Macro-level determinants of formal entrepreneurship versus informal entrepreneurship

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ABSTRACT

Based on the eclectic theory of entrepreneurship, this article analyzes macro-level determinants of national rates of formal versus informal entrepreneurship. Our evaluation of the factors identified in this theory reveals a set of empirically-testable, higher-order determinants: economic opportunities, quality of governance, macro-level resources and abilities, performance-based culture and socially-supportive culture. The results of our analysis obtained through the PLS (partial least squares) approach to structural equation modeling contribute to the entrepreneurship literature by providing an empirically-supported model that shows how formal and informal entrepreneurship are driven differently. This model clarifies the conflicting findings in previous research about the effects of socioeconomic, institutional, and cultural factors on entrepreneurship rates across countries. Finally, by showing the effect of each determinant on formal and informal entrepreneurship, this study has important implications for policymakers as well as businesses.

1. Executive summary

Based on the eclectic theory of entrepreneurship, this article analyzes macro-level determinants of national rates of formal versus informal entrepreneurship. Our evaluation of the factors identified in this theory reveals a set of empirically-testable, higher-order determinants: economic opportunities, quality of governance, macro-level resources and abilities, performance-based culture and socially-supportive culture. The results of our analysis obtained through the PLS (partial least squares) approach to structural equation modeling contribute to the entrepreneurship literature by providing an empirically-supported model that shows how formal entrepreneurship and informal entrepreneurship are driven differently.

On the demand-side side, economic opportunities (which include GDP growth, share of the service sector in the economy, innovation and financial development) and the quality of governance (governance index, democracy index and ease of doing business) are found to encourage formal entrepreneurship and discourage informal entrepreneurship. This insight can explain the underlying reasons for discrepancies in previous studies. Specifically, studies with a focus on entrepreneurship in the formal sector find that good institutions and a high level of economic development and technology advancement are positively related to national rates of entrepreneurship. On the other hand, studies focusing on entrepreneurship in countries where informal commercial activities account for a large share of the economy find a negative relationship. Studies with no clear bias on the proportion of countries with a higher percentage of formal or informal entrepreneurship may show no relationship at all. Furthermore, our study can explain the U-shaped relationship between economic development and national rate of entrepreneurship. When the economy is at a low development stage, informal entrepreneurship is common. As it grows and

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exerts pressure on the cost of doing business (higher wages, competition, etc.), informal firms are squeezed out. When the economy reaches an advanced stage, formal entrepreneurship flourishes and thus drives up the national rate of entrepreneurship.

With regard to supply-side factors, our study supports the argument found in population theories that people are the main agents of social and economic changes. It also offers strong support for motivation theories which stress intrinsic motivations and self-determination in human behaviors. As people come to be better educated, enjoy a higher level of social security and earn more income, they are less inclined to engage in the informal economy. Furthermore, it shows that informal entrepreneurship is driven by a socially-supportive culture, while performance-based culture has a strong impact on formal entrepreneurship. The evidence we found with regard to the impact of government intervention and culture supports theories in the behavioral school of thought stressing the role of the human-made, formal (e.g., regulations) or informal (e.g., culture) constraints in shaping human interaction. As individuals and organizations are pushed to comply with rules and norms, institutions determine the setting and legitimacy of entrepreneurship.

Finally, our results with regard to the linkages among governance, economic opportunities and resources and ability variables also contribute to the literature. More precisely, they strongly support the institutional economics literature by confirming that improved regulatory efficiency stimulates economic development. They also validate the development economics literature's argument that economic development increases peoples' resources and abilities. In addition, our study supports theories of culture change by showing that improvement in people's resources and abilities leads societies to a performance-based culture that rewards performance, encourages gender equity and future-oriented activities, and increases uncertainty avoidance while discouraging power distance and in-group collectivism.

These findings reveal that governments can reduce informal entrepreneurship and at the same time boost formal entrepreneurship by (1) nurturing a performance-based culture, (2) creating favorable conditions for economic advancement, (3) increasing quality of governance, and (4) enhancing people's resources and abilities. However, these measures may not be feasible for developing countries whose informal sector accounts for a significant share of the economy. To increase entrepreneurship in these countries, we recommend promoting cooperation and networking to encourage social capital and to encourage informal entrepreneurship before undertaking the necessary governance and economic reforms to motivate entrepreneurs to transfer to the formal sector.

Understanding the determinants of formal and informal entrepreneurship can be beneficial for managers. Both formal firms and informal firms compete in the market. Since informal firms operate outside the regulatory system, their competition dynamics can be different from formal firms and their activities are not easily traceable. Familiarity with a country's contextual factors allows managers to determine whether their competition in that country comes from the formal or informal economy and to develop business strategies accordingly (i.e., whether to enter that country, and if yes, how to compete). Moreover, a company's supply chain may be made up of both formal firms and informal firms. Therefore, our findings about determinants of the national rates of entrepreneurship in the formal and informal sectors can help managers to understand the nature of their companies' supply chain, thereby enabling them to develop appropriate strategies.

2. Introduction

Entrepreneurship is one of the most important forces shaping the changes in the economic landscape (Baumol, 1968) regardless of whether it occurs within the framework of the formal economy or takes place informally outside state regulatory systems (Carree and Thurik, 2010; Thurik et al., 2002; Williams and Nadin, 2010 etc.). Although entrepreneurship in the informal economy receives very little attention in academic literature, there are several reasons why it cannot be ignored. First, informal commercial activities account for a sizeable share (over 30% on average) of economic activity around the world (Schneider et al., 2010a). Second, informal entrepreneurship takes places in all countries regardless of their level of economic development (Thai and Turkina, 2012). Third, informal entrepreneurship is highly prevalent in certain countries. For example, 90% of Ukraine's business start-ups operate partially or wholly in the informal economy (Williams and Round, 2007). Fourth, informal entrepreneurship can be vulnerable to unethical practices (e.g., corruption, worker exploitation, natural environment abuse, etc.). Therefore, it is vitally important to understand what drives entrepreneurs to set up new businesses in the formal sector or in the informal one.

At the macro level, it is useful for policymakers to understand what makes entrepreneurs in their countries engage in the formal or the informal economy when setting up their new business. This knowledge can help them not only understand the current situation of their country in comparison with other countries, but also come up with macro-level measures to direct their countries' entrepreneurship development. In addition, this knowledge can help businesses to develop certain competitive advantages in doing business in a country according to its ratio of formal versus informal entrepreneurship.

Previous research shows that the level of entrepreneurship varies systematically across countries (see Wennekers et al., 2002 for a review). It has been argued that factors such as culture, economic conditions, institutions, technology advancement, and education level are important determinants (Bettignies and Brander, 2007; Gentry and Hubbard, 2000; Harper, 1998; McMillan and Woodruff, 2002; Shane, 1996, etc.). Although entrepreneurship scholars tend to agree on the categories of factors influencing entrepreneurship, their empirical studies have led to different conclusions with regard to the relative importance of each driver and at times to contrasting directions of influence. For example, several studies (e.g., Havrylyshyn, 2001; Kaufmann et al., 2006; Nyström, 2008) show that good institutions and a high level of economic development and technology advancement are positively related to national rates of entrepreneurship. On the other hand, several other studies demonstrate that these same factors have a negative relationship (e.g., Naudé, 2009; Wong et al., 2005), a U-shape relationship (Wennekers et al., 2005) or

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even no relationship at all (Van Stel et al., 2007). When taking a closer look, we see that the studies in favor of economic development and technology advancement are based on registered business data while the others are based on the general level of entrepreneurship data provided by the Global Entrepreneurship Monitor (GEM), which include both formal and informal entrepreneurship (Reynolds, 2005). These conflicting findings in the literature lead us to speculate that the same factors may have a very different impact on formal entrepreneurship than on informal entrepreneurship.

Since previous empirical articles only look at the relationship between individual determinants or particular groups of determinants (economic indicators, or cultural indicators, or technology, etc.) (George and Zahra, 2002; Hofstede et al., 2004; Mitchell et al., 2007) and do not consider all factors together, there is no empirically-assessed model of entrepreneurship that takes into account the combined effects of these factors. Certain conceptual articles (e.g., Freytag and Thurik, 2007; Morrison, 2000; Verheul et al., 2002; Wennekers et al., 2002) propose overarching, macro-level models of entrepreneurship. However, these models neither distinguish formal entrepreneurship from informal entrepreneurship nor give hints on how their determinants may differ.

In light of the foregoing, this article attempts to make two important contributions: (1) to understand which country-specific factors drive entrepreneurs to set up their businesses in the formal versus the informal economy; and (2) to empirically test the explanatory power of the determinants of entrepreneurship that have been theoretically developed and/or empirically examined in the literature. To meet these objectives, it first presents the eclectic theory of entrepreneurship (ETE) and then identifies a set of factors that, according ETE, have an impact on entrepreneurship: economic opportunities, resources and abilities, quality of governance, and culture, each of which consists of multiple indicators. The article then presents an empirical analysis of the relationship between these factors and national rates of formal and informal entrepreneurship followed by the discussion of findings. It concludes with a discussion of business creation trends across countries and perspectives for policies aimed at entrepreneurship development.

3. Conceptual framework

3.1. Formal versus informal entrepreneurship

Entrepreneurship scholars have yet to reach a common definition of the concept of entrepreneurship (Wiklund et al., 2011). Depending on the focus of the research undertaken, numerous definitions of entrepreneurship are used in the literature (see Table 1 in Gedeon's review (2010) for a comprehensive list). The literature with macro-level analyses of entrepreneurship presents four streams of research that adopt four different views on the functions of entrepreneurs in the economy.

