Female Entrepreneurship in Latin America and the Caribbean: Characteristics, Drivers and Relationship to Economic Development

Article *in* European Journal of Development Research · July 2010

DOI: 10.1057/ejdr.2010.13 · Source: RePEc

CITATIONS
117

READS
2,341

2 authors:

José Ernesto Amorós
Tecnológico de Monterrey
106 PUBLICATIONS **3,241** CITATIONS

SEE PROFILE

Siri Terjesen
Florida Atlantic University
168 PUBLICATIONS **7,276** CITATIONS

SEE PROFILE

Original Article

Female Entrepreneurship in Latin America and the Caribbean: Characteristics, Drivers and Relationship to Economic Development

Siri Terjesen[a,*] and José Ernesto Amorós[b]

[a]Kelley School of Business, Indiana University, Bloomington.
[b]Universidad del Desarrollo, Santiago, Chile.
E-mail: eamoros@udd.cl

*E-mail: terjesen@indiana.edu

Abstract This article explores female entrepreneurial activities in 13 Latin American and Caribbean countries: Argentina, Bolivia, Brazil, Chile, Colombia, Dominican Republic, Ecuador, Jamaica, Mexico, Peru, Puerto Rico, Uruguay and Venezuela. Specifically, we explore the following research questions: What percentage of the female and male Latin American populations is involved in opportunity- and necessity-based entrepreneurial activities? And what quality of institutions is associated with female entrepreneurial activity opportunity and necessity rates? We comment on the impact of female entrepreneurship on economic development and conclude with implications for policy, practice and future research.

Cet article explore les activités entrepreneuriales des femmes dans treize pays d'Amérique latine: l'Argentine, la Bolivie, le Brésil, le Chili, la Colombie, la République dominicaine, l'Équateur, la Jamaïque, le Mexique, le Pérou, le Porto Rico, l'Uruguay et le Venezuela. Plus précisément, nous soulevons les questions de recherche suivantes: quels sont les pourcentages de femmes et d'hommes qui sont engagés dans des activités d'entreprenariat de nécessité et d'opportunité? Quelle est la qualité des institutions associée aux taux d'entrepreneuriat de nécessité et d'opportunité parmi les femmes? Nous examinons l'impact de l'entreprenariat féminin sur le développement économique et ses implications en termes de politiques, pratiques et de recherches futures.

European Journal of Development Research (2010) **22,** 313–330. doi:10.1057/ejdr.2010.13
Published online 13 May 2010

Keywords: female entrepreneurship; economic development; Global Entrepreneurship Monitor; Latin America

Introduction

Entrepreneurship is the 'study of how, by whom, and with what effects opportunities to create future goods and services are discovered, evaluated and exploited' (Shane and Venkataraman, 2000, p. 218). Key questions in entrepreneurship include: Who pursues new venture opportunities? What factors are associated with their ability to pursue new opportunities? And what impact does entrepreneurial activity have on economic development? Many countries are not realizing their full entrepreneurial potential owing to the lack of participation by females in new business activities. For example, in the Global Entrepreneurship Monitor (GEM)[1] study of entrepreneurship in approximately 60 countries, females comprise just one-third of the world's entrepreneurs (Allen *et al*, 2008). Women's share varies across countries, from 26.1 per cent in Peru to 1.4 per cent in Latvia,[2] with Latin American[3] countries having some of the highest shares of total female

entrepreneurship rates, but the highest necessity-based rates (for example, 9.7 per cent in Colombia; 6.6 per cent in Peru). Low levels of female entrepreneurial activity may negatively impact a nation's economic growth and development. In countries such as the United States there is evidence that the 10.1 million female-owned companies employing 13 million people and generating US$1.9 trillion in sales play a major role in growing the economy (Center for Women's Business Research, 2010).

