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**LONGITUDINAL ANALYSIS OF
ENTERPRENEURSHIP AND
COMPETITIVENESS DYNAMICS IN LATIN
AMERICA**

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Departament d'Economia de l'Empresa

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**Longitudinal Analysis of Entrepreneurship and
Competitiveness Dynamics in Latin America**

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Longitudinal Analysis of Entrepreneurship and Competitiveness Dynamics in Latin America

Abstract

This study analyzes the relationship between entrepreneurial dynamics in Latin-American countries and the level of competitiveness these countries show. Based on the research conducted by Wennekers et al. (2005) that demonstrates a U-shaped relationship between the country's rate of entrepreneurship and its level of competitiveness and economic development, we hypothesize that Latin-American countries have a descending behaviour under the U-shaped curve approach. The results from three regression models support this relationship and suggest that region's competitiveness and economic growth have not had an important effect on entrepreneurial dynamics. We discuss that Latin-American countries need to improve some structural factors to achieve a high level of entrepreneurial dynamics.

Keywords: Entrepreneurship, competitiveness, economic growth, Latin America.

The study of the “entrepreneurial activities” has come accompanied by the development of the industrial and commercial activities that have had its inflection point with the industrial revolution. Under a classic approach, the role of entrepreneurship used to be related to economic development. In the 18th century, for instance, Richard Cantillon¹ or Jean-Baptiste Say² broadened concepts of entrepreneurship linked to sales and production factors. But it was Schumpeter (1911) who added the concept of innovation to the definition of entrepreneurship. His seminal work emphasized the role the entrepreneur plays in the creation and the responses he makes to economic discontinuities in the form of “creative destruction”. Based on this Schumpeterian statement the process of “creative destruction” is essential for a company to achieve a high economic performance because the entrepreneur identifies opportunities to create value. When these opportunities are combined with skills and motivations, the result is the creation of new businesses that scroll out the least efficient. Furthermore, in a competitive ambience, the innovations introduced by the entrepreneurs are imitated by the rest of the industry, thus the impact they have is much bigger.

Entrepreneurship is a very important activity for a country’s competitiveness and growth, and a significant source of social mobility. The new venture phenomena have been relevant to the economic development of countries, especially for the contribution to new job creation (Birch, 1979, 1987). Many Latin-American countries have experimented on the last 20 years high economic growth rates. Natural resources exports and some low value-added products, led the economic expansion on these countries until the mid-1990s, but in the last few years economic growth rates have slowed down considerably (Echecopar, 2004; IADB, 2006). Latin-American countries have a big potential to generate competitiveness and well-being through the creation of new firms but have not managed to consolidate the entrepreneurial dynamics (Kantis, 2004). Some countries of emergent regions other than Latin America have made an important bet on entrepreneurship. Economies of Latin America need to transform

the self-employment or isolated new ventures with little value-added into innovative-based firms and create business networks that allow them to compete globally (Miles, Miles & Snow, 2005). This translates into an emerging interest on how to develop more industries to produce value-added products or services. Entrepreneurship and innovation processes are key factors to increase economic dynamism (Minniti, Bygrave & Autio, 2006).

Entrepreneurship phenomenon is a relatively new subject area in Latin America, and it has become a rapidly expanding field of knowledge (Kantis, Ishida & Komori, 2002; Kantis, 2004). Tiffin (2004) shows the increasing interest and the rapid implication of entrepreneurship topics in almost all the countries of this region. Nevertheless, empirical studies of the impact of entrepreneurial activity on competitive development of the countries are limited (Van Stel, Carree & Thurik., 2005). This paper analyzes the relationship between entrepreneurial dynamics of Latin-American countries and their levels of competitiveness. Using the methodology proposed by Wennekers, Van Stel, Thurik & Reynolds (2005) that shows a U-shaped relationship between the country's rate of entrepreneurship and its level of economic development, we examine the entrepreneurial dynamics on a sample of Latin-American countries during the period between 2000 and 2006, when we would expect a descending behavior of entrepreneurship level under the U-shaped curve approach. The purpose of this paper is to give empirical support this conjecture and to show different competitive stages that Latin-American countries may have. The entrepreneurial dynamics is measured by the early-stage entrepreneurial activity rate of Global Entrepreneurship Monitor, GEM, which is defined as the number of persons actively involved in the creation of businesses, expressed as a percentage of the adult population. The indexes of competitiveness are based on the World Economic Forum's Reports (2001-2006). Additionally, competitiveness is narrowly linked to the level of economic development, and that is why we use the gross domestic product per capita as an additional explanatory variable.

The rest of the paper is structured as follows. In Section 2 we discuss the recent literature that concentrates in the Latin-American region, and we state our hypothesis. In Section 3, we present the model used for the analysis, and we describe the variables under study. The Section 4 shows the results obtained, followed by the discussion and conclusion on Section 5.

Entrepreneurship and Competitive Development: A Latin-American Perspective

The existing relationship between entrepreneurship and competitiveness has been mainly examined under the perspective of economic growth (Acs & Storey, 2004). Authors like Wennekers and Thurik (1999), Carree and Thurik (2003), Karlsson, Friis and Paulsson. (2004) and Schramm (2004) provide an extensive review of theoretical and empirical literature. Generally, the literature indicates that entrepreneurship contributes to economic performance by introducing innovation, making market changes, enhancing rivalry and creating competition (Wong, Ho & Autio, 2005, p. 337). The influence of entrepreneurial dynamics³ on competitive development (and by consequence economic growth) of the countries or regions presents a complex relationship (Spencer & Gómez, 2004). This is mainly because the lack of agreement on what entrepreneurship is and how to measure it. Moreover, the causality between those variables is not well defined. In fact, the level of country development can encourage and strengthen the entrepreneurial activity (Acs, Arenius, Hay & Minniti, 2005, p 38) but, at the same time entrepreneurship contributes to economic development. Some studies argue that during the last two decades the development of new technologies, and by consequence the emergence of new business models, has shifted from large corporations to small and new ventures (Audretsch & Thurik, 2001; Thurow, 2003; Wennekers et al., 2005). Nevertheless, the competitive impact, and consequently the contribution of these entrepreneurial efforts to economic growth, differs not only among countries with different development stages (Carree, van Stel, Thurik & Wennekers, 2002;

Van Stel et al., 2005), but also among regions in a single country (Audretsch & Keilbach, 2004; Lee, Florida & Acs, 2004; Belso, 2005).

