of the constructs and the indicator variables (rectangles) (Hair et al., 2016; Hair, Ringle, & Sarstedt, 2011).

Three models are proposed with reflective and formative latent variables. The reflective model is usually used in social sciences and is directly based on classical testing theory. According to Nunnally and Bernstein (1994), the measurement model represents the effects (or manifestations) of an underlying construct. Moreover, if the indicators are very interchangeable and correlated, then this model is reflective (Diamantopoulos, Sarstedt, Fuchs, Wilczynski, & Kaiser, 2012). The latent variables are reflective of the three proposed models, except for “R&D” where there is a formative construct. In this case, it is the causal indicators that form the latent variable as the linear combination of companies’ R&D indicators (RDE) and public or government entities (RDG). An important characteristic of training indicators is that they are not interchangeable (Diamantopoulos & Winklhofer, 2001).

The factor loadings in the reflective measurement models must be above 0.70, which is the level at which 50% of the indicator variance can be explained (Hair et al., 2016). All the indicator loadings are above 0.7, except for SB in the third model and PATR in the first and second models.

In the case of the formative constructs, the weights of the outer models represent the relative contribution of an indicator to the definition of this variable. The weights also range from 0 to 1, and a variable is important when the weight is above 0.5 (Hair et al., 2016)

Table 2 illustrates the reliability and validity of the measurement model. The internal consistency reliability is measured by Jöreskog (1971) composite reliability. Higher values generally indicate higher levels of reliability (Diamantopoulos et al., 2012). Another important measure of reliability is the relationship between each indicator and its construct, which is measured by the value of Cronbach’s alpha. It has been established that a construct has internal consistency when the value of Cronbach’s alpha is greater than 0.7 (Barclay et al., 1995; Nunnally & Bernstein, 1994). However, Cronbach’s alpha is a less precise measure of reliability than composite reliability due to the items being unweighted. In contrast, with composite reliability, the items are weighted based on the construct indicators’ individual loadings and, hence, this reliability is higher than Cronbach’s alpha (Hair et al., 2019). The latent variables except for ‘innovation’ in the first two models meet this criterion, but in the three models proposed, this latent

Table 2
Reliability and validity of the measurement model.

	Cronbach's Alpha	Composite Reliability	AVE	R-Squared
Model for 2004–2006				
Economic Growth	0.853	0.930	0.869	0.237
Entrepreneurship	1.000	1.000	1.000	0.172
Innovation	0.611	0.771	0.645	0.373
Institutions	0.787	0.865	0.619	
Social Climate	0.613	0.833	0.715	0.538
Model for 2008–2010				
Economic Growth	0.828	0.916	0.845	0.244
Entrepreneurship	1.000	1.000	1.000	0.225
Innovation	0.681	0.785	0.663	0.308
Institutions	0.827	0.888	0.671	
Social Climate	0.729	0.863	0.761	0.445
Model for 2014–2016				
Economic Growth	0.795	0.906	0.828	0.285
Entrepreneurship	1.000	1.000	1.000	0.293
Innovation	0.816	0.880	0.788	0.299
Institutions	0.839	0.898	0.696	
Social Climate	0.805	0.908	0.832	0.667

variable has a composite reliability greater than 0.7.

The average variance extracted (AVE) reflects the convergent validity and the variance extracted from the indicators, representing the common variability due to the latent variable. According to Fornell and Larcker (1981), there is convergent validity when $AVE > 0.5$. All our variables meet this criterion.

As for the structural submodel, it is possible to measure the R^2 coefficients associated with latent variable regressions using only endogenous constructs. The R^2 indicates the variance of the model that is explained by the model. All endogenous latent variables show values greater than 0.1 in the three periods considered. These R^2 values are usually accepted in exploratory studies in social sciences (Falk & Miller, 1992).

The PLS calculates the indirect effects that would be added to the direct ones. The results in Figs. 1, 2, and 3 give us the total effects between the latent variables that are shown in Table 3 for each of the periods considered.