In one view, entrepreneurs are seen as the main agents of production in the economy and act in a world of equilibrium by assessing the most favorable economic opportunities (Hébert and Link, 1988). They are firm managers whose payoff is not profits arising from risk-bearing but, rather, a wage accruing to a scarce type of labor (Say, 2007). In this view, the self-employment rate has been used to compare entrepreneurship across countries (e.g., Acs et al., 1994; Blanchflower, 2000; Eurostat, 2001; Le, 1999; OECD, 1998; Parker, 2004; etc.).

In another view, entrepreneurs are seen as arbitrageurs who balance supply and demand in the economy (Cantillon, 1959; Knight, 1971). As such, entrepreneurs are risk-bearing agents who react to economic opportunities in a world of constant change and, therefore, work to bring equilibrium to the economic system (Kirzner, 1973; Schultz, 1975). Scholars adopting this view use the business ownership rate as measurement of entrepreneurship (e.g., Gartner and Shane, 1995; Meyer, 1990; Stephan and Uhlaner, 2010).

In the third view, entrepreneurs are seen as innovators who push back the production possibility frontier (or the cost curve) by creating new combinations and seeking new opportunities (Schumpeter, 1934). In this view, several measures have been used.

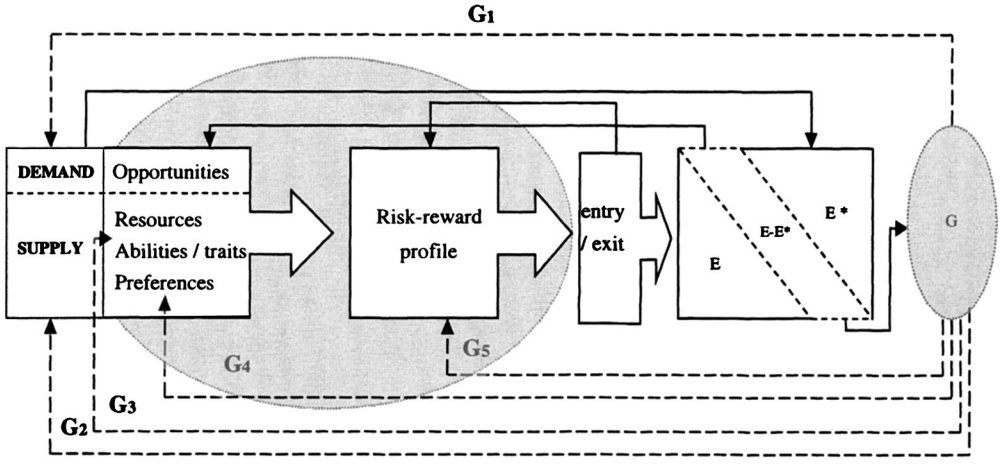

Fig. 1. Eclectic theory of entrepreneurship. (Source: Verheul et al., 2002, p. 20).

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The rates of entry and exit into and out of self-employment are used in studies by Evans and Leighton (1989), Fairlie (1999), Lin et al. (2000), etc. Firm entry rates are used in studies by Acs and Audretsch (1989), Austin and Rosenbaum (1990), Caves (1998), OECD (2005), etc. Survival rates are used in studies by Bartelsman et al. (2003), OECD (1997), Delgado et al. (2010), etc.

Most recently, entrepreneurship scholars adopt the view proposed by Shane and Venkataraman (2000), who argue that "entrepreneurship involves the nexus of two phenomena: the presence of lucrative opportunities and the presence of enterprising individuals" (p. 218). In other words, entrepreneurs are individuals drawn by the interaction between the demand for and the supply of entrepreneurship. At the same time, scholars agree with Casson's argument (2003) that entrepreneurs are individuals who specialize in decision making, that is, they assess the unique situations that will arise in the future and make decisions about how to exploit them to make a profit. In this fourth view, entrepreneurship is measured by people's involvement in new venture creation. In this connection, data produced by the Global Entrepreneurship Monitor (GEM) or the World Bank (WB) have become increasingly popular in recent studies (Amorós et al., 2013; Sternberg and Wennekers, 2005).

Of the four views, the fourth is the most suitable for our research because it seeks to understand the effects of macro-level factors on entrepreneurship within and outside of the regulatory radar. Therefore, we searched the relevant literature to find commonly accepted definitions of the two forms of entrepreneurship (i.e., formal and informal) and their corresponding measurement.

The World Bank defines entrepreneurship as "the activities of an individual or a group aimed at initiating economic activities in the formal sector under a legal form of business" (Klapper et al., 2008, p.3). Since the World Bank only considers the "economic unit of the formal sector incorporated as a legal entity and registered in a public registry, which is capable, in its own right, of incurring liabilities and of engaging in economic activities and transactions with other entities" (Klapper et al., 2008, p.4), we can conclude that the WB definition refers to formal entrepreneurship.

Williams and Nadin's comprehensive review of the development of the informal entrepreneurship concept reveals that scholars tend to agree that informal entrepreneurship "involves somebody actively engaged in starting a business or is the owner/

Table 1
Determinant of entrepreneurship across countries.

Verheul et al.'s categories	Cross-country data	Literature background	Sources of data used in our study	Data year
Demand factors (economic opportunities)	GDP growth	Bjørnskov and Foss, 2008; Klapper et al., 2007	World Economic Outlook database (Note: we use GDP growth rate)	2009
	Innovation	Shane et al., 1991	Global competitiveness report	2009
	Economic integration	Shane, 2005; Audretsch and Sanders, 2007; Bjørnskov and Foss, 2008	Swiss Institute database	2009
	Financial development	Black and Strahan, 2002; Klapper et al., 2007; Evans and Jovanovic, 1989; Black and Strahan, 2002; Parker, 2004; Bjørnskov and Foss, 2008	World development indicators database	2009
	Contribution of services to total GDP	Acs, 2006	CIA World Factbook, 2009	2009
Supply factors (resources and abilities)	Social security arrangement	Parker and Robson, 2004; Wennekers et al., 2005; Hessels et al., 2007	International Labor Organization	2009
	Unemployment	Evans and Leighton, 1989; Meager, 1992; Parker and Robson, 2004; Bjørnskov and Foss, 2008	World Bank data	2009
	GDP per capita	Kuznets, 1971; Lucas, 1978; Schultz, 1975; Yamada, 1996; Klapper et al., 2007	World Economic Outlook database	2009
	Human development	Delmar and Davidsson, 2000; Uhlaner and Thurik, 2007; Bjørnskov and Foss, 2008	Worldwide Trends in the Human Development Index 1970–2010	2009
Quality of governance	Governance	Bjørnskov and Foss, 2008	World Bank indicators	2009
	Ease of doing business	Kaufmann et al., 2006; Klapper et al., 2007; Nyström, 2008	World Bank's report on ease of doing business	2009
	Democracy index	Lowrey, 2003	Economist Intelligence Unit	2009
Culture	Power distance	McGrath et al., 1992; Mitchell et al., 2002; Stephan and Uhlaner, 2010	GLOBE data (House et al., 2004)	2004
	Uncertainty avoidance	McGrath et al., 1992; Mueller and Thomas, 2000; Baughn and Neupert, 2003; Wennekers et al., 2007; Stephan and Uhlaner, 2010	GLOBE data (House et al., 2004)	2004
	Individualism	McGrath et al., 1992; Shane, 1993; Mueller and Thomas, 2000; Mitchell et al., 2002; Stephan and Uhlaner, 2010	GLOBE data (House et al., 2004)	2004
	Masculinity	McGrath et al., 1992; Thomas and Mueller, 2000	GLOBE data (House et al., 2004)	2004
	Human orientation	Stephan and Uhlaner, 2010	GLOBE data (House et al., 2004)	2004
	Institutional collectivism	Freytag and Thurik, 2007; Stephan and Uhlaner, 2010	GLOBE data (House et al., 2004)	2004
	Future orientation	Freytag and Thurik, 2007; Stephan and Uhlaner, 2010	GLOBE data (House et al., 2004)	2004
	Performance orientation	Suddle et al., 2010; Stephan and Uhlaner, 2010	GLOBE data (House et al., 2004)	2004

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manager of a business that is less than 42 months old who participates in the paid production and sale of goods and services that are legitimate in all respects besides the fact that they are unregistered by, or hidden from, the state for tax and/or benefit purposes" (Williams and Nadin, 2010, p. 363).

It should be noted that entrepreneurial activities can be productive (e.g., innovation), unproductive (e.g., rent seeking), or even destructive to the society (e.g., organized crime) (Baumol, 1990). However, the purpose of this article is not to find drivers of these types of entrepreneurship. Rather, it seeks to find drivers of entrepreneurship in the formal economy (formal entrepreneurship) versus the informal economy (informal entrepreneurship).

Furthermore, our study does not concern the legality of formal versus informal entrepreneurial activities. Nevertheless, we must not equate informal with illegal even though some articles implicitly consider formal entrepreneurship as a legal form of entrepreneurship (e.g., Djankov et al., 2002). Desai (2009) clearly demonstrates that formally registered firms may carry out illegal activities while the activities of informal firms can be completely legal. A literature review by Williams and Nadin (2010) also shows that informal entrepreneurship can be entirely legal even when it is not reported or monitored by authorities. Webb et al. (2012) maintain that informal entrepreneurship occurs within informal institutional boundaries for large societal groups despite being outside of formal institutional boundaries. Thus, informal entrepreneurship is legitimate (Webb et al., 2009).

3.2. Eclectic theory of entrepreneurship

Given that entrepreneurship is about people's involvement in new venture creation, Verheul et al. (2002) propose the eclectic theory of entrepreneurship (Fig. 1), which provides broad categories of macro and micro factors that determine the level of entrepreneurship in a given country. The following paragraphs explain the theory's core categories (demand side, supply side, individual decision making, actual and equilibrium rates, government intervention and culture) and the relationships among them.

