



UNITED NATIONS
UNIVERSITY

UNU-WIDER

World Institute for Development
Economics Research

Research Paper No. 2009/07

Entrepreneurship and Quality of Institutions

A Developing-Country Approach

José Ernesto Amorós

February 2009

Abstract

Over the last few years we have observed a prominent flourishing of empirical studies on the determinants of new business creation and its effect on the economy. The present study focuses on an important determinant of entrepreneurship: the *quality of institutions*. This paper is an empirical exploratory work that has the objective of uncovering the relationships between entrepreneurial dynamics and different variables related to the quality of government institutions, with an emphasis on developing countries. The study is based on the panel data of 60 countries that participated in the Global Entrepreneurship Monitor (GEM) project. The results indicate that the quality of institutions is a relevant factor for the distribution and type of entrepreneurial activities. Some implications for public policy are discussed.

Keywords: entrepreneurship, government institutions, Global Entrepreneurship Monitor

JEL classification: L26, H11, L53, O57

Copyright © UNU-WIDER 2009

* Universidad del Desarrollo, School of Business and Economics, Santiago, and ESADE Business School, Barcelona; emails: eamoros@udd.cl, ernesto.amoros@esade.edu

This study has been prepared within the UNU-WIDER project on Entrepreneurship and Development (Promoting Entrepreneurial Capacity), directed by Wim Naudé.

UNU-WIDER gratefully acknowledges the financial contributions to the project by the Finnish Ministry for Foreign Affairs, and the financial contributions to the research programme by the governments of Denmark (Royal Ministry of Foreign Affairs), Finland (Finnish Ministry for Foreign Affairs), Norway (Royal Ministry of Foreign Affairs), Sweden (Swedish International Development Cooperation Agency—Sida) and the United Kingdom (Department for International Development).

ISSN 1810-2611

ISBN 978-92-9230-176-7

Acknowledgements

I am grateful to Juan Pablo Couyoumdjian who works with me on previous related research and Oscar Cristi for helpful comments on an earlier draft. I thank Wim Naudé for the opportunity to participate in UNU-WIDER projects. Also acknowledged is the support of the Global Entrepreneurship Monitor Research Consortium. All errors are mine.

Acronyms

GEM Global Entrepreneurship Monitor programme

NECs necessity-based entrepreneurs

OPP opportunity-based entrepreneurs

TEA total entrepreneurship activity index

WGI worldwide governance indicators

The World Institute for Development Economics Research (WIDER) was established by the United Nations University (UNU) as its first research and training centre and started work in Helsinki, Finland in 1985. The Institute undertakes applied research and policy analysis on structural changes affecting the developing and transitional economies, provides a forum for the advocacy of policies leading to robust, equitable and environmentally sustainable growth, and promotes capacity strengthening and training in the field of economic and social policy making. Work is carried out by staff researchers and visiting scholars in Helsinki and through networks of collaborating scholars and institutions around the world.

www.wider.unu.edu

publications@wider.unu.edu

UNU World Institute for Development Economics Research (UNU-WIDER)
Katajanokanlaituri 6 B, 00160 Helsinki, Finland

Typescript prepared by Liisa Roponen at UNU-WIDER

The views expressed in this publication are those of the author(s). Publication does not imply endorsement by the Institute or the United Nations University, nor by the programme/project sponsors, of any of the views expressed.

1 Introduction

Over the last few years we have observed a growing body of research investigating the relationship between entrepreneurship¹ and basic regional and national economic variables such as aggregate income and competitiveness (e.g., Blanchflower 2000; Carree et al. 2002; Carree and Thurik 2003; Acs and Armington 2004; van Stel, Carree and Thurik 2005; Wennekers et al. 2005). Some empirical contributions based on the Global Entrepreneurship Monitor (GEM) research initiative show that variations in economic growth rates can be explained by differing rates of entrepreneurship (Reynolds, Hay and Camp 1999; Zacharakis, Bygrave and Shepherd 2000). In this sense the creation of new ventures² may contribute to the economic performance of countries and regions because entrepreneurial activities introduce innovation, create competition and enhance rivalry (Audretsch and Keilbach 2004; Wong, Ho and Autio 2005). Nevertheless, the impact of these entrepreneurial efforts on economic growth differs not only between countries at similar levels of development (Carree et al. 2002, 2007), but also between countries at different stages of development (Wennekers et al. 2005; Acs and Amorós 2008) as well as among regions within a single country (Acs and Armington 2004; Belso-Martínez 2005; Hall and Sobel 2008).

In this context, entrepreneurship as the engine of economic growth is related to a combination of other determinants such as education levels, business climate, and legal and political conditions (Grilo and Thurik 2005; Hwang and Powell 2005; van Stel, Carree and Thurik 2005; Grilo and Irigoyen 2006; Bowen and De Clercq 2008). Some of these ‘macro level’ factors³ can explain the *entrepreneurship rates* but also the *type* of entrepreneurial activities between countries and regions (Bowen and De Clercq 2008). A number of researchers have developed frameworks to explain some of the macro (and micro) determinants of entrepreneurship activities or entrepreneurial process (Reynolds, Hay and Camp 1999; Reynolds et al. 2005; Verheul et al. 2002; Wennekers and Thurik 1999; Sobel 2008). Precisely, these frameworks consider institutional factors to be the determinants of entrepreneurial dynamics.

¹ In the literature it is possible to find several definitions for entrepreneurship both in static and in dynamic contexts. Some definitions include the creation of new business, pursuing new opportunities, or even the Schumpeterian process of creative destruction. Without a loss of generality, we refer to the definition of entrepreneurship used by the GEM project: ‘adults in the process of setting up a business they will (partly) and or currently be owning and managing an operating young business’.

² Recent studies confirm that during the last two decades, the development of new technologies, and the emergence of new business models have shifted from large corporations to small and new ventures (Acs and Audretsch 1988; Jorgenson 2001; Audretsch and Thurik 2001; Thurow 2003).

³ Micro-level research, in terms of formally modelling an agent’s labour choice, has been undertaken by several economists, including Lucas (1978); Kihlstrom and Laffont (1979); Iyigun and Owen (1998); Blanchflower and Oswald (1998). These studies suggest that a micro-foundational approach does indeed provide a useful theoretical framework in terms of examining the expected evolution of entrepreneurship. Consider, for example, the model presented by Lucas (1978). The central proposition of his model is that given the distribution of agents according to managerial talent, an increase in real wages tends to increase the opportunity cost of entrepreneurship. This, in turn, affects the allocation of labour across different activities. In terms of Lucas’ analysis, the size distribution of firms tends to change in favour of larger firms as an economy grows wealthier.

The present study focuses on a crucial determinant of entrepreneurship in developing (and developed) countries: the *quality of institutions*.⁴ This work is an empirical exploratory work with the objective of identifying the relationship between the rates and types of entrepreneurial dynamics to different variables relating to the quality of institutions. Specifically, we explore the question: What kinds of institutions are related to the phenomenon of entrepreneurship in developing countries?

In a sense, this work proposes taking a ‘step back’ on the problem of entrepreneurship and public policy by explicitly considering a more general perspective of the influence of government institutional quality. Governance impacts on economic outcomes, including entrepreneurship, basically through the government’s general role to provide—or not to provide—institutions that underpin an effective rule of law (Kaufmann, Kraay and Zoido-Lobato 1999; Kaufmann, Kraay and Mastruzzi 2008; Hellman et al. 2000). Why do we focus on the developing countries? There is a general consensus that low- and middle-income countries have a relatively low degree of institutional quality in comparison with the more developed nations. Developing and emerging economies have specific environments, and for a developing-country perspective, some of the assumptions generally applied to the developed countries (North America, Europe or Japan) need a ‘re-focus’ (Bruton, Ahlstrom and Obloj 2008; West, Bamford, and Marsden 2008; Acs and Amorós 2008). In this sense, this paper attempts, by contrasting the developed versus the developing countries, to examine whether the quality of institutions affects the entrepreneurial dynamics.

The rest of the paper is organized as follows. In the next section, the paper presents a general framework on the concept of the *quality of institutions* and describes how it affects entrepreneurship. Section 3 details the methodology and variables. Section 4 presents the results of the empirical application, with some discussion on the relationship between entrepreneurship and quality of institutions. Finally section 5 concludes.

2 Institutions, institutional quality and entrepreneurship

In economics, the research on entrepreneurship has important theoretical models. The early contributions by Joseph A. Schumpeter (1934, 1950), Frank H. Knight (1971), and Israel Kirzner (1973) represent not only examples of ground-breaking research in economic theory but at the same time, constitute the essential foundations for many of these theories of entrepreneurship. Developments in economics in the last few decades have also led to very interesting new formal models of entrepreneurship (Audretsch and Thurik 2001; Audretsch 2007). Reynolds, Hay and Camp (1999) introduce a general model, which argues that established business activity at the national level varies with the number of variables denominated to ‘general national framework conditions’, while entrepreneurial activity varies with the ‘entrepreneurial framework conditions’. These conditions are related to the social, cultural and political context of a country, but the entrepreneurial framework conditions include the specific policy and governmental

⁴ I follow North’s (1990) definition of institutions: ‘Institutions are the humanly devised constraints that structure political, economic and social interaction’.

programmes that enhance the entrepreneurship dynamics of a country.⁵ It is, however, remarkable that as Boettke and Coyne (2006) note, ‘Only recently have economists begun to pay attention to the role of institutions and how they influence entrepreneurial behaviour’.

