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Abstract

This work analyzes the role of the institutional context in determining the levels of high-impact entrepreneurship in a given territory. Contrary to usual practice in the literature when analyzing entrepreneurship in absolute terms, our approach considers that not all initiatives have the same quality and that the goal of a society should be to encourage those activities that best contribute to innovation and value generation. Moreover, in incorporating the institutional component to the analysis of high-impact entrepreneurship, we distinguish between formal and informal institutions by elaborating on the moderating role of the latter on the former. Our main result suggests that a strong development of formal institutions increases high-impact entrepreneurship. However, the informal dimension moderates this effect. In particular, in countries with a more individualistic orientation, the relationship between formal institutions and high-impact entrepreneurship is more intense, as happens in societies with lower levels of uncertainty avoidance.

Keywords: High-impact entrepreneurship; Formal institutions; Informal institutions; Global Entrepreneurship Monitor.

JEL Classification: M13

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1. Introduction

Entrepreneurship has become a phenomenon of paramount importance that is receiving increasing attention in recent years (Acs 2006; Wennekers et al. 2005). Given its relationship to economic growth and wealth (Reynolds et al. 1999; Zacharakis et al. 2000, Minniti 2008; Dejardin 2000), it has attracted the interest of scholars and policy makers alike to identify both the factors that encourage entrepreneurship and the type of entrepreneurship that generates higher externalities for society (Baumol 1990; Sobel 2008).

Extant empirical evidence, mainly from reports and monographs (see, for example, www.gemconsortium.org), shows that, although entrepreneurial initiatives can be found in every country, the level of entrepreneurship varies greatly across economies. These differences have opened a promising stream of research devoted to the analysis of why some countries are more entrepreneurially-oriented than others.

Previous research has evolved from works that analyze the levels of entrepreneurship across countries in an undifferentiated way (i.e. evaluating the differences in absolute terms) to the most recent stream that introduces the idea that not all types of entrepreneurship are equally desirable, suggesting that a more granular analysis is needed. Therefore, it seems convenient to go one step further when explaining country differences in entrepreneurship levels. This means that, although the analysis of entrepreneurship differences across countries is an important problem *per se*, it may be even more important to know the type of entrepreneurship that characterizes a specific region (Baumol 1990). In this paper, we focus on high-impact entrepreneurship, which can be defined as that which is especially valuable because it commercializes key innovations, extracts substantial entrepreneurial rents, spurs growth and employment, and shifts the production possibility frontier outwards (Henrekson et al. 2010; OECD 2010).

In analyzing country differences in the level of entrepreneurship, recent work has incorporated the institutional component as a factor that either enables or hinders entrepreneurial activity (Stenholm et al. 2013; Aidis et al. 2012; Bruton and Alhstrom 2003). In this vein, one of the most influential works is Baumol (1990), who argues that the institutional context, understood as the rules of the game (North 1990), may

determine the allocation of resources between productive and unproductive activities (Baumol 1990; Minniti 2008).

However, despite the growing body of studies examining the institutional influence on different types of entrepreneurial initiatives (Bowen and DeClerq 2008; Levie and Autio 2011, Liñán et al. 2013), most of them consider institutions only in an aggregate way, thus reducing their explanatory power. This paper aims to overcome this limitation and contribute to the discussion that connects the role of institutions with the types of entrepreneurship. Specifically, we make use of the well-established distinction between formal and informal institutions (North 1990) to analyze the relationship between institutions and the type of entrepreneurship. The lack, in the entrepreneurship literature, of a more fine-grained analysis that integrates both formal and informal institutions seems surprising, as recent work has explicitly called for this. For instance, Li and Zahra (2012), in a paper analyzing the variance of venture capital activity depending on both different levels of formal institutions and different cultural settings, suggest the study of the quality of entrepreneurship, adopting an institutional perspective, as a necessary avenue for further research.

Following the previous rationale, our starting point is the recognition that the level of development of formal institutions is positively related to high-impact entrepreneurship. Previous research has begun to study this relationship postulating, for instance, that a country's institutional environment influences the extent to which entrepreneurial effort is directed toward high-growth activities (Bowen and DeClerq 2008) or analyzing the effect of the regulatory burden and rule of law on strategic and non-strategic entrepreneurship entry rates (Levie and Autio 2011). However, most of this work does not consider that firms, when analyzing the institutional landscape, face not only the formal dimension but also the informal one, thus omitting the potential interdependences that could take place between them (Peng et al. 2009). Our logic is that formal institutions are embedded within a broader context represented by informal institutions. This means, for instance, that the latter become predominant when the former fail (Helmke and Levitsky 2004; Peng et al. 2009).

Accordingly, our work will consider that the relationship between the development of formal institutions and high-impact entrepreneurship is contingent to the cultural

characteristics of the country. We specifically focus on the two cultural dimensions that have been more clearly connected with entrepreneurship, namely, the individualistic character of a society and uncertainty avoidance, (Tiessen 1997; Li and Zahra, 2012; Zahra et al. 2004). Our hypotheses suggest that these distinctive dimensions of the informal institutional environment moderate the relation between formal institutions and high-impact entrepreneurship.

We test our hypotheses using a sample of 47 countries that participated in the Global Entrepreneurship Monitor (GEM) between 2002 and 2012. GEM is an international initiative that analyzes entrepreneurial activity in a large sample of countries. This international dimension and the presence of countries from different economic environments provide us with enough variability in the institutional dimensions, which is strongly recommended in studies analyzing the influence of the institutional context (Franke and Richey 2010). Moreover, the use of a common methodology facilitates comparisons and gives credibility to the results obtained in an international scenario. Furthermore, GEM identifies several types of entrepreneurship, which allows us to illustrate the discussion about high-impact entrepreneurship.

Our work contributes to the literature in several ways. First, it helps to integrate institutions and entrepreneurship literatures, pointing to the need to simultaneously consider formal and informal institutions when explaining the type of entrepreneurship. This joint analysis of formal and informal institutions should also reinforce our knowledge of the institutional conditions that favor or hinder high-impact entrepreneurship. This emphasis on high-impact entrepreneurship constitutes our second contribution. To our knowledge, the few attempts to isolate high-impact entrepreneurship do not take into account the informal dimension of the economy (Bowen and DeClerq 2008; Levie and Autio 2011; Sobel 2008), which may provide an incomplete picture of the phenomenon under study. As a consequence, our analysis takes a step further in the discussion of the role that informal institutions play.

2. Literature review: institutions and entrepreneurship

Extant literature has proved that an appropriate institutional environment provides the necessary conditions for individuals to identify market opportunities, start new activities,

introduce innovations and new products or services and generate employment (Verheul et al. 2002; El-Namaki 1988; Baumol 2002). Likewise, the quality of the institutional context influences the allocation of the different types of entrepreneurship (Baumol 1990).

To determine the relevant institutions for entrepreneurship dynamics, it is necessary to precisely define the term *institution.* North (1990) defines institutions as the rules of the game that guide the behavior of individuals and provide the structure of incentives to the agents, reducing transaction problems. In this sense, institutions can facilitate economic, political and social interactions, creating incentives for different courses of action and guiding the election of the economic actors (Boettke and Coyne 2009). When these rules are well defined, opportunism decreases, trust increases and so does the enforcement of long-term contracts, reducing transaction costs and leading to an efficient institutional structure (Arias and Caballero 2006). On the contrary, "poor quality institutions reduce the incentive to invest and prevent resources being allocated to their most productive end" (Knowles and Weatherston 2006, p.10).