Entrepreneurship is a complex phenomenon involving multiple factors at individual, firm and environmental levels, making it difficult to utilize just one approach. Nevertheless, the GEM project has advanced our understanding of entrepreneurship by including a series of measures that provide insights into entrepreneurial dynamics and offer implications for regional and national approaches (Bosma and Levie, 2010). GEM methodology and reports incorporate key environmental conditions and institutions that affect female (and male) entrepreneurial activities. Using the analogy of the Schumpeterian entrepreneur, an 'opportunity-based' entrepreneur has a 'pull motive' such as the desire for independence, income, challenge, status and recognition. In contrast, a 'necessity-based' entrepreneur is 'pushed' into entrepreneurship because he/she has no other choice. Although many studies recognize that most entrepreneurial activity results from searching for business opportunities (Kolvereid, 1996; Feldman and Bolino, 2000; Carter *et al*, 2003; Bosma *et al*, 2008; Hessels *et al*, 2008), low- and middle-income countries have the highest rates of necessity-based entrepreneurship, especially among females (Minniti *et al*, 2006; Verheul *et al*, 2006; Allen *et al*, 2008). Countries with higher levels of development have higher shares of female entrepreneurship, especially pursuing opportunity-motivated ventures (Weeks and Seiler, 2001; Allen *et al*, 2008). Recent empirical evidence (Wennekers *et al*, 2005; Acs and Amorós, 2008; Amorós and Cristi, 2008) indicates that low- and middle-income countries' entrepreneurial activity varies with Gross Domestic Product (GDP) levels.

A growing body of research investigates the role of institutions in facilitating female entrepreneurship (for example, Allen *et al*, 2008; Elam and Terjesen, 2010) and female entrepreneurship generally (Terjesen *et al*, forthcoming); however, limited attention has been paid to Latin American economies (Weeks and Seiler, 2001). This study fills this gap by analyzing the levels and drivers of female entrepreneurship activity in 13 Latin American and Caribbean countries, Argentina, Bolivia, Brazil, Chile, Colombia, Dominican Republic, Ecuador, Jamaica, Mexico, Peru, Puerto Rico, Uruguay and Venezuela, using GEM data. Over 6 per cent of the world's population lives in Latin America, and the region has some of the highest rates of entrepreneurial activity and self-confidence about entrepreneurial skills, as well as increasing rates of female entrepreneurial activity (Weeks and Seiler, 2001; Acs, Desai and Klapper, 2008; Allen *et al*, 2008). In parallel, as a region, Latin America has one of the lowest historical rates of female participation in economic activity – just 35 per cent compared to an average of over 50 per cent in developed countries, Africa, Central Asia and Southeast Asia (Weeks and Seiler, 2001).

Specifically, we explore the following research questions: What percentage of the female and male Latin American populations is involved in opportunity- and necessity-based entrepreneurial activities? What quality of economic institutions is associated with female entrepreneurial activity opportunity and necessity rates? We comment on the impact of female entrepreneurship on economic development and conclude with a summary of the findings and suggestions for implications for policy, practice and future research.

Methodology and Data

Methodology

We begin with a descriptive analysis using GEM data, comparing the different rates of female and male entrepreneurial activity in 13 Latin American countries. Next, following Acs and Amorós (2008), we verify the relationships between female entrepreneurship rates and competitiveness and economic growth. A country's degree of competitiveness and economic performance is a good proxy of the efficiency and quality of its national institutions (Sala-i-Martin and Artadi, 2004). To examine these relationships, we use a series of regressions following the general model $WE_{it} = f(CI_{it}, GDP_{it}, X_{it})$ where WE is Women's Entrepreneurial Activity, CI is Competitiveness Index, GDP is per capita Gross Domestic Product (adjusted purchasing power parity, PPP), X are Control Variables, i is the country index and t is the time period.

We estimate the model using two approaches. First, we pool the cross-section of countries with time-series data over the period 2001–2008. Second, to solve the potential problems associated with pooling country data with vastly different numbers of observations each year (not all countries participate in all years, as shown in Appendix A), we perform a panel data model, controlling for the year. We verify linear, logarithmic and inverse relations specifications and the quadratic specification using a general-to-specific modeling procedure to test for the best statistical fit.[4] We test three models using pool and panel data for each independent variable: (a) both CI and GDP; (b) only GDP; and (c) only CI that captures differences in countries' institutions.[5]

Data

Dependent variables

Our analysis is based on GEM measures of entrepreneurial activity. GEM is an annual telephone or in-person Adult Population Survey that includes the following information about both entrepreneurs and non-entrepreneurs: demographics (age, gender, education, household income, employment status); personal context (is acquainted with an entrepreneur, feels that he/she possesses the skills to start a business, sees opportunities in the business environment and fears failure); and firm characteristics (for example industrial sector, current number of employees, growth expectations, use of technology) (see Reynolds *et al* (2005) for a detailed overview of the GEM methodology and approach). During 2001–2008, GEM analyzed 66 countries' entrepreneurship activities. Thirteen of these 66 countries are in the Latin American and Caribbean region. GEM methodology estimates the percentage of adult population that is actively involved in starting a new business, a rate known as the early-stage TEA index. GEM methodology considers two different types of entrepreneurs involved in TEA: the 'pulled' opportunity-based entrepreneurs and the 'pushed' necessity-based entrepreneurs. Opportunity-based entrepreneurs have taken actions to create a new venture pursuing perceived business opportunities. Necessity-based entrepreneurs are involved in new ventures because they perceive no better employment options.

