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ENTREPRENEURSHIP AND SOCIOECONOMIC INDICATORS IN LATIN AMERICA

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Abstract: This article examines the relationship between entrepreneurial activity and a set of economic variables including gross domestic product, economic growth, unemployment, informality, corruption perceptions, macroeconomic stability, and labor regulations. We use panel data from nine Latin American countries covered by the Global Entrepreneurship Monitor from 2000 to 2010. We focus on necessity-based entrepreneurship, as the rates of this type of activity are relatively high in Latin America. The results show that economic growth is positively related to opportunity-based entrepreneurship. Other factors such as inflation, informality, and transparency (versus corruption) are positively associated with higher rates of necessity-based entrepreneurship. Lines of future research and policy implications are discussed.

Entrepreneurship has only fairly recently been an explanatory factor for economic growth (Acs and Storey 2004; Wennekers and Thurik 1999). Research on economic growth from the past century concluded that capital and labor were the main sources of economic growth (Solow 1956). The firm was viewed as a chain of contracts that attenuate transaction costs (Coase 1937). Later, knowledge was included among the factors that explained economic growth. Scholars believed that large organizations had competitive advantages (Chandler 1990) because knowledge was too expensive and advanced for small business to handle. From that perspective, success at the international level was associated with larger companies (Gomes-Casseres 1997). More recently, it has been emphasized that entrepreneurship activities and the creation of small businesses are vital factors for economic growth (Audretsch and Thurik 2001, 2004; Audretsch and Keilbach 2004).

The increase in the quantity and variety of companies due to the creation of new firms contributes to competition. The increase in competition—when it takes the form of introducing new methods and ideas—creates opportunities in the form of niches or original applications of those ideas (Jacobs 1969). In turn, this

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supports the idea that entrepreneurship contributes variety and new approaches to industry (Wong, Ho, and Autio 2005), and enables companies to create jobs. According to Birch (1987), in the United States most new jobs tend to arise from smaller businesses.

As a result, entrepreneurship has an important role in the formulation of economic development policies. At the same time, proper comprehension of entrepreneurship dynamics is needed to understand whether entrepreneurship has a positive influence on economic growth. One of the starting points is to understand the reasons that entrepreneurs emerge, the features that characterize them, and the effects of such features on the different parameters of their performance. The purpose of this study is to analyze idiosyncratic factors from developing countries, specifically in Latin America, to find elements beyond those already stated in the literature that will allow for an accurate interpretation of the entrepreneurship dynamic observed in the region. Even though Latin American countries are not homogeneous, they have more in common among themselves than with respect to the rest of the world in social, cultural, institutional, and production structure. Our contribution is related to two main issues that the existing literature has not sufficiently covered. First, although the literature analyzes the correlation between entrepreneurship and economics variables, few studies have focused on an ample number of directly related hypotheses to understand the multidirectional characteristics of entrepreneurship. Second, we use a longitudinal study that analyzes how these socioeconomic variables in Latin America shape entrepreneurship dynamics in the region. To pursue these goals, this study used data from the Global Entrepreneurship Monitor (GEM), which is one of the most comprehensive data sets on entrepreneurship dynamics in Latin America in terms of country and year coverage.

Regarding entrepreneurship dynamics, we focus on some specific typologies of entrepreneurship. For the purposes of this study we distinguish between opportunity-based entrepreneurship, or new firms that start with the intention to exploit an opportunity, and necessity-based entrepreneurship, or individuals who start a new business for “push motives” as a way to compensate for the lack of other employment sources (Reynolds et al. 2005). In its data set the GEM research project distinguishes necessity-based (NEC) from opportunity-based entrepreneurial (OPP) activity. Both types of entrepreneurship conform to what GEM calls early-stage entrepreneurial activity (TEA). The difference in these types of entrepreneurship lies with the entrepreneur’s motivation (Block and Wagner 2007). In accordance with Bosma and colleagues (2008), opportunity TEA includes those individuals who take advantage of a market opportunity that leads them into entrepreneurial activity. In turn, necessity-based entrepreneurs aim to seek income that they cannot obtain through other means. In other words, being an entrepreneur is the best alternative for those individuals who cannot find a job. This is very relevant because most of the GEM member countries in Latin America show relatively high necessity-based entrepreneurship rates, which is common in many other developing countries (Singer, Amorós, and Moska 2015). We need to fully understand the factors that affect the prevalence rates of entrepreneurship activity and their evolution in order to propose some policy recommendations.