Finally, to study whether the relationships between the variables are

significant, the bootstrapping technique is used in PLS. The figures include the variables' values (p-values: * $p \leq 10$ percent, ** $p \leq 5$ percent, and *** $p \leq 1$ percent). Normally, 5% is acceptable, which implies that the p-values must be less than 0.05 for the relationships to be significant. When researchers are very conservative or strict in their relationship tests, the level of significance is set at 1%. However, in exploratory studies, 10% is commonly used (Hair et al., 2016, p. 153).

The results confirm Hypothesis 1. The positive relationship between innovation and entrepreneurial activity is greater in expansionary periods than in periods of economic crisis. The influence of innovation is more prominent in the 2014–2016 period (0.403) than in the economic crisis (0.276); this result confirms the theses of Drucker (1998) and Bagheri et al. (2019).

In this sense, it is also relevant to consider that the latent variable R & D determines the degree of innovation of the countries in the three periods, but only if the weights of the indicators in the formative latent variable are analysed. When a latent variable is formative, the weights indicate what each indicator contributes to the formation of that latent variable. Here, it is observed that the R&D weight carried out by the companies was greater before the crisis (2004–2006); however, both during the crisis and in the recovery phase, the R&D weight of the public sector was greater than that of the private sector. Therefore, the results seem to indicate the importance of public technology policies for stimulating innovation in periods with less economic expansion. These results would be consistent with those obtained by Autio et al. (2014) and Griliches (1998).

Regarding Hypothesis H2, it is observed that there is a positive relationship between the social climate and entrepreneurship, but in the first models, this relationship has low and non-significant path coefficients. However, after the economic crisis in the recovery phase (2014–2016), it is observed that there is a positive and significant relationship with $p \leq 10$ percent. Therefore, the improvement of the social climate stimulates entrepreneurial activity. It is assumed that the indicator values show the existence of social tensions due to the high unemployment rate, and the positive value of the relationship between this variable and entrepreneurship is essentially due to higher entrepreneurship by necessity (Evans & Leighton, 1989; Roche & Conti, 2018; Thompson, 2011). The problem is that entrepreneurship by necessity is usually not sustainable over time since it usually disappears

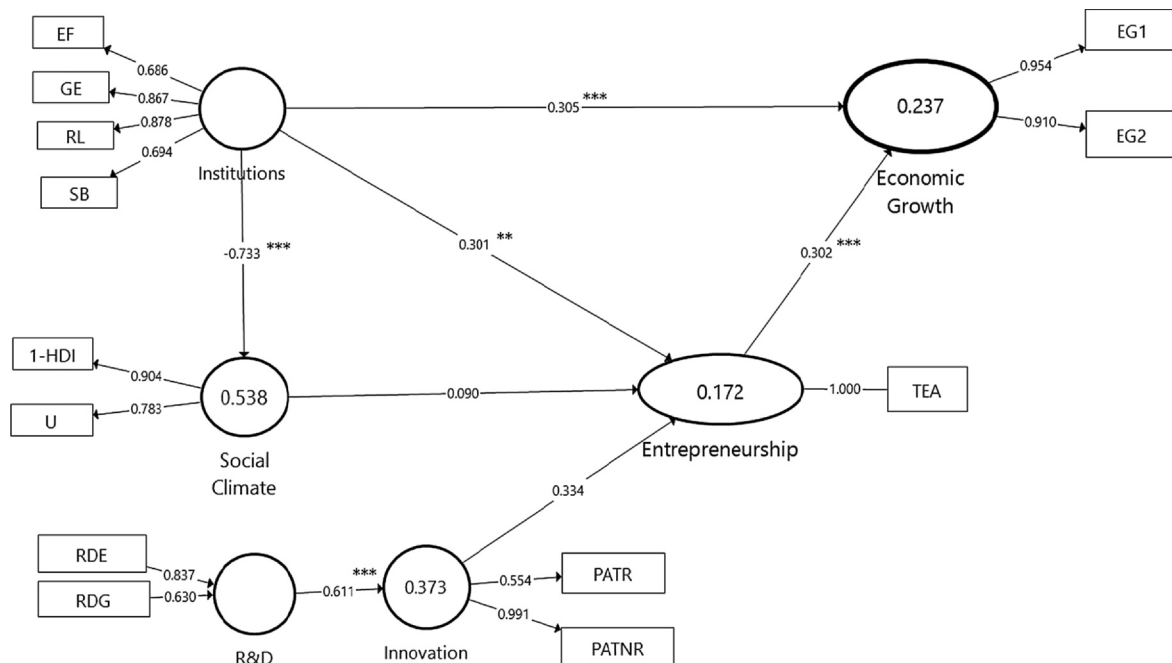


Fig. 1. Model estimated for 2004–2006 before the economic crisis: expansionary phase. Note: ** = $p \leq 5\%$ and *** = $p \leq 1\%$. Source: Own elaboration.