Government institutions can clearly influence the rate of entrepreneurship. Public policies can basically determine the entrepreneurial dynamics of a country or region by introducing specific entrepreneurship policies as well as by creating a general institutional structure conducive to entrepreneurship (Sobel, Clark and Lee 2007). There is a flourishing body of literature examining the role of specific policies on entrepreneurship (Audretsch, Grilo and Thurik 2007). This theoretical and empirical research reviews the characteristics of different entrepreneurship policies and evaluates their implementation (Stevenson and Lundström 2005, 2007; Hoffmann 2007). Other researchers also evaluate the impact of these policies but include extended criticisms about their effectiveness—or ineffectiveness (Li 2002; Storey 2005; Parker 2007). It is important to remark, however, that this body of literature is mainly based on developed-country experiences. At this point it is important to note that the emphasis of this work on institutional quality is related to the preceding approaches regarding specific entrepreneurship policies. These policies ‘emerge’ from the general governmental environment, and the interaction with this environment is a central determinant of entrepreneurship.⁶

As stated before, the second type of government influence related to institutional structures that determine the ‘rules of the game’ for entrepreneurship is less studied, and is again focused mainly on the more developed economies (Sobel, Clark and Lee 2007).

The efficient allocation of resources in an economy (in this case, the allocation of entrepreneurial talent) is expected to be quite different under different institutional structures. Institutions, as the basic set of constraints within which economic agents interact, will have a crucial effect on an economy. Different institutional environments, *ceteris paribus*, (i.e., differences in the quality of institutions) have different effects on the level and/or type of entrepreneurship. An analogy may be useful here. Consider economic interaction as a game; it becomes quite evident that the rules of the game can shape, in a crucial sense, the outcome of the interaction (Buchanan 1991). Alternative structures of the rules can then be expected to lead to different outcomes.

But how does the quality of institutions in reality affect entrepreneurial activities and the decision of whether or not to become an entrepreneur? Following the basic tenets of neoclassical economic theory, entrepreneurship in this context must commence from an individualistic perspective. It is the economic agent who decides whether or not to undertake entrepreneurial activities or any other type of wage-earning activities. It is the individual’s rationale that determines the allocation of inputs across different activities when he or she is faced with a given budgetary constraint or a given environmental

⁵ For complete measurements and methodology of the GEM model and entrepreneurial framework conditions, see Reynolds et al. (2005). For recent changes in GEM, see Bosma et al. (2008). Levie and Autio (2008) make an extensive empirical test of the GEM model using a review of Leibenstein’s theories of entrepreneurship and economic development (1968, 1978, 1995) and link these theories with the entrepreneurial framework conditions.

⁶ On these issues, see the discussion in Storey (2005).

opportunity. Then, a model of labour choice can explain entrepreneurship.⁷ Risk aversion also plays a role in the decision to be entrepreneur. For instance, Iyigun and Owen (1998) model a situation in which the accumulation of entrepreneurial and other professional skills cannot be undertaken simultaneously (although they both constitute elements of an aggregate production function). To the extent that entrepreneurship is a risky activity, agents are less likely to be entrepreneurs when good, safer alternatives are available. The model by Kihlstrom and Laffont (1979) differs from the above in terms of the attitudes of agents towards risk, where under conditions of general equilibrium with agents maximizing their expected utility, it is noted that agents who are less risk-averse will tend to be entrepreneurs.

Note that the quality of institutions critically matters in this context. For instance, it is well-known that if ‘prices’ do not convey accurate information as to the relative scarcities of different ‘products’ (Hayek 1945), then the allocation of resources will be misguided. It is evident that this analysis can be extended to the problem of the allocation of entrepreneurial effort (or, more generally, the allocation of labour). At the same time, risk perceptions and assessments can also be affected by institutional quality. An economy where the institutional framework does not safeguard an agent’s economic freedom tend to be riskier in an objective sense,⁸ affecting once again the manner in which the economy resolves its resource allocation problem. These cases represent particularly illustrative instances in which institutional variables dramatically influence the determinants of entrepreneurship.

To the extent that economic relations are carried out in a context where transactions costs are important, the significance of these latter variables are also relevant in the decision of whether to engage in entrepreneurial activities. As the costs of determining and enforcing contracts, and of obtaining information on different market conditions, are influenced by the quality of institutions (North 1990), this is another mechanism through which institutions matter for entrepreneurship.

The fact that institutional quality has important effects on the allocation of entrepreneurial talent in a given economy is highlighted by Baumol (1990). The work of Baumol is one of the first to argue that the differences in entrepreneurship are the result of varying institutional elements across countries or regions. His contribution about the concept of productive, unproductive and destructive entrepreneurship links not only the rates (or level) of entrepreneurial activities to a specific context, but also relates the allocation of entrepreneurial efforts to institutional variables. Baumol’s conjectures explain that countries (or regions) with better institutions have more productive entrepreneurship and less unproductive (or destructive) entrepreneurship. The starting point of his work is the attractive egalitarian world where entrepreneurial talents are uniformly distributed across the population, but where such talent is only conducive to economic growth, in terms of it being harnessed productively under certain institutional conditions. When the incentive structure of an economy leads agents to unproductive (rent-seeking) activities, we can expect that agents will follow suit. For example, in a world where the largest ‘prizes’ are awarded to those that undertake unproductive

⁷ For different models along these lines, see Lucas (1978) and Lazear (2005).

⁸ This greater risk can be captured by examining the assessments of risk-rating agencies, as well as from the point of view of modern portfolio financial theory in terms of the higher returns demanded by the investors in these economies.

activities, the level of productive entrepreneurship will necessarily be smaller. Boettke and Coyne (2003) have observed that entrepreneurship manifests itself differently across alternative institutional regimes and that only some of these expressions are consistent with economic development.

In concluding this section, it is important to explain that some of the arguments reviewed here have been the subject of empirical research, which tends to corroborate that institutions (or, more accurately, institutional quality) have an important effect on economic outcomes.⁹ But only a few studies have inquired about the link between institutional quality and entrepreneurship (Sobel 2008). Thus, it should be stated again quite emphatically that institutional quality is an element that should be present in any model and theory purposing to explain entrepreneurship. In this sense, the general research question is: if institutional variables are different depending on the country's degree of development, does this situation affect the rates and types of entrepreneurship in a different manner? With an empirical approach, I explore the relationship between some entrepreneurial rates utilizing the GEM data and certain measures of the quality of institutions, using the World Bank approach described in the next section.

3 Empirical model

3.1 Data sources

The well-known GEM project represents a fundamental underpinning to provide harmonized, internationally comparable data to evaluate entrepreneurship activity across different countries. Also, GEM is useful for studying the effects and the determinants of entrepreneurship. It is generally recognized in the GEM reports that institutional quality plays a key role as a determinant of entrepreneurship (Reynolds et al. 2005). By the end of 2007, 60 different countries had participated in GEM, 32 of which are considered to be developing and emerging countries (see Appendix for complete list and classification). GEM's database contains various entrepreneurial indicators that have been constructed on the basis of a survey known as the 'adult population survey'. This survey helps GEM to estimate the percentage of the adult population (generally people between 18–64 years old) who are actively involved in starting a new venture. This indicator is called the *early-stage entrepreneurial activity index* (also known as the *total entrepreneurship activity index* or TEA).¹⁰ The GEM methodology disaggregates early-stage entrepreneurial activity according to two main entrepreneur motives. The first category is the opportunity-based entrepreneurs (OPP) who undertake action to create a new venture pursuing perceived business opportunities. There are the 'Schumpeterian entrepreneurs' who have a 'pull motive', such as the desire for independence, or the purpose of increasing his personal or family income, challenge, status and recognition. The second category is the necessity-based

⁹ For seminal research on this question see, for example, the papers by Keefer and Knack (1995); Knack and Keefer (1997) and Barro (1991).

¹⁰ This index is based on the life-cycle of the entrepreneurial process which is divided into two periods: the first covers nascent entrepreneurs who have undertaken some action to create a new business in the past year but have not paid any salaries or wages in the last three months. The second category includes owners/managers of businesses that have paid wages and salaries for over three months, but less than 42 months.

entrepreneurs (NECs), who are ‘pushed’ into entrepreneurship because ‘being an entrepreneur’ is the only option for subsistence. Although many studies recognize that the majority of entrepreneurial activity is the result of the search for business opportunities (Kolvereid 1996; Feldman and Bolino 2000; Carter et al. 2003; Hessels, van Gelderen and Thurik 2008; Bosma et al. 2008), there is a relatively high prevalence of NEC entrepreneurs starting new endeavours in many low- and middle-income countries. These motive-based entrepreneur categories make a good proxy for Baumol’s concepts of productive-unproductive entrepreneurship. This is discussed in the next section.