LITERATURE AND HYPOTHESES ASSESSMENT

Entrepreneurship, Income, and National Economic Growth

An increasing number of studies have emphasized the relationship between entrepreneurship (business ownership rates) and economic growth, which is generally measured by per capita gross domestic product (GDP). It is difficult to understand the causality between entrepreneurial activities and general economic development at the country level. Some studies emphasize the effect of economic growth or economic development on countries' entrepreneurial rates (Wennekers et al. 2005), and others focus on the effect of entrepreneurial activity on national economic growth (van Stel, Carree, and Thurik 2005). Carree and colleagues (2002, 2007) offer a special case in that they develop a simultaneous equation model for economic development and business ownership rate.

Yamada (1996) found a strong negative correlation between self-employment participation—defined as the status of an individual who chooses to go into business as an entrepreneur in low-productivity activities—and level of economic growth. He analyzes data from the World Bank's World Development Report 1992 on thirty-one countries that reflected different stages of economic growth. This relationship weakens in the case of developed countries. Yamada explains this relationship through several factors. First, the lower consumption of less developed countries does not generate the scale needed for the creation of large companies. In these countries, for example, a large portion of self-employment activities consist of providing services related to the recovery of items that in developed countries are discarded. In contrast, economic development provides more resources to governments, thus allowing for the development of skills to improve taxation that will lead to, among other things, a decrease in entrepreneurship, the competitiveness of which is based on tax evasion or regulatory noncompliance.

Blau (1987) and Acs, Audretsch, and Evans (1994) were among the first to propose the U-shaped relationship between entrepreneurial rates (self-employment) and economic development. Carree and colleagues (2002), Wennekers and colleagues (2005), Belso-Martínez (2005), and Amorós and Cristi (2008) also found a U-shaped curve. Carree and colleagues (2007), using data for twenty-three OECD countries, revisited the U-shape approach and proposed an L-shaped curve to describe the effect of economic growth on entrepreneurial activities.

The GEM has systematically discovered throughout the years a relationship between entrepreneurship levels and the economic development level that follow the U-shaped curve approach (Bosma et al. 2008; Bosma et al. 2009; Bosma and Levie 2010). With the U-shaped curve approximation, Latin American countries are on the decreasing phase of the curve. Bosma and colleagues (2008, 13) provide this explanation:

In countries with low per capita income, the national economy is characterized by the prevalence of many very small businesses. As per capita income increases, industrialization and economies of scale allow larger and established firms to satisfy the increasing demand of growing markets and to increase their relative role in the economy. An important factor for achieving growth is the presence of macroeconomic and political stability, which is reflected by the development of strong institutions. The increase in the role of large firms may

be accompanied by a reduction in the number of new businesses, since a growing number of people find stable employment in large industrial plants.

This statement has been empirically contrasted in the case of Latin America by Acs and Amorós (2008) and Amorós and Cristi (2008), who have highlighted that very small firms are related to necessity-based entrepreneurs. By consequence these firms are not very competitive because they have low value-added. The “low competitive new firms” phenomenon is related to the findings of Yamada (1996). Because Latin American countries show low and middle levels of per capita income, and by consequence high rates of entrepreneurs (many necessity-based ones), it might be possible to find a negative correlation between development and necessity-based entrepreneurship. Therefore:

H_{1a}: Per capita income increase in Latin American countries leads to a decrease in necessity-based entrepreneurship levels.