Empirical studies based on information gathered from different countries in different time periods reveal different types of relationships between the variables that measure the level of entrepreneurship and the variables that measure competitiveness. For example, Tang and Koveos (2004) show a positive correlation between entrepreneurship rates and economic growth in high-income countries, whereas for the low and middle-income countries the correlation is negative. Van Stel et al. (2005) and Wennekers et al. (2005) have reported that the relationship between entrepreneurship rates and different economic and competitive performance variables, using a sample of GEM participant countries, do not present simple linear relationships, and that they even show some negative effects on relatively poor countries. Furthermore, Carree et al. (2002) showed a U-shaped relationship between the level of per capita income and the rate of self-employment (or business ownership) in 23 OECD countries. Wennekers et al. (2005) also showed three U-shaped approaches between the entrepreneurship rates and the level of economic development, measured by income per capita, innovation capacity and diverse associate socio-demographic variables. According to Van Stel et al. (2005) results, high entrepreneurship (start up) rates in developing countries could be caused by “informal sectors”. Therefore, for these countries the effect of the entrepreneurial dynamics in the competitiveness and economic growth (Van Stel et al., 2005, p. 313) is less certain than that of countries in higher stages of the development process. The GEM methodology⁴ places Latin-American participant countries at high levels of entrepreneurship. Nevertheless the dynamism of the new Latin-American companies⁵ is lower in comparison with other emergent regions such as Southeast-Asia, especially for the high necessity-based entrepreneurship rates and low value-added business opportunities in Latin America (Kantis, Angelelli & Moori-Koenig, 2004; Autio, 2005; Minniti et al., 2006).

Given the arguments stated above, economic growth and entrepreneurial dynamics rates in Latin America show a particular stage characterized by sustained economic growth in the last few years (an average growth rate of 4.9 percent). But the region has been less successful to improve his economic performance compared to other emerging markets (Blejer, 2006; López-Claros, Altinger, Blanke, Drzeniek & Mía, 2006). Thus, there is an ambiguous relationship between entrepreneurial activity and competitiveness as well as between entrepreneurial activity and economic growth in Latin America countries. Porter (1990) and Porter, Sachs and McArthur (2002) defined competitiveness according to the country economic development, distinguishing three specific stages: *factor-driven stage*, *efficiency-driven stage* and *innovation-driven stage*; and two transitions between these stages. In the first stage countries compete through low cost efficiencies in the production of commodities or low value-added products. The analysis done by López-Claros et al. (2006) shows that some Latin America and a few Caribbean countries are in this stage; such is the case of Bolivia, Honduras and Nicaragua. To move into the second stage, the *efficiency-driven stage*, countries must increase their production efficiency and educate the workforce to be able to adapt for the subsequent technological development phase. Colombia and Peru are on this transition. To compete in this second stage the countries must have efficient productive practices on large markets, which allow companies to exploit economies of scale. Industries in this stage are manufacturers or provide basic services. The biggest and most important Latin American economies in this stage are Argentina, Brazil, Chile, Mexico and Venezuela. In order for economies to move into the third stage it is necessary for them to promote innovation so they are able to reach the technological border, and thus becoming a knowledge-based economy that is particular of the *innovation-driven stage*. Porter (2005) and López-Claros et al. (2006) classified Trinidad and Tobago as the only economy in this transition.

The third stage of economic development defined by Porter presents certain similarities with the arguments of Audretsch and Thurik (2001, 2004). The latter stated that most developed countries have experienced a transition from a model of “managed economy” to a model of “entrepreneurial economy”, characterized by knowledge spillovers, increased competition and the existence of diversity among major firms. These allow major flexibility and innovation in the economy. The model of “entrepreneurial economy” can also be described using “Schumpeterian” terms (Carree et al., 2002, Van Stel et al., 2005). Schumpeter (1911) states that entrepreneurs are the main cause of economic development, due to the effect they have on “creative destruction”, introducing new inventions into the market and consequently renewing the products and services offered in the market. These features are known as the *Schumpeter Mark I regime*, and it is common on the late 19th and 20th centuries. On the other hand, a “managed economy” model is characterized by a concentration of resources, both capital and human, among a few large companies with large scale production and efficiency. Therefore, the sources of competition on this model are fundamentally based on large companies, as Schumpeter (1950) described. Innovation is found on large and established companies. This process of “creative accumulation” has been named *Schumpeter Mark II regime*, and it is mainly found on the period 1930-1970. Generally, Latin America countries present features of a “managed economy” (*Schumpeter Mark II regime*), in which most of the small-scale production firms have minor significance in innovation, and the products manufactured and the services provided are of discreet value added in comparison with the large and concentrated companies. Latin-American economies have a limited number of nascent ventures under the model of “entrepreneurial economy” (*Schumpeter Mark I regime*) because of the many restrictions present to create knowledge-based businesses (Angelelli & Kantis, 2004). Empirical evidence shows that the transition between two economic models is slower for Latin-American countries than in industrialized countries. The reason for that is

that for industrialized economies the shift from one economic model to another may be interpreted as a “Schumpeterian regime switch”, with an innovation-driven stage of economic development where new firms are crucial for technological improvement and innovation (Porter et al., 2002).

Summing up, our hypothesis is that Latin-American entrepreneurial dynamics under *ceteris paribus* conditions⁶ shows a descending behavior under the U-shaped curve approach that is consistent with the efficiency-driven stage. This behavior suggests that as the competitiveness and the economy growth of the region increase, the entrepreneurial dynamics decrease. The latter implies that Latin-American countries can be characterized as “managed economies.”