On the demand side, entrepreneurial opportunities are created by industrial structure and diversity of demand, both of which are determined by economic development, technological development and international economic integration. On the supply side, there are individuals that make up the pool of potential entrepreneurs. In this light, entrepreneurship is determined by the characteristics of the population, participation of women and people's income. Potential entrepreneurs can seize the opportunities available to them if they have the right resources, abilities and preferences.

Therefore, occupational choices of individuals (i.e., being entrepreneurs versus other types of employment) are based on availability of opportunities (as a function of the external environment's characteristics), resources (e.g., personal financial resources and education) and individual characteristics (e.g., ability, personality traits and preferences). These choices are then made on the basis of their risk-reward profile in the process of weighing alternative types of employment, i.e., self-employment versus wage jobs (or unemployment). At the aggregate level, these occupational choices materialize as entry and exit rates of entrepreneurship.

Entry and exit rates can also impact an individual's risk-reward profile of entrepreneurship because the dynamics of entry and exit reveal the perceived attractiveness of self-employment, independent of existing opportunities and individual characteristics. Upon observing others entering self-employment, people may be lured into doing the same without taking into consideration the possibilities and the financial and/or intellectual capital needed to successfully launch a business.

At any given time, a country's actual level of entrepreneurship does not necessarily equal the equilibrium level (E^* on Fig. 1) — a long-term equilibrium rate contingent upon demand-side forces. However, 'disequilibrium' ($E–E^*$ on Fig. 1) can be restored either through market forces (i.e., a surplus or lack of entrepreneurial opportunities, leading to entry and exit of entrepreneurs, respectively) or the quality of governance that leads to changes in environmental conditions and as a consequence, individual characteristics. For example: good governance can make doing business easy by simplifying and making transparent registration procedures and other bureaucratic processes, and thereby modify business start-up opportunities (arrow G1 on Fig. 1); government policies can modify the supply of future entrepreneurs (arrow G2 on Fig. 1); education, promoting the availability of capital, provision of information through consulting or counseling and so on can change individual characteristics and resources (arrow G3 on Fig. 1); the educational system and the media can change people's preferences (arrow G4 on Fig. 1); and fiscal incentives, subsidies, labor market regulation and bankruptcy legislation codetermine the net rewards and the risks of the various occupational opportunities (arrow G5 on Fig. 1).

Given that entrepreneurship is conducted by and for human beings (Sarasvathy, 2008), it is embedded in culture (shaded area coded C on Fig. 1). A nation's prevailing attitude towards entrepreneurship can influence individual preferences for self-employment. Since economic opportunities have an impact on personal resources and affect abilities and preferences, there is a relationship between the demand and the supply sides. Therefore, risk-reward profile, which is an important part of culture, is affected by opportunities and resources, abilities and preferences in the following manner: opportunities in the economy endow people with certain resources and abilities, which, in turn, affect their risk-taking behaviors (Verheul et al., 2002).

In short, ETE provides a framework for understanding what drives a country's entrepreneurship rate at both the macro and the micro levels. However, this framework has only been conceptually developed and needs empirical validation.

3.3. Macro-level determinants of entrepreneurship

As mentioned above, ETE offers a set of factors that affect entrepreneurship at the macro level: economic opportunities, quality of governance, resources and abilities at the aggregate level (e.g., education level in a country), and culture. We conducted an

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extensive literature review of these factors and discovered that they can be estimated with multiple indicators. Table 1 lists these indicators and the studies in which these factors were empirically examined.

3.3.1. Demand-side factors

Consistent with ETE, our review of the literature on economic opportunities brought out a set of variables (see Table 1). Rousseau and Sylla's analysis of economic history over the last two centuries (2003) reveals that economic opportunities are represented by financial development, economic growth and international economic integration. The authors find that countries with more sophisticated financial systems engage in more trade, appear to be better integrated with other economies and offer more economic opportunities. Their findings are consistent with other studies highlighting that financial advancement is a means to innovativeness (Gemünden et al., 1992; Levin, 1997) and then to economic growth (Mowery and Rosenberg, 1989). Indeed, in addition to economic and financial indicators, present-day economic opportunities are highly dependent upon innovation (Haines, 2006; Solow, 1956, 1957). The service sector is another important variable that plays a role in economic development and increasing economic opportunities (Gemmell, 1982; Riddle, 1987).

3.3.2. Supply-side factors

ETE's resources and abilities category also includes several indicators. Financial resources are usually operationalized with GDP per capita and employment level (Bradshaw et al., 1983). The social security and human development index (health and education) reflects abilities and physical and social resources (Rudra, 2002). In countries with full employment and high income levels, people tend to have better education opportunities, better access to healthcare services and more developed social security programs (Rudra, 2002).

It should be noted that personal traits, preferences and risk–reward profiles (see Fig. 1) are micro-level determinants. However, they are partly determined by national culture (Hofstede et al., 2010; House et al., 2004).

3.3.3. Cultural factors

Different approaches have been used to operationalize national culture empirically. Previous studies used the cultural variables provided in work by Geert Hofstede (1991, 2010), Schwartz (1994), the World Values Survey (2009) and the GLOBE project (House et al., 2004). Several studies (e.g., Brewer and Venaik, 2011; Fischer et al., 2010; Inglehart and Oyserman, 2004) point out that since these studies provide overlapping data, one has to choose from among them. In our study, we opted for the GLOBE indices for the reasons given below.

First, the GLOBE indices were generated to help understand leadership behavior. Second, they represent informal institutions whereas Hofstede's indices represent work-related values (Brewer and Venaik, 2011; Venaik and Brewer, 2010). It has been well argued that Hofstede's cultural dimensions do not adequately describe cross-country differences in forms of entrepreneurial activities (Hechavarria and Reynolds, 2009). Therefore, we chose the GLOBE's dimensions for power distance, uncertainty avoidance, individualism and masculinity rather than those developed by Hofstede.

Second, there is a substantial similarity in structure across levels between Schwartz's and Hofstede's data (Fischer et al., 2010). Moreover, since Schwartz's data were obtained from student and teacher populations, findings based on them would not be accurate for predicting behaviors of entrepreneurs who can come from all walks of life. Therefore, we excluded Schwartz's dimensions from our analysis.

Third, the World Value Survey (WVS) seeks to investigate socio-cultural and political change. Inglehart, the creator of the WVS, argues that its survival/self-expression dimension taps an underlying construct similar to Hofstede's individualism/collectivism construct and Schwartz's autonomy/embeddedness construct, with the result that these data are highly correlated

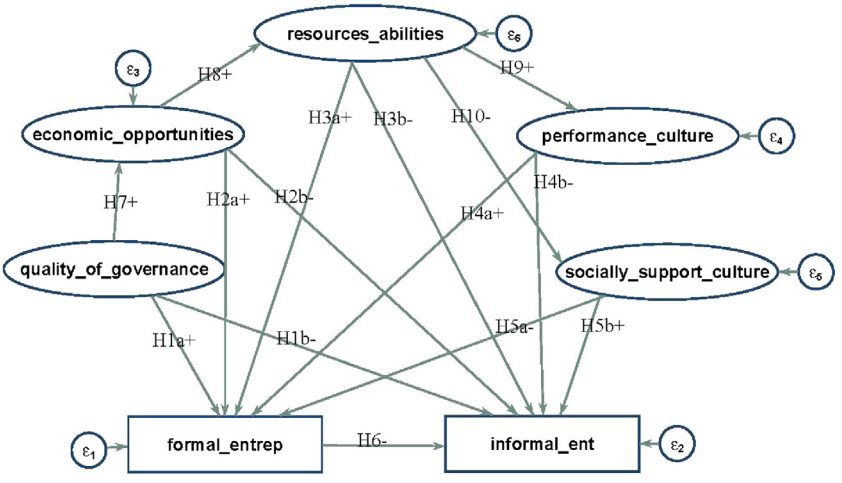

Fig. 2. Macro determinants of formal vs. informal entrepreneurship: theoretical model.

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(Inglehart and Oyserman, 2004). At the same time, Schwartz, the creator of the Schwartz Value Survey, argues that the WVS secular-rational/traditionalism dimension and Hofstede's individualism/collectivism construct overlap conceptually with his autonomy/embeddedness dimension (Schwartz, 2004). In other words, WVS indices are captured in Schwartz and Hofstede's indices. Since the GLOBE indices can offer better insights for examining entrepreneurs' decisions with regard to their new venture creation than Schwartz's and Hofstede's indices, we excluded factors constructed from the World Value Survey.

As a result, our study only examines factors from the GLOBE. For each of the GLOBE's dimensions, there are two sub-dimensions: cultural practice and cultural value. Previous studies have been concerned with either the value side of culture or descriptive norms (cultural practices). Stephan and Uhlaner (2010, p. 4) demonstrate that values are loosely related to entrepreneurial activity because "people do not necessarily act in line with their expressed personal preferences." We concur with the argument that cultural practices have a stronger predictive power on the level of entrepreneurship since they are related to answers by respondents concerning typical behavior in their culture versus personal preferences (House et al., 2004; Schneider et al., 2010b; Stephan and Uhlaner, 2010). Therefore, our study only examined the GLOBE's practice values.

Previous studies (e.g., Smith, 2006; Stephan and Uhlaner, 2010) demonstrate that cultural factors are highly correlated and should be grouped to be used in the same study. Using Stephan and Uhlaner's approach (2010), we operationalize cultural dimensions by two categories:

1. *Performance-based culture* focuses on goal achievement, favors competition, supports individual development and progress, promotes gender equity and encourages self-expression while lacking hierarchy and in-group collectivism. Owing the properties of these components, performance-based culture reflects the common traits, preferences and risk–reward profiles of people in that culture (see Fig. 1).
2. *Socially-supportive culture* favors institutional collectivism and human orientation, promotes traditionalism and spurs external locus of control while discouraging assertiveness. The degree of social support in a given culture underpins social resources available for entrepreneurship and influences social perception of entrepreneurship as well as common risk–reward profiles of people in that culture (Stephan and Uhlaner, 2010).