In a broad sense, the literature usually distinguishes between formal and informal institutions (North, 1990). Generally speaking, the first can be understood as a set of political, economic and regulatory rules that facilitate exchanges. The second are rules that have not been designed consciously but come from the information that has been socially transmitted through what we call culture (North 1990).

There is a growing body of literature that tries to link institutions with entrepreneurship. Factors like governance (Amorós 2009), economic freedom (McMullen et al. 2008), property rights and financial capital (Desai et al. 2003; Bowen and De Clerq 2008), regulation of entry (Klapper et al. 2006) and control of corruption (Anokhin and Schulze 2009) are some of the key formal institutional factors considered. McMullen et al. (2008) show how the institutional context influences opportunity and necessity entrepreneurship in different ways. Bowen and De Clerq (2008) demonstrate that the allocation of entrepreneurial resources toward high-growth activities is positively related to financing and education and negatively to the level of corruption in a country. In the same way, Anokhin and Schulze (2009) show that the control of corruption increases the trust of individuals in government and encourages entrepreneurial activities and

innovation. Recent research (Estrin et al. 2012) supports the idea that higher levels of corruption, weaker property rights and a greater government activity reduce entrepreneurs' aspirations of growth.

A large body of research also discusses the informal institutional dimension and its relationship with entrepreneurship. Some studies have focused on entrepreneurial traits or characteristics (Mueller and Thomas 2001; Thomas and Mueller 2000), new firm-formation rates at the regional or national level (Davidsson 1995; Davidsson and Wiklund 1997), entrepreneurial orientation (Lee and Peterson 2000; Tiessen 1997) and innovation (Shane 1992, 1993). Kreiser et al. (2010) argue that national culture has an impact on) the willingness of firms to display risk taking and proactive behaviors, two key dimensions of entrepreneurial orientation. Levie and Hunt (2004) analyze the role of culture in entrepreneurship and conclude that there is a positive relationship between new business activity-related beliefs and the level of new business activity, but they do not find empirical evidence for the direct association between cultural values and entrepreneurship. Autio et al. (2013) analyze the influence of national culture on aspects such as entry behaviors and post-entry aspirations. In the same way, Hechavarria and Reynolds (2009) show that culture is a significant factor in predicting entrepreneurship rates at the country level.

The previous literature review reveals that the relationship between both formal and informal institutions and entrepreneurship is well documented. However, there are still significant gaps with respect to the possible relationships between the two types of institutions that are necessary to fill in order to provide a more accurate picture of their relation with entrepreneurship. Our main contention is that there is a lack of coherent analyses that simultaneously consider both formal and informal institutions to explain entrepreneurship, which is surprising given the intrinsic relationship that seems to exist between the two types of institutions (Peng et al. 2009). This study is an attempt to advance in the understanding of the joint effect of the two types of institutions on entrepreneurship and, more specifically, in the moderating effect of informal institutions on the relationship between formal institutions and entrepreneurship. In the following section we elaborate on this.

3. Hypotheses

3.1. The relation between formal institutions and high-impact entrepreneurship

Formal institutions are a multidimensional concept that includes aspects such as political, economic and legislative systems (Pejovich 1999). These dimensions define the nature of the political processes, decrease uncertainty, facilitate the necessary managerial efforts to acquire resources at the start of a new venture (Busenitz et al. 2000) and increase the availability of financial resources (Holmes et al. 2013). In general, formal institutions provide the framework of trust that the entrepreneur needs when starting up a business. They also facilitate the perception of business opportunities and influence their number and characteristics (Verheul et al. 2002). This will result in an increase in the level of entrepreneurial activity, as well as in the aspirations of growth and in the size of the new companies (Levie and Autio 2008).

Accordingly, an environment with a transparent legal system and clearly defined property rights mitigates the risks taken by the agents who provide funds for entrepreneurs (Estrin et al. 2012). This facilitates access to financing, usually a key factor for the creation and growth of new businesses (Rajan and Zingales 1998). As a consequence, more developed formal institutions promote, for example, the investment of venture capital (Sobel 2008; Li and Zahra 2012), a specially relevant alternative for financing projects in contexts of high uncertainty but high potential growth (Bowen and De Clerq 2008). Other factors, such as the protection of property rights, have also been positively related to innovation, growth aspirations (Autio and Acs 2010), the size of new companies (Kumar et al. 1999), and the reinvestment of profits (Johnson et al. 2002). It has also been demonstrated that the control of corruption increases trust in institutions and markets and makes it more likely for entrepreneurs to appropriate a portion of the rewards that can be earned by encouraging entrepreneurship and innovation (Anokhin and Schulze 2009).

On the contrary, weak formal institutions can constitute an important limitation for entrepreneurship and, in particular, for the quality of business initiatives. For example, an excess of entry regulation increases the profits necessary to compensate for the opportunity costs of other investment alternatives, discouraging opportunity entrepreneurship (Ho and Wong 2007). Similarly, financial constraints limit investments

in high growth projects (Beck et al. 2005). In general, regulatory complexity discourages job creation and, in some cases, limits the growth aspirations that can accompany high-impact entrepreneurship (Verheul et al. 2002).

Furthermore, a weak formal institutional structure not only limits high-impact activities but also leads to an increase in low-impact ones (Mehlum et al. 2006). It has been observed that when tax rates are high, there are high rates of corruption or there are market restrictions, economic activity moves from formal to informal economy (Johnson et al. 1998; Schneider and Enste 2000). In line with this argument, Coyne and Leeson (2004) support the idea that political and legal instability lead to the non-performance of contracts because it is easier to ignore the laws than to keep them, increasing the level of corruption and the informal economy. In the same way, "the lack of an effective court system limits the expansion of one's network of clients, lenders or suppliers and makes it extremely difficult for entrepreneurs to extend their network beyond a few close friends and neighbors whom they know well" (Coyne and Leeson 2004, p. 242).

To sum up, the existence of institutional structures that guarantee the safety of property rights and a fair judicial system that allows the correct enforcement of contracts makes individuals more likely to take part in the generation of wealth through high-impact entrepreneurship. Accordingly, our first hypothesis is formulated in the following way:

> **H1**: The greater the development of formal institutions, the higher the level of high-impact entrepreneurship.

3.2. The moderating effect of informal institutions

The previous section has argued that the existence of sound formal institutions leads to an environment that encourages high-impact entrepreneurship (McMullen et al. 2008; Sobel 2008). However, the evidence suggests that the same formal institutions show different effects in different societies (North 1990; Acs 2006). This can be due, at least partially, to the fact that formal institutions coexist with informal ones and that both, as well as their interdependences, have to be considered for the correct interpretation of the institutional dimension (Helmke and Levitsky 2004; Williamson 2000). In this sense, North's (1990) institutional theory explains that formal institutions are the result of the crystallization of the informal component and that they co-evolve through organizations.