Data on the approximation of the countries’ institutions and institutional quality were derived from the World Bank’s ‘Project on Governance’.¹¹ The motivation for this project lies, to use the same expression employed by the Bank’s initiative, in the recognition that ‘governance matters’ (Kaufmann, Kraay and Zoido-Lobaton 1999; Kaufmann, Kraay and Mastruzzi 2008). The way in which governance is expected to make a difference on economic outcomes can be captured by the World Bank’s definition of governance: ‘We define governance as the traditions and institutions by which authority in a country is exercised for the common good’.¹² A product of this project is the worldwide governance indicators (WGI). WGI has developed aggregate and individual governance indicators for 212 countries and territories covering the period 1996–2007. The WGI covers six dimensions of governance:

- Voice and accountability,
- Political stability and absence of violence,
- Government effectiveness,
- Regulatory quality,
- Rule of law, and
- Control of corruption.

The relation between these variables and entrepreneurial decisionmaking is quite straightforward. Respect for the basic principles of a free-market economy represents a basic condition for entrepreneurial activity.¹³ To use a Schumpeterian term, entrepreneurship presupposes that an agent will be able to ‘combine’ different resources in different ways, which in turn implies that he has the right to do so without being confiscated or facing other violations. Detailed definitions of these variables and their measures are given in section 3.3.

¹¹ For the complete World Bank Institute Initiative of Governance and Anti-Corruption Programme, see www.worldbank.org/wbi/governance.

¹² It is interesting to note that this definition is quite similar to North’s (1990) standard definition of institutions. See note 5.

¹³ On these issues, see also the analysis by Bjørnskov and Foss (2008), which suggests that many components of the economic freedom index that one would expect to be related to entrepreneurship do not seem to show any sort of relationship.

3.2 Dependent variables

Dependent variables are from the GEM databases covering the 8-year period, 2001-07, and 60 countries. The first dependent variable is the rate of OPP, defined as the percentage of the adult population who are involved in early-stage entrepreneurial activity and who claim to be driven by the recognition of a business opportunity. These business opportunities can be a good proxy for Baumol's productive entrepreneurial activities.¹⁴ By the year 2007, the GEM methodology had been improved and calculation of OPP rates revised. According to the new definition,

... those who chose recognition of an opportunity were asked whether the main driver behind pursuing this opportunity was (i) to increase their own income, (ii) to be independent or (iii) to maintain their income. The latter category was not considered as a genuine opportunity for the measures (Bosma et al. 2008: 62).

The new OPP category includes an additional variable, 'improved opportunity' (IMPROPP), which is a measure of the proportion of opportunity-driven undertakings in early-stage entrepreneurial activity, with theoretical values ranging from 0 to 100. This ratio can provide an indication 'of the anatomy' of opportunity entrepreneurship (Levie and Autio 2008), rather than population-level rates (or volume). So, the OPP measure for 2007 is not totally comparable to previous years, and will thus be used as control for 2007 in the panel models for testing for significant differences between periods. A specific model using IMPROPP only for the 2007 year and their correspondent independent variables is tested.

The third dependent variable is the rate of necessity-based entrepreneurs (NEC). Again, it is the percentage of the country's adult population involved in entrepreneurship 'because they cannot find a suitable role in the world of work; creating a new business is their best available option' (Reynolds et al. 2005: 217). This measure is relevant for understanding entrepreneurship activities in developing countries. The GEM reports establish that low-income countries have a high rate of entrepreneurial activity because a large part of the population has been unable to find other sources of employment. This type of entrepreneurship corresponds to Baumol's unproductive entrepreneurial activities because in the developing countries, many of these are in the 'shadow' or informal economy. Furthermore, many of these entrepreneurs abandon their efforts once they have the opportunity to become employees. Based on the modified 2007 OPP, it is assumed that NECs for specific countries have increased during the year, so 2007 will again be used as a control.

¹⁴ Even though the recognition of an opportunity is one of the 'central factors' of the entrepreneurship process (Timmons and Spinelli 2007), GEM's OPP measure can incorporate any type of entrepreneurial activity, including self-employment, and this can involve low-growth or no-growth entrepreneurship. In the GEM data, nearly 50 per cent of all start-up attempts do not expect to create any jobs within five years (Autio 2007). Within Baumol's productive-entrepreneurship-activity approach, GEM's OPP measure probably does not 'fit' at all. This discussion will be taken up in the results section. The GEM methodology computes the high-expectation TEA (HEA) index, which is the percentage of adult-aged population involved in TEA who expect to create 20 or more jobs within five years. GEM's 2007 *Executive Report* and 2007 *Global Report on High-Growth Entrepreneurship* suggest that early-stage entrepreneurial activity in the middle- and low-income countries may be dominated more by low-growth entrepreneurial initiatives. Unfortunately, this measure is not available for all the years and countries analysed here.

3.3 Independent variables

I utilize the six WGI variables defined in exact terms according to Kaufmann, Kraay and Mastruzzi (2008: 7-8):

- i) Voice and accountability (VA), measuring perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.
- ii) Political stability and absence of violence (PS), measuring perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism.
- iii) Government effectiveness (GE), measuring perceptions of the 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 credibility of the government's commitment to such policies.
- iv) Regulatory quality (RQ), measuring perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.
- v) Rule of law (RL), measuring perceptions of the extent to which agents have confidence in and abide 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.
- vi) Control of corruption (CC), measuring perceptions of the 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.

Clearly, some of these variables are related more directly with entrepreneurship activities (or total economy activities) but all variables are considered for the initial analysis. These indicators are measured following a normal distribution with a mean of zero and a standard deviation of one in each period. According to WGI, these variables virtually have scores between -2.5 and 2.5, with the higher scores corresponding to better outcomes. In order to test the different specifications including logarithmic, the scores are transformed to 0-5 scale. The WGI indicators are available biannually from 1996, and annually for the six-year period 2002-07. Thus, for this reason the 2001 measures are not available.¹⁵

¹⁵ Different missing-values procedures are inputted to calculate the 2001 rates, but the models with these values do not produce a better statistical fit (R^2). Therefore the model is calculated with only the available years.

3.4 Control variables

In addition to independent variables, the first control variable is the gross domestic product per capita (GDP pc) for the period 2002-07. Per capita income growth rate is a good proxy for measuring economic growth and is one of main sources for qualifying economic development (Wennekers et al. 2005). These variables are adjusted by the purchasing power parity per US dollars, GDP per capita (PPP). The data are taken from IMF's *World Economic Outlook Database* published September 2007. To resolve the potential collinearity problem (some institutional variables are highly correlated with GDP), the models are retested, using a control variable for the country's degree of economic welfare: HINCOME with the value 1 for GEM's high-income countries (see the Appendix). In order to control for the effect of the recalculated OPP, dummy variable Y2007 with value 1 is used for the countries participating in 2007. A correlation matrix for all variables is given in Table 1.

Table 1
Correlations

	OPP	IMPROPP	NEC	VA	PS	GE	RQ	RL	CC	GDP	HINCOME
OPP	1										
IMPROPP	-0.166	1									
NEC	0.683**	-0.488**	1								
VA	-0.322**	0.622**	-0.611**	1							
PS	-0.408**	0.722**	-0.681**	0.719**	1						
GE	-0.337**	0.782**	-0.670**	0.782**	0.816**	1					
RQ	-0.328**	0.721**	-0.653**	0.787**	0.800**	0.950**	1				
RL	-0.329**	0.773**	-0.683**	0.803**	0.837**	0.973**	0.947**	1			
CC	-0.290**	0.817**	-0.638**	0.788**	0.815**	0.971**	0.936**	0.974**	1		
GDP pc	-0.331**	0.766**	-0.687**	0.705**	0.724**	0.868**	0.833**	0.870**	0.863**	1	
HINCOME	-0.316**	0.778**	-0.617**	0.655**	0.661**	0.811**	0.779**	0.821**	0.806**	0.880**	1

Note: ** significant at 0.01% level.

3.5 Methodology

The sections on the literature framework and variable descriptions note that the developing countries have relatively high rates of necessity-based entrepreneurial dynamics, while most developed nations have relatively high rates of productive entrepreneurs. Mindful of the general research proposition, in countries under *ceteris paribus* conditions,¹⁶ the relationship between the institutional-quality variables is positive for the opportunity entrepreneurial dynamics rates, and negative for necessity entrepreneurship. In order to examine these relationships, we use a series of regressions following this general model:

$$E_{it} = f(WGI_{it}, X_{it})$$

¹⁶ Obviously other different economic, demographic, social and institutional factors exist, which influence entrepreneurial activity. See Wennekers et al. (2005: 298).

where:

E is entrepreneurial dynamics: OPP, IMPROPP or NEC;

WGIs represent each of the World Bank's government variables;

X is the control variables: GDP per capita (PPP) or HINCOME and Y2007;

i is the country index and t is the time period.