3.3.4. Quality of governance

There are several indicators for quality of governance in the literature. Kaufmann and Kraay (2007) argue for measuring the quality of governance with a specific business-related "ease of doing business" indicator and general governance indicators (related to rule of law, political stability and absence of violence, voice and accountability). The level of democracy is another important factor affecting the quality of governance (Hirst, 2000; Rivera-Batiz, 2002; etc.).

It should be noted that because the analysis of individual decision making is at micro level, this category was not included in our analysis. Moreover, we could not derive any operationalizable variables from the literature for the category of actual and equilibrium rates of entrepreneurship because no prior studies could give us the basis for determining these rates. We acknowledge that the absence of these variables is a shortcoming of this study.

4. Hypotheses

4.1. Determinants of formal entrepreneurship versus informal entrepreneurship

Based on ETE and its factors presented in the previous section, we have developed a theoretical model of macro-level determinants of formal versus informal entrepreneurship (Fig. 2). This section discusses the model and its hypotheses.

4.1.1. Quality of governance

Havrylyshyn (2001) and Kaufmann et al. (2006) argue that greater entrepreneurial activity is fostered by, among other things, solid laws and well-defined property rights, transparent and easy procedures required for starting a business, good political and economic institutions, and efficient regulation of the economy. Their argument is supported by Klapper et al. (2009) whose analysis of the World Bank's Global Enterprise Survey data collected from 100 countries during the eight-year period from 2000 to 2008 reveals that an improved regulatory environment significantly drives up the number of registered businesses.

On the other hand, bureaucratic barriers to legal property ownership and a lack of legal structures that recognize and encourage ownership of assets force people to keep to underground activities (de Soto, 1990, 2003). Moreover, a report by the European Commission on undeclared work (1998) notes that regulatory and administrative burdens are among the principal reasons for informal activities. Subsequent research by the European Commission (2003) confirms that improvement in the efficiency of the regulatory environment entices businesses to move from the informal to the formal sector.

Hypothesis 1a. Quality of governance encourages formal entrepreneurship.

Hypothesis 1b. Quality of governance discourages informal entrepreneurship.

4.1.2. Economic opportunities

People in countries with an economically-challenged environment and socioeconomic marginalization have to cope with an internal dissatisfaction that forces them to make the venture-creation decision in its self-employment form (Baker et al., 2005;

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Serviere, 2010). Yamada (1996) finds that while entrepreneurship is very vibrant in developing countries, it usually takes an informal form.

However, when the economy develops, it brings opportunities which can make self-employment a less attractive career option. In addition, economic advancement makes things more difficult for informal start-ups because of rising labor costs, opportunity costs of self-employment and a need for higher efficiency (Lucas, 1978). This argument is in line with Serviere's study (2010) demonstrating that economic advancement negatively affects necessity entrepreneurship, which dramatically reduces informal entrepreneurship. Furthermore, several authors argue that financial development, innovation and economic advancement significantly boost new business registrations. A better financial system and economic growth strengthen demand and increase the availability of credits for newly-registered ventures and of the technological and economic infrastructure necessary to operate in a formal economy (Beugelsdijk, 2007; Jovanovic, 1993; Klapper et al., 2008; Verheul et al., 2002).

International economic integration can also foster entrepreneurship by promoting self-reliance and independent action, placing a higher value on individual accomplishments, nurturing assertiveness and goal achievement, and offering more opportunities for individual success (Hofstede, 1980; McGrath et al., 1992; Morris et al., 1993; Mueller and Thomas, 2000; Uhlaner and Thurik, 2007). Additionally, international economic integration enhances transnational immigration. Immigrant entrepreneurs blend business practices rooted in the cultural, social and economic context of their country of origin with those of the new country, which often leads to the development of new successful business models and facilitates the entry and growth of new ventures (Colantone and Sleuwaegen, 2007).

On the other hand, there is also evidence that economic integration may negatively affect entrepreneurship (Grossman, 1984). The negative effects of international economic integration on entrepreneurship are particularly evident in developing countries in which subsidiaries of foreign-based multinationals tend to outcompete domestic entrepreneurs and negatively affect the domestic informal economy, which can sometimes account for more than 70% of the country' s economy (Colantone and Sleuwaegen, 2007; Grossman, 1984). Direct foreign investment also diverts domestic human resources from entrepreneurship to provide foreign-owned subsidiaries with a labor force (Colantone and Sleuwaegen, 2007). Since this phenomenon is especially relevant to developing countries in which the informal economy makes up more than half the total economy, it is expected that international economic integration will make things particularly difficult for the informal economy and, therefore, for informal entrepreneurship.

Hypothesis 2a. Economic opportunities encourage formal entrepreneurship.

Hypothesis 2b. Economic opportunities discourage informal entrepreneurship.

4.1.3. Resources and abilities

The literature amply substantiates the claim that resources are needed to start a new venture and to ensure business growth (Jarillo, 1989; Shane and Venkataraman, 2000; etc.). Kor et al. (2007) note that individuals and their knowledge, resources and skills are at the heart of entrepreneurship. The author argues for a fundamental subjectivity in entrepreneurial discovery and creativity in which resources and abilities are critically important. This line of thought is strongly supported by several recent publications (e.g., Klein et al., 2013; Teece, 2012; Woldesenbet et al., 2012) which emphasize that entrepreneurial actions require dynamic managerial capabilities. Since these studies were conducted on registered businesses, we can expect that resources and abilities positively influence formal entrepreneurship.

On the other hand, many studies show that increases in GDP per capita imply increases in wage income, which, in turn, lead people to be more reluctant to opt for self-employment (Iyigun and Owen, 1998; Lucas, 1978). Shapero's model of the entrepreneurial event (Shapero, 1982) suggests that entrepreneurship is less likely when people are satisfied with the status quo or life in general. People are pushed into entrepreneurship only when affected by an interruption such as job loss or disappointment with their current job (Campbell, 1992; Katz, 1992). Previous studies show that unemployment is a significant push factor for necessity entrepreneurship (Carree et al., 2002; Serviere, 2010), which is negatively related to an index of the generosity of the unemployment benefit system (Robson, 2010). Given that necessity entrepreneurship often takes place in the informal sector (Williams, 2007), we expect resources and abilities to discourage entrepreneurship in the informal sector.

Hypothesis 3a. Resources and abilities encourage formal entrepreneurship.

Hypothesis 3b. Resources and abilities discourage informal entrepreneurship.

4.1.4. Performance-based culture

Previous empirical studies analyzing the relationship among the components of performance-based culture and formal entrepreneurship (e.g., Naffziger et al., 1994; Wennekers et al., 2007; Wildeman et al., 1999) find that this culture type fosters registered entrepreneurship. A survey by Stewart et al. (2003) suggests that founders of large firms (usually registered firms) have a higher degree of goal orientation than micro-business founders. Furthermore, goal-oriented people exhibit a high degree of uncertainty avoidance, leading them to seek protection and formal support by registering their business. People with a strong inclination towards future-oriented behaviors such as planning, investing in the future and delaying individual or collective gratification are likely to go into the formal sector to benefit from public services. Indeed, public services not available to informal firms (e.g., legal protection and contract enforcement) help formal firms to sustain competition and meet goals in the formal

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economy (Amaral and Quintin, 2006; Straub, 2005). It is for this reason that we expect a positive relationship between performance-based culture and formal entrepreneurship.

Stephan and Uhlaner (2010) argue that performance- and achievement-oriented cultures go hand in hand with and may lead to the building of efficient formal institutions which create increased competition and squeeze out new firms. Other studies (Kreiser et al., 2010; McGrath et al., 1992) reveal that performance-based culture hampers entrepreneurial orientation. In societies explicitly focused on goal achievement, it is harder to attract human resources (Baughn and Neupert, 2003). Moreover, since goal achievement requires sufficient trust and enough stability to enable partners to move forward, and formalized organization allows for enhanced enforcement of commitment, goal-oriented people tend to seek formality (Starr and Fondas, 1992; Wiewel and Lieber, 1998). Therefore, we can expect that performance-based culture hinders entrepreneurship in the informal sector.

Hypothesis 4a. Performance-based culture encourages formal entrepreneurship.

Hypothesis 4b. Performance-based culture discourages informal entrepreneurship.

4.1.5. Socially-supportive culture

Social support increases entrepreneurial self-efficacy and the social desirability of entrepreneurship (Stephan and Uhlaner, 2010). Moreover, people in socially-supportive cultures can expect reciprocal support and can thus count on their community to obtain necessary resources, which explains why Stephan and Uhlaner (2010) find significant statistical evidence that this kind of culture promotes entrepreneurship overall.

However, socially-supportive cultures do not promote self-reliance and independent action and place a lower value on individual accomplishments (Hofstede, 1980; Mueller and Thomas, 2000). They reward individuals for being fair, altruistic, friendly, generous, caring and kind to others (House and Javidan, 2004). As a result, people in this kind of culture tend to rely on informal networks and public morality (House et al., 2004). Entrepreneurs can rely on "private ordering" (e.g., social norms and using non-government forces to resolve conflicts) and thus may not have strong incentives to register their businesses with the government. Furthermore, collective identity, especially when it is outside formal institutions, strengthens the relationship between entrepreneurial alertness and opportunity recognition in the informal economy (Webb et al., 2009). As such, entrepreneurs in cultures of this kind tend to stay in the informal economy, which implies low motivation for formal entrepreneurship in these cultures.

Hypothesis 5a. Socially-supportive culture discourages formal entrepreneurship.

Hypothesis 5b. Socially-supportive culture encourages informal entrepreneurship.