Formal institutions are subordinated to informal ones in that the former are the means used to structure the interactions of the society in accordance with the norms and values that the latter represent.

Informal institutions are self-regulating but "where the formal institutions do not reflect the underlying informal norms, formal institutions will be costly to enforce because the formal rules governing society will be at odds with the underlying belief systems" (Boettke and Coyne 2009, p. 142). In contrast, where formal norms are in line with informal ones, the cost of implementing the former will be relatively low and they will be accepted, supported and developed over time (Weingast 1995).

Following the above reasoning, Garretsen et al. (2004) develop a cluster analysis to identify patterns of behavior in accordance with social and legal norms and demonstrate that sociocultural variables allow legal institutions to better achieve their objectives. Licht et al. (2001) reach similar conclusions when relating the rights of investors and cultural factors. They demonstrate that cultural factors determine what types of legal systems can be perceived and accepted as legitimate in a country. Similarly, Li and Zahra (2012, p. 96) suggest that "formal institutions are important for venture capital activity but the effects of formal institutions depend also on the cultural settings".

In accordance with these arguments, we can conclude that when informal institutions (understood as the value system of a group or society), improve the social desire towards entrepreneurship as a choice of occupation (Stenholm et al. 2013), individuals are more receptive to the incentives offered by formal institutions. As a consequence, formal institutions cannot be analyzed in isolation, given that informal ones (culture) moderate their effect on entrepreneurship.

Culture has been approached in several ways but, probably, the framework most frequently used by the literature is the one proposed by Hofstede (2001) and Hofstede et al. (2010). Among the six dimensions this author develops (power distance, individualism or collectivism, masculinity vs femininity, uncertainty avoidance, long-term orientation and indulgence vs restriction), our analysis will focus on the two more clearly linked to entrepreneurship and its typology (see, for example, Li and Zahra 2012; Mueller and Thomas 2001, or Levie and Hunt 2004): individualism and uncertainty avoidance. These dimensions, such as motivation to achieve and the pursuit of personal

goals, internal locus of control, risk taking or innovativeness (Mueller and Thomas 2001; Shane 1993) are significantly related to the profile of the entrepreneur. In what follows, we will elaborate on their interplay with formal institutions.

***Individualism vs collectivism*.** Individualism is one of the most representative dimensions of culture (Schimmack et al. 2005) and it is considered to be a key element when it comes to describing changes in behavior, attitudes, norms, values, goals and family structures (Triandis 1996). At the same time, individualism has frequently been associated with studies on entrepreneurship (Morris et al. 1993; Pinillos and Reyes 2011; Cullen et al. 2013).

Individualism cannot be defined independently but must be understood as part of a continuum in which individualism and collectivism are located at opposite ends (Hofstede 2001). In individualistic cultures, individuals are more motivated by their own personal interest and the achievement of personal goals than by group achievements (Triandis 1993), thus making it more difficult to identify collective targets. By contrast, in collectivist societies, individuals are considered to be a part of a group from birth and are motivated to achieve rewards at group level (Triandis et al. 1988).

It is important to emphasize that, in these individualistic environments, where communication is low and collective punishment does not exist for the breaching of contracts, trust lies in contractual safety (Tiessen 1997; Steensma et al. 2000). In these societies, collective actions, exchanges and the enforcement of contracts and norms are obtained through the development of specialized formal institutions (Greif 1994). Therefore, formal institutions in those cultures play “a central role in enforcing contracts, mitigating transaction cost problems and providing the proper incentive structure for economic transactions” (Li and Zahra 2012, p. 99). These arguments are in line with those offered by Licht et al. (2007) and Gorodnichenko and Roland (2010) who conclude that individualism encourages and strengthens the enforcement of norms and formal regulations.

On the contrary, in collectivist societies, individuals interact at the social and economic level with the members of family groups and the fulfillment of contracts is obtained through informal economic and social institutions. In these countries, “the employment of informal relationships to tackle transaction problems may not help with the

development of formal institutions" (Li and Zahra, 2012 p. 99), these being less necessary since the government of the country relies on loyalty to the group and power hierarchy (Gaygisiz 2013). Based on the above, we argue that individualistic societies, that encourage the discovery of opportunities, creativity and innovation, and have a greater acceptance of entrepreneurship at a social level, strengthen the effect of formal institutions in their attempt to encouraging high-impact entrepreneurship.

H2: The more individualism, the stronger the positive relationship between formal institutional development and high-impact entrepreneurship.

Uncertainty avoidance. Another important dimension that influences entrepreneurship is uncertainty avoidance (Mueller and Thomas 2001; McGrath et al. 1992, Wennekers et al. 2007). Uncertainty is a central concept when speaking about entrepreneurship and, particularly, or start-up entrepreneurs who are unable to calculate the expected profits of new ventures (Wennekers et al. 2007). Uncertainty avoidance, unlike risk aversion that pertains to individuals and shows a wide within-group dispersion, is usually understood as a group or country attribute (Wennekers et al. 2007). According to Hofstede (2001), uncertainty refers to the level of tolerance of societies to ambiguity and the extent to which they feel threatened by unknown, uncertain and new situations. Uncertainty implies, therefore, differences in how individuals perceive the opportunities and threats of the environment and how they react to them (Schneider and De Meyer 1991). In societies with greater uncertainty avoidance, there is less tolerance of ambiguity, fear of failure is greater and willingness to take risks is lower (Hofstede 1980). On the other hand, low uncertainty avoidance is associated with optimism and a positive evaluation of uncertain situations (Schneider and De Meyer 1991), with the subsequent search for opportunities and the assumption of greater risks (Palich and Bagby 1995).

Uncertainty avoidance influences the way in which other variables affect business undertaking (Wennekers et al. 2007). We have previously argued a positive relationship between formal institutions and high-impact entrepreneurship. However, this relationship is contingent to the level of uncertainty avoidance. For low levels of this societal trait, individuals are more likely to participate in activities with uncertain outcomes, becoming more innovative, more proactive and more open to new norms and

laws (Yan and Hunt 2005). In this context, sound formal institutions are particularly important because they provide the framework to develop economic activity. On the contrary, when formal institutions are weak, new firms are created in a much more uncertain context, thus reducing the incentives to start the ventures.

When uncertainty avoidance is high, individuals are less willing to take risks and entrepreneurs will concentrate on activities with less uncertain outcomes. Given that inefficient institutions increase the ambiguity about the link between entrepreneurs' decisions and their outcomes (Li and Zahra, 2012), this ambiguity is less important when the variance of the expected outcome is low, thus increasing the relative entrepreneurship rates when formal institutions do not work properly. High uncertainty avoidance reduces the number of projects undertaken, especially high quality-high risk ventures, and the institutional framework becomes less important. This line of reasoning is similar to that of Li and Zahra (2012) who analyze the decisions taken by venture capitalists to invest in new projects, and show how venture capitalists are less responsive to incentives offered by formal institutions in societies with greater uncertainty avoidance.

Based on the above arguments, we expect that, in societies with low uncertainty avoidance, where fear of failure is small and willingness to take risks is high, the incentives offered by formal institutions can be understood as an opportunity associated with the creation of new businesses, thus stimulating high-impact entrepreneurship.