Measures and Methodology

Entrepreneurial Dynamics

To measure the entrepreneurial dynamics rates in each country we use the GEM database from 2000-2006. By the end of 2006, 55 different countries had participated in GEM, ten of which were Latin-American and Caribbean countries (see Appendix). The GEM provides harmonized, internationally comparable data on entrepreneurial activity. This database contains various entrepreneurial measures that are constructed on a survey basis⁷, known as Adult Population Survey. This survey helps GEM estimate the percentage of adult population (people between 18–64 years old) that is actively involved in starting a new venture on two categories. The first one includes nascent entrepreneurs who have taken some actions to create a new business in the past year and have not paid any salaries or wages for more than three months: The second category includes owner/managers of a business that have paid wages and salaries for over three months, but less than 42 months. The sum of these measurements is the Early-stage Entrepreneurial Activity Index (GEM-EA). formerly known as the Total Entrepreneurship Activity (TEA). Our dependent variable is the GEM-EA rates

over a 7-year period (2000-2006). The prevalence rates of GEM-EA (old TEA index) per 100 adults, on the period 2000-2006, ranges from 40.34 in Peru and 31.50 in Uganda (both on 2004). to values of 1.25 in Ireland and 1.26 in Japan (both on 2000). These observations have important implications that validate the wide variation of entrepreneurial dynamics among countries. Nevertheless the stability in the GEM's rates indicates that these indexes may be seen as a relatively stable entrepreneurial dynamics measure (Reynolds et al., 2005) and as an economy's structural characteristic (Van Stel et al., 2005, p 314).

Growth Competitiveness Index

The World Economic Forum has been measuring national competitiveness and filing Global Competitiveness Reports (GCR). The main objective of the GCR is to assess the capacity the world's economies have to achieve sustained economic growth. Since 2001 the GCR methodology has been based on the model developed by McArthur and Sachs (2002) called the Growth Competitiveness Index (GCI). This index aims to "measure the capacity of the national economy to achieve sustained economic growth over the medium term, controlling for the current level of economic development" (McArthur & Sachs, 2002). The GCI is comprised of three indexes associated with the three "major pillars" of economic growth identified in the GCR framework: the technology index, the public institutions index, and the macroeconomic environment index. The GCR methodology assigns the "technology pillar" the highest weigh to determine the competitiveness and economic growth of the developed countries. GCR differentiates between *core innovators* and the *non-core innovators* countries. Core innovators countries have over 15 US utility patents registered per million population; usually the most advanced and rich countries are classified in this category. Non-core innovators countries are the countries that don't have the feature stated above. This latter category includes all Latin America and Caribbean countries.

On our estimation we use GCI as an independent variable between the years 2001 and 2006⁸.

Rate of Economic Growth

Per capita income growth rate is one of main sources of economic development (Wennekers et al., 2005). We use the gross domestic product per capita to measure the economic growth on the period 2000-2006⁹. These variables are adjusted by the purchasing power parity per US dollars, GDP per capita (PPP). The data was taken from The International Monetary Fund's World Economic Outlook Database published on September 2006¹⁰.

Methodology

Following Wennekers et al. (2005) who suggest a "U-shaped natural rate" of entrepreneurial dynamics, we construct series of regressions to verify the relationship between entrepreneurial dynamics and the level of competitiveness and economic growth. Using a longitudinal data for 55 countries over the period 2000-2006 and a general-to-specific modelling procedure we tested the quadratic specification (U-shaped). Initially, we estimate the model pooling the cross-section of countries with the time-series data on each country. Then we test whether there are country's idiosyncratic characteristics that affect countries' relationship between entrepreneurial dynamics and the level of competitiveness and economic growth. For that we specify a different intercept coefficient for each country.

Our first model is as follows:

$$\text{GEM-EA}_{it} = a + b\text{GCI}_{it} + c\text{GCI}_{it}^2 + d\text{GDP}_{it} + e\text{GDP}_{it}^2 + \varepsilon_{it}$$

Where i is the country index and t is the time period. In the model that allows heterogeneity among countries the coefficient a is replaced by a_i .

Our second model was constructed on a similar regression using solely the GCI, and the third model was based only on the GDP. For every model we verified that our quadratic specification (U-shape) hypothesis had a better statistical fit (adjusted R^2 values) and a superior statistical specification, compared with the linear and inverse relations. Finally we showed the entrepreneurial “behavioural path” for the period 2000-2006, in relation to GEM’s Latin American countries.

Results

Model 1- GCI and GDP

The results from the pooled model indicate that the R^2 values and the likelihood ratio tests are higher for the quadratic specification (U-shaped) than the linear and inverse specifications. Estimation results of the quadratic specification are shown in Table I. In addition to corroborate the robustness of this specification, we carried out another regression omitting the extreme values (GEM-EA>30 and GDP per capita> 40,000). Again the quadratic specification performs best. This model corroborates the first part of our hypothesis since all the terms are significant and it confirms the negative effect the GCI and GDP per capita variables have on the entrepreneurial dynamics on those countries with relative lower levels of CGI or GDP. As a consequence, the expected relationship between GEM-EA and competitiveness and economic performance rates has an estimated U-shaped form. The results for the Latin-American countries analyzed are shown on the models presented in the following sections.

Insert Table 1 about here

Model II- GCI

Analogous to the Model I presented on the previous section, we test the linear, inverse and quadratic specifications using the GCI variable. Again we reject the linear and inverse specifications in favor of the quadratic specification. The results are shown in the second column of Table I. Although the term of R^2 diminishes compared with Model I, the effect of the GCI on the entrepreneurial dynamics is significant and negative. Being the later true for those countries with a level of GCI lower than 5.21. This suggests that under the approach of the U-curve, the countries that do not reach the above mentioned level of competitiveness (5.21) are more related to “managed economy” characteristics.

Figure 1 shows the U-curve based on the estimated parameters of Table I, as well as the “behavioral path” of the entrepreneurial dynamics and the competitiveness indexes’ relation for a sample of six Latin American countries. For each of those countries we show on the trajectory the starting and the ending years on the figure. Although only Argentina and Brazil have measurements for the entire period of the sample, the trajectories of those countries show that the entrepreneurship level has experienced variations with an average tendency to decline in the analyzed period. Moreover, with exception of Peru the other countries analyzed on this sample also present a constant or fall in their competitive indexes.