4.1.6. Impact of formal entrepreneurship on informal entrepreneurship

From the point of view of government authorities, the informal economy is generally associated with social and economic problems (Bigsten et al., 2004). Authorities insist that informality has fiscal implications associated with tax revenue losses, labor market outcomes, productivity and growth through several channels as well as social implications such as corruption, workers' social protection and insurance, inequality and poverty, etc. (Andrews et al., 2011; Dreher and Schneider, 2010). Therefore, they employ several measures to encourage and even create pressures to force entrepreneurs to transition to the formal economy (Becker, 2004; Fajnzylber et al., 2007; Salazar-Xirinachs and Diop, 2009). As more and more entrepreneurs move to the formal economy, the pool of existing entrepreneurs for informal entrepreneurship shrinks. Furthermore, new entrepreneurs are more likely to engage in formal entrepreneurship if more and more people start their business in the formal sector rather than the informal one. This tendency can be explained by the fact that new entrepreneurs often lack experience, resources and information, causing them to imitate other entrepreneurs (Bernardo and Welch, 2001; Lieberman and Asaba, 2006). The relative rise of registered firms over informal firms creates stiffer competition for the latter when it comes to seeking labor supply, resources for production, output market, etc. (Tokman, 1978). As a result, we expect a negative relationship between formal entrepreneurship and informal entrepreneurship.

Hypothesis 6. Formal entrepreneurship discourages informal entrepreneurship.

4.2. Mediation effects

In addition to the direct effects on formal and informal entrepreneurship stated above, we also predict mediation effects (Fig. 2).

4.2.1. Impact of "quality of governance" via "economic opportunities"

In addition to direct policies that can have an effect on formal and informal entrepreneurship (e.g., simplifying bureaucratic procedures for business), governments can influence both types of entrepreneurship through the enhancement of economic opportunities. It has long been acknowledged that political institutions have economic impacts (Henisz, 2000). In fact, the institutional economics literature notes that institutions are the ultimate determinants of economic performance (Chang, 2011).

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Regulation is meant to redistribute resources and rents. A good country governance profile can correct market failures and drive economic development (North, 2005). However, inefficient regulation can have a significant adverse impact on economic growth. Therefore, governments around the world have been making considerable efforts to improve their regulatory environment in order to boost economic performance (Bishop and Thompson, 1992; Eschenbach and Hoekman, 2006; Lo, 2009; etc.).

Hypothesis 7. The quality of governance is positively associated with the availability of opportunities, which, in turn, encourages formal entrepreneurship and discourages informal entrepreneurship.

4.2.2. Impact of "economic opportunities" via "resources and abilities"

Economic **development increases social welfare (Islam and Clarke, 2002). As the economy grows, people are better off with higher purchasing power, and the government has more funds for public services such as education, healthcare, social security and so on (Alesina and Rodrik, 1991). As such, advanced economies have higher income per capita, better education systems, better social security schemes and so on than economies in lower development stages (Ray, 1998). Therefore, we expect economic opportunities to positively influence resources and abilities.

Hypothesis 8. The availability of economic opportunities is positively associated with the availability of resources and abilities, which, in turn, encourages formal entrepreneurship and discourages informal entrepreneurship.

4.2.3. Impact of "resources and abilities" via "performance-based culture"

Inglehart and Welzel (2005) provide a strong argument to the effect that economic development affects culture and economic and cultural changes go together in coherent patterns that change the world in predictable ways. With more economic resources and better abilities, the traditional fabric of society becomes significantly altered by modernity and people tend to become more individualistic and competitive (Hayek, 1948; Inglehart, 1997). Moreover, with better education and greater personal income, people both desire and have the means to pursue self-actualization (Maslow, 1970; Nurmi, 1991) and become more goal oriented (Schunk et al., 2007). Furthermore, in countries with low unemployment and high social security, people tend to strive for performance improvement and excellence (O'Brien, 1986). For these reasons, we expect a positive relationship between the resources and abilities variable and the performance-based culture variable.

Hypothesis 9. The level of resources and abilities is positively associated with performance-based culture, which, in turn, encourages formal entrepreneurship and discourages informal entrepreneurship.

4.2.4. Impact of "resources and abilities" via "socially-supportive culture"

A study by Dunkel-Schetter and Skokan (1990) on determinants of social support provision reveals that stressful experiences increase people's willingness to provide support to peers who themselves are experiencing stressful problems. When people are poor, they have easier access to other poor people and most often can help each other better since they are intimately familiar with the problems and can act in ways which people with abundant financial resources fear to act (Wexler, 1970). This argument is supported in Putnam's study (2000) which shows that, compared to poorer residents, the affluent display a very low rate of civic engagement and neighborliness even within their boundaries. Similarly, DeFilippis (2001) posits that economic growth is the cause of social capital decline. These studies suggest a negative relationship between social support provision and people's resources and abilities.

Hypothesis 10. Resources and abilities are negatively associated with socially-supportive culture, which, in turn discourages formal entrepreneurship and encourages informal entrepreneurship.

For brevity, we do not develop specific hypotheses for other mediation effects. However, it is important to mention that the mediating properties of formal entrepreneurship vis-à-vis informal entrepreneurship are factors that encourage formal

Table 2
List of countries in the analysis.

1	Albania	14	Egypt	27	Israel	40	Qatar
2	Argentina	15	El Salvador	28	Italy	41	Russia
3	Austria	16	England	29	Japan	42	Singapore
4	Australia	17	Finland	30	Korea (South)	43	Slovenia
5	Bolivia	18	France	31	Kuwait	44	South Africa
6	Brazil	19	Germany	32	Malaysia	45	Spain
7	Bulgaria	20	Great Britain	33	Mexico	46	Sweden
8	Canada	21	Greece	34	Namibia	47	Switzerland
9	China	22	Hong Kong	35	Netherlands	48	Taiwan
10	Colombia	23	Hungary	36	New Zealand	49	Thailand
11	Costa Rica	24	India	37	Nigeria	50	United States
12	Denmark	25	Indonesia	38	Poland	51	Zambia
13	Ecuador	26	Ireland	39	Portugal	52	Zimbabwe

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entrepreneurship and can potentially discourage informal entrepreneurship. For instance, by applying policies specific to elevating the level of formal entrepreneurship in a country, its government can already effectively decrease the level of informal entrepreneurship. Additionally, we do not develop specific hypotheses for the following mediation effects: the indirect effect of governance quality on resources and abilities through economic opportunities; and the indirect effect of economic opportunities on culture through resources and abilities. However, it is important to acknowledge these effects, which are expected based on modernization theory by Inglehart (1997) and Inglehart and Welzel (2005). Proponents of this theory argue that culture and especially its risk–reward profile (that is critical for entrepreneurship, as posited by ETE) are affected by governmental policies and economic development through personal resources. In this view, the increase in personal materialistic well-being that comes with economic development (which, in turn, is caused by an increase in regulatory efficiency and specific policies undertaken by the governments) has a direct effect on culture, making it more competitive and individualistic. The direct effect of resources and abilities on culture is noted above in Hypotheses 9 and 10.

5. Methodology and data analysis

5.1. Sample

The information for the variables employed in this study is available for 52 countries. These countries give a wide geographical basis for exploring global variance in entrepreneurship since they represent five continents: Africa (5 countries); Asia and the Middle East (14 countries); Australasia (2 countries); North (3) and South (7) America; and Europe (21). Table 2 gives a detailed list of the countries.

Table 3
Descriptive statistics and Pearson correlations.[a]

	1	2	3	4	5	6	7	8	9	10	11	12
1. Formal ent.												
2. Informal ent.	−0.39***											
3. Financial develop.	0.29**	−0.27*										
4. Unemployment	−0.17*	−0.51***	−0.18*									
5. Innovation	0.33***	−0.02	0.68***	−0.11								
6. GDP per capita	0.12***	−0.39**	0.17	−0.73***	0.11*							
7. Governance	0.24**	−0.59***	0.25	−0.13	0.09	0.30						
8. Democracy	0.11***	−0.02	0.13	−0.19	0.12	0.16	0.63***					
9. GDP growth	0.29**	−0.14	0.51***	−0.19	0.64***	0.11	0.09	0.04				
10. HDI	0.19*	−0.10**	0.02	−0.64***	0.14	0.50***	0.23	0.16	0.12			
11. Share of services	0.36**	−0.11	0.48***	−0.15	0.57***	0.12	0.18	0.14	0.59***	0.07		
12. Econ_integr	0.39**	−0.23***	0.54***	−0.13	0.49***	0.14	0.03	0.08	0.43***	0.06	0.05	
13. Soc_secur	−0.31***	−0.60***	0.10	−0.66***	0.02	0.71***	0.11	0.12	0.04	0.72***	0.11	0.09
14. Ease_bus	0.74***	−0.76***	0.12*	−0.19	0.16	0.19	0.80***	0.60***	0.17	0.12	0.12	0.16
15. Future orient.	0.25*	0.09	0.09	−0.03	0.12	0.15	0.12	0.03	0.05	0.03	0.04	0.07
16. Power dist.	−0.42***	0.11*	−0.11	0.10	−0.07	−0.19	−0.12*	−0.21**	−0.03	−0.10	−0.06	−0.03
17. Uncert. Av.	0.27**	−0.13*	0.13	−0.12*	0.04	0.09	0.05	0.03	0.04	0.07	0.03	0.02
18. In − group collect	−0.16*	0.24***	−0.05	0.13	−0.05	−0.04	−0.02	−0.09	−0.01	−0.01	−0.08	−0.04
19. Institutional coll.	−0.35**	0.15**	−0.06	0.05	−0.10	−0.02	−0.07	−0.07	−0.02	−0.06	−0.07	−0.08
20. Perform orient.	0.38***	−0.06	0.14	−0.15*	0.17	0.12	0.10	0.17	0.06	0.08	0.05	0.11
21. Assertiveness	0.08*	−0.16	0.02	−0.04	0.06	0.05	0.02	0.02	0.03	0.03	0.03	0.05
22. Humane orient.	0.03	0.19**	0.04	0.08	0.02	0.11	0.03	0.09	0.02	0.11	0.06	0.09
23. Gender eq.	0.29*	−0.04	0.10	−0.10	0.08	0.14	0.11	0.15	0.01	0.15	0.05	0.06
Mean	0.16	0.21	0.36	0.16	0.27	21,008	1.04	0.56	1.41e + 08	0.71	0.41	0.21
S.D.	0.13	0.18	0.21	0.11	0.18	12,925	1.25	0.31	2.11e + 06	0.12	0.35	0.26