> **H3:** Weaker uncertainty avoidance increases the positive relationship between the development of formal institutions and high-impact entrepreneurship.

4. Sample and variables

The proposed model will be tested using a sample of 47 countries that have taken part in the Global Entrepreneurship Monitor (GEM) project between 2002 and 2012. GEM is an international research project that started in 1999 and whose main objective is to assess “entrepreneurial activity, aspirations and attitudes of individuals across a wide range of countries” (http://www.gemconsortium.org). It initially started with 10 participants but coverage rapidly increased as a number of countries joined the project. In any case, it is important to note that most countries have not been part of the sample

throughout the whole period. There are two main reasons for this. The first one is that some nations joined the project several years after 2002. The second is that a number of countries participated only in specific years. Therefore, our sample finally includes an unbalanced panel data with a total of 47 countries with 291 observations.[1]

One of the main reasons we believe that the GEM observatory is a good laboratory to test our hypotheses is that it presents enough heterogeneity in various areas that are crucial to our study, including the level of economic development, the legal and governmental structures and the social and cultural norms that prevail between the different countries. In other words, the "variance" of the institutional dimension is guaranteed. It is important to recall that this variability is a necessary condition in works where institutions play a relevant role, given that no absolute conclusions should be inferred if only a few countries take part in the study (Franke and Richey 2010).

4.1. Dependent variable

Our dependent variable aims to proxy *high-impact* entrepreneurship, which has previously been defined as entrepreneurship that commercializes key innovations, extracts substantial entrepreneurial rents, spurs growth and employment, and shifts the production possibility frontier outwards (Henrekson et al. 2010; OECD 2010). Alvarez and Busenitz (2001) understand opportunity as a central element of high-impact entrepreneurship and the initiatives that derive from it arise as a result of the desire for income, wealth and achievement (Hessels et al. 2008; Shane et al. 1991; McClelland 1961). Following this logic, we will identify high-impact entrepreneurship with the opportunity entrepreneur defined by Reynolds et al. (2002).

In this context, GEM seems to be particularly recommended for our purposes. Besides identifying the entrepreneurship rate in each country (defined as the percentage of population aged between 18 and 64 that is involved in a business activity), it breaks it down into opportunity and necessity entrepreneurship. The first one is linked to the identification of good business opportunities while, in the second, firms are created

[1] It is important to note here that, as we will describe below, the independent variables are incorporated into the model with a time lag. This means that the inclusion of a country in the sample needs, at least, the availability of information for two consecutive periods. This implies a reduction in the number of observations of our sample.

because of the lack of better job opportunities and not because of identifying a clear market niche.

Opportunity entrepreneurship is often associated with technology and high growth rates (Hechavarria and Reynolds 2009), having a positive impact on the economy of a region or country. By contrast, necessity entrepreneurs are less likely to take risks, less confident in their own abilities and more sensitive to environmental obstacles (Bhola et al. 2006), being limited to the development of subsistence activities (Valdez and Richardson 2013).

It is important to note at this point that entrepreneurship rates (both, opportunity and necessity entrepreneurship) are highly dependent on cultural and religious (Thomas and Mueller 2000) as well as economic (Wennekers et al. 2005) factors of the countries where the entrepreneur resides. Therefore, independently of the institutional framework, there are countries with a higher propensity to entrepreneurship. For example, Wennekers et al. (2005) show a U-shaped relationship between economic development and entrepreneurship dynamics. Similarly, the GEM report (Amorós and Bosma 2013, p. 20) acknowledges that "the contribution of entrepreneurs to an economy varies according to its phase of economic development", distinguishing three stages: factor-driven, efficiency-driven and innovation-driven economies. As a consequence, the absolute entrepreneurship rate may be biased by these circumstances. Accordingly, our proxy for *high-impact entrepreneurship* is the ratio of opportunity[2] to necessity entrepreneurship that describes the relative importance of the two types of entrepreneurship (Acs 2006). This measure has previously been used with similar purposes by Acs and Amorós (2008) and Acs (2006).

4.2. Formal institutions

Formal institutions will be proxied by governance dimensions developed by Kaufmann, Kraay and Mastruzzi for the World Bank (WGI, *Worldwide Governance Indicators*)

[2] It is important to note that, in the context of GEM data, other studies have alternatively used the variable high-growth entrepreneurship instead of opportunity entrepreneurship (Autio and Acs 2010; Estrin et al. 2012). However, the former is more associated with job creation, while the latter is more broadly defined as that which starts a new business by exploiting an identifiable business opportunity. This idea behind opportunity entrepreneurship better captures our concept of high-impact entrepreneurship, not only focused on employment growth, but also on innovation, exports and economic growth in general (Acs 2008). Besides, the correlation between the two is positive (0.572) and statistically significant.

(2009). These indicators have previously been used in the literature with very similar purposes (Aidis et al. 2008; Amorós 2009) because they cover a wide range of countries and have been proven to be very accurate (Thomas 2010). Kaufmann et al. (2010) define governance as “the traditions and institutions by which authority in a country is exercised” and they approach it through a set of six indicators that “include the process by which governments are selected, monitored and replaced, the capacity of the government to effectively formulate and implement sound policies and the respect of citizens and the state for the institutions that govern economic and social interactions among them” (Kaufmann et al. 2010,p. 4). These indicators have been developed for 215 countries for the period between 1996 and 2012. All of them range between 2.5 and 2.5, with the higher scores corresponding to better outcomes of institutions and vice versa (Kaufmann et al. 2010).

Given the high correlation between these six dimensions, with values ranging from 0.60 to 0.96, and similarly to previous research (Gaygisiz 2013; Licht et al. 2007), our work uses principal component analysis to elaborate a composite score of the formal institutional environment (Garrido et al. 2014). The six indicators were reduced to one factor, with factor loadings between 0.87 and 0.98. This allows us to capture the formal institutional dimension in a single variable and we avoid the multicollinearity problems that derive from a high correlation between these dimensions. As a consequence, we will use the factor resulting from previous principal component analysis to measure formal institutions.

4.3. Informal institutions: Culture

Most of the entrepreneurship research that considers cultural variables is based on the theory of Hofstede (1980, 2001) that shows how the culture of societies and organizations is influenced by different features deep-rooted in the traditions of the different territories. Initially, Hofstede (2001) established cultural differences through four dimensions: power distance, uncertainty avoidance, individualism vs collectivism and masculinity vs femininity. Recently, Hofstede et al. (2010) added two new dimensions to their cultural model: long-term orientation and indulgence vs restriction. These indexes usually take values from 0 to 100 (although they can exceptionally surpass this threshold), where higher scores correspond to cultures with greater power

distance, more individualists, more masculine, with high uncertainty avoidance, more based on a long term approach and where relatively free gratification of basic and natural human desires related to enjoying life and having fun is.

When including the informal institutional component and as we have previously argued, our study considers the two dimensions of Hofstede that are more closely related to entrepreneurship: *Individualism* vs *collectivism* and *uncertainty avoidance* (Mueller and Thomas 2001; Thomas and Mueller 2000).