As we mentioned already, Blau (1987) and Acs, Audretsch, and Evans (1994) have found that the relation between economic development and levels of entrepreneurship adopts a U shape. The aforementioned authors do not distinguish between necessity- and opportunity-based entrepreneurship. This relationship is corroborated by the GEM results (Bosma et al. 2008; Bosma et al. 2009; Bosma and Levie 2010). When we only consider the levels of necessity-based entrepreneurship, there is an inverse relationship between necessity-based entrepreneurship and economic development (Kelley, Bosma, and Amorós 2011, 28). This is consistent with the previously described process by which economic growth generates changes in the productive structure of the country, which results in greater productivity and manual labor, thus reducing the incidence of necessity-based entrepreneurship.

Even though in the long term development affects the structure and productivity of companies and creates paid jobs that are attractive to prospective entrepreneurs, in the short term, companies’ productivity does not vary substantially. In the short term, economic growth should have the opposite effect to that stated in the previous hypothesis; that is, economic growth should encourage entrepreneurial activity by creating an environment where identified risks of and expected income from entrepreneurial activity would improve more than advances in paid jobs. We hypothesize that for the unemployed, the more stimulating atmosphere resulting from an increase in economic activity would encourage them to undertake entrepreneurial activity, thus increasing the rates of necessity-based entrepreneurship:

H_{1b}: There exists a positive correlation between the per capita GDP growth rate and levels of necessity-based entrepreneurship.

Unemployment and Necessity-Based Entrepreneurship

Studies on the relationship between unemployment and levels of entrepreneurship have not been conclusive. Robson (1996, 1998) discovered that unemployment depressed entrepreneurship in the United Kingdom, but Robson (1998) did not

find such a relationship in other countries, similar to what was found by Abell, Khalaf, and Smeaton (1995) and Parker and Robson (2004). In contrast, some studies have found that an increase in unemployment increases the number of new entrepreneurs. Among these studies are those of Bogenhold and Staber (1991) and Acs, Audretsch, and Evans (1994), both of which are on OECD countries, and one on UK local markets (Cowling and Hayward 2000). There also exists an inconclusive study by Blanchflower (1998) that analyzes OECD countries, and another by Cowling (2003) on UK local markets. In a later study, Cowling and Bygrave (2003) assessed the relationship between necessity-based entrepreneurship and unemployment generally, and specifically youth unemployment. For this study, they analyzed data from thirty-seven GEM countries that participated in the survey in 2002. From this study, they found evidence only in support of their hypothesis related to the impact of young people on unemployment; that is, when their participation in a country increases, necessity-based entrepreneurship increases.

Cowling and Bygrave (2003) and Parker and Robson (2004) agree on their interpretation that unemployment has contradictory effects on entrepreneurship. On the one hand, when unemployment rises, unemployed individuals probably believe that job opportunities have become scarce or less attractive and so decide to set up a business. As unemployment rises, the number of people who believe that setting up a business is an alternative should increase. These empirical findings imply a positive unemployment-entrepreneurship relationship. But an increase in the unemployment rate might indicate a global reduction of economic activity, creating conditions that the unemployed consider less favorable for starting a successful entrepreneurial venture. Starting a business implies a risk that is reduced when entrepreneurs know that if they fail, they would still have other labor opportunities. These reasons lead to a negative unemployment-entrepreneurship relationship.

Even though no conclusive evidence has been found regarding the unemployment-entrepreneurship relationship, it is possible that the contradictory effects of unemployment on entrepreneurship have different degrees of impact in each case; we hypothesized a positive correlation for Latin American countries. The primary difference is that in the case of developed countries, generous unemployment benefits give individuals the chance to wait for a job opportunity for longer periods:

H₂: The increase in unemployment leads to an increase in the necessity-based entrepreneurship.