The opportunity- and necessity-based rates can be analyzed by gender. Our first dependent variable is the rate of female opportunity-based entrepreneurs ($FOPP$). The second dependent variable is the rate of $FNEC$. In order to capture variations between these indexes, our third dependent variable ($FRATIO$) is the ratio of $FOPP$ to $FNEC$.

All measures are based on an 8-year period (2001–2008). Appendix A provides an overview of GEM countries from 2001–2008. Appendix B contains the specific data from Latin American and Caribbean countries.

Independent variables

The Growth Competitiveness Index (*GCI*) is reported annually by the World Economic Forum using McArthur and Sachs' (2002) methodology. In 2005–2006, the World Economic Forum introduced a more comprehensive competitiveness index called the *Global Competitiveness Index* (Global CI).[6] This revised index evaluates and benchmarks several critical factors that were absent from the original *GCI*. The Global CI measures 'the set of institutions, policies, and factors that set the sustainable current and medium-term levels of economic prosperity' (Sala-i-Martin and Artadi, 2004, p. 52). We employ *GCI* and Global CI as an independent variable.

Our second independent variable is *GDP* per capita for the period 2001–2008. Per capita income growth rate is a good proxy for economic growth and is one of the main measures of economic development (Wennekers *et al*, 2005). The *GDP* variables are adjusted by PPP**.** The data were taken from the International Monetary Fund's World Economic Outlook Database published in April 2009.[7]

Control variables

In addition to the independent variables and to mitigate the problem of different weights across countries, we introduce control variables for each country's degree of economic welfare and location. The dummy variable *HINCOME* has a value of 1 for GEM high-income countries. High-income countries are defined by the World Economic Forum and World Bank criteria (see Appendix A). We have 173 observations for *HINCOME* countries ($n = 292$). We use *HINCOME* as a moderator for *GDP* and *CI* in order to test for differences between groups of countries. For the regional approach, we use the dummy variable LATAM with a value of 1 for GEM Latin American countries. We have 49 observations for LATAM.

Results

RQ1: What percentage of the female Latin American population is involved in opportunity- and necessity-based entrepreneurial activities?

Opportunity and necessity entrepreneurship rates vary considerably around the world and within Latin America (see Figure 1 for the opportunity and necessity TEA rates for males and females in Latin America; full data, including male:female ratios, can be found in Appendix B). The male:female ratio of opportunity entrepreneurship ranges from Puerto Rico's near 1:1 ratio to Uruguay where men are five times more likely to be involved in opportunity-oriented entrepreneurship than are women. Necessity entrepreneurship rates present a similar case of gender diversity. For example, Peruvian women are far more likely to be involved in necessity entrepreneurship than are their male counterparts.

Figures 2(a) and (b) plot the opportunity- and necessity-based female entrepreneurship rates for all GEM countries during 2001–2008, highlighting Latin America.

RQ2: What quality of economic institutions is associated with female Latin American opportunity- and necessity-based entrepreneurial activities?

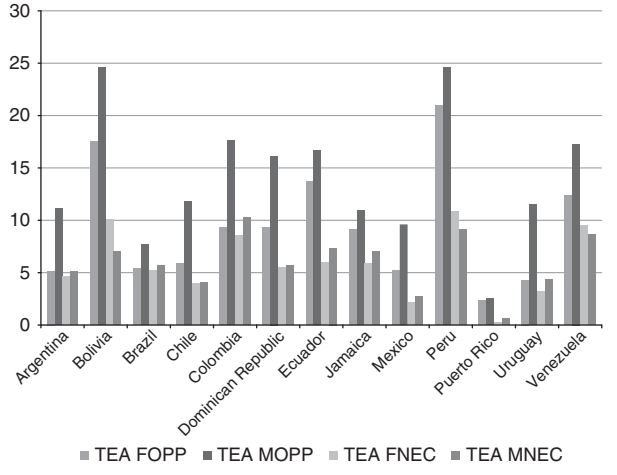

Figure 1: Latin American entrepreneurial activity: Average rates 2001–2008.