4.4. Control variables

Our study also includes several control variables that take into account economic and demographic characteristics of the countries that constitute our sample and that have previously been considered in entrepreneurship studies. The first is the degree of economic activity that is proxied through *GDP growth.* There are a number of studies that document the existence of a positive relationship between economic growth and entrepreneurship and, in particular, between economic growth and high-impact entrepreneurship (see, for instance, Carree et al. 2007). Our work also controls for the rate of *unemployment.* The effect on unemployment may be twofold. On the one hand, it has a negative impact on entrepreneurship because business opportunities are reduced; on the other hand, an increase of necessity entrepreneurship will be expected (Verheul et al. 2002). The existence of a suitable financial supply is also incorporated into the model since it facilitates the mobilization of resources to finance projects, with the resulting improvement of innovative activity and economic growth (King and Levine 1993). It has been observed that exploitation of opportunities is frequently associated with a greater access to financial capital (Hurst and Lusardi 2004) and that more developed financial markets promote the entry and growth of new companies (Guiso et al. 2004). Consequently, the model includes the variable *domestic credit* provided by financial sector as a proxy of the financial supply. A good knowledge of what it means to be an entrepreneur and of the consequences that it can have in society is another key element to be considered in the estimation. Individuals that know or have direct contact with entrepreneurs will be strengthened in their desire, motivation and intentions with respect to entrepreneurial activity (Venkataraman 2004; Lafuente et al. 2007). Furthermore, role models enhance entrepreneurial self-efficacy and can be seen as a

possible source of relevant human or social capital (Bosma et al. 2012). This may improve the quality of entrepreneurial initiatives and their outcomes. Therefore, we control for the variable *role models*, defined as the percentage of the adult population who personally knows someone who started a business in the past two years. A demographically relevant factor for entrepreneurship is *population growth* since it provides business opportunities associated with new markets, which will increase both the supply and demand of entrepreneurs (Wennekers, et al. 2005). Finally, we consider year dummies to control for time-specific effects. To mitigate simultaneity issues, all explanatory variables are lagged one year (Cornett et al. 2007).

The variables used in our empirical model and the data sources are summarized in Table 1.

Table 1. Description of the variables used in the study

Dimension	Variable	Description	Source
High-impact entrepreneurship	*Opportunity TEA /Necessity TEA*	Ratio of the adult population that claims to be involved in a business because of the identification of a market opportunity and those who start a business forced by the circumstances.	GEM
Formal Institutions	*Voice and Accountability*	Ability of the citizens to participate in selecting their government, as well as freedom of expression, freedom of association, and free media.	WGI
	Political Stability	Likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism.	WGI
	Government Effectiveness	Quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.	WGI
	Regulatory Quality	Ability of the government to formulate and implement sound policies and regulations which permit and promote private sector development.	WGI
	Rule of Law	Confidence of the agents in and abidance by the rules of society, and in particular the quality of contract enforcement, property rights, the police and the courts, as well as the likelihood of crime and violence.	WGI
	Control of Corruption	Extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.	WGI
Informal Institutions	*Individualism/ Collectivism*	Extent to which individuals prefer to act and feel recognized as individual versus being part of a group or collective.	Hofstede
	Uncertainty Avoidance	Extent to which members of a society accept uncertainty and ambiguity.	Hofstede
Control Variables	*GDP Growth*	Annual percentage growth rate of GDP (local currency).	WB
	Domestic Credit provided by financial sector	Credit to various sectors on a gross basis, with the exception of credit to the central government, which is net (% of GDP).	WB
	Unemployment	Share of the labor force that is without work but available for and seeking employment.	WB
	Role Models	Percentage of population aged 18-64 who personally knows someone who started a business in the past two years.	GEM
	Population Growth	Exponential rate of growth of midyear population (%).	WB

Note: GEM= Global Entrepreneurship Monitor, WGI= Worldwide Governance Indicators of World Bank, Hofstede (1980, 2001), WB= World Bank.

4.5. Descriptive Statistics

Descriptive statistics and correlations between our variables are shown in Table 2. As can be observed, the ratio that proxies high-impact entrepreneurship takes an average of 5.34. This value can be interpreted as meaning that, for each business that starts up forced by circumstances, more than five initiatives emerge as a consequence of the identification of a good opportunity. Nevertheless, it is important to note the high standard deviation of this variable, with extreme values as high as 27.73 and as low as 0.89. Thus, our sample includes a wide variety of entrepreneurship contexts, ranging from countries where (almost) all new ventures are created because of the identification of a market niche to countries where most of the new initiatives are developed because of a difficult environment.

The mean value of the indicator that proxies formal institutions (governance) is 0.70. For a range of this variable between -2.5 and 2.5, this means the average country in our sample shows a reasonable level of institutional development. The standard deviation is also high, indicating that our sample covers a wide range of countries with very different institutional contexts. Regarding informal institutions, the mean values of individualism and uncertainty avoidance are, respectively, 53.43 and 67.82, with moderate to high variation among the different observations. When we analyze the correlation matrix, we observe that high-impact entrepreneurship is positively correlated with governance, individualism, domestic credit provided by the financial sector and role models. On the other hand, the correlation is negative between high-impact entrepreneurship and uncertainty avoidance and unemployment.

Table 2. Descriptive Statistics and Correlation Matrix (N=291)

Variable	Mean	Std. Dev.	Min	Max	1	2	3	4	5	6	7	8	9
(1)High-impact entrepreneurship	5.34	4.30	0.89	27.73	-								
(2)Governance	0.70	0.83	-1.54	1.84	0.56*	-							
(3 Individualism	53.43	23.18	13.00	91.00	0.38*	0.62*	-						
(4)Uncertainty avoidance	67.82	24.38	8.00	112.00	-0.39*	-0.46*	-0.42*	-					
(5)GDP growth	2.70	3.82	-17.95	12.68	-0.04	-0.23*	-0.32*	-0.04	-				
(6)Domestic credit financial sector	122.99	69.67	0.52	337.47	0.24*	0.51*	0.27*	-0.31*	-0.28*	-			
(7)Unemployment	7.90	4.39	0.70	27.20	-0.36*	-0.31*	-0.05	0.19*	-0.12*	-0.09	-		
(8)Role models	38.52	10.18	13.00	88.00	0.22*	-0.22	-0.19*	-0.12*	0.14*	-0.27*	-010	-	
(9)Population growth	0.66	0.62	-1.48	2.53	0.08	-0.00*	-0.01	-0.01*	0.22*	-0.07	-0.03	0.17*	-

* $p < 0.05$

Table 3 complements the information provided by Table 2. First, it allows us to verify the variability within the institutional dimensions (a necessary condition to address a study of these characteristics). Second, it offers some relevant details about the exact position of the countries of our sample both in relationship to the dependent variable and in the variables that capture the effect of institutions. The first aspect that attracts our attention in Table 3 (listed from bigger to smaller values of the dependent variable) is that countries with higher levels of high-impact entrepreneurship are usually those countries where formal institutions are more developed: the top positions in both rankings are held by countries like Denmark, Norway, Iceland or Sweden. This preliminary evidence is consistent with the arguments outlined in our Hypothesis 1. A less clear pattern is observed in the relationship between high-impact entrepreneurship and the individualistic character or uncertainty avoidance of a society. This lack of a clear relationship would be in line with previous evidence that does not identify a direct impact of the informal institutional dimension on entrepreneurship. Therefore, this preliminary evidence could suggest a moderation effect between formal and informal institutions.