Insert Figure 1 about here

The results of Model II initially suggest that the Latin-American countries analyzed maintain a competitive level in the *efficiency-driven* stage. A possible explanation for this result is that those countries have low innovation and technology development. If those factors increase, and so the GCI index grows, the “business opportunities” from new technologies and innovation are captured by big firms that absorb necessity entrepreneurship reducing the GEM-EA index. There is some level of GCI at which that relationship changes and higher

competitiveness improve the entrepreneurial activity and the “Schumpeterian regime switch” occurs.

The low relative competitiveness rates and the analyzed paths provided by our results suggest that these relations are not taking place in Latin America. The particular case of Argentina that shows a very singular trajectory indicates that both the entrepreneurial dynamics and the competitiveness changes depend on the country’s situation (in this case it could be an economic crisis like the one Argentina experienced between 2002 and 2003). These results suggest that the below-median developed countries may present more volatile entrepreneurship rates (Wong et al., 2005).

Model III: Entrepreneurial Dynamics and GDP

In the third model we also test the linear, inverse and quadratic specifications, the latter being once again best adjusted. The results are shown in the right column of Table I. In this model the term of R^2 present a slight fall compared with Model I, but this confirms that the effect of the GNP per capita on the entrepreneurial dynamics is significant and negative. The later is true for those countries with a GDP lower than US\$ 28,470.53. Once more the assumption is that the countries that do not reach the above mentioned level of income show more “managed economy” characteristics. Six Latin America countries analyzed are relatively further from this level of GDP per capita when compared to the competitiveness rates. Figure 2 shows the estimated U-curve and presents the behavioral path of the entrepreneurial dynamics in relation to the GDP per capita for those countries. In order to make the later, we have placed the points of the beginning and end years on the above mentioned trajectory for each of those countries. Argentina, presents a behavior coherent with our assumptions since the decrease of the country’s GDP during the period 2002-2003 translates into a growth of entrepreneurship rates. The rest of the analyzed countries continue a decreasing trajectory on

entrepreneurial dynamics when their GDP per capita grows. This behaviour confirms our hypothesis.

Insert Figure 2 about here

The Dummy Variable Approach

In this section we want to test whether there are country's idiosyncratic characteristics that affect the relationship between Entrepreneurial Dynamics and CGI or GDP. Hence, we use a dummy variable approach to estimate a different intercept for each country. The specific intercept for each country captures the effect of the mentioned idiosyncratic characteristics and allow us to assume heterogeneity among countries. The results obtained with this model support the U-shape hypothesis. Moreover, an F test obtained for models II and III with the dummy approach shows that we should reject the hypothesis that the countries have same intercept coefficient at the 5 percent significance. Table II reports the estimation results for model II and III with the dummy approach.

Insert Table 2 about here

In Figure 3 we graph the relationship between Entrepreneurial Dynamics and CGI or GDP for each country based on the parameters of Table II. As we can observe on that figure, those countries in the descending part of the U-curve, like Latin American analyzed countries, present a higher dispersion around the U-curve than countries in the ascending part. These results offer an econometrical prove of the following GEM statement: "countries, even in similar stages of economic development, differ strongly in rates of entrepreneurial activity" (Van Stel et al., 2005, p.313). Moreover, they suggest that country's idiosyncratic

characteristics should be considered to reach a better understanding of Entrepreneurial Dynamics, mainly in the case of developing countries. Thus, valuable future research should deal with the identification of those idiosyncratic characteristics

Insert Figure 3 about here

Insert Figure 4 about here

Discussion and Conclusions

The three models analyzed support our hypothesis that there is a U-shape relationship between the entrepreneurial dynamics and the competitiveness, and the economic growth during the period from 2000 to 2006. Moreover, those models suggest that there exists a significant heterogeneity among developing countries in that relationship. That heterogeneity occurs because there are country's idiosyncratic characteristics that affect the entrepreneurial dynamics of each country. With the Latin-American countries that were part of the sample used for this study, we corroborate that they are in the downward part of the curve and in general their entrepreneurial dynamics (GEM-EA) have diminished in this period. The significant and negative effects of competitiveness rates, GCI and economic growth, GDP per capita on entrepreneurial dynamics, suggest that for developing countries the competitiveness has more oriented to structural production efficiency instead to enhance the entrepreneurial dynamics of the country. Wennekers et al. (2005, p 306) mention that "low-income nations should not consider the promotion of new business as a top priority on their policy agenda". Without a doubt the Latin-American countries must work to achieve the *efficiency driven to innovation-driven* transition, which implies stable regulatory and macroeconomic conditions.

The particular case of Argentina confirmed that the entrepreneurial dynamics varies with the economic cycles (and competitive changes). This suggests that will be interesting to conduct future research to test whether or not countries have different entrepreneurship volatility.

The GEM Reports establish that the countries with low-income have a high rate of entrepreneurial activity derived from the fact that a large part of the population has not been able to find another source of employment. This phenomenon is present in Latin-American entrepreneurship rates (Listerri, Kantis, Angelelli & Tejerina, 2006). In this case, when the medium-sized and large companies that operate on conventional industries are strengthened and when they have managed to become a source of employment, they attract necessity-based entrepreneurs. The experience of the analyzed countries during period 2000-2006, shows that the economic growth translated into a decrease on the unemployment and the necessity-based entrepreneurship. The inverse phenomenon is present in the case of Argentina, where the economic crisis probably increased the necessity-based entrepreneurship and decreased the entrepreneurial dynamics, when the economic recovery began. Analyzing GEM necessity-based entrepreneurship rates of six chosen Latin-American countries, it is observed that this type of entrepreneurship activity has diminished close to 37 % (in average) in the period 2000-2006 being Mexico the most significant case with an 83 % decrease. Yet it is necessary to emphasize that the opportunity-based entrepreneurship in the same period for these countries was relatively stable (Argentina and Brazil) or diminishing (Chile, Mexico, Peru and Venezuela). These results forced us to question whether entrepreneurship is truly relevant for Latin-American economies or not. We believe that not only it is relevant, but it is highly necessary. All the same the implications to develop the entrepreneurial activity in Latin America go beyond achieving an *efficiency-driven* economy stage. They uphold high-expectation entrepreneurial activity¹¹ (dynamic new ventures) that may reflect a better performance of the competitiveness and economic development (Autio, 2005).