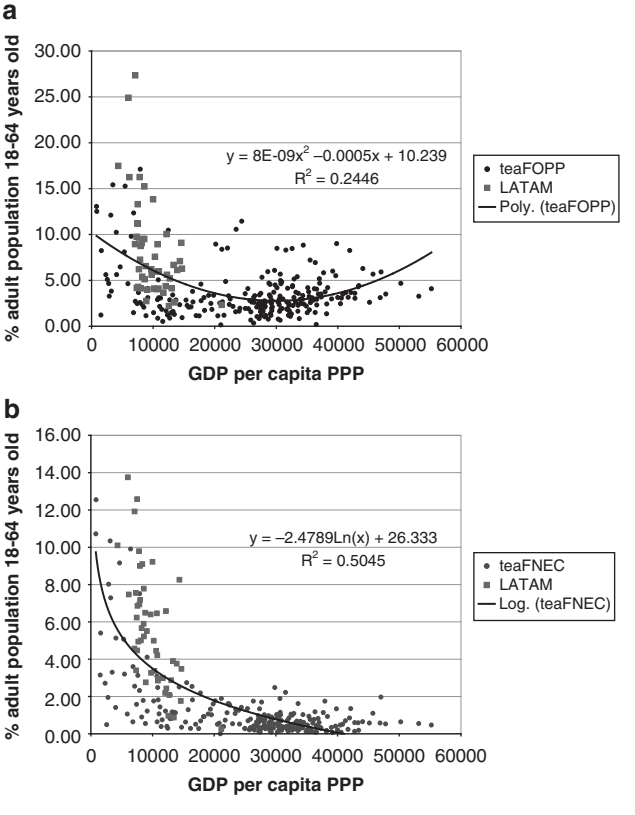

Figure 2: (**a**) Latin American and rest of world: Female opportunity entrepreneurial activity. *Source*: GEM Adult Population Survey 2001–2008; (**b**) Latin American and rest of world: Female Necessity Entrepreneurial Activity.
Source: GEM Adult Population Survey 2001–2008.

Female Opportunity-Oriented Entrepreneurship

Using our proposal model and testing different specifications, as observed in Figure 2(a), the quadratic model has the best statistical fit (adjusted R^2 values) and specification (see note 4). As *GDP* and *CI* are highly correlated (0.781), we use a separate model for each variable:

$$FOPP_{it} = a + b_1 GDP_{it} + b_2 GDP_{it}^2 + c_1 GDP \times HINCOME_{it} + c_2 GDP^2 \times HINCOME_{it} + dLATAM + e_{it} \quad (1)$$

$$FOPP_{it} = a + b_1 CI_{it} + b_2 CI_{it}^2 + c_1 CI \times HINCOME_{it} + c_2 CI^2 \times HINCOME_{it} + dLATAM + e_{it} \quad (2)$$

For pooling, model regressions were estimated using Ordinary Least Squares (OLS). The panel data utilizes fixed and random effects Generalized Least Square (GLS) with and without autoregressions. The autoregressive models were more robust. Within these, we chose the fixed effects model because our Hausman test does not reject the null hypothesis that the random effects are more efficient than those estimated by the consistent fixed effects. To estimate panel data, we only consider countries with more than two observations. The panel data model includes year controls.

As prior research indicates that opportunity-based entrepreneurial activity has a positive effect on economic growth (Van Stel *et al*, 2005), our models may be endogenous on the regressors *GDP* per capita and *CI*. Thus, we perform a residual-based form of the Hausman test in equations (1) and (2) that is asymptotically equivalent to the original Hausman test (Wooldridge, 2002), and involves estimating an auxiliary regression for *GDP*, $GDP \times HINCOME$, *CI* and $CI \times HINCOME$ on a constant, and regressor specific instruments. We use dummies for the country, year and location (that is, Latin America or not). The regressions *GDP* and *CI* on *FOPP*, including the residuals from the auxiliary regression for *GDP* and *CI* as additional explanatory variables, are then estimated by OLS. The statistical significance of the coefficient associated with the residuals is evaluated. If that parameter is not statistically significant, then the Hausman test does not reject the hypothesis of exogeneity of the regressor. The coefficients associated with the residuals have *P*-values > 0.10, which indicates that there are no endogeneity problems with *GDP* and *CI*. See Tables 1(a) and (b) for the results.