Models are estimated by pooling the cross-section of countries with the time-series data on each country for the period 2002-07. Linear, logarithmic, inverse relations are verified, as is the quadratic specification, using a general-to-specific modelling procedure to test the better statistical fit.¹⁷ In addition, a different intercept coefficient is specified for each country (fixed and random effects). The relationship between OPP and NEC entrepreneurial activities and the quality of institutions variables is tested. For 2007, only a simple OLS linear model is used.

4 Results

The panel models on opportunity and necessity are performed using a random-effect specification.¹⁸ The first results confirm the potential problems of multicollinearity between some WGI variables that were advised in the correlation matrix. To solve this problem, VA, PS, and CC are dropped from the panel models,¹⁹ but for each variable a useful graphical analysis is considered. The first results from the regression models indicate that the R^2 values and the likelihood ratio tests are higher for the quadratic specification on opportunity-based entrepreneurial activities. Logarithmic specification is better on NECs, while linear specification is more suitable for improved opportunity.

4.1 Opportunity entrepreneurial activity

Linear, logarithmic, inverse and quadratic specifications using the OPP variable are tested. Graphical analyses given in Figure 1 show the relationship between OPP and each of the six WGI variables. Quadratic specification (U-shape) has a better statistical fit (adjusted R^2 values) and superior statistical specification.

The results are shown in Table 2. In the GDP model, 'government effectiveness', GE and GE squared are significant (negative and positive, respectively); GDP and GDP squared are significant (negative and positive, respectively). The HINCOME model has

¹⁷ A series of Akaike tests and Schwarz tests, such as selection criteria for different models, are performed.

¹⁸ Hausman tests are used to prove the better specifications for each model. The null hypotheses for these tests are that there are no systematic differences between the fixed- and random-effects specifications. High p-values on OPP and NEC models would confirm this and support the use of random-effects specification.

¹⁹ VA and PS, by definition, are 'less related' to economic activities. CC is highly correlated with RL. Nevertheless a model using all variables (not shown here) was performed with non-significant variations with respect to the restricted model. Also variance inflation factor (VIF) test was performed, which corroborates the multicollinearity problem.

the same results as the GE variables and HINCOME is significant and negative. This last result is consistent with the observation by Carree et al. (2007) who find that rich countries face a decreasing level of total entrepreneurship activity. Compared with the whole period 2001-07, the control for the year 2007 is not significant, so significant variations of the 2007 OPP measures can be discarded. Even though the models are statistically significant and in accordance with previous research (Wennekers et al. 2005; Acs and Amorós 2008; Amorós and Cristi 2008), the observed relationships (U-shaped relationship) are not plausible explanations for the allocation of productive entrepreneurship with respect to the quality of institutions. The graphical analysis shows that countries with lower rates in their government variables (generally the low- and medium-income countries) exhibit a high degree of ‘opportunity’ entrepreneurial activities. Thus, even though GEM’s opportunity rates for developing countries are high, they do not necessarily represent ‘high-quality’ (productive) entrepreneurship activities (Bosma et al. 2008).

Figure 1
GEM opportunity-based entrepreneurship versus WGI quality of government institutions, 2002-07

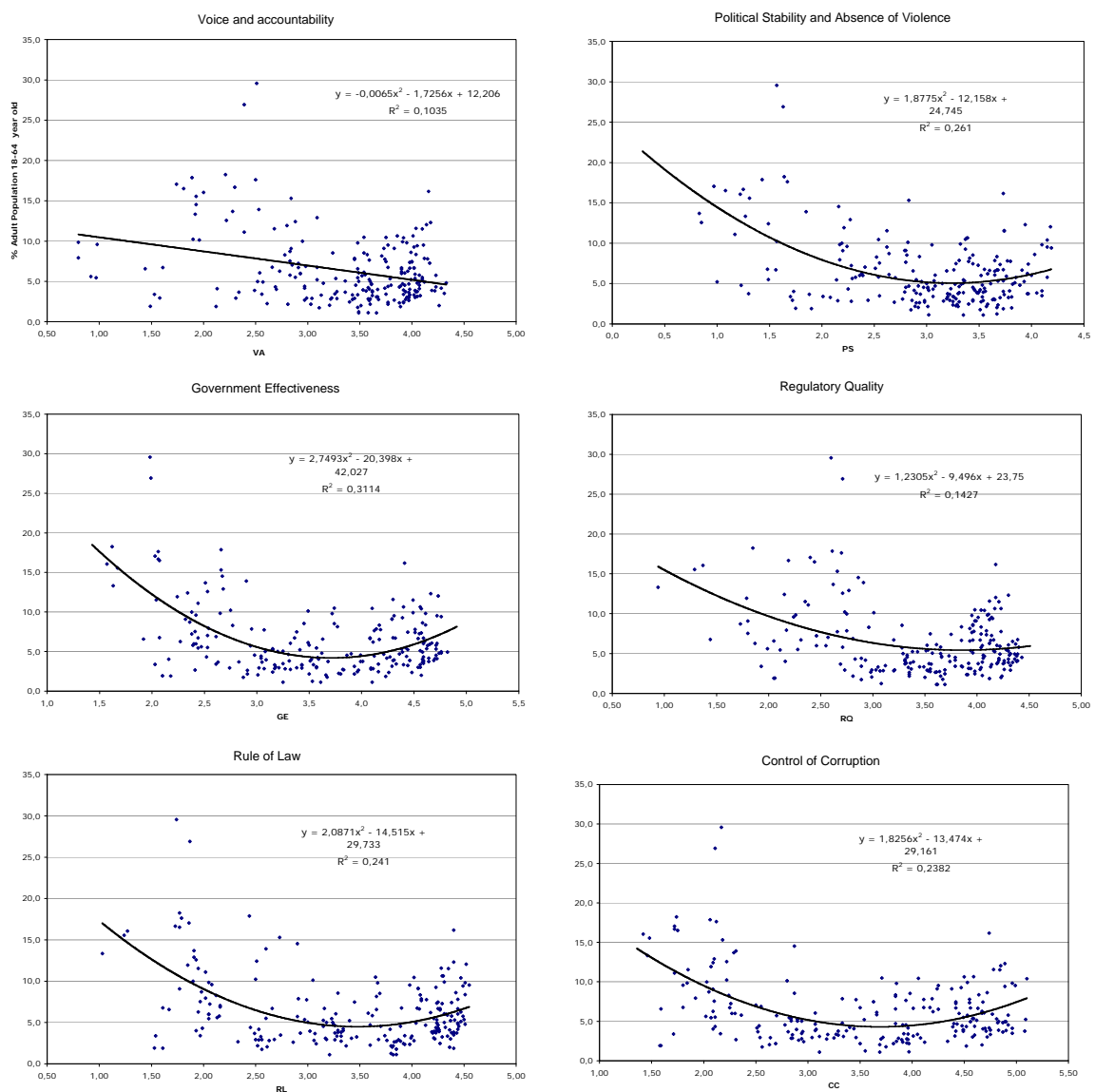


Table 2
Opportunity-based entrepreneurship models

	GDP model	HINCOME model
GE	-12.709**	-14.107**
GE (squared)	1.680**	1.835**
RL	-4.591	-4.775
RL (squared)	0.659	0.709
RQ	6.755	6.768
RQ (squared)	-0.878	-0.889
GDP pc	-0.001**	
GDP pc (squared)	4.30E ^{-09*}	
HINCOME		-1.633*
Y2007	-0.001	-0.142
Constant	27.707	28.360
R ²	0.329	0.3840
Wald chi ²	23.63***	21.43***
Observations	221	221
Groups	60	60

Note: * Significant at 0.10% level; ** significant at 0.05% level; *** significant at 0.01% level.

4.2 Improved opportunity

For this dependent variable two different series of WGI variables are tested. The results are shown in Table 3.