	14	15	16	17	18	19	20	21	22	23	24
13. Soc_secur											
14. Ease_bus	0.11										
15. Future orient.	0.02	0.03									
16. Power dist.	−0.13	−0.15**	−0.69***								
17. Uncert. Av.	0.02	0.10	0.83***	−0.59***							
18. In-group collect	−0.08	−0.09	−0.62***	−0.51***	−0.50***						
19. Institutional coll.	−0.07	−0.11	−0.10	−0.25*	0.09	0.19*					
20. Perform orient.	0.12	0.14	0.71***	−0.66***	0.63***	−0.74***	0.02				
21. Assertiveness	0.03	0.04	−0.02	−0.10	−0.03	0.06	−0.01	−0.09			
22. Humane orient.	0.01	0.02	0.03	0.04	0.07	0.05	0.08	0.07	−0.03		
23. Gender eq.	0.15	0.12	0.57**	−0.65**	0.58***	−0.52*	0.04	0.61**	−0.10	0.12	
Mean	0.09	59	3.56	4.13	3.92	3.06	2.87	3.44	3.20	3.63	4.01
S.D.	0.08	37	1.12	1.72	1.41	1.10	1.08	1.86	1.02	1.26	2.37

a. *p < 0.05, **p < 0.01, ***p < 0.001 (two-tailed).

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For each continent, the sample includes the largest countries in terms of population and territory (i.e., Russia, the U.S., India, China and Australia). The selected countries display marked cultural and socioeconomic diversities and also significant variations in institutions and level of technological development, thereby providing a good basis for exploring the effects of these different national contexts on entrepreneurial activity levels. Our database is cross-sectional and the data for all the variables except for the cultural variables are 2009 data. Although the data on Globe's cultural variables were published in 2004, it is legitimate to use them in our analysis because even though culture is affected by economic development (Inglehart, 1997; Inglehart and Welzel, 2005), it does not change over short periods of time (House et al., 2004).

5.2. Variables

5.2.1. National rates of formal and informal entrepreneurship

We followed existing reliable approaches to measuring different types of entrepreneurship (e.g., Acs, 2006). Since the concept formal entrepreneurship is defined by the World Bank's definition of entrepreneurship, we used WB cross-country data on registered businesses (the number of newly-registered firms as a percentage of the country's population) to measure formal entrepreneurship. Given the lack of comprehensive and systematic data on unregistered businesses, we measured informal entrepreneurship by subtracting formal entrepreneurship from total entrepreneurship measured by GEM's Young Firm Entrepreneurial Activity Index (YFEA). The YFEA index measures the number of people who own/manage a young business (i.e., up to 3.5 years, or 42 months) as a percentage of the country's population. This index includes both registered and unregistered businesses since the GEM data are given as the total number of businesses, without separating them into formal and informal enterprises. The YFEA's focus on young firms makes it most comparable to the WB index which focuses solely on newly-registered businesses. For both indices, we use 2009 data. Therefore, we measured both total entrepreneurship and formal entrepreneurship as percentages of a country's population. As such, total entrepreneurship (in percentage) is always higher than formal entrepreneurship (in percentage). By subtracting the percentage of formal entrepreneurship from the percentage of total entrepreneurship, we got a more or less accurate percentage for informal entrepreneurship. We admit that this measure is not ideal. However, in light of the absence of comprehensive data on informal entrepreneurship, we are forced to use this approach. To illustrate with an example, Bolivia's total entrepreneurial activity (based on GEM data) as a percentage of its population is 39.4% whereas formal entrepreneurship (based on World Bank data) is only 6.2% of its population. Therefore, informal entrepreneurship constitutes 33.2% of this country's entrepreneurial activity. Both variables are based on 2009 data (the most recent and comprehensive data sets).

5.2.2. Variables affecting formal and informal entrepreneurship

This study sought to examine a variety of factors (discussed above and presented in Table 1) that explain variance in entrepreneurship levels and to provide a comprehensive analysis of formal and informal entrepreneurship. There are two

Table 4
Composite reliability, indicator loadings, and AVE. Construct validity and reliability are in bold. All indicators are higher 0.7, which indicates good validity and reliability of the constructs.

Construct name/items	Loadings	AVE (average variance extracted)	Composite reliability
Economic Opportunities		0.77	**0.84**
GDP growth	0.970		
Financial development	0.870		
Economic Integration	0.812		
Innovation	0.719		
Services	0.899		
Quality of governance		**0.93**	**0.97**
Governance index	0.919		
Democracy	0.788		
Ease of doing business	0.949		
Resources and abilities		**0.81**	**0.86**
GDP per capita	0.873		
HDI	0.840		
Social security	0.912		
Unemployment	−0.703		
Performance-based culture		**0.74**	**0.79**
Gender equality	0.711		
Group collectivism	−0.749		
Performance orientation	0.918		
Power distance	−0.824		
Future orientation	−0.718		
Uncertainty avoidance	0.783		
Socially-supportive culture		**0.85**	**0.89**
Institutional collectivism	0.826		
Assertiveness	−0.714		
Humane orientation	0.930		

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Table 5
Discriminant validity.

	1.	2.	3.	4.	5.	6.	7.
1. Economic opportunities	**0.88**						
2. Quality of governance	0.49	**0.96**					
3. Resources and abilities	0.58	0.17	**0.90**				
4. Performance-based culture	0.16	0.11	0.44	**0.86**			
5. Socially-supportive culture	−0.09	−0.04	−0.05	0.00	**0.92**		
6. Formal entrepreneurship	0.65	0.69	−0.03	0.52	−0.04	**1.00**	
7. Informal entrepreneurship	−0.47	−0.48	−0.54	−0.13	0.51	0.39	**1.00**

Note: Bold numbers on the diagonal indicate the square root of the average variance extracted, numbers below the diagonal represent construct correlations.

limitations to our data: 1) they are cross-sectional; and 2) due to the absence of time variation we are unable to control for some important factors such as business cycles.

Table 3 presents the descriptive statistics and correlations for all the first-order variables.

We also checked the sampling adequacy with KMO (Kaiser–Meyer–Olkin) and Bartlett's test of sphericity. The KMO value is 0.887 (approximate Chi-Square 6869.655; Significant 0.000), which is indicative of the good quality of our sample.

5.3. Model estimation using partial least squares

Partial least squares (PLS) (Fornell and Bookstein, 1982; Fornell and Cha, 1994; Hair et al., 2011; Lohmoller, 1989; Ringle et al., 2005) is particularly suited for estimating the causal relationships as well as relationships between the variables and their indicators in our case. Unlike covariance-based SEM, PLS focuses on maximizing the variance of the dependent variables explained by the independent ones instead of reproducing the empirical covariance matrix (Dijkstra, 2010). Unlike covariance-based SEM, PLS requires neither multivariate normality nor the large sample size necessary for maximum likelihood estimation (Chin and Newsted, 2000). It should be noted that the unit of analysis (country) in our case makes the sample size small ($n = 52$). PLS is also particularly useful when predictor variables are highly correlated or when the number of predictors exceeds the number of cases (Cassel et al., 1999). Furthermore, using a Monte Carlo simulation, Cassel et al. (1999) show that PLS is quite robust with regard to several inadequacies (e.g., skewness or multicollinearity of the indicators, misspecification of the structural model) and that the latent variable scores always conform to the true values.

As a nonparametric estimation procedure (Wold, 1982), PLS provides an iterative combination of principal components analysis that relates measures to constructs and a path analysis that captures the structural model of constructs. The structural

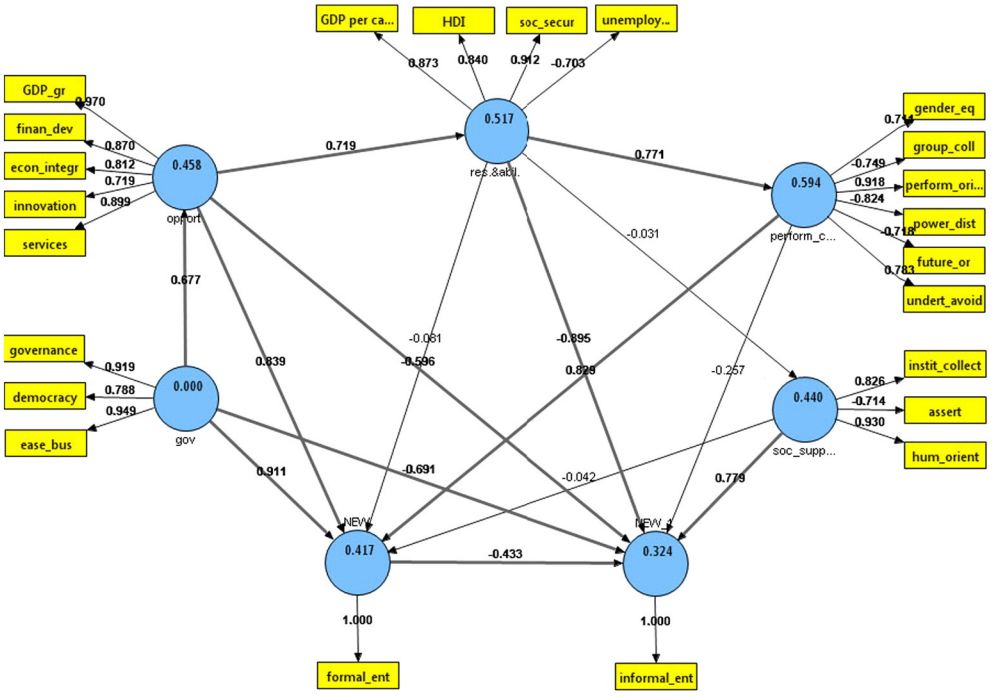

Fig. 3. Macro determinants of formal vs. informal entrepreneurship: empirical results.