In the OLS estimation model (a), *GDP* is significant and negative and *GDP* squared is significant and positive. $GDP \times HINCOME$ is significant and positive and *GDP* squared $\times$ *HINCOME* is significant and negative. The LATAM control variable is significant and positive. The coefficients confirm the expected U-curve relationship. For more developed countries (*HINCOME* moderate controls), the U-curve is less pronounced owing to the inclusion of the coefficients from $GDP + GDP \times HINCOME$ and $GDP^2 + GDP^2 \times HINCOME$. As shown in Table 1(b) (GLS estimation), *GDP* and *GDP* squared and *HINCOME* controls are not significant. However, the LATAM coefficients in *GDP* and *CI* estimations (3.79 and 7.33, respectively) confirm that Latin American female entrepreneurs (and also women in other developing countries) have relatively higher rates of entrepreneurship (Bosma *et al*, 2008), although not necessarily of 'high quality.' In both OLS and GLS estimations, the models with *CI* and *HINCOME* controls are not significant, meaning that there are no significant differences among groups of countries regarding the relationship between *FOPP* and competitiveness. The LATAM

Table 1: Estimation results of female opportunity entrepreneurial dynamics and competitiveness and economic growth rates (2001–2008)

	Model a	*Model b*
(a) Pool data using OLS		
GDP per capita	$-7.75E^{-04}$***	—
	(−7.13)	
GDP per capita, squared	$1.52E^{-08}$***	—
	(5.50)	
	$3.03E^{-04}$***	—
	(3.95)	
GDP per capita, squared × *HINCOME*	$-7.68E^{-09}$***	—
	(−3.08)	
CI	—	−20.98***
		(−2.76)
CI squared	—	2.36^{8}***
		(2.63)
CI × *HINCOME*	—	1.27
		(0.00)
CI, squared × *HINCOME*	—	−0.33
		(−0.98)
LATAM	3.79***	3.38***
	(6.73)	(5.30)
Constant	10.39***	50.41 ***
	(12.21)	(3.14)
Adjusted R^2	0.34	0.25
F	32.24***	20.25***
Observations	292	289
(b) Panel data using GLS and fix effects[a]		
GDP per capita	3.05E-05	—
	(0.13)	
GDP per capita, squared	−1.18E-09	—
	(−0.37)	
GDP per capita × *HINCOME*	−4.46E-05	—
	(−0.42)	
GDP per capita, squared × *HINCOME*	1.40E-09	—
	(0.51)	
CI	—	−9.87*
		(−1.71)
CI, squared	—	1.10*
		(1.66)
CI × *HINCOME*	—	2.01
		(1.35)
CI, squared × *HINCOME*	—	−0.40
		(−1.37)
LATAM	7.33***	8.56***
	(3.90)	(4.86)
Constant	5.28***	24.77 **
	(4.81)	(2.04)
Adjusted R^2	0.83	0.83
F	25.57***	20.97***
Observations	264	264

[a]Controls for each year were performed but do not appear in the table as the differences across years are not statistically significant.
Absolute *t-values* in parentheses.
*Significant at 0.10 level; **significant at 0.05 level; ***significant at 0.01 level.

control variable is significant and positive, confirming that Latin American countries have higher entrepreneurship rates. However, when Latin American countries achieve more competitiveness, many female entrepreneurs 'migrate' to other activities, for example leaving business ownership or self-employment to become employees of a firm. When competitiveness rises further, as in the case of the most developed countries, more people (including women) return to entrepreneurship activities (Acs and Amorós, 2008).

Female Necessity-Oriented Entrepreneurship

Next we explored female necessity entrepreneurship rates. In this model, we also verify linear, logarithmic and inverse relations specifications, as well as the quadratic specification. As observed in Figure 2(b), the logarithmic model has the best statistical fit (adjusted R^2 values) and specification (see note 4). The logarithmic (log) models are:

$$FNEC_{it} = a + b\log(GDP)_{it} + c\log(GDP)\times HINCOME_{it} + dLATAM + e_{it} \quad (3)$$

$$FNEC_{it} = a + b\log(CI)_{it} + c\log(CI)\times HINCOME_{it} + dLATAM + e_{it} \quad (4)$$

We also performed endogeneity tests on the *FNEC* models. The coefficients associated with the residuals have *P*-values > 0.10, which indicates that there are no endogeneity problems with *GDP* and *CI*. The results are shown in Table 2 (a) and (b). Both estimation procedures and models confirm significant negative effects of *GDP* per capita and *CI* on *FNEC* rates. LATAM is positively related to *FNEC* whereas $GDP \times HINCOME$ is positive and $CI \times HINCOME$ is negatively related, both significant. These relationships confirm that, for Latin American and other low- and middle-income countries, the degree of competitiveness does not have the same effect of 'reducing' necessity-based female entrepreneurial activities.