Inflation, Unemployment Benefits, and Entrepreneurship

Parker and Robson (2004) were able to identify the determining factors of self-employment rates of twelve OECD countries for the period 1972–1996. They used a wide range of explanatory variables from previous literature, including per capita income, participation of women in the workforce, participation of labor in the GDP, income tax, employees' contributions to social security (which results in the average income tax rate), employers' contributions to social security, and unemployment benefits. They found that self-employment was positively

and substantially related to unemployment benefits and women's participation in the workforce. They also fund a correlation between income tax rates and self-employment. High income tax rates usually allow those who are self-employed differential expense deductions related to their work, and they are conducive to evasion, which represents an economic advantage over those who are employed.

In contrast, unemployment benefits discourage self-employment through several channels. First, self-employment is discouraged because such status implies the loss of benefits. Moreover, as the self-employed lack the employment benefits that employees have access to, high benefits discourage employees from leaving their jobs to start a business on their own, as they are afraid of losing such benefits. Staber and Bogenhold (1993) discovered a negative correlation between unemployment benefits and self-employment in OECD countries.

In turn, income tax encourages entrepreneurial as opposed to employed status. However, inflation can act as a tax on income, and it is felt as such. An inflationary tax differs from ordinary taxes in that it incorporates an element of uncertainty, in terms of how much income will be deducted and which variations will take place in this respect. Therefore, we believe that inflation behaves as a stimulus for entrepreneurial activity, as entrepreneurs have more independence than employees to regulate their net income in order to be able to keep actual income. However, inflation creates more labor conflicts that arise from companies' implementation of more conservative policies on personal employment. Pro-employment policies will lead to a scenario in which, for many individuals, job alternatives will not exist and paid jobs will be less attractive, as those companies' protective policies reduce activity levels and create an overload of work.

It is possible that informality will have the opposite effect, acting as an "exemption" from income taxes. In that respect, it is expected that increased informality leads to increased entrepreneurial levels.

Latin America is characterized by high inflation volatility, which is considered in our model as equivalent to a high, uncertain tax pressure. At the same time, there are not many policies and programs for employment protection, which results in a high level of informality, or a "shadow" economy. We consider that the effects of inflation and informality on entrepreneurship affect both necessity- and opportunity-based entrepreneurs. In the case of the opportunity-based entrepreneurship, more important will be the loss of attractiveness of jobs caused by these phenomena. But in the case of necessity-based entrepreneurs—our main focus—it will be its pernicious effect on job creation. Thus, we propose the following:

H₃: The rise in the inflation rates generates higher levels of necessity-based entrepreneurship.

H₄: The rise in the economy's degree of informality generates higher levels of necessity-based entrepreneurship.

Labor Market Regulations and Entrepreneurship

Blau (1985) estimates an entrepreneurial choice model to analyze the option between employment and self-employment in developing countries. This model

states that entrepreneurs are not a random sample of the population regarding the entrepreneurial skills variable, which would be stronger among those who undertake entrepreneurial activities. The existence of minimum wages, trade unions, and certain employment practices in the public sector keep the labor market over the balance point, creating a deficit of job offers in the market.

In this respect, in the employment scenario, many of these employees could have entrepreneurial skills (e.g., because it is related to their education) but would choose to continue as employees, as they would have some advantages. Their incomes as employees would be higher than those obtained if the market is at the level of clearance, at the same time the risks of undertaking are far less than those of the entrepreneurial option. However, individuals with low entrepreneurial skills will have to choose self-employment, thus leading to low levels of income and low probability of success. This, in turn, will strengthen the negative perspective regarding self-employment among those who are employed and possess entrepreneurial skills.

Yamada (1996) found that in Peru, with the absence of strong distortions in the labor market, self-employment generates more income than paid jobs. In this respect, the informal economy is the greatest indicator of lack of distortions in the market's natural performance.