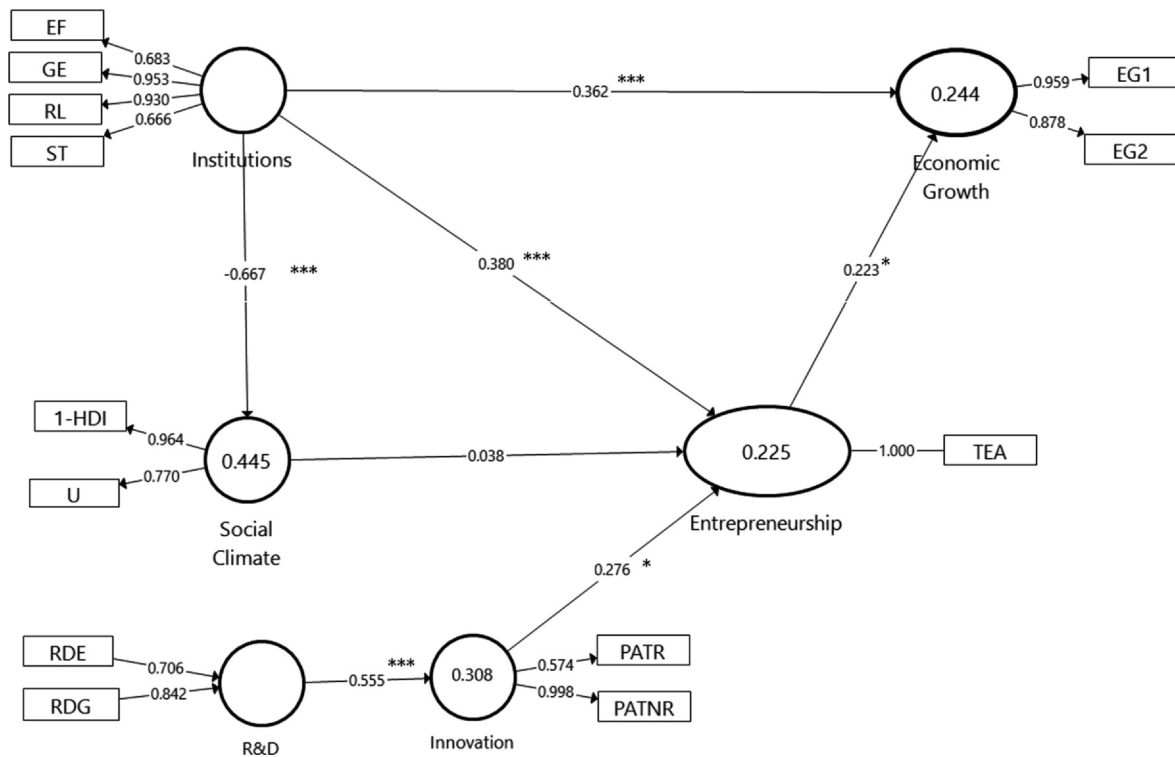


Fig. 2. Model estimated for 2008–2010 during the economic crisis: recessionary phase. Note: * = $p \leq 10\%$ and *** = $p \leq 1\%$. Source: Own elaboration.

when the labour market improves. In this sense, it would be convenient to design actions that enhance this social climate, especially with a more active employment policy. In addition, institutions should introduce regulations and measures that improve expectations, reduce inequality and create more human capital.