Ratio between Opportunity and Necessity for Female Entrepreneurs

As the dependent variable is a ratio, we use a linear model:

$$FRATIO_{it} = a + bGDP_{it} + cGDP\times HINCOME_{it} + dLATAM + e_{it} \quad (5)$$

$$FRATIO_{it} = a + bCI_{it} + cCI\times HINCOME_{it} + dLATAM + e_{it} \quad (6)$$

The results are shown in Tables 3 (a) and (b). The OLS models show that LATAM and *HINCOME* moderators are not significant. The fixed effect estimation on the *CI* model LATAM is negative and significant. Latin American necessity-based female entrepreneurs have a large share of total female activity, with the *FNEC* rate often exceeding the *FOPP* rate.

Table 2: Estimation results of female necessity entrepreneurial rates and competitiveness and economic growth rates (2001–2008)

	Model a	*Model b*
(a) Pool data using OLS		
log *GDP* per capita	−2.44***	—
	(−11.63)	
log *GDP* per capita × *HINCOME*	0.10***	—
	(3.21)	
log *CI*	—	−4.73***
		(−3.98)
log *CI* × *HINCOME*	—	−0.48**
		(−2.27)
LATAM	3.07***	2.82***
	(10.74)	(8.47)
Constant	22.81***	9.24***
	(12.94)	(5.22)
Adjusted R^2	0.64	0.53
F	175.62***	108.12***
Observations	292	289
(b) Panel data using GLS and fix effects[a]		
log *GDP* per capita	−5.41***	—
	(−4.18)	
log *GDP* per capita × *HINCOME*	0.03	—
	(0.48)	
log *CI*	—	−1.71
		(−1.00)
log *CI* × *HINCOME*	—	0.11
		(0.37)
LATAM	15.14***	7.29 ***
	(7.25)	(8.99)
Constant	44.99***	4.38***
	(4.95)	(1.76)
Adjusted R^2	0.86	0.85
F	32.7***	30.04***
Observations	264	264

[a]Controls for each year were performed but do not appear in the table as the differences across years are not statistically significant.
Absolute *t-values* in parentheses.
*Significant at 0.10 level; **significant at 0.05 level; ***significant at 0.01 level.

Discussion: Impact on Economic Development

Women's share of entrepreneurship in Latin America lags behind more advanced nations in Europe, North America and Asia (Amorós and Pizarro, 2007a; Allen *et al*, 2008). Latin American female entrepreneurship is diverse and covers almost all sectors of the economy. However, gender differences are still important, especially when we measure available incentives for getting started. Generally in Latin America there is gender inequity with respect to entrepreneurship. Opportunities and incentives are unfavorable for women to begin businesses, even when women possess the abilities and knowledge, and a favorable perception of entrepreneurship (Amorós and Pizarro, 2007a). Furthermore, women start firms in industry sectors such as retail and on a small scale. For example, in Chile, 96 per cent

Table 3: Estimation results of female ratio opportunity/necessity entrepreneurial rates and competitiveness and economic growth rates (2001–2008)

	Model a	*Model b*
(a) Pool data using OLS		
GDP per capita	2.23E^{-04}**	—
	(2.53)	
GDP per capita × *HINCOME*	1.88E-06	—
	−0.28	
CI	—	3.80***
		(3.51)
CI × *HINCOME*	—	0.26
		(0.96)
LATAM	−0.76	−0.20
	(−0.62)	(−0.16)
Constant	0.29	−13.21***
	(0.24)	(−2.84)
Adjusted R^2	0.18	0.18
F	21.30***	20.47***
Observations	291	288
(b) Panel data using GLS and fix effects[a]		
GDP per capita	6.62E-06	—
	(0.20)	
GDP per capita × *HINCOME*	8.85E-05	—
	(−0.89)	
CI	—	−2.18
		(−0.86)
CI × *HINCOME*	—	−0.45
		(−0.65)
LATAM	−15.76	−16.72**
	(−1.22)	(−2.2)
Constant	14.40	24.4*
	(0.89)	(1.70)
Adjusted R^2	0.33	0.33
F	3.51***	3.53***
Observations	263	263