A second feature that deserves our attention is the distribution of the sample: In spite of the wide range of variation of our variables (which is a key feature to test our hypotheses), there seems to be a slight over-presence of countries in which the development of formal institutions is high. This is evidenced by the fact that the average of governance is above 0 (0.70). This is not the case with the cultural dimensions, whose means and variances are more evenly distributed. The variable individualism has an average almost in the center of the range of the variable (do not forget that it usually ranges between 0 and 100) and a standard deviation of 23.18. The values for uncertainty avoidance are somewhat more skewed, with an average of 67.82 and a standard deviation of 24.38.

Table 3. Average institutional features by country

Country	High-impact entrepreneurship	Governance	Individualism	Uncertainty avoidance
Denmark	15.82	1.76	74	23
Norway	13.41	1.55	69	50
Iceland	13.03	1.56	60	50
Sweden	10.56	1.65	71	29
Belgium	10.12	1.16	75	94
Saudi Arabia	9.36	-0.65	25	80
Netherlands	9.34	1.56	80	53
New Zealand	8.49	1.64	79	49
Slovenia	7.48	0.74	27	88
Malaysia	7.35	0.05	26	36
Italy	6.68	0.34	76	75
Australia	6.34	1.46	90	51
Finland	6.02	1.79	63	59
United Kingdom	5.99	1.28	89	35
Ireland	5.96	1.37	70	35
Canada	5.89	1.35	80	48
Switzerland	5.83	1.60	68	58
Singapore	5.81	1.31	20	8
Spain	5.47	0.76	51	86
USA	4.96	1.08	91	46
México	4.42	-0.45	30	82
Portugal	4.28	0.71	27	104
France	3.76	1.07	71	86
Japan	3.60	1.00	46	92
Greece	3.57	0.29	35	112
Latvia	3.57	0.41	70	63
Uruguay	3.12	0.51	36	100
Thailand	3.12	-0.61	20	64
Chile	2.90	0.98	23	86
Peru	2.81	-0.64	16	87
Hungary	2.71	0.58	80	82
Germany	2.69	1.31	67	65
Colombia	2.68	-0.70	13	80
Russia	2.64	-1.18	39	95
Dominican Republic	2.09	-0.75	30	45
Hong Kong	2.02	1.24	25	29
Romania	1.97	-0.18	30	90
Argentina	1.92	-0.68	46	86
South Africa	1.81	0.03	65	49
Turkey	1.79	-0.37	37	85
Croatia	1.72	0.09	33	80
Iran	1.69	-1.68	41	59
Brazil	1.56	-0.13	38	76
Serbia	1.54	-0.59	25	92
South Korea	1.48	0.51	18	85
China	1.34	-0.97	20	30
Poland	1.31	0.61	60	93
Mean	**5.34**	**0.70**	**54.43**	**67.82**
Standard Deviation	**4.30**	**0.83**	**23.18**	**24.38**

Source: Own elaboration from GEM (Global Entrepreneurship Monitor). WGI (Worldwide governance indicators World Bank) and Hofstede (1980,2001)

5. Results

Table 4 shows random effect estimates of our models.[3] All of them are robust to heteroskedasticity and autocorrelation (HAC). To test our hypotheses, we estimate five models where the variables that proxy formal institutions and their interactions with informal ones are introduced in a nested way. Model 1 only considers the influence of control variables. Model 2 introduces the direct effect of formal institutions (governance) on high-impact entrepreneurship (Hypothesis 1). Models 3 and 4 add, respectively, the interaction between formal institutions and individualism (hypothesis 2), and between formal institutions and uncertainty avoidance (hypothesis 3). Finally, Model 5 is the full model that incorporates all the interactions.

It is important to note that several of our models include interaction terms, which implies that some multicollinearity problems may arise. To assess their importance, we calculate the variance inflation factors (VIFs). In the models without interaction terms, no variable has a VIF above the usual threshold of 10. However, in the models that include only one of the interactions terms and in the full model, some variables have a VIF above 10, which warns us our data is prone to collinearity. Nevertheless, it is important to take into account that the main effect of this multicollinearity is an increase in the standard deviation of the estimated coefficients, with the subsequent reduction in their statistical significance. Hence, this situation may not pose a serious problem when R^2 is high and the regression coefficients are individually significant (Gujarati 2004), as in our case.

Focusing our analysis on the results from the model that only includes control variables, we can observe that unemployment has a negative and significant effect on high-impact entrepreneurship. This may indicate, on the one hand, that higher unemployment rates are related depressed economies, leading to a reduction in the availability of business opportunities; on the one hand, higher levels of unemployment push individuals into self-employment due the lack of alternatives, increasing necessity entrepreneurship. Role models present a significant and positive effect, which confirms that direct knowledge and contact with entrepreneurs favors the launch and the quality of new

[3] The use of random effects is justified by the result of the Hausman test when comparing the regressions with fixed and random effects.

businesses. It is also important to note that these two variables (unemployment and role models) maintain their sign and significance across the five models. With respect to the variable individualism, it is also positive and significant in model 1. However, in the remaining estimations, individualism is non-significant. The rest of the variables we consider (GDP growth, domestic credit, population growth and uncertainty avoidance) usually present the expected signs, although their coefficients are not statistically significant.

Model 2 includes formal institutions (governance) that show a positive and significant relationship (β=1.778, $p<0.01$) with high-impact entrepreneurship, suggesting that, in countries where formal institutions are more developed, entrepreneurship is, in general, of higher quality. This result provides support for Hypothesis 1.

The interaction term between governance and individualism (model 3) is also positive and significant (β=0.037, $p<0.05$), while the interaction with uncertainty avoidance (model 4) takes the expected negative sign (β= -0.033, $p<0.10$). Therefore, although the variables that proxy culture and society values do not directly influence high-impact entrepreneurship, they indirectly moderate it through the effect of formal institutions. More precisely, we observe that, in countries with higher individualism, the relationship between the development of formal institutions and high-impact entrepreneurship is more intense while, in countries with lower uncertainty avoidance, the relation is also negatively reinforced. Model 5 includes all the explanatory variables and, according to the F-tests shown at the end of Table 4, it is the model that best fits our data.