The results also confirm Hypothesis H3. These results show that institutions would improve the social climate and the relationship is significant ($p \leq 1\%$), which supports that the proper functioning of the institutions reduces unemployment and increases HDI. According to

the estimates, the weight of the institutions is greater in the expansionary phases, which may be essentially because, as indicated above, institutions have a greater capacity to implement measures that can favour HDI and employment. Therefore, the proper functioning of the institutions positively affects the social climate and indirectly affects entrepreneurial activity, confirming Galindo and Méndez's approaches (2014).

Hypothesis H4 is confirmed in the three periods considered. Regarding the relationship between institutions and entrepreneurship,

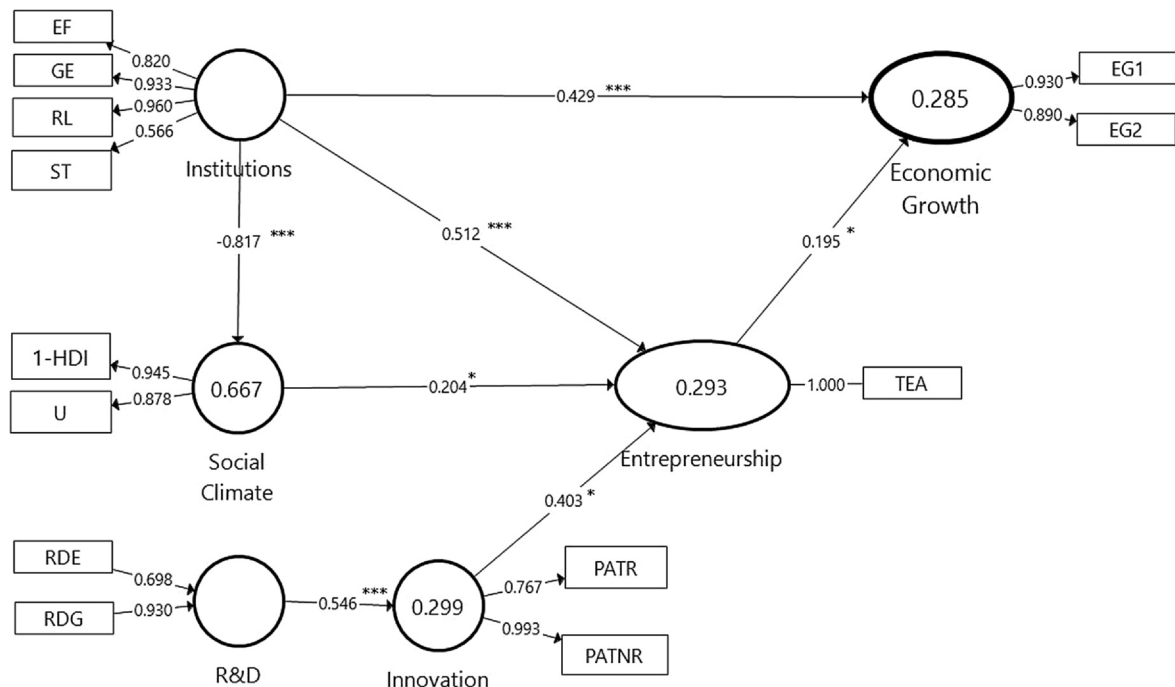


Fig. 3. Model estimated for 2014–2016 after the economic crisis: expansionary phase. Note: * = $p \leq 10\%$ and *** = $p \leq 1\%$. Source: Own elaboration.

Table 3
Total effects between latent variables.

	Economic Growth	Entrepreneurship	Innovation	Social Climate
Model for 2004–2006				
Entrepreneurship	0.302			
Innovation	0.101	0.334		
Institutions	0.376	0.235		–0.733
R&D	0.061	0.204	0.611	
Social Climate	0.027	0.090		
Model for 2008–2010				
Entrepreneurship	0.223			
Innovation	0.062	0.276		
Institutions	0.441	0.354		–0.667
R&D	0.034	0.153	0.555	
Social Climate	0.009	0.038		
Total Effects				
Model for 2014–2016				
Entrepreneurship	0.195			
Innovation	0.079	0.403		
Institutions	0.496	0.345		–0.817
R&D	0.043	0.220	0.546	
Social Climate	0.040	0.204		

the path coefficient increased in the recessionary phase (2008–2010) compared to the previous phase. This seems to indicate that the institutions designed actions to favour entrepreneurial activity, considering it as a factor that affects growth. This path coefficient increased even in the last phase considered, which indicates that institutions are still betting on the role that entrepreneurship plays in stimulating and sustaining growth.