[a]Controls for each year were performed but do not appear in the table as the differences across years are not statistically significant.
Absolute *t-values* between parentheses.
*Significant at 0.10 level; **significant at 0.05 level; ***significant at 0.01 level.

of women's businesses are self-employment initiatives or have fewer than five employees (Amorós and Pizarro, 2007b). Only 13 per cent of female entrepreneurs expect that their company or business will grow considerably during the next 5 years. These findings underscore the relatively lower industrial productivity of many Latin American new ventures (self-employment) compared to their counterparts in developed economies (Fajnzylber *et al*, 2006).

In this context, formal and informal institutions may play an important role in improving the quality and quantity of female entrepreneurs. In the general social context in Latin America, it is commonly thought that a firm managed by a woman is a supplementary activity (that is, an 'extension of the family'). However, many Latin American women, in addition to fulfilling the traditional family role, are developing entrepreneurial

activities. Latin American women's roles are becoming more relevant in economic terms as employees and as potential new job creators. This is mainly a result of the growing participation of women in the workforce and the consequent changes in family organizations.

In this exploratory study, we have attempted to advance our understanding of the characteristics and drivers of women's entrepreneurship in Latin America. Our preliminary results are useful for the fields of gender and entrepreneurship. Furthermore, this study may be of interest to public, educational and social institutions managing policies, programs or initiatives to encourage and support women's entrepreneurship. Women's entrepreneurship, particularly when focused on high-value-added activities, is fundamental to social and economic progress in developing countries. We suggest that policy makers encourage female entrepreneurship, particularly opportunity-based, providing incentives for women to start high-value-added ventures. We hope this study contributes additional knowledge on the dynamics of female entrepreneurs in Latin America, thus enhancing our understanding of new venture creation.

Going forward, there are multiple directions for future research. First, future research could utilize other methods to investigate Latin American opportunity- and necessity-based entrepreneurship and their drivers. Multi-level methodology using the GEM data set enables researchers to understand individual as well as institutional factors (for example, Elam and Terjesen, 2010). Qualitative approaches such as field research, action research, ethnographies and comparative case studies provide rich descriptions of the processes and experiences of female entrepreneurs. A second promising direction for further enquiry is the exploration of diverse theories. An excellent example is Browne's (2001) study of the impact of colonial legacies on female entrepreneurship in the Caribbean countries of Puerto Rico, Martinique and Barbados. Third, researchers' energies should be devoted to pragmatic, pressing issues. For example, Latin American countries have experienced global economic crises (for example, Argentina 1999–2002; all of Latin American 2009-present) and catastrophic events (for example, Chilean earthquake 2010). Future researchers could ask questions such as: How do crises impact female entrepreneurial activity? And what role do female entrepreneurs play in rebuilding after a crisis?

Acknowledgement

We are grateful to the GEM Consortium and Niels Bosma for the use of the data. All errors are our own.

Notes

1. The GEM project is an annual population-representative survey that measures entrepreneurship activities, and includes 4 billion of the estimated 6.3 billion world population. GEM data is used by the Organisation for Economic Co-operation and Development, the *Economist* and numerous other outlets for comparative entrepreneurship studies.
2. GEM's definition of entrepreneurial activity is the share of adults (aged 18–64 years) in the population who are either actively involved in starting a new business or in managing a business that is less than 42 months old.
3. By Latin America, we refer to Latin American and Caribbean countries.
4. We performed a series of Akaike tests and Schwarz tests for different model specifications. Previous empirical studies show that GEM's Total Entrepreneurial Activity (TEA) and

opportunity-driven rates follow a quadratic specification 'U-shape' (see Wennekers *et al*, 2005; Acs and Amorós, 2008). This model is less restricted than linear or logarithmic models. For necessity-based rates, we used a logarithmic model because our hypothesis is that the relationship between female necessity-based entrepreneurs (FNEC) and economic or competitive performance is negative following the 'L-Shape' path (see also Acs and Amorós, 2008).