From this analysis, we can propose that Latin-American countries face two big possibilities:

- 1) A “low track”, which means to keep on growing through the conventional industries without doing major emphasis on the innovative entrepreneurship. This is, to continue “the natural rate” (Wennekers et al., 2005) through the U-curve tendency line, reducing the necessity-based entrepreneurship, and not achieving a higher growth for opportunity-based or high-expectation entrepreneurship. The Latin-American countries analyzed present this behavior. They have an economic growth, along with rates slightly above the Latin-American average, but without a significant growth of the global competitiveness rates.
- 2) A “fast track”, in which the innovative entrepreneurship should be promoted in order to create new and better firms with new business models (Morris, Schindehutte & Allen , 2005). This road implies that there must be better strategies to accelerate the growth rate and move more rapidly towards the “Schumpeterian regime switch”, thus allowing major innovation activity and a real impact of competitiveness and economic development on entrepreneurial dynamics. Furthermore some Latin-American countries should develop the right policies to allow them to move some were above the U-curve. Figure 5 shows these possible stages using the 2006 information (country codes are found in the Appendix). Following a dynamic path, Latin-American countries probably might have more competitiveness and “accelerate” the creation of new sustainable businesses.

The results of this study demonstrate the significant relations that we have raised, but they have some limitations that must be taken into consideration when interpreting the results. GEM studies consistently place Latin-American countries among the most entrepreneurial in the world. Other studies operating outside the GEM methodology show that the average Latin-American entrepreneurial rate is considerably low compared with other emerging economies like South-Eastern Asia countries (Kantis et al., 2002). Even if the GEM is one of the few efforts to describe and measure the entrepreneurial activity on a global scale

(Sternberg & Wennekers, 2005). many of the participants are highly developed countries that show most favorable ratios of opportunity-based business, generally related with high value added industries. Although six of the analyzed countries represent some of biggest economies of the region, future research will include more Latin-American countries or include a specific dummy variable that capture the region's particularities, thus giving us a better perspective of the entrepreneurship phenomenon. Latin-American countries are affected by strong cyclical components that influence the entrepreneurial activity. Our observations are on a relative short period and it is possible that developments that were showed on Figures 1 and 2 are driven by business cycles. This is why the conditions for the countries of the region are not uniform and we will be very careful interpreting these developments because longer periods of time are more reliable in this respect. The GEM-EA and GCI are aggregate indicators. The use of sub-indexes or components can give us a better perspective of the entrepreneurial dynamics since the particular case of the Latin America countries present major necessity-based entrepreneurial rates and their competitiveness indexes have less weighting on innovation aspects. Finally some specific industrial sectors have different rates of entrepreneurship activity. Disaggregating the indexes by sector may lead to different results. Even though limitations exist for the obtained results, this research intends to undertake the study the critical success factors relevant to entrepreneurship and their relationship with competitiveness and economic growth. We hope this work contributes to additional knowledge on a general perspective of the entrepreneurial dynamics in Latin America, and thus contributing to the discussion of the creation of highly competitive new ventures.

Insert Figure 5 about here

Appendix: Participant Countries in GEM 2000-2006

Country	Code	2000	2001	2002	2003	2004	2005	2006
Argentina	AR	♦	♦	♦	♦	♦	♦	♦
Australia	AU	♦	♦	♦	♦	♦	♦	♦
Austria	AS						♦	
Belgium	BE	♦	♦	♦	♦	♦	♦	♦
Brazil	BR	♦	♦	♦	♦	♦	♦	♦
Canada	CA	♦	♦	♦	♦	♦	♦	♦
Chile	CL			♦	♦		♦	♦
China	CH			♦	♦		♦	♦
Colombia	CO							♦
Croatia	HR			♦	♦	♦	♦	♦
Czech Republic	CZ							♦
Denmark	DK	♦	♦	♦	♦	♦	♦	♦
Ecuador	EC					♦		
Finland	FI	♦	♦	♦	♦	♦	♦	♦
France	FR	♦	♦	♦	♦	♦	♦	♦
Germany	DE	♦	♦	♦	♦	♦	♦	♦
Greece	GR				♦	♦	♦	♦
Hong Kong	HK			♦	♦	♦		
Hungary	HU		♦	♦		♦	♦	♦
Iceland	IS			♦	♦	♦	♦	♦
India	IN	♦	♦	♦				♦
Indonesia	ID							♦
Ireland	IE	♦	♦	♦	♦	♦	♦	♦
Israel	IL	♦	♦	♦		♦		
Italy	IT	♦	♦	♦	♦	♦	♦	♦
Jamaica	JA						♦	♦
Japan	JP	♦	♦	♦	♦	♦	♦	♦
Jordan	JO					♦		
Korea	KR	♦	♦	♦				
Latvia	LA						♦	♦

Malaysia	MA							♦
Mexico	MX		♦	♦			♦	♦
Netherlands	NL		♦	♦	♦	♦	♦	♦
New Zealand	NZ		♦	♦	♦	♦	♦	
Norway	NO	♦	♦	♦	♦	♦	♦	♦
Peru	PE					♦		♦
Philippines	PH							♦
Poland	PL		♦	♦		♦		
Portugal	PO		♦			♦		
Russia	RU		♦	♦				♦
Singapore	SG	♦	♦	♦	♦	♦	♦	♦
Slovenia	SI			♦	♦	♦	♦	♦
South Africa	ZA		♦	♦	♦	♦	♦	♦
Spain	ES	♦	♦	♦	♦	♦	♦	♦
Sweden	SE	♦	♦	♦	♦	♦	♦	♦
Switzerland	SW			♦	♦		♦	
Taiwan	TW			♦				
Thailand	TH			♦			♦	♦
Turkey	TU							♦
Uganda	UG				♦	♦		
United Arab Emirates	UA							♦
United Kingdom	UK	♦	♦	♦	♦	♦	♦	♦
United States	US	♦	♦	♦	♦	♦	♦	♦
Uruguay	UR							♦
Venezuela	VE				♦		♦	
	n=	21	29	37	31	34	35	42

Notes

¹ Cantillon is considered the first economical theorist. His reputation is based on his work *Essai Sur la Nature du Commerce en Général*.