With regards to the relationship between institutions and economic growth in the three periods, it is positive and growing. All of these results indicate that institutions influence growth in three ways: directly, through entrepreneurship and, finally, through the social climate that in turn influences growth.

In the case of entrepreneurial activity, considering the effects of the indicators that form the latent institutions variable, it is observed that the rule of law, the proper functioning of public services and the good implementation of economic policies always have higher loadings than the regulations or procedures entrepreneurs have to face at the beginning of their business activity; this is particularly observed in the recovery phase (2014–2016).

Finally, hypothesis H5 is also confirmed. The major and most significant effect corresponds to the period before the crisis (2004–2006), perhaps because during the crisis and in the recovery phase, many of the ventures arose from the need for people create their own jobs, what makes them a very small company and, therefore, their effects on growth are less.

4. Conclusions

The recessionary phase experienced by the economies at the end of the last decade has led to the emergence of research related to the relationship between entrepreneurship and economic growth. This has led to the interest in expanding this type of study by focusing on two aspects. The first is the inclusion of new factors that affect the process and consider the indirect relationships that may arise. In this sense, the analysis carried out in this paper has incorporated the role played by the social climate. Second, the different phases of economic activity, including expansionary and recessionary periods, have been considered to compare the results obtained. Specifically, the empirical analysis has considered the case of 15 OECD countries and three periods: a) prior to the economic crisis, 2004–2006; b) economic crisis, 2008–2010; and c) post-crisis economic recovery, 2014–2016.

Four main results were obtained from comparative empirical analysis of the different phases of the economic cycle. First, there is a

greater positive relationship between innovation and entrepreneurial activity in the economic expansionary phases than in the economic recessionary phases. R&D investment is the determining factor in the three periods considered, but public R&D expenditures are fundamental both in the crisis period and in the subsequent recovery phase to stimulate innovation and, therefore, entrepreneurial activity. These results confirm the theses of Autio et al. (2014) and Griliches (1998). Although technological public policy focused on increasing R&D spending is observed, it becomes a key element to stimulate innovation and offset the lower investment in private sector R&D during the economic crisis. Therefore, it would help if public R&D expenditures were higher during economic recessionary phases.

Second, it can be affirmed that institutions positively affect economic growth and business activity in the three periods considered. However, it is worth noting from the analysis of the weights that an adequate general regulatory framework and the protection of property rights, together with an efficient implementation of public policies, would affect more than the specific regulations related to entrepreneurship.

Third, it is observed that institutions and the social climate are related such that proper institutional functioning reduces unemployment and increases HDI, most significantly in the economic recovery phase (2014–2016).

Fourth, it can be seen that the social climate is positively related to entrepreneurial activity, but more significantly in the recovery phase (2014–2016). However, we must bear in mind that the values of the indicators reflect the existence of social tensions, and the positive value for the relationship between this variable and the entrepreneurship is essentially because entrepreneurship by necessity would increase due to the fewer job opportunities and the need to obtain income after an economic recession (Evans & Leighton, 1989; Roche & Conti, 2018; Thompson, 2011), but this type of entrepreneurship by necessity tends to decrease when the economic situation improves. It would be necessary for the institutions to adopt measures so that this entrepreneurship by necessity becomes entrepreneurship by opportunity and is maintained for a longer period of time. Finally, there is a positive relationship between entrepreneurial activity and economic growth in the three phases considered.

The study could be improved in several ways. First, the sample of countries could be increased by including countries with different structures and development levels, which would allow for the specification and introduction of measures based on economic development. Then, these measures could be compared with the actions carried out in other countries with greater economic development. Second, the behaviour of the credit market when financing the innovative process in the economy could be considered and its effects could be compared in each of the phases considered. Third, the role of corruption in institutions should be included in each of the phases considered, with the goal of showing how it can affect business decisions and economic growth. Finally, it would also be important to consider the feedback effects that could exist between the variables considered.

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