The greater the labor market distortions (increasing wages over the market-set price), the greater the level of necessity-based entrepreneurship would be. To conclude, labor market regulations reduce job offers but also make the remaining positions more attractive. In contrast, there is a set of skills, which we refer to as entrepreneurial skills, which can be used to obtain attractive and scarce job positions. Faced with a higher compulsory minimum wage, the market is not cleared. Entrepreneurial skills would be useful to procure jobs that have become attractive enough to compete with the entrepreneurial option regarding the environment and risks. On the other hand, it may be thought that a competitive advantage of regulatory nature is created for those entrepreneurships that are able to provide services competing directly with paid jobs. Therefore:

H₅: The higher the actual national compulsory minimum wage, the higher the level of necessity-based entrepreneurship.

Entrepreneurship, Corruption, and Risk Perception

There exists another factor that may lead to differences between necessity-based and opportunity-based entrepreneurship regarding entrepreneurial activity and risks. It is usually presumed that entrepreneurs are particularly daring individuals; however, studies do not provide enough evidence showing that they are more prone to undertaking risks than those who are not entrepreneurs (Brockhaus and Horwitz 1986).

However, not all entrepreneurs behave in the same manner. An alternative approach is based on cognitive theory (Palich and Bagby 1995). Pursuant to this theory, entrepreneurs do not necessarily prefer to undertake risky actions; they just see situations from a different perspective. They spot opportunities where

others do not, and they do not let threats prevent them from undertaking entrepreneurial activity. Moreover, they have more faith in their strengths and in their ability to surpass or counterbalance their weaknesses.

Consequences are very important from the businessman training point of view, as the difference between entrepreneurs and nonentrepreneurs would have a vital dimension regarding distinctions in the understanding and assessment of business situations according to the skills they possess that may be altered by means of training providing the relevant analysis framework (Mount and Thompson 1987). Studies in line with cognitive theory have shown that entrepreneurs possess more faith in their ability to meet the challenges that their surroundings pose. That faith to face threats—and, from time to time, to turn those into opportunities—is one of their most important elements that build their faith.

Corruption is one of the clearest threats to entrepreneurial activity (Anokhin and Schulze, 2008; Amorós 2011). Aidis, Estrin, and Mickiewicz (2012) argue that corruption could discourage potential entrepreneurs from starting a business. In countries with weak institutions (Estrin, Korosteleva, and Mickiewicz 2013) and the absence of impartial law enforcement or clear rule of law—both common practices of highly corrupt governments—entrepreneurs perceive more risk and reduce some investments. In this respect, we believe that opportunity-based entrepreneurs are able to face the threat that corruption poses to their entrepreneurial activity while necessity-based entrepreneurs are not. Therefore:

H₆: When the perceived corruption rate increases, opportunity-based entrepreneurship decreases.

METHODOLOGY

To prove the aforementioned hypotheses, we estimated econometrically models of panel data for ten Latin American countries. The use of a data panel allows us to control by countries' heterogeneity.

In particular, the following panel data model were estimated:

$$y_{it} = \alpha_i + X_{it}\beta + \lambda_t + U_{it},$$

where y_{it} is the entrepreneurial rate (TEA), the opportunity entrepreneurial rate (OPP), or the necessity entrepreneurial rate (NEC), and α_i is the unobserved country effect that captures the quality of the institutions, compliance with legislation, the quality of policies, and so on.

For the purposes of explaining TEA, OPP, and NEC, the following X_{it} explanatory variables are considered:

- GDP per capita—purchase power parity, PPP (and its square term)
- Growth rate of GDP
- Inflation rate
- Unemployment rate
- Real minimum wage
- Informality
- Corruption perception

Data

The countries considered in the analysis were Argentina, Brazil, Chile, Colombia, Dominican Republic, Ecuador, Mexico, Peru, Uruguay, and Venezuela. Because the GEM does not collect information for all country-years, table 1 shows the real availability of data.