² Catechism of Political Economy, 1815.

³ It is possible to distinguish between the static and dynamic perspectives of entrepreneurship. The static perspective refers to the number of business-owners as a dimension of the industrial structure of the economy. The dynamic perspective refers to the gross changes on the entrepreneurship rate (Wennekers et al., 2005, p. 295).

⁴ For the methodological design and implementation of the GEM project see Reynolds et al. (2005).

⁵ For dynamic enterprise both GEM (2005, 2006) and Kantis et al. (2004) considered those that have or will have a sustainable employee's growth (sources of new employment) as well as the selling rates.

⁶ There exist diverse economic, institutional and demographic factors that influence the economic growth and could be related to the entrepreneurial activity. See Wennekers et al. (2005). p. 298.

⁷ For the complete GEM project measurements see Reynolds et al. (2005). and for recent changes on GEM see Minniti et al. (2006)

⁸ In the GCR 2005-2006 the World Economic Forum introduced a new and more comprehensive competitiveness index, which was called the *Global Competitiveness Index* (Global CI). This new index evaluates and benchmarks many critical factors, which were absent from the GCI. The Global CI aims to measure "the set of institutions, policies, and factors that set the sustainable current and medium-term levels of economic prosperity" (Sala-i-Martin & Artadi, 2004, p. 52). The Global CI was developed by World Economic Forum's Global Competitiveness Programme and Professor Xavier Sala-i-Martin, a leading

expert on the process of economic growth at Columbia University. The Global CI is built with “nine pillars”, each of which is critical to driving productivity and competitiveness in national economies. The Global CI uses Porter’s competitiveness stages to determine three sub-indexes based on the nine pillars: *Basic requirements subindex (Stage 1: factor-driven)*: Institutions (pillar 1). Infrastructure (pillar 2). Macroeconomic (pillar 3). Health and basic education (pillar 4). *Efficiency enhancers subindex (Stage 2: efficiency-driven)*: Higher education and training (pillar 5). Market efficiency (pillar 6). Technological readiness (pillar 7). *Innovation and sophistication factor subindex (Stage 3: innovation-driven)*: Business sophistication (pillar 8). Innovation (pillar 9). A brief description on the construction of the index is provided in Chapter 1.1 (see Appendix B and Appendix C) of GCR 2005-2006 (López-Claros et al. 2005, p. 40-42). With these concepts Global CI uses the model of developmental stages by weighing each of the sub-indexes differently, depending on the stage a given country is in. Latin American and Caribbean countries are weighed on basic requirements and efficiency enhancers. To maintain the homogeneity we only use GCI on 2005 measures, but performed additional analysis using Global CI as a supplementary competitiveness measure, with no significant variations.

⁹ GDP is a better measure of the state of production in the short term, and is closer to entrepreneurial dynamics than the Gross National Income which is better when analyzing sources and uses of income, including profits from capital held abroad.

¹⁰ Available online at <http://www.imf.org/external/pubs/ft/weo/2006/01/data/index.htm>

¹¹ GEM’s methodology defines high-expectation entrepreneurship as the early-stage business that expects to employ at least 20 employees within five years time.

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TABLE 1

**Estimation results of Entrepreneurial Dynamics and Competitiveness and Economic
Growth Rates (2000-2005) for the Pooled Model**

	Model I GCI and GDP per capita	Model II GCI	Model III GDP per capita
Constant	73.72** (4.77)	107.79 ** (6.39)	21.97** (18.64)
GCI	-23.10** (-3.46)	-38.66** (-5.49)	
CGI, squared	2.52** (3.65)	3.71** (4.87)	
GDP per capita	-1.09 E ⁻⁰² ** (-7.47)		-1.13 E ⁻⁰² ** (-9.88)
GDP per capita, squared	1.81 E ⁻⁰⁸ ** (6.38)		1.99 E ⁻⁰⁸ ** (7.76)
Adjusted R^2	.40	.24	.38
Observations	207	207	229

Absolute *t-values* between parentheses.

** Significant at 0.05 level.

TABLE 2.

**Estimation Results of Entrepreneurial Dynamics and Competitiveness and Economic
Growth Rates (2000-2005) for the Dummy Approach.**

	Model II GCI	Model III GDP per capita
Constant	48.81*	29.63**
	(3.20)	(14.17)
CGI	-10.96*	
	(-1.64)	
CGI, squared	1.28**	
	(1.90)	
GDP per capita		-6.90 E ⁻⁰⁴ **
		(-2.37)
GDP per capita, squared		1.02 E ⁻⁰⁸ **
		(2.19)
Adjusted R^2	0.88	0.87
F (n-1,nt-n-k)	23.32	18.36
Observations	207	229

Absolute *t-values* between parentheses.

* Significant at 0.10 level.

** Significant at 0.05 level.

FIGURE 1.