Even though high bivariate correlations, and positive and significant one-to-one linear relationships for the six WGI variables can be observed for IMPROPP (Figure 2), some correlations disappear (or change to negative) in the OLS test with the introduction of GDP or HINCOME. For the GDP model using CC (control of corruption), PS (political stability) and RL (rule of law), the first two are positive and significant, RL is negative and significant²⁰ and GDP is insignificant. In the HINCOME model, the results are

Table 3
Improved opportunity-based entrepreneurship 2007 models

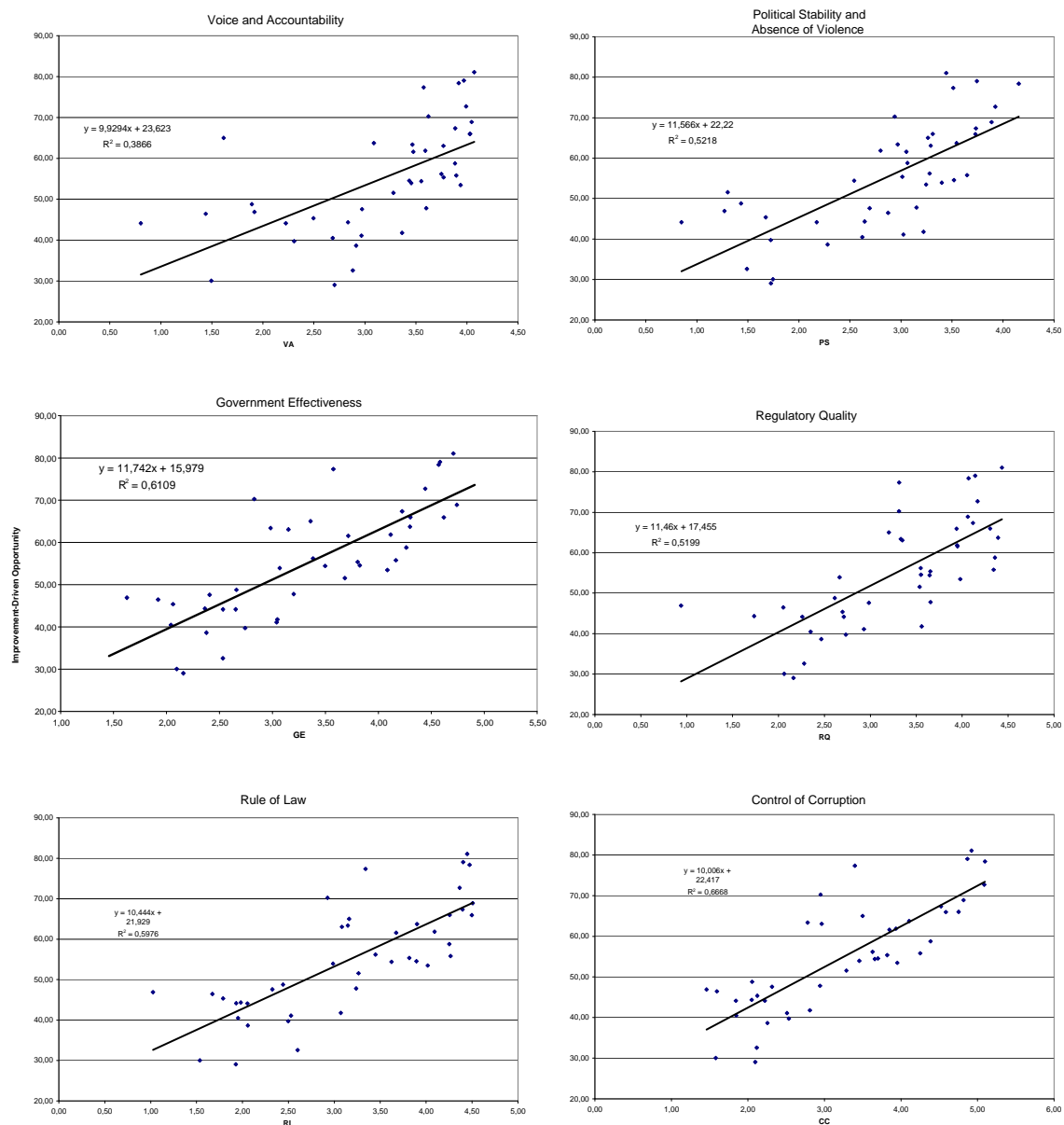
	GDP model 1	HINCOME model 1	GDP model 2	HINCOME model 2
CC	12.360**	11.480**		
PS	3.849*	4.770**		
RL	-8.962*	-9.420**	1.526	0.864
RQ			-1.186	-0.133
Ge			6.610	6.020
GDP per capita	0.000		0.000	
HINCOME		11.923***		11.639**
Constant	42.661***	45.030***	41.025***	43.739***
R ²	0.690	0.77	0.590	0.660
F	23.950***	34.55***	16.250***	21.160***
Observations	42	42	42	42

Note: * significant at 0.10% level; ** significant at 0.05% level; *** significant at 0.01% level.

²⁰ This result is probably collinearity problem because CC is highly correlated with RL and this cross-section model has a relatively low number of observations.

similar but HINCOME is positive and significant. These last results are more plausible and confirm that those with high relative prevalence of improved opportunity-driven entrepreneurship are the high-income countries²¹ (Bosma et al. 2008). For the developing countries, the necessity-motivated entrepreneurs constitute an important share of the total entrepreneurial activity and, in many cases, the non-opportunity oriented (or necessity) unproductive entrepreneurial activities rates are above the OPP.

Figure 2
GEM improved opportunity-based entrepreneurship
versus WGI quality of government institutions, 2007



²¹ Of the developing countries, only Chile and Uruguay have IMPROPP exceeding 50 per cent.

4.3 Necessity

In this model similar to OPP, random effects and the same WGI variables are used. Linear, logarithmic and inverse relations are verified, as is the quadratic specification. Logarithmic model being once best adjusted. The results are shown in Table 4 and the graphical analysis in Figure 3.

Table 4
Necessity-based entrepreneurship models

	GDP model	HINCOME model
ln(GE)	-0.924	-2.969*
ln(RL)	-3.344**	-5.305
ln(RQ)	2.817*	2.948
ln(GDP) per capita	-2.171***	
HINCOME		-0.122
Y2007	0.147	-0.289*
CONSTANT	25.182***	8.672***
R^2	0.605	0.512
Wald χ^2	97.99***	60.36***
Observations	221	221
Groups	60	60

Note: Significant at 0.10 level. ** Significant at 0.05 level. *** Significant at 0.01 level.

Figure 3
GEM necessity-based entrepreneurship
versus WGI quality of government institutions, 2002-07

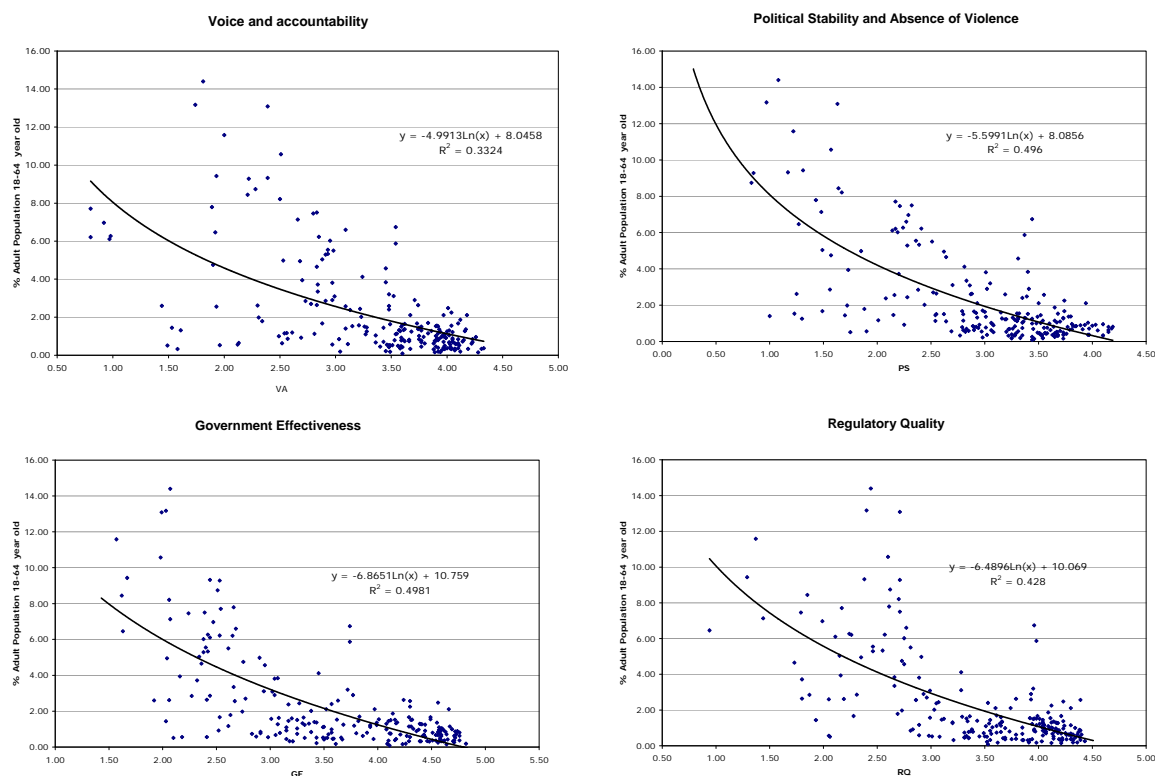
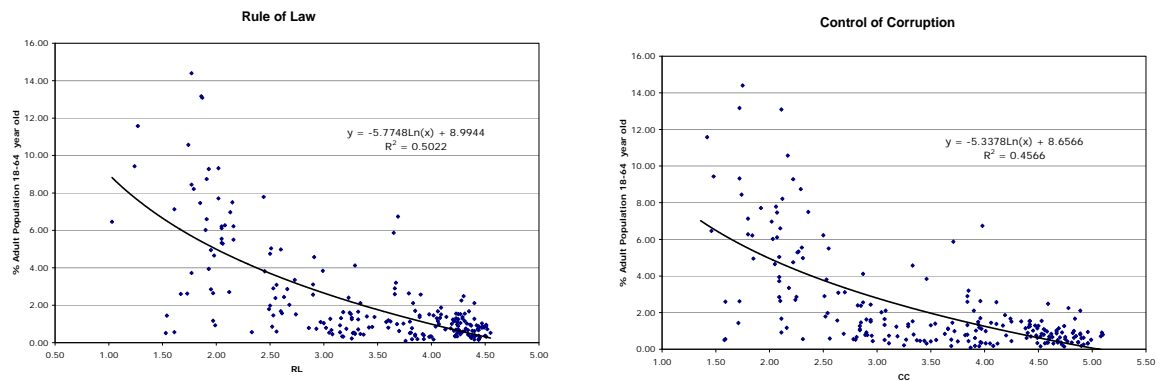