Table 4. Formal institutions, informal institutions and high-impact entrepreneurship

Dependent Variable ***High-impact entrepreneurship***	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Governance		1.778***	0.303	3.873***	2.420*
		(0.548)	(0.920)	(1.147)	(1.416)
Governance x Individualism			0.037**		0.031*
			(0.017)		(0.017)
Governance x Uncertainty avoidance				-0.033*	-0.030*
				(0.018)	(0.017)
GDP growth	0.005	0.017	0.021	0.030	0.032
	(0.044)	(0.040)	(0.040)	(0.041)	(0.040
Domestic credit provided by the financial sector	0.003	-0.002	-0.002	-0.000	-0.000
	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Unemployment	-0.232***	-0.162***	-0.136***	-0.158***	-0.137***
	(0.036)	(0.043)	(0.045)	(0.042)	(0.046)
Role models	0.090***	0.087***	0.081***	0.090***	0.084***
	(0.030)	(0.029)	(0.029)	(0.028)	(0.029)
Population growth	-0.442	-0.326	-0.351	-0.320	-0.344
	(0.441)	(0.442)	(0.437)	(0.426)	(0.423)
Individualism	0.057***	0.026	-0.004	0.025	-0.001
	(0.019)	(0.017)	(0.020)	(0.017)	(0.019)
Uncertainty avoidance	-0.024	-0.018	-0.001	0.007	0.009
	(0.020)	(0.019)	(0.017)	(0.014)	(0.015)
Year dummies	YES***	YES ***	YES ***	YES ***	YES ***
Constant	2.229	2.246	2.753	0.116	0.772
	(1.976)	(1.778)	(1.587)	(1.869)	(1.918)
N	291	291	291	291	291
R^2	0.40	0.44	0.45	0.46	0.47
F-Test vs.1		10.51***	15.83***	19.03***	21.27***
F-Test vs.2			4.74***	3.47*	6.98**
F-Test vs.3					2.73*
F-Test vs.4					3.29*

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

All the relevant variables maintain their sign and remain statistically significant, thus our previous conclusions hold. The only difference is that the significance of the main independent variables is reduced because of the multicollinearity problem mentioned above. Overall, the results of model 5 give support to our Hypotheses 1, 2 and 3.

Figures 1a and 1b present a graphical illustration of our results with the aim of providing a more nuanced analysis of the moderating effect of the informal dimension on the relation between formal institutions and high-impact entrepreneurship. Figure 1a shows the moderating effect of individualism (Hypothesis 2). More precisely, using coefficient estimates from the fully specified model in Table 4 and considering the average of the other moderating variable (uncertainty avoidance) of 67.82, we analyze the effect of governance on high-impact entrepreneurship when individualism is low (one standard deviation below the mean) when it is equal to the mean and when it is high (one standard deviation above the mean). We observe that for a medium formal institutional development (values of the governance variable close to zero), differences in the levels of individualism in a country hardly lead to significant variations in the levels of high-impact entrepreneurship. However, these differences become more pronounced as the formal institutions development move further away from values around 0. Therefore, for high values of governance, the individualistic character of a society improves the relation between formal institutions and high-impact entrepreneurship. However, where formal institutions are less developed, a collectivistic culture favors their relation with high-impact entrepreneurship.

A similar assessment can be carried out when we analyze the effect of governance on high-impact entrepreneurship for different values of uncertainty avoidance. With this aim in mind, again from the full model (Model 5) and considering an average value for individualism of 53.43, we analyze the effect of governance when uncertainty avoidance takes low, medium and high scores. Figure 1b shows that the moderating effect of uncertainty avoidance on the relation between formal institutional development and high-impact entrepreneurship increases when governance shifts away from zero. In other words, the degree of uncertainty avoidance has a limited effect on entrepreneurial rates when formal institutions have a medium level of development. However, the

picture changes dramatically for high (low) levels of development of formal institutions. In this case, a lower (greater) aversion can potentiate (reduce) high-impact entrepreneurship.

Figure 1a. Moderating effect of individualism in the relation between formal institutions and high-impact entrepreneurship

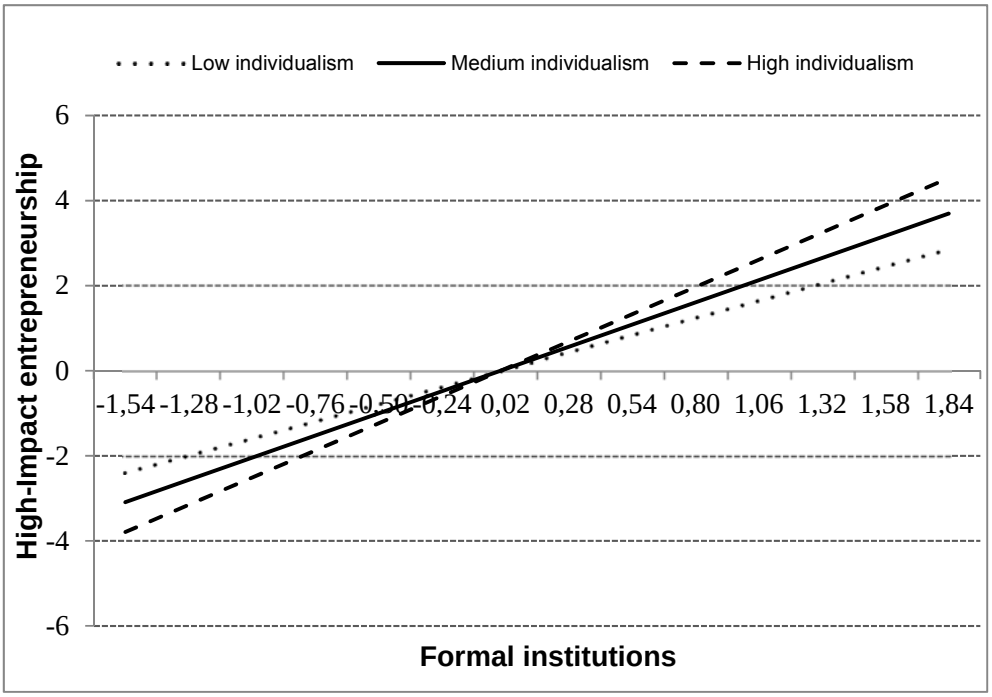
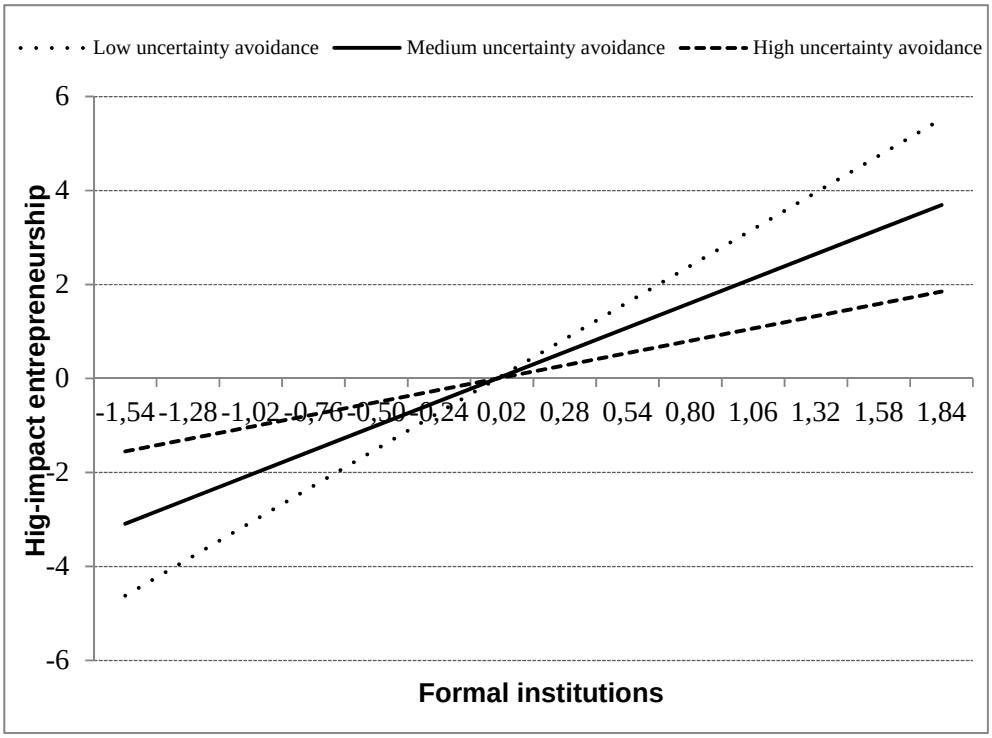