Table 2 shows data sources and descriptive statistics of the data used in the econometric analysis. It is interesting to note the important variation in the explanatory variables. For example, GDP per capita in Latin American countries ranges from US\$3,491 to \$14,273 between 2000 and 2010.

Per capita GDP derives from the World Development Indicators (WDI) of the World Bank and is measured in 2005 constant American dollars adjusted by purchasing power parity. This allows for the control of different purchasing power of American dollars in different countries and periods. The inflation rate is also from the WDIs.

Table 1 Global entrepreneurship data availability per country-year

Country	TEA	OPP and NEC
Argentina	2000–2010	2001–2010
Brazil	2000–2010	2001–2010
Chile	2002–2003, 2005–2010	2002–2003, 2005–2010
Colombia	2006–2010	2006–2010
Dominican Republic	2007–2009	2007–2009
Ecuador	2004, 2008–2010	2004, 2008–2010
Mexico	2001–2002, 2005–2006, 2008, 2010	2001–2002, 2005–2006, 2008, 2010
Peru	2004, 2006–2010	2004, 2006–2010
Uruguay	2006–2010	2006–2010
Venezuela	2003, 2005, 2007, 2009	2003, 2005, 2007, 2009

Source: GEM.

Table 2 Descriptive statistics and data sources

Variable	N	Mean	SD	Min.	Max.	Source
TEA (%)	63	16.7	6.8	5.3	40.3	GEM
OPP (%)	61	11.0	4.9	3.4	29.6	GEM
NEC (%)	61	5.6	2.5	0.9	13.1	GEM
GDP per capita (constant PPP 2005 USD)	63	9,803	2,585	3,491	14,273	World Bank
Economic growth (%)	63	4.3	4.2	–10.9	10.3	World Bank
Inflation (%)	63	7.5	6.8	–1.1	31.1	World Bank
Unemployment (%)	63	9.5	3.3	3.3	19.6	ILO
Minimum wage (2000 = 100)	63	131.4	471.9	81.3	323.2	ILO
Informality (%)	63	46.0	8.3	30.6	62.1	ILO
Transparency (0 to 10)	63	4.0	1.6	1.8	7.5	Transparency International

Table 3 Correlation coefficients

	1	2	3	4	5	6	7	8	9	10
1. TEA	1									
2. OPP	0.96***	1								
3. NEC	0.86***	0.70***	1							
4. GDP per capita	-0.53***	-0.46***	-0.58***	1						
5. Economic growth	0.14	0.19	-0.07	0.00	1					
6. Inflation	0.04	-0.07	0.21	0.13	-0.25**	1				
7. Unemployment	0.17	0.09	0.43***	-0.51***	-0.30**	0.24**	1			
8. Minimum wage	-0.23*	-0.24*	-0.19	0.46***	0.27**	0.30**	-0.26**	1		
9. Informality	0.54***	0.46***	0.64***	-0.69***	0.00	0.08	0.34***	-0.25**	1	
10. Trans- parency	-0.27**	-0.23*	-0.34***	0.41***	0.02	-0.35***	-0.27**	0.04	-0.74***	1

Source: GEM, World Bank, ILO, and TI.

* $p < .10$; ** $p < .05$; *** $p < .01$.

Unemployment rate, minimum wage, and informality are from the International Labor Organization (ILO). The real minimum wages were set at a base of 100 in 2000. These variables are constructed based on household surveys in urban areas. The informality variable is calculated as the proportion of workers with no social security coverage.

The Corruption Perception Index (CPI) is a composite index obtained from Transparency International (TI) and derived from several expert opinion polls that analyze perceptions on public-sector corruption in 178 countries worldwide. It is a 0–10 rating of countries, where 0 indicates the highest levels of perceived corruption and 10, the lowest levels. The index ranks countries according to their perceived corruption. Table 3 shows the correlation coefficient between the different variables used in the economic analysis only for the country-years with GEM data.