Entrepreneurial Dynamics versus Competitiveness

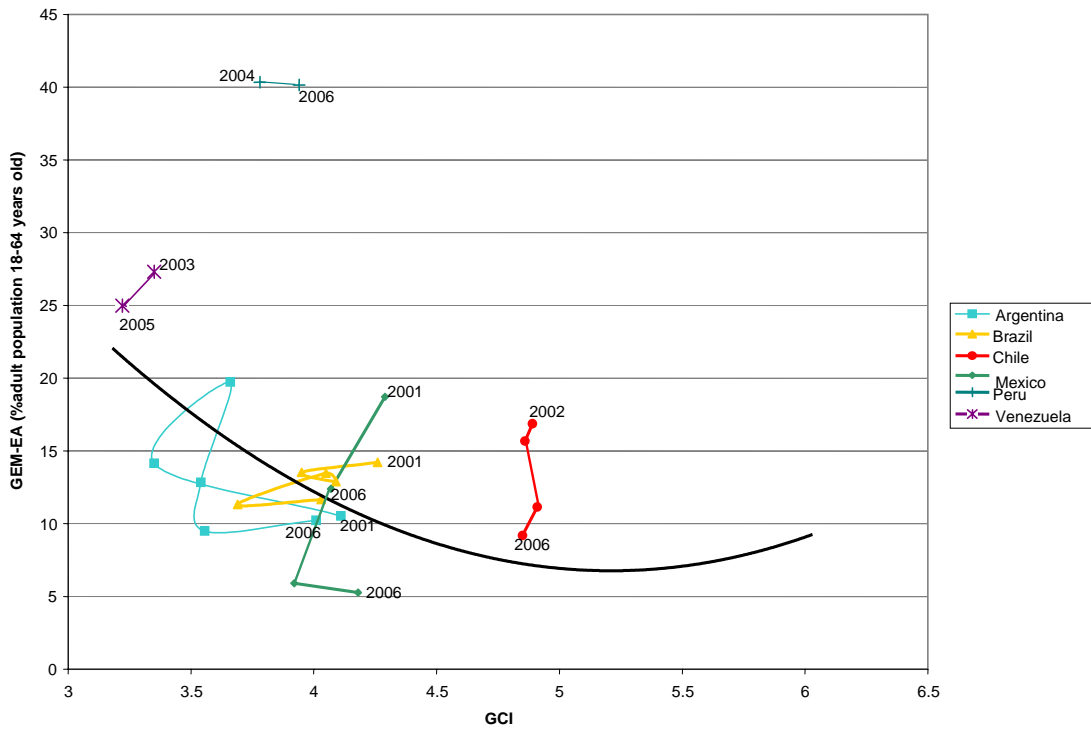


FIGURE 2.

Entrepreneurial Dynamics versus GDP per capita.

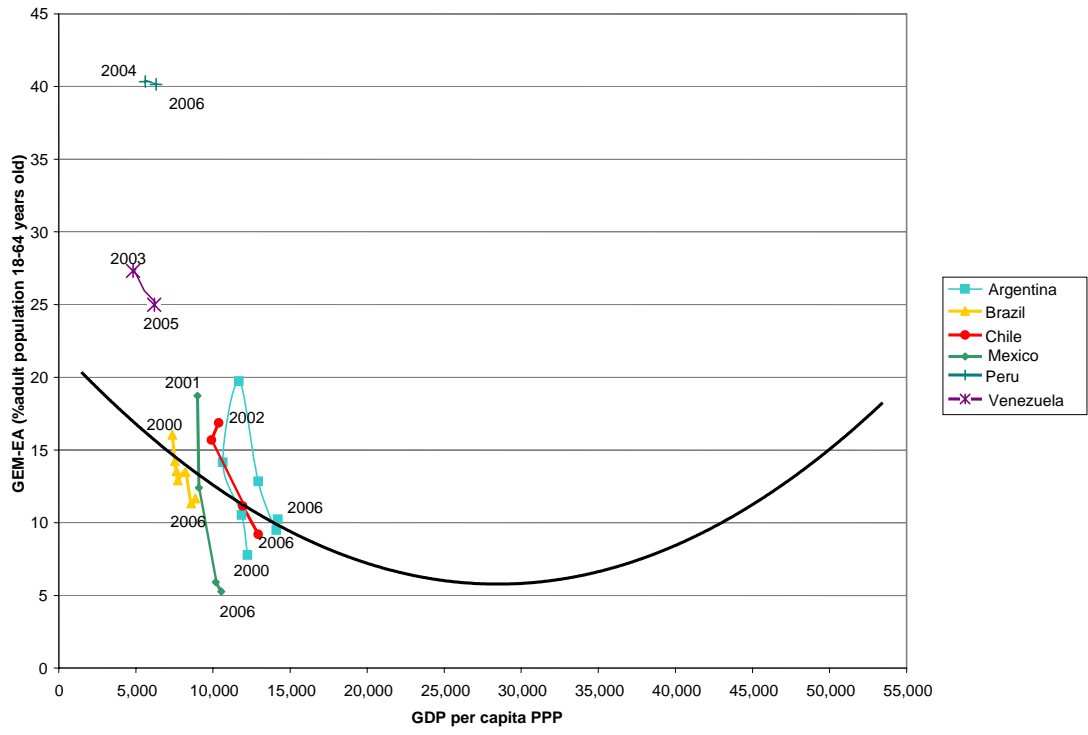


FIGURE 3.

Entrepreneurial Dynamics versus GCI Allowing for Heterogeneity among Countries

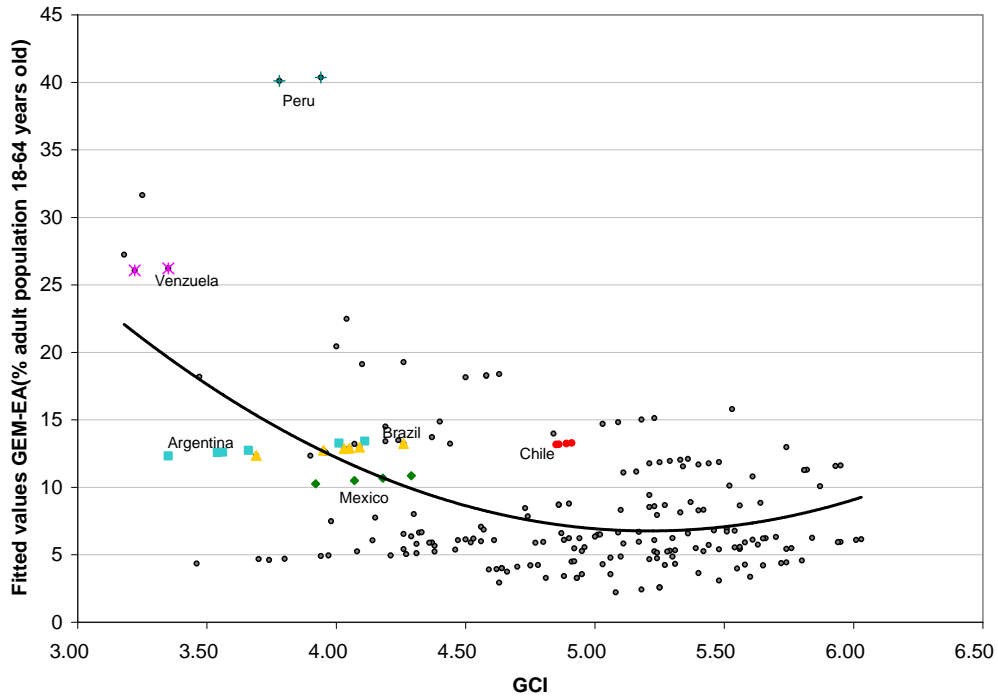


FIGURE 4.