Table 6
Parameter estimates for the structural model.

Hypothesis	Impact of	On	Path coefficient	t-value	Hypothesis supported
H1a+	Quality of governance	Formal entrepreneurship	0.911	10.54[a]	Yes
H1b−	Quality of governance	Informal entrepreneurship	−0.691	8.61[a]	Yes
H7+	Quality of governance	Economic opportunities	0.677	7.15[a]	Yes
H2a+	Economic opportunities	Formal entrepreneurship	0.839	9.88[a]	Yes
H2b−	Economic opportunities	Informal entrepreneurship	−0.596	1.75[b]	Yes
H8+	Economic opportunities	Resources and abilities	0.719	2.01[c]	Yes
H3a+	Resources and abilities	Formal entrepreneurship	−0.081	1.03	No
H3b−	Resources and abilities	Informal entrepreneurship	−0.895	2.13[c]	Yes
H9+	Resources and abilities	Performance-based culture	0.771	9.45[a]	Yes
H10−	Resources and abilities	Socially-supportive culture	−0.031	0.99	No
H4a+	Performance-based culture	Formal entrepreneurship	0.889	12.17[a]	Yes
H4b−	Performance-based culture	Informal entrepreneurship	−0.257	1.15	No
H5a−	Socially-supportive culture	Formal entrepreneurship	−0.042	1.20	No
H5b+	Socially supportive culture	Informal entrepreneurship	0.779	1.67[b]	Yes

Two-tailed test.
[a] Significant at the 1% level.
[b] Significant at the 10% level.
[c] Significant at the 5% level.

model represents the direct and indirect unobservational relationships among constructs. The measurement model represents the epistemic relationships between observed variables and constructs.

We used SmartPLS 2.0 software (Ringle et al., 2005), which is popular in the established literature (Hair et al., 2012) to estimate the model.

5.4. Measurement model evaluation

We evaluated our measurement model according to well-established criteria (Hair et al., 2011). We presented the following tables in line with established researchers using PLS in their articles (Rapp et al., 2010; Wagner et al., 2010).

Table 4 presents the composite reliability, indicator loadings and AVE (average variance extracted). In our case, the composite reliability of all latent variables is above the recommended level of 0.70 (internal consistency reliability) (Hair et al., 2011; Nunnally, 1978). The indicator loadings are all greater than the recommended 0.70 (indicator reliability) (Hair et al., 2011). AVE indicates the amount of variance that is captured by the latent variable in relation to the amount of variance due to measurement error. AVE for each latent variable is greater than the cut-off level of 0.50 (convergent validity) suggested by Fornell and Larcker (1981).

Table 5 indicates the discriminant validity of the constructs and shows that the square root of AVE for each latent construct is higher than the highest correlation with any other latent construct, which confirms the discriminant validity of the constructs (Hair et al., 2011).

These results establish the validity of our measurement model.

5.5. Structural model analysis

Fig. 3 obtained through SmartPLS 2.0 software (Hair et al., 2012; Ringle et al., 2005) provides a graphical representation of the estimates of the structural and the measurement parameters.

Since PLS involves no distributional assumptions about the data, traditional statistical testing methods are not well suited. Therefore, the significance of the PLS estimates is conventionally tested by the bootstrapping technique (Hair et al., 2012; Ringle et al., 2005). The bootstrap procedure in the SmartPLS 2.0 software (Ringle et al., 2005) enables the calculation of the standard deviation and an approximation of the t-statistic, which overcomes the nonparametric methods' lack of formal significance tests for estimated parameters (Chin, 1998). When using the bootstrap technique, we use 5000 bootstrap samples, and 52 cases (equivalent to our number of observations) as recommended by Hair et al. (2011). Fig. 3 also demonstrates the R^2 values for each endogenous latent variable (the figures are given inside the circles). Based on Hair et al. (2011), the R^2 values for our endogenous variables are moderate.

Table 6 includes the path coefficients and t-values of the structural model estimation, as well as a list of supported hypotheses. The analysis shows that most of our hypotheses are supported, except for the effects of resources and abilities on formal entrepreneurship (H3a), resources and abilities on socially-supportive culture (H10), performance-based culture on informal entrepreneurship (H4b) and socially-supportive culture on formal entrepreneurship (H5a).

5.6. Mediating properties

We tested the mediating properties of the variables in cases in which the model did not presume direct effects (Rapp et al., 2010) by conducting additional post-hoc analysis using established methodology (Baron and Kenny, 1986; Rapp et al., 2010). For

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instance, we tested for the direct effect of economic opportunities on performance-based and socially-supportive cultures while excluding any influence of resources and abilities. In both cases, the direct link turned out to be insignificant (significance was tested with the bootstrapping technique). Since the link between resources and abilities is significant only in the case of performance-based culture, it is possible to conclude that resources and abilities fully mediate the relationship between economic opportunities and performance-based culture. We have also tested for the direct effect between the quality of governance and resources and abilities. The analysis indicated a weak but statistically significant positive effect ($b = 0.181$, $p < .05$). The effect is maintained when the indirect effect is included (Rapp et al., 2010). Therefore, it is possible to conclude that economic opportunities partially mediate the relationship between governance and resources and abilities and that governance can affect resources and abilities directly.

6. Discussion

Overall, the results of this research provide strong support for the argument that the same factors have a very different impact on formal entrepreneurship than on informal entrepreneurship. The results of the analysis contribute to the entrepreneurship literature by providing an empirically-supported model of the drivers of formal versus informal entrepreneurship. This model, developed with significant empirical evidence, not only contributes to theoretical advancement, but also leads to policy and management recommendations.

6.1. Theoretical contributions

This study contributes to the eclectic theory of entrepreneurship in a number of ways. First, it identifies a list of operationalizable variables for empirical testing and their reliable data sources. Second, it confirms that demand-side factors (economic opportunities), supply-side factors (resources and abilities), governance quality, and culture influence national rates of formal and informal entrepreneurship. Furthermore, it shows how each of the determinants affects formal and informal entrepreneurship differently. This insight helps explain the discrepancies in the literature regarding the influence of socioeconomic, institutional and cultural factors on entrepreneurship.

On the demand side, economic opportunities (which include GDP growth, share of the service sector in the economy, innovation and financial development) and the quality of governance (governance index, democracy index and ease of doing business) are found to encourage formal entrepreneurship and discourage informal entrepreneurship. As such, our study shows the underlying reasons for discrepancies in previous studies. Specifically, studies with a focus on entrepreneurship in the formal sector (e.g., Havrylyshyn, 2001; Kaufmann et al., 2006; Nyström, 2008) find that good institutions and a high level of economic development and technology advancement are positively related to national rates of entrepreneurship. On the other hand, studies focusing on entrepreneurship in countries where informal commercial activities account for a large share of the economy (e.g., Naudé, 2009; Wong et al., 2005 find a negative relationship. Studies with no clear bias on the proportion of countries with a higher percentage of formal or informal entrepreneurship may show no relationship at all (Van Stel et al., 2007).

Furthermore, our study can explain why Wennekers et al.'s study (2005) shows a U-shape relationship between economic development and national rate of entrepreneurship. When the economy is at a low development stage, informal entrepreneurship is common. As it grows and exerts pressure on the cost of doing business (higher wages, competition, etc.), informal firms are squeezed out. When the economy reaches an advanced stage, formal entrepreneurship flourishes and thus drives up the national rate of entrepreneurship.

Our findings on the effect of demand-side factors show strong support for theories in the economic school of thought that stress the inherent disequilibrium of market dynamics, such as investment, trade flow, GDP, technology, research and development, etc. (Freytag and Thurik, 2007). Specifically, models using Schumpeter's theory of economic development (e.g., Schumpeter, 1934; Shane, 1996) argue that the creation of new firms depends on opportunities for new combinations of factors of production which come mainly from technological change. At the same time, models relying on the theory of endogenous regional development (e.g., Acs and Varga, 2005; Audretsch and Acs, 1994; Romer, 1986) argue that investments in physical capital, research and development, human capital and social mobility produce spillover effects which, in turn, foster new firm formation.

Our findings with regard to supply-side factor — resources and abilities (that include GDP per capita, (un)employment, level of human development and social security) support the argument found in population theories that people are the main agents of social and economic change (Schnore, 1972). Our results offer strong support for motivation theories which stress intrinsic motivations and self-determination in human behavior (Deci and Ryan, 1985). As people come to be better educated, enjoy a higher level of social security and earn more income, they are less inclined to engage in the informal economy.

It is widely acknowledged that individual cognitive scripts and behaviors are conditioned by their socio-cultural background (Audretsch et al., 2004; Busenitz and Lau, 1996; Mueller and Thomas, 2000; Weber, 1964). However, for the most part, the entrepreneurship literature has ignored the socio-psychological side of entrepreneurship (George and Zahra, 2002; Hofstede et al., 2004; Mitchell et al., 2007). Our study presents empirical evidence with regard to how different types of culture induce different entrepreneurial choices. Specifically, it shows that informal entrepreneurship is driven by a socially-supportive culture, while performance-based culture has a strong impact on formal entrepreneurship.