Figure 1b. Moderating effect of uncertainty avoidance and the relation between formal institutions and high-impact entrepreneurship



6. Discussion and conclusions

The main objective of this research has been to provide a more detailed picture of the relationship between institutions and entrepreneurship. Our starting point is the evidence that many countries have recently demonstrated a growing concern to improve their entrepreneurial levels. Entrepreneurship scholars have increasingly incorporated the institutional perspective into their research to analyze the impact of the environment on the rate of new venture creation. In our paper, we build on the well-established distinction between formal and informal institutions proposed by North (1990) and we acknowledge that, although previous literature has frequently addressed these two institutional components separately, our proposal suggests that they should be jointly considered for a better understanding of their impact.

However, not all the initiatives have the same positive effects on wealth creation. Our contention is that high-impact entrepreneurs are motivated to start and develop larger, highly visible, and more valuable firms (Henderson 2002) and that these firms have

clear implications on economic growth and innovation (Wong, Ho and Autio 2005). As a consequence, we elaborate on the relationship between high-impact entrepreneurship and institutions. Our theoretical rationale establishes that well-developed formal institutions increase high-impact entrepreneurship, but the informal dimension moderates this relationship. Our main findings confirm our assumptions and, although it is true that the highest high-impact entrepreneurship rates are observed in countries where the rules of the game (formal institutions) are well defined, culture and society values (informal institutions) greatly affect the process of business creation through their moderating effect on formal institutions. Particularly, in more individualistic-oriented countries the relation between formal institutions and high-impact entrepreneurship is greater, as is the case in nations where the level of uncertainty avoidance is lower.

Our results may have important implications for the development of existing entrepreneurship theory and empirical research. The discussion initiated by Baumol (1990), where productive and unproductive entrepreneurship are dependent on the prevailing *rules of the game*, has opened a prolific stream of research. Some previous studies, including Sobel (2008), have contributed to empirically testing Baumol's postulates and further literature has called for the consideration of not only the number of new ventures but also their quality (Li and Zahra 2012). However, most previous research only provides a limited approach to this analysis. Some studies analyze the quality of entrepreneurship but they do not take into account the institutional component (Acs 2006, Block and Sadner 2009). Other scholars include formal institutions in their analyses of the quality of entrepreneurship but they omit the role played by informal institutions (Sobel 2008). Finally, additional work analyzes the different dimensions of culture and their impact on the type of entrepreneurial activity (Hechavarria and Reynolds 2009). Our work aims to fill this gap by proposing that the approach to institutions should be more granular and consider formal institutions, as well as their interactions with informal ones, as key factors that determine high-impact entrepreneurship.

The paper also has relevant implications from a public policy point of view. Despite the growing adoption of measures to encourage the creation of new ventures, it is imperative to take into account that not all the initiatives have the same impact on value

creation and economic growth. As Sobel (2008) argues, it is not uncommon to identify entrepreneurial projects that simply receive public funds through subsidies and grants, but with a doubtful contribution to value creation (zero-sum economic activities). For this reason, the stimuli provided by governments should essentially focus on allocating resources to initiatives with a greater innovative component or with high potential growth.

Another implication from a public policy perspective is the importance of strengthening formal institutions, particularly in less developed countries where the rules of the game are usually less clear. Policymakers in these countries should be conscious of the positive effects in terms of development and wealth creation of giving sufficient attention to reinforcing the regulatory framework. In any case, formal institutions should not be managed in isolation; they are contingent on informal ones. It is important to be aware that similar formal institutions may have different effects on new business creation depending on the informal institutions (Li and Zahra 2012; Rodrik 2007). Unfortunately, it is not easy to establish a clear casual relationship between policymakers' actions and society values. Thus, the effect of the decisions adopted with respect to these variables is difficult to identify, given that they are only perceived in the long run. It is true that governments are frequently conditioned by short-term outcomes but they should be conscious of the positive consequences of the efforts that derive from this type of decisions. As a consequence, public authorities should promote measures, such as improving the social recognition of the entrepreneur and highlighting the long-term consequences of the quality of entrepreneurship, aimed at sensitizing citizens to developing their entrepreneurial spirit. The inclusion of issues related to entrepreneurship at different educational levels and raising awareness of the importance of entrepreneurs in society are only some of the challenges facing governments in the promotion of quality entrepreneurship.

Our results also leave several questions unanswered that will deserve further attention in the future. First, we have proxied formal institutions through an aggregate index, which tries to measure objective perceptions about the quality of governance in different countries. Undoubtedly, perceptions may often be as important as objective differences in institutions across countries (Kaufmann et al. 1999, p.2) but it would be of interest if

future work provided a more disaggregated analysis of formal institutions, including dimensions such as economic freedom, political stability, the quality and independence of public services, ease of access to finance, the control of corruption or legal security. It cannot be discarded that the interaction between these factors and informal institutions would be heterogeneous. As the moderating effect of informal institutions would be contingent to each (or some) of these dimensions, our knowledge would be enriched by identifying adequate variables that measure and assess them separately.

Second, our empirical analysis has been performed through the use of GEM data. This has the advantage of providing us with a wide variety of cultural contexts, which is the exception in studies which relate entrepreneurship and institutional theory (Bruton et al. 2010). However, GEM data are not free from criticism. For example, GEM coverage -at least at the beginning of the project- is slightly biased toward developed countries, which might limit the variability of our independent variables. It is true that the sample has been widened in recent years so we can expect a more homogeneous representativeness in the near future. Our hope is that entrepreneurship scholarship will develop and test more complex measures that improve the accuracy of the findings.

Third, culture is assumed to be a construct that is extremely stable over time. Hofstede (1980, 2001) gathered the information used to develop his first set of indicators in the late 70's and revised it in the late 90's. However, it can be argued that, in a highly dynamic world cultural patterns may evolve over time (Inglehart and Baker 2000), which raises concerns about whether the indices collected by Hofstede a few decades ago are still relevant (Jones 2007). As a consequence, future research should make additional efforts to update (or complete) these indicators with the aim of taking new cultural patterns into account in a landscape that is becoming more and more global.

Fourth, we analyze culture at the national level to predict rates of high-impact entrepreneurship also at national level. However, culture is a multi-level construct that ranges from the macro to the individual level (Erez and Gati 2004). The effects of culture at the individual level remain largely understudied. Subsequent analysis should explore the role of culture at the individual level as a possible moderator between formal institutions and high-impact entrepreneurship. Similarly, our macro-level analysis is

centered on the institutional side. However, there are probably other macro dimensions that may influence the propensity towards high-impact entrepreneurship; thus, future research would benefit from identifying new, potentially relevant, variables.

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