Entrepreneurial Dynamics versus GDP per capita Allowing for Heterogeneity among Countries

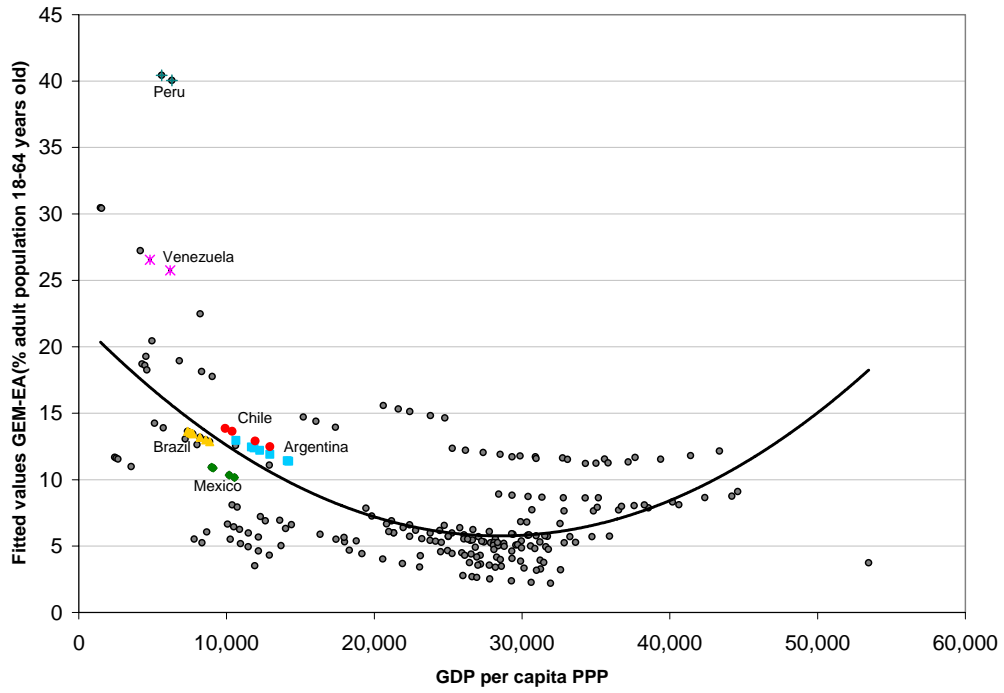
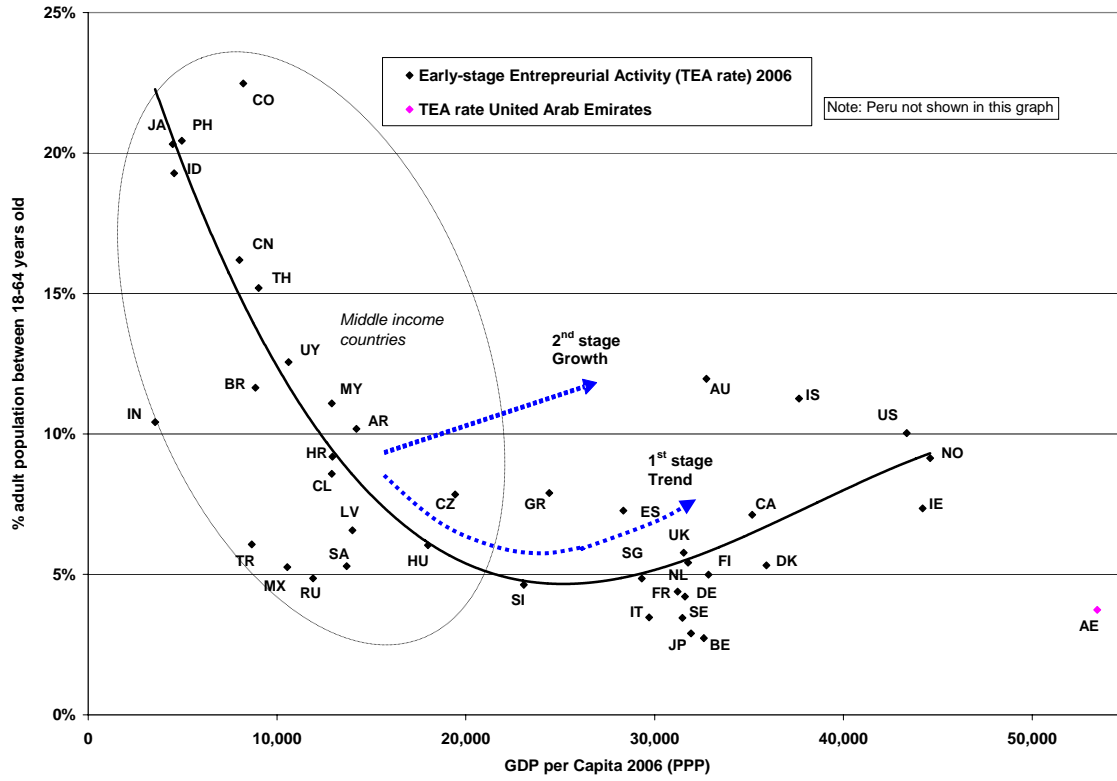


FIGURE 5:

Entrepreneurial Dynamics Stages (2006 Data)



Source: Authors based on GEM 2006 Executive Report

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