RESULTS

Table 4 shows the econometric estimate results. The results indicate that the rates of entrepreneurship are not related to the wealth of the countries approximated by their GDP per capita. This is because we are considering only low- and middle-income countries. These results are not consistent with our H_{1a} . However, opportunity-based entrepreneurship is positively related to economic cycle calculated by the GDP growth rate. The higher the growth level is, the higher the entrepreneurship rate, which confirms H_{1b} .

Results do not confirm a significant correlation between unemployment and necessity-based entrepreneurship. This indicates that in the countries of Latin

Table 4 Entrepreneurship panel data models

Exploratory variables	Dependent variable		
	TEA	OPP	NEC
GDP per capita	−0.001 (0.002)	−0.001 (0.001)	0.000 (0.001)
GDP per capita squared	8.18E-09 (1.12E-07)	4.66E-08 (7.65E-08)	−3.67E-08 (3.74E-08)
Economic growth	0.215 (0.116)*	0.116 (0.064)*	0.024 (0.055)
Inflation	0.252 (0.123)**	0.064 (0.095)	0.124 (0.037)***
Unemployment	−0.337 (0.366)	−0.282 (0.274)	0.050 (0.104)
Minimum wage	−0.007 (0.014)	−0.003 (0.011)	0.002 (0.007)
Informality	0.467 (0.107)***	0.290 (0.112)***	0.204 (0.049)***
Transparency	1.342 (0.593)**	0.572 (0.502)	0.665 (0.279)**
Constant	1.378 (13.564)	6.661 (10.806)	−8.044 (4.338)*
R ² , overall	0.42	0.33	0.58
Observations	63	61	61
Number of countries	10	10	10
Sample	2000–2010	2001–2010	

Notes: Robust standard errors in parentheses. According to the Hausman test, the random effect model is the appropriate one.

* $p < .10$; ** $p < .05$; *** $p < .01$.

America, the benefits of unemployment or the perception of adverse economic surroundings are sufficiently powerful to dissuade the unemployed from trying to enter entrepreneurship. This does not confirm our H_2 . Results also show a relationship with similar characteristics between unemployment and opportunity-based entrepreneurship. It may also indicate that when unemployment rises, there is a depreciation of paid job attraction to such an extent that the entrepreneur has the opportunity to set up his own business despite having a job and facing a difficult context. This is also related to H_{1a} .

A positive correlation between inflation and necessity-based entrepreneurial activity in H_3 is corroborated by the data. If our interpretation is correct, this can be explained because inflation behaves as an income tax. We concluded the same for the informality variable. Therefore, H_4 is supported by the data. While there is an inverse relationship between percentage of informal sector and per capita income, this relationship vanishes when a vast set of explanatory variables is con-

trolled. A possible explanation for these results is that levels of informality are so high in most Latin American countries, with some countries reaching 60 percent, that informality is not a distinct advantage for entrepreneurs in relation to established companies.

We find that real minimum wages do not affect necessity- or opportunity-based entrepreneurship rates. This is not consistent with H_5 .

The Corruption Perception Index does not have a significant effect on opportunity-based entrepreneurship, but it positively affects the rate of necessity-based entrepreneurship. As a result, more transparency is associated with more NEC. Consequently, control of corruption appears to limit necessity-based entrepreneurship in Latin America. In a related work Amorós (2011) finds a positive and negative impact of corruption on opportunity entrepreneurial. His empirical results link entrepreneurship to the quality of institutions and control of corruption from the World Bank's Project on Governance for sixty countries. That we find no impact of corruption on opportunity entrepreneurial can be explained by the fact that we use another definition of corruption (Transparency International's Corruption Perception Index) and focus only on Latin America. Even though the international evidence shows that corruption reduces entrepreneurship, our results indicate that the situation in Latin America may be different.