Figure 3 (cont'd)



5 Discussion and conclusions

5.1 Overall findings

In this paper I have conducted an exploratory analysis to examine the relationships between the quality of a country's government institutions and the different types of entrepreneurship activities. Following Baumol's (1990) propositions of the allocation of entrepreneurship activities, this study adds to the empirical evidence on the importance of institutional context in the level, motivations and quality of new venture creation across countries (Sobel, Clark and Lee 2007; Bowen and De Clercq 2008; Bjørnskov and Foss 2008), with an emphasis on the comparison between developed and developing economies. As Boettke and Coyne (2006) state, institutions can be understood as the formal and informal rules regulating human behaviour and the enforcement of these rules. Entrepreneurship is the outcome of human behaviour and the institutional environment—in this case, government institutions—will either enhance or not enhance—entrepreneurial activities.

The findings presented in this paper suggest that differences in institutional quality help to explain differences in entrepreneurship across developed and developing countries. A country's overall level of opportunistic entrepreneurial activities are not significantly affected by the WGI variables, and exhibit a non-plausible U-shaped curve.²² Acs and Amorós (2008) note:

U-shaped approach is useful in understanding the decline in self-employment in developing countries both across countries and over time, but not useful in explaining entrepreneurship (broadly defined). Second, the U-shaped approach is not very useful in explaining the role of

²² Acs and Szerb (2008) and Ahmad and Hoffmann (2008), among others, are developing new global entrepreneurship indices. Complex Global Entrepreneurship Context Index (CDC) has three sub indexes that measure entrepreneurial activity, entrepreneurial strategy and entrepreneurial attitudes (Acs and Szerb 2008). The relationship between GDP growth and CDC index is more linear or mildly S-shaped, rather than U-shaped (Virgill 2008). Using fifty-three countries over the period 2005-06, with an emphasis on a developing region, Latin-America, only one country was in the bottom half of the index: Chile ranked 12th, Argentina 31st, Colombia 34th, Uruguay 35th, Venezuela 42nd, Mexico 52nd and Brazil 53rd (Acs and Amorós 2008).

developing countries in the efficiency-driven stage of development, either as they enter the efficiency-driven stage or leave the efficiency-driven stage.

Certainly the OPP measures for developing countries encompass many activities, which in comparison to those in the developed countries, do not constitute true opportunities or productive value-added activities.

The positive relationships between improved opportunity-driven entrepreneurship activities utilized as a proxy for productive entrepreneurship and ‘control of corruption’, ‘political stability’ and high-income countries indicate that real opportunity ventures can be allocated if the existing government institutions are of adequate quality. This has an important implication for entrepreneurs in the developing countries: the adoption of certain institutions has to precede productive entrepreneurial behaviour because these institutions, in this specific analysis, facilitate the right type of entrepreneurship (Boettke and Coyne 2006).

Finally, results of NEC entrepreneurship activities have important implications for the developing countries. The negative relationship between ‘government effectiveness’, ‘rule of law’ and GDP per capita confirm the influence of institutional quality on the allocation of entrepreneurship efforts. The results in general terms indicate that more economic development associated with better quality of institutions could reduce the prevalence rates of the unproductive entrepreneurial activities that are mainly motivated by necessity. For public policy, Leibenstein (1968: 83) suggests that attention be focused on: ‘... the gaps, obstructions, and impediments in the market network of the economy in question and on the gap-filling and input-completing capacities and responsiveness to different motivational states of the potential entrepreneurs in the population’. In this sense, government institutions should converge to enhance the efficiency of the market, as well as to provide a general environment that is open to motivated entrepreneurs (Levie and Autio 2008). For developing countries, this general environment is faced with the lack of regulations and rule of law (de Soto 2000), so many entrepreneurial efforts lead to large-scale, predominantly unproductive activities rather than the more desirable productive and real opportunity entrepreneurship. Thus institutional profiles in developing countries contrast with those of the high-income developed economies that benefit from a well-established regulatory base and wide support for entrepreneurship (Manolova, Eunni and Gyoshev 2008).

5.2 Limitations and future research

I hope that this study, based on a longitudinal analysis of 60 countries, provides some empirically relevant results related to entrepreneurship and the quality of institutions. Nevertheless, the exploratory nature of this research faces several limitations and the results are not conclusive. First, both GEM and WGI indicators are being improved continually. The IMPROPP variable is a good example of this. The GEM project has other variables that measure dimensions of high growth-oriented entrepreneurship, innovation-driven or degree of internationalization (Levie and Autio 2008; Hessels, van Gelderen and Thurik 2008). The use of alternative entrepreneurial measures like self-employment indicators or new indexes could be useful in developing this line of research. Other measures of the quality of institutions like the *Index of Economic Freedom* (Heritage Foundation), *Economic Freedom of the World* (Fraser Institute), *Corruption Perception Index* (Transparency International) or other sources of

government information like UNDP or the World Economic Forum could be complementary and help to define new models. These variables will possibly also help to resolve problems of collinearity by using different metrics. Using an approach based on a more specific regional focus or degree of development (for example, OECD countries, European Union countries, transition economies, Latin-America, etc.) can help to improve the estimations.

Second, this paper is restricted to national-level data. An analysis at individual-level might show different patterns. Another level is the region; a regional approach faces differences in institutional quality and this affects on entrepreneurship activities (Hall and Sobel 2008; Sobel 2008).

Finally, it is clear that any approach modelling entrepreneurship without explicitly considering institutional variables could be methodologically flawed. Moreover, the results of this paper find that both entrepreneurship and other determinants (for example, GDP) can be influenced asymmetrically by the quality of institutions. Thus, in future research more robust and nonlinear models need to be considered.

5.3 Conclusions

This paper analyses the relationship between different types of entrepreneurial dynamics and the quality of government institutions during the period 2002 to 2007. Even though these empirical results are not conclusive, as stated earlier, the study corroborates the significant and positive effects of the quality of institutions on opportunity (productive) entrepreneurial activities, and significant and negative effects on necessity (unproductive) entrepreneurial rates. Furthermore, high-income countries exhibit similar relationships, but low- and middle-income developing countries ‘move in the opposite direction’. Based on previous analyses (Acs and Amorós 2008; Amorós and Cristi 2008), this research stresses that entrepreneurship activities, on their own, are only another ‘economy indicator’ if they are not accompanied with a positive environment that promotes the new venture creation. The national business environment is a decisive factor that determines the motivation of entrepreneurial projects and their quality. For this reason, the relatively high index of entrepreneurship rates in the developing countries as indicated with the GEM methodology, is characterized by a great number of necessity-motivated initiatives (which is an indicator of poverty rather than growth). This is in contrast to countries with greater economic development where a high proportion of entrepreneurial initiatives is triggered by opportunity that truly contributes to national economic growth.

These results have important implications for public policy. The results suggest that for developing countries in general, the quality of institutions alone does not enhance or improve entrepreneurship. These countries need to work in order to achieve stable regulatory and macroeconomic conditions (Amorós and Cristi 2008). This implies continuing efforts for the reduction of unemployment and necessity-based entrepreneurship. But this kind of public policy, although indispensable, is insufficient. If developing countries do not consider the promotion of productive entrepreneurship as a main concern in their policy agenda (Wennekers et al. 2005), they will only reduce necessity-based entrepreneurship without achieving higher growth through opportunity-based entrepreneurship. Such governmental decisions necessitate the creation of better national strategies to accelerate country growth and move more rapidly toward major innovation-based entrepreneurial activities (Acs and Amorós 2008). Developing

countries must rationally organize their functions, and seek to remove unnecessary barriers and controls that hamper entrepreneurial activity. They need to protect and stimulate property rights, and introduce policies that support the creativity and efficiency of the private sector. With an adequate environment, including the quality of institutions, entrepreneurship can help to improve the economic and social conditions for developing economies.