The evidence we found with regard to the impact of government intervention and culture supports theories in the behavioral school of thought stressing the role of the human-made, formal (e.g., regulations) or informal (e.g., culture) constraints in shaping

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human interaction (Ahlstrom and Bruton, 2010; Busenitz et al., 2000; North, 1990; Reynolds et al., 1994). As individuals and organizations are pushed to comply with rules and norms, institutions determine the setting and legitimacy of entrepreneurship.

Finally, our results with regard to the linkages among the governance, economic opportunities and resources and abilities variables also contribute to the literature. More precisely, they strongly support the institutional economics literature by confirming that improved regulatory efficiency stimulates economic development. They also validate the development economics literature's argument that economic development increases peoples' resources and abilities. In addition, our study supports theories of culture change by showing that improvement in people's resources and abilities leads societies to a performance-based culture that rewards performance, encourages gender equity and future-oriented activities, and increases uncertainty avoidance while discouraging power distance and in-group collectivism.

6.2. Policy implications

The knowledge generated by this study about the effect of each determinant on formal and informal entrepreneurship has important implications for policies aimed at entrepreneurship development.

On the supply side of entrepreneurship, performance-based culture plays a significant role. It encourages entrepreneurs to engage in formal entrepreneurship and discourages entrepreneurship in the informal sector. Therefore, governments could increase the pool of formal entrepreneurs by promoting individualism and competitive spirit in their population. Another measure would be to educate people to be goal oriented and motivated to become achievers by, for instance, publicly recognizing individual achievements. Increased competitiveness will increase the need for formal businesses and for clear rules and regulations. It is important to support people in their efforts towards personal development and progress, both of which foster self-efficacy and internal locus of control. Measures to this end will encourage entrepreneurs to conduct their business out in the open rather than hiding it from the regulatory systems.

Even with a large pool of potential entrepreneurs, entrepreneurship will not occur if there is no demand for it (i.e., opportunities). The strongest motivator of formal entrepreneurship on the demand side is economic advancement (measured by innovation, financial development, services, and GDP growth). Since government spending is an important contribution to GDP growth, formal entrepreneurship could be promoted when governments increase spending to stimulate market demands and technological advances. Investing in the development of financial systems to facilitate business transactions through the formal economy could attract entrepreneurs to the formal sector. Previous research (e.g., Ulijn and Brown, 2004; Wong et al., 2005) shows that innovation can create quality entrepreneurship, which leads to job creation and subsequently to economic development. Therefore, government support for innovation (e.g., investment in education and training, research and development and so on) and the development of an institutional environment conducive to innovation (e.g., freedom of expression, appreciation of diversity, etc.) are critical factors. These economic development efforts could ultimately encourage people to register their entrepreneurial activities and thus reduce their participation in the informal economy.

Our empirical evidence reveals that a high quality of governance significantly boosts formal entrepreneurship while deterring informal entrepreneurship. Therefore, governments seeking to foster entrepreneurship development in the formal economy need to improve their governance systems and relax regulations to make it easier for new firms to enter the market. This task can be daunting for developing countries locked into institutional traps — inefficient yet stable norms of behaviors such as the dominance of barter exchange, arrears, corruption, black market activities, etc. By using mathematical modeling, Do (2004) explains that initial conditions determine whether an economy converges towards a steady state characterized by efficient governance and low levels of inequality or towards an institutional trap in which regulatory capture and wealth inequality reinforce one another. For example, when access to investment is regulated, rent-seeking entrepreneurs form coalitions to bribe regulators to restrict entry and favor the long-term persistence of inefficiencies (Do, 2004). Therefore, to improve the institutional environment, measures are needed to break out of these traps. Polterovich (2008) notes that institutional traps are supported by mechanisms of coordination, learning, linkage and cultural inertia, and can only be overcome by accelerating economic growth (through measures such as export-led development, foreign direct investment and so on, which contribute to boosting the level of international economic integration), systemic crisis, the evolution of some cultural characteristics and the development of civil society. In short, bold measures aimed at breaking institutional traps are needed to create an environment conducive to entrepreneurship development in the formal sector.

Another effective measure to decrease informal entrepreneurship would be to enhance people's resources and abilities. This could be achieved through programs aimed at improving social security, education, living standards and public health, and reducing unemployment. Programs of this kind would likely encourage people to engage in opportunity-based rather than necessity-based entrepreneurship, which would be reflected in a reduction of informal entrepreneurship.

However, measures to encourage people to register their entrepreneurial activities through economic growth and improved governance quality may not be feasible for countries in low economic development stages. Our data show that informal entrepreneurship is more widespread in poorer countries and that formal entrepreneurship is more vibrant in developed countries. This observation is in line with Reynolds (2005) who argues that start-up models based on rich countries may not be the best ones for understanding entrepreneurship in poorer countries, an enormous unexplored phenomenon that involves tens of millions of people and new firms.

In developing countries, the regulatory environment is generally weak and people can gain legitimacy without government support. Moreover, since people may fear the government or have doubts about its ability to protect them, they are more likely to remain in the informal sector. It is also possible that the fluid flow of market forces may not be that important for informal

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entrepreneurship. On the other hand, it has been argued that although formal firms have access to public services (e.g., legal protection and contract enforcement) unavailable to informal firms (Amaral and Quintin, 2006; Straub, 2005), formal firms are faced with higher labor costs (Bennett, 2010; Loayza, 1996; Rauch, 1991). It is for this reason that some people carry out their entrepreneurial activities in the informal sector. Furthermore, informality may be a stepping stone to formality for some firms. Indeed, without this stepping stone, formality might never be achieved (Bennett, 2010). Interestingly, studies about informal economies reveal that informal business activities can contribute as much as 70% to GDP in developing countries (Schneider and Enste, 2000; Schneider et al., 2010a), and the percentage is increasing (Fajnzylber et al., 2007).

Given that entrepreneurship in the informal sector can account for a large share of a country's entrepreneurship and that informal entrepreneurship may be a necessary step for formal entrepreneurship, effective entrepreneurship development efforts could be placed first on encouraging informal entrepreneurship and then on motivating entrepreneurs to move to the formal sector. Our results suggest that in addition to fostering competitiveness and goal orientation, it would be worthwhile to promote human-oriented cooperative values that encourage collaboration, sensitivity, friendship and tolerance, and support for others to drive up informal entrepreneurship. Governments could create programs that support both entrepreneurial networking and general social networking, and thereby increase the level of social capital. The effectiveness of these programs in promoting domestic and international entrepreneurial activities has been well argued and empirically supported (Etemad and Lee, 2003; Greve and Salaff, 2003; Tan and Tan, 2002); etc.). Additionally, since culture is neither static nor rigid, it is feasible to influence cultural norms and attitudes related to entrepreneurship by elevating the status of entrepreneurs and increasing appreciation for the entrepreneurial lifestyle in society (Augé and Colleyn, 2004; Douglas and Craig, 2006).

Finally, enhancing economic integration and gender equity are promising avenues in this regard because they drive formal entrepreneurship. Indeed, with accelerated economic integration, people are more likely to do business with strangers and need protection and access to better information. As such, the formal sector can give entrepreneurs certain advantages.

6.3. Management implications

Understanding the determinants of formal and informal entrepreneurship can be beneficial for managers. Both formal firms and informal firms compete in the market. Informal entrepreneurship is carried out not only bynecessity-driven entrepreneurs, but also by the most competent opportunistic entrepreneurs (Sinclair-Desgagné, 2012). Since informal firms operate outside the regulatory system, their competition dynamics can be different from formal firms and their activities are not easily traceable. Familiarity with a country's contextual factors allows managers to determine whether their competition in that country comes from the formal or informal economy and to develop business strategies accordingly (i.e., whether to enter that country, and if yes, how to compete). Moreover, a company's supply chain may be made up of both formal firms and informal firms. Therefore, knowledge about determinants of the national rates of entrepreneurship in the formal and informal sectors can help managers to understand the nature of their companies' supply chain, thereby enabling them to develop appropriate strategies.

7. Conclusion

The analysis conducted in this study gives us confidence in the explanatory power of the factors selected for analysis as macro-level determinants of formal and informal entrepreneurship. Our analysis empirically tested the main propositions of ETE at the macro-level of analysis and clarified the underlying issues that lead to discrepancies in findings in the literature. Our findings demonstrate four means of reducing informal entrepreneurship and boosting formal entrepreneurship: nurturing a performance-based culture; creating favorable conditions for economic advancement; increasing quality of governance; and enhancing people's resources and abilities. However, these measures may not be feasible for developing countries whose informal sector accounts for a significant share of the economy. To increase entrepreneurship in these countries, we recommend promoting cooperation and networking to encourage social capital and to encourage informal entrepreneurship before undertaking the necessary governance and economic reforms to motivate entrepreneurs to transfer to the formal sector.

Future studies could analyze micro-level factors that drive entrepreneurs to the formal versus informal economy. The results of these studies could inform more accurate policymaking. It would be interesting to empirically test recent propositions about entrepreneurs' involvement in the formal versus informal sector. For example, Sinclair-Desgagné (2012) argues for an inverted U-shape for the relationship between entrepreneurs' competences and the likelihood of entering the formal economy. His basic thesis is that both the least confident necessity-driven entrepreneurs and the most competent and confident ones will opt for the informal sector. Another proposition to be tested is Webb et al.'s (2009) argument that informal economy ventures producing illegal goods and services are subject to greater pressure to transition to the formal economy than ventures using illegal means to produce legal products. As mentioned in our Methodology and data analysis section, a certain limitation of this study is its cross-sectional nature and the absence of a temporal perspective. Future studies could conduct a longitudinal comparative analysis of the determinants of formal and informal entrepreneurship.

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