Finally, because the Dominican Republic is the poorest country in our sample and we had only three observations for this country, as a robustness check we estimate other model excluding such country. Table 5 shows that the previous result maintains. The only difference is that now we observe a U-shaped relationship between entrepreneurship and GDP per capita. In the estimation, the marginal effect of GDP per capita on entrepreneurship is positive for a level of GDP per capita higher than US\$12,000.

FUTURE RESEARCH AND POLICY IMPLICATIONS

Because it cannot be stated *a priori* that one type of entrepreneurship is more successful than the other (Amorós and Cristi 2011), we show results for both types of entrepreneurship. Some scholars believe that higher rates of opportunity-based entrepreneurship are preferred to higher rates of necessity-based entrepreneurship (Acs et al. 2005; Acs and Varga 2005). Block and Sandner (2007) discovered that opportunity-based entrepreneurs stayed self-employed for a longer period of time than necessity-based entrepreneurs, but this difference was explained by the fact that the opportunity-based entrepreneurs were able to set their entrepreneurial activities in relation to an occupation they had already learned. Once this advantage of opportunity-based entrepreneurs was taken into account, differences were not meaningful. Block and Sandner (2007) also state that the opportunity-based entrepreneur has choices while the necessity-based entrepreneur does not, which means that the necessity-based entrepreneur will have to embark even when the conditions are not right, as when the entrepreneur's educational profile is not aligned with that of his or her field of entrepreneurship.

Evidence shows that necessity- and opportunity-based entrepreneurs have clearly different characteristics, and socioeconomic indicators affect them differ-

Table 5 Robustness check: Entrepreneurship panel data models without Dominican Republic

Exploratory variables	Dependent variable		
	TEA	OPP	NEC
GDP per capita	−0.015 (0.006)**	−0.012 (0.004)***	−0.003 (0.002)*
GDP per capita squared	6.55E-07 (2.66E-07)**	5.13E-07 (1.88E-07)***	1.34E-07 (8.14E-08)
Economic growth	0.378 (0.168)**	0.303 (0.117)***	0.050 (0.064)
Inflation	0.248 (0.182)	0.119 (0.155)	0.124 (0.046)***
Unemployment	0.068 (0.243)	−0.062 (0.173)	0.139 (0.097)
Minimum wage	−0.022 (0.017)	−0.021 (0.013)	−0.000 (0.007)
Informality	0.105 (0.210)	0.002 (0.150)	0.108 (0.061)*
Transparency	0.619 (0.632)	0.172 (0.437)	0.469 (0.269)*
Constant	90.445 (44.516)**	73.897 (33.486)**	15.845 (11.537)
R ² , overall	0.58	0.51	0.67
Observations	60	58	58
Number of countries	9	9	9
Sample	2000–2010	2001–2010	

Notes: Robust standard errors in parentheses. According to the Hausman test, the random effect model is the appropriate one.

* $p < .10$; ** $p < .05$; *** $p < .01$.

ently. Therefore the distinction between opportunity- and necessity-based entrepreneurship is relevant in Latin America.

Apart from the development level of the country measured in terms of per capita income growth, other factors affect the entrepreneurship level of the economy, such as trust in macroeconomic policies, labor regulations, and institutional quality.

The results show that economic growth is positively related to opportunity-based entrepreneurship. Other factors like inflation, informality, and transparency (as opposed to corruption) are positively related to major prevalence rates of the necessity-based rates. As a result, corruption appears to constrain necessity-based entrepreneurship in Latin America.

Some lines of future research can be derived from this study. First, it will be relevant to compare different data mainly on unemployment and informality in Latin America, because these rates could change depending on the source. Sec-

ond, the incidence of labor market regulations and their impact on entrepreneurship levels should be explored more closely. Finally, the hypotheses of differences between opportunity-based and necessity-based entrepreneurs in connection with entrepreneurial skills, whether real or perceived, and their consequences for different threats, opportunities, strengths, and weaknesses should be verified.

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