References

- Acs, Z. J., and C. Armington (2004). 'Employment Growth and Entrepreneurial Activity in Cities'. *Regional Studies*, 38 (8): 911-28.
- Acs, Z. J., and D. B. Audretsch (1988). 'Innovation in Large and Small Firms: An Empirical Analysis'. *American Economic Review*, 78 (4): 678-90.
- Acs, Z. J., and J. E. Amorós (2008). 'Entrepreneurship and Competitiveness Dynamics in Latin America'. *Small Business Economics*, 31 (3): 305-22.
- Acs, Z. J., and L. Szerb (2008). 'A Complex Global Entrepreneurship Context Index (CEC)'. Pecs: Faculty of Business and Economics, University of Pecs. Mimeo.
- Ahmad, N., and A. N. Hoffmann (2008). 'A Framework for Addressing and Measuring Entrepreneurship'. OECD Statistics Working Paper, 2. Paris: OECD. Available at: www.ssrn.com/abstract=1090374.
- Amorós, J. E., and O. Cristi (2008). 'Longitudinal Analysis of Entrepreneurship and Competitiveness Dynamics in Latin America'. *International Entrepreneurship and Management Journal*, 4 (4): 381-99.
- Audretsch, D. B. (2007). *The Entrepreneurial Society*. Oxford: Oxford University Press.
- Audretsch, D., and R. Thurik (2001). 'What is New about the New Economy: Sources of Growth in the Managed and Entrepreneurial Economy'. *Industrial and Corporate Change*, 10 (1): 267-315.
- Audretsch, D., and M. Keilbach (2004). 'Entrepreneurship and Regional Growth: An Evolutionary Interpretation'. *Journal of Evolutionary Economics*, 14 (5): 605-16.
- Audretsch, D., I. Grilo, and R. Thurik (2007). *The Handbook of Entrepreneurship Policy*. Cheltenham: Edward Elgar.
- Autio, E. (2007). 'GEM's Report 2007: Global Report on High-growth Entrepreneurship'. Produced in association with Mazars/London Business School/Babson College.
- Barro, R. J. (1991). 'Economic Growth in a Cross-Section of Countries'. *The Quarterly Journal of Economics*, 106 (2): 407-43.
- Baumol, W. J. (1990). 'Entrepreneurship: Productive, Unproductive, and Destructive'. *Journal of Political Economy*, 98 (5): 893-921.
- Belso-Martínez, J. A. (2005). 'Equilibrium Entrepreneurship Rate, Economic Development and Growth. Evidence from Spanish Regions'. *Entrepreneurship and Regional Development*, 17 (2): 145-61.

- Bjørnskov, C., and N. Foss (2008). 'Economic Freedom and Entrepreneurial Activity: Some Cross-Country Evidence'. *Public Choice*, 134 (3-4): 307-28.
- Blanchflower, D. G. (2000). 'Self-employment in OECD Countries'. *Labor Economics*, 7: 471-505.
- Blanchflower, D. G., and A. J. Oswald (1998). 'What Makes an Entrepreneur?'. *Journal of Labor Economics*, 16 (1): 26-60.
- Boettke, P. J., and C. J. Coyne (2003). 'Entrepreneurship and Development: Cause or Consequence'. *Advances in Austrian Economics*, 6: 67-88.
- Boettke, P. J., and C. J. Coyne (2006). 'Entrepreneurial Behaviour and Institutions'. In M. Minniti (ed.), *Entrepreneurship: The Engine of Growth*, Vol. 1. Westport, CT: Praeger Press, 119-34.
- Bosma, N., K. Jones, E. Autio, and J. Levie (2008). *Global Entrepreneurship Monitor 2007 Executive Report*. London: Global Entrepreneurship Research Association.
- Bowen, H. P., and D. De Clercq (2008). 'Institutional Context and the Allocation of Entrepreneurial Effort'. *Journal of International Business Studies*, 39: 747-67.
- Buchanan, J. M. (1991). 'The Economy as a Constitutional Order'. In J. M. Buchanan (ed.), *The Economics and the Ethics of Constitutional Order*. Ann Arbor: University of Michigan Press.
- Bruton, G. D., D. Ahlstrom, and K. Obloj (2008). 'Entrepreneurship in Emerging Economies: Where Are We Today and Where Should the Research Go in the Future'. *Entrepreneurship Theory and Practice*, 32 (1): 1-14.
- Carree, M., and R. Thurik (2003). 'The Impact of Entrepreneurship on Economic Growth'. In D. Audretsch and Z. J. Acs (eds), *Handbook of Entrepreneurship Research*. Dordrecht: Kluwer-Academic Publishers, 437-71.
- Carree, M., A. van Stel, R. Thurik, and S. Wennekers (2002). 'Economic Development and Business Ownership: An Analysis Using Data of 23 OECD Countries in the Period 1976-1996'. *Small Business Economics*, 19 (3): 271-90.
- Carree, M., A. van Stel, R. Thurik, and S. Wennekers (2007). 'The Relationship between Economic Development and Business Ownership Revisited'. *Entrepreneurship and Regional Development*, 19 (3): 281-91.
- Carter, N. M., W. B. Gartner, K. G. Shaver, and E. J. Gatewood (2003). 'The Career Reasons of Nascent Entrepreneurs'. *Journal of Business Venturing*, 18 (1): 13-39.
- de Soto, H. (2000). *The Mystery of Capital*. New York: Basic Books.
- Feldman, D. C., and M. C. Bolino (2000). 'Career Patterns of the Self-employed: Career Motivations and Career Outcomes'. *Journal of Small Business Management*, 38 (3): 53-67.
- Grilo, I., and R. Thurik (2005). 'Entrepreneurial Engagement Levels in the European Union'. *International Journal of Entrepreneurship Education*, 3 (2): 143-68.
- Grilo, I., and J. M. Irigoyen (2006). 'Entrepreneurship in the EU: To Wish and not to be'. *Small Business Economics*, 26 (4): 305-18.

- Hall, J. C., and R. S. Sobel (2008). 'Institutions, Entrepreneurship, and Regional Differences in Economic Growth'. *Southern Journal of Entrepreneurship*, 1 (1): 69-96.
- Hayek, F. A. (1945). 'The Use of Knowledge in Society'. *American Economic Review*, 35 (4): 519-30.
- Hellman, J. S., G. Jones, D. Kaufmann, and M. Schankerman (2000). 'Measuring Governance, Corruption and State Capture: How Firms and Bureaucrats Shape the Business Environment in Transition Economies'. WB Policy Research Working Paper 2444. Washington, DC: World Bank
- Hessels, J., M. van Gelderen, and R. Thurik (2008). 'Entrepreneurial Aspirations, Motivations and their Drivers'. *Small Business Economics*, 31 (3): 323-39.
- Hoffmann, A. N. (2007). 'A Rough Guide to Entrepreneurship Policy'. In D. Audretsch, I. Grilo and R. Thurik (eds), *The Handbook of Entrepreneurship Policy*. Cheltenham: Edward Elgar, 94-129.
- Hwang, H., and W. W. Powell (2005). 'Institutions and Entrepreneurship'. In S. Alvarez, R. Agarwal and O. Sorenson (eds), *Handbook of Entrepreneurship Research. Disciplinary Perspectives*. New York: Springer, 201-32.
- Iyigun, M., and A. L. Owen (1998). 'Risk, Entrepreneurship, and Human-Capital Accumulation'. *American Economic Review*, 88 (2): 454-57.
- Jorgenson, D. (2001). 'Information Technology and the US Economy'. *American Economic Review*, 91: 1-32.
- Kaufmann, D., A. Kraay, and P. Zoido-Lobaton (1999). 'Governance Matters'. WB Policy Research Working Paper 2196. Washington, DC: World Bank.
- Kaufmann, D., A. Kraay, and M. Mastruzzi (2008). 'Governance Matters VII: Aggregate and Individual Governance Indicators, 1996-2007'. WB Policy Research Working Paper 4654. Washington, DC: World Bank.
- Keefer, P., and S. Knack (1995). 'Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures'. *Economics and Politics*, 7 (3): 207-27.
- Kihlstrom, R., and J. J. Laffont (1979). 'A General Equilibrium Entrepreneurial Theory of Firm Formation Based on Risk Aversion'. *Journal of Political Economy*, 87 (4): 719-48.
- Kirzner, I. M. (1973). *Competition and Entrepreneurship*. Chicago: University of Chicago Press.
- Knack, S., and P. Keefer (1997). 'Why Don't Poor Countries Catch-up? A Cross-National Test of an Institutional Explanation'. *Economic Inquiry*, 35 (3): 590-602.
- Knight, F. H. (1971) *Risk, Uncertainty and Profit*. Boston: Houghton Mifflin Company.
- Kolvereid, L. (1996). 'Organizational Employment versus Self-Employment: Reasons for Career Choice Intentions'. *Entrepreneurship Theory and Practice*, 20 (3): 23-31.
- Lazear, E. P. (2005). 'Entrepreneurship'. *Journal of Labor Economics*, 23 (4): 649-80.

- Levie, J., and E. Autio (2008). 'A Theoretical Grounding and Test of the GEM Model'. *Small Business Economics*, 31 (3): 235-63.
- Leibenstein, H. (1968). 'Entrepreneurship and Development'. *American Economic Review*, 58 (2): 72-83.
- Leibenstein, H. (1978). *General X-efficiency Theory and Economic Development*. Oxford: Oxford University Press.
- Leibenstein, H. (1995). 'The Supply of Entrepreneurship'. In G. M. Meier (ed.), *Leading Issues in Economic Development*. New York: Oxford University Press, 273-5.
- Li, W. (2002). 'Entrepreneurship and Government Subsidies: A General Equilibrium Analysis'. *Journal of Economic Dynamics and Control*, 26 (11): 1815-44.
- Lucas, R. E. (1978). 'On the Size Distribution of Firms'. *Bell Journal of Economics*, 9 (2): 508-23.
- Manolova, T. S., R. V. Eunni, and B. S. Gyoshev (2008). 'Institutional Environments for Entrepreneurship: Evidence from Emerging Economies in Eastern Europe'. *Entrepreneurship Theory and Practice*, 32 (1): 203-18.
- North, D. C. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press.
- Parker, S. (2007) 'Policy-makers Beware!'. In D. Audretsch, I. Grilo and R. Thurik (eds), *The Handbook of Entrepreneurship Policy*. Cheltenham: Edward Elgar, 54-63.
- Reynolds, P. D., M. Hay, and S. M. Camp (1999). 'Global Entrepreneurship Monitor'. Kansas City: Kauffman Center for Entrepreneurial Leadership.
- Reynolds, P., N. Bosma, E. Autio, S. Hunt, N. De Bono, I. Servais, P. Lopez-Garcia, and N. Chin (2005). 'Global Entrepreneurship Monitor: Data Collection Design and Implementation 1998-2003'. *Small Business Economics*, 24 (3): 205-31.
- Schumpeter, J. A. (1934). *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle*. Translated from the second edition by R. Opie. Harvard: Harvard University Press.
- Schumpeter, J. A. (1950). *Capitalism, Socialism and Democracy*. New York: Harper and Row.
- Sobel, R. S. (2008). 'Testing Baumol: Institutional Quality and the Productivity of Entrepreneurship'. *Journal of Business Venturing*, 23 (6): 641-55.
- Sobel, R. S., J. R. Clark, and D. R. Lee (2007). 'Freedom, Barriers to Entry, Entrepreneurship, and Economic Progress'. *Review of Austrian Economics*, 20: 221-36.
- Stevenson, L., and A. Lundström (2005). 'Entrepreneurship Policy for the Future: Best Practice Components'. In R. van der Horst, S. King-Kauanui and S. Duffy (eds), *Keystones of Entrepreneurship Knowledge*. Oxford: Blackwell Publishing, 177-94.
- Stevenson, L., and A. Lundström (2007). 'Dressing the Emperor: The Fabric of Entrepreneurship Policy'. In D. Audretsch, I. Grilo and R. Thurik (eds), *The Handbook of Entrepreneurship Policy*. Cheltenham: Edward Elgar, 94-129.

- Storey, D. (2005). 'Entrepreneurship, Small and Medium Sized Enterprises and Public Policies'. In Z. J. Acs and D. Audretsch (eds), *Handbook of Entrepreneurship Research: An Interdisciplinary Survey and Introduction*. New York: Springer, 473-511.
- Timmons, J. A., and S. Spinelli (2007). *New Venture Creation: Entrepreneurship for the 21st Century*, 7th Edition. New York: McGraw-Hill/Irwin.
- Thurow, L. (2003). *Fortune Favours the Bold: What We Must Do to Build a New and Lasting Global Prosperity*. New York: Harper Collins.
- Wennekers, S., and R. Thurik (1999). 'Linking Entrepreneurship and Economic Growth'. *Small Business Economics*, 13 (1): 27-55.
- Wennekers, S., A. van Stel, R. Thurik, and P. Reynolds (2005). 'Nascent Entrepreneurship and the Level of Economic Development'. *Small Business Economics*, 24 (3): 293-309.
- West, G. P., C. E. Bamford, and J. W. Marsden (2008). 'Contrasting Entrepreneurial Economic Development in Emerging Latin American Economies: Applications and Extensions of Resource-Based Theory'. *Entrepreneurship Theory and Practice*, 32 (1): 15-36.
- Wong, P. K., Y. P. Ho, and E. Autio (2005). 'Entrepreneurship, Innovation and Economic Growth: Evidence from GEM Data'. *Small Business Economics*, 24 (3): 335-50.
- van Stel, A., M. Carree, and R. Thurik (2005). 'The Effect of Entrepreneurial Activity on National Economic Growth'. *Small Business Economics*, 24 (3): 311-21.
- Verheul, I., S. Wennekers, D. B. Audretsch, and R. Thurik (2002). 'An Eclectic Theory of Entrepreneurship'. In D. B. Audretsch, R. Thurik, I. Verheul and S. Wennekers (eds), *Entrepreneurship: Determinants and Policy in a European-US Comparison*. Boston/Dordrecht: Kluwer Academia Publishers, 11-81.
- Virgill, N. (2008). 'Export Processing Zones: Tools of Development or Reform Delay?'. Fairfax: School of Public Policy, George Mason University. PhD Dissertation.
- Zacharakis, A. L., W. D. Bygrave, and D. A. Shepherd (2000). *Global Entrepreneurship Monitor: National Entrepreneurship Assessment: United States of America*. Kansas City: Kauffman Center for Entrepreneurial Leadership.

Appendix: Participant countries in GEM 2002-07 and their income classification

Country	2002	2003	2004	2005	2006	2007	Country	2002	2003	2004	2005	2006	2007
High-income countries							Low-middle income countries						
1 Australia	☞	☞	☞	☞	☞		32 Argentina	☞	☞	☞	☞	☞	☞
2 Austria				☞		☞	33 Brazil	☞	☞	☞	☞	☞	☞
3 Belgium	☞	☞	☞	☞	☞	☞	34 Chile	☞	☞		☞	☞	☞
4 Canada	☞	☞	☞	☞	☞		35 China	☞	☞		☞	☞	☞
5 Czech Republic					☞		36 Colombia					☞	☞
6 Denmark	☞	☞	☞	☞	☞	☞	37 Croatia	☞	☞	☞	☞	☞	☞
7 Finland	☞	☞	☞	☞	☞	☞	38 Dominican Rep.						☞
8 France	☞	☞	☞	☞	☞	☞	39 Ecuador			☞			
9 Germany	☞	☞	☞	☞	☞		40 Hungary	☞		☞	☞	☞	☞
10 Greece		☞	☞	☞	☞	☞	41 India	☞				☞	☞
11 Hong Kong SAR	☞	☞	☞			☞	42 Indonesia					☞	
12 Iceland	☞	☞	☞	☞	☞	☞	43 Jamaica				☞	☞	
13 Ireland	☞	☞	☞	☞	☞	☞	44 Jordan			☞			
14 Israel	☞		☞			☞	45 Kazakhstan						☞
15 Italy	☞	☞	☞	☞	☞	☞	46 Latvia				☞	☞	☞
16 Japan	☞	☞	☞	☞	☞	☞	47 Malaysia					☞	
17 Korea	☞						48 Mexico	☞			☞	☞	
18 Netherlands	☞	☞	☞	☞	☞	☞	49 Peru			☞		☞	☞
19 New Zealand	☞	☞	☞	☞			50 Philippines					☞	
20 Norway	☞	☞	☞	☞	☞	☞	51 Poland	☞		☞			
21 Portugal			☞			☞	52 Romania						☞
22 Puerto Rico						☞	53 Russia	☞				☞	☞
23 Singapore	☞	☞	☞	☞	☞		54 Serbia						☞
24 Slovenia	☞	☞	☞	☞	☞	☞	55 South Africa	☞	☞	☞	☞	☞	
25 Spain	☞	☞	☞	☞	☞	☞	56 Thailand	☞			☞	☞	☞
26 Sweden	☞	☞	☞	☞	☞	☞	57 Turkey					☞	☞
27 Switzerland	☞	☞		☞		☞	58 Uganda		☞	☞			
28 Taiwan	☞						59 Uruguay					☞	☞
29 United Arab Emirates					☞	☞	60 Venezuela		☞		☞		☞
30 United Kingdom	☞	☞	☞	☞	☞	☞							
31 United States	☞	☞	☞	☞	☞	☞							

Note: ☞ = Country participating.

Source: Compiled by the author, based on GEM annual reports.