5. This may explain why the inclusion of a set of dummies for each country in preliminary models for entrepreneurial dynamics as a function of CI induces substantial collinearity in the estimation.
6. The Global CI was developed by World Economic Forum's Global Competitiveness Programme and conducted by Professor Xavier Sala-i-Martin. The Global CI uses Porter's competitiveness stages to determine three sub-indexes based on the nine pillars: *Basic requirements sub-index (Stage 1: factor-driven)*: Institutions (pillar 1), Infrastructure (pillar 2), Macroeconomic (pillar 3), Health and basic education (pillar 4). *Efficiency enhancers sub-index (Stage 2: efficiency-driven)*: Higher education and training (pillar 5), Market efficiency (pillar 6), Technological readiness (pillar 7). *Innovation and sophistication factor sub-index (Stage 3: innovation-driven)*: Business sophistication (pillar 8), Innovation (pillar 9). With these concepts, Global CI uses the model of developmental stages by weighing each sub-index differently, depending on a country's development stage. Latin American and Caribbean countries are weighted on basic requirements and efficiency enhancers.
7. The International Monetary Fund's World Economic and Financial Surveys and World Economic Outlook Database are available at http://www.imf.org/external/pubs/ft/weo/2009/01/weodata/index.aspx.

References

Acs, Z.J. and Amorós, J.E. (2008) Entrepreneurship and competitiveness dynamics in Latin America. *Small Business Economics* 31(3): 305–322.

Acs, Z.J., Desai, S. and Klapper, L.F. (2008) What does 'entrepreneurship' data really show? *Small Business Economics* 31(3): 265–281.

Allen, E., Elam, A., Langowitz, N. and Dean, M. (2008) *The Global Entrepreneurship Monitor (GEM) 2007 Report on Women and Entrepreneurship*. Babson Park, MA – New York: Babson College and Baruch College.

Amorós, J.E. and Cristi, O. (2008) Longitudinal analysis of entrepreneurship and competitiveness dynamics in Latin America. *International Entrepreneurship and Management Journal* 4(4): 381–399.

Amorós, J.E. and Pizarro, O. (2007a) Women entrepreneurship context in Latin America: An exploratory study in Chile. In: M.R. Markovic (ed.) *The Perspective of Women's Entrepreneurship in the Age of Globalization*. Charlotte, NC: Information Age Publishing, pp. 107–126.

Amorós, J.E. and Pizarro, O. (2007b) Emprendimiento Femenino en Chile: Derribando Mitos. In: P. Cortes (ed.) *Emprendimiento e Innovación en Chile*. Santiago, Chile: Ediciones Universidad del Desarrollo, pp. 129–147.

Bosma, N., Jones, K., Autio, E. and Levie, J. (2008) *Global Entrepreneurship Monitor, 2007 Executive Report*. Wellesley, MA; London, UK: Babson College, London Business School.

Bosma, N. and Levie, J. (2010) *Global Entrepreneurship Monitor, 2009 Executive Report*. Wellesley, MA: Babson College.

Browne, K. (2001) Female entrepreneurship in the Caribbean: A multisite, pilot investigation of gender and work. *Human Organization* 60(4): 326–342.

Carter, N.M., Gartner, W.B., Shaver, K.G. and Gatewood, E.J. (2003) The career reasons of nascent entrepreneurs. *Journal of Business Venturing* 18(1): 13–39.

Center for Women's Business Research. (2010) *Key Facts about Women Owned Businesses*. Silver Spring, MD: Center for Women's Business Research.

Elam, A.B. and Terjesen, S. (2010) Institutional logics. *European Journal of Development Research*, (forthcoming).

Fajnzylber, P., Maloney, W. and Montes Rojas, G. (2006) Microenterprise dynamics in developing countries: How similar are they to those in the industrialized world? Evidence from Mexico. *The World Bank Economic Review* 20(3): 389–418.

Feldman, D.C. and Bolino, M.C. (2000) Career patterns of the self-employed: Career motivations and career outcomes. *Journal of Small Business Management* 38(3): 53–67.

Hessels, J., van Gelderen, M. and Thurik, R. (2008) Entrepreneurial aspirations, motivations and their drivers. *Small Business Economics* 31(3): 323–339.

Kolvereid, L. (1996) Organizational employment versus self-employment: Reasons for career choice intentions. *Entrepreneurship Theory and Practice* 20(3): 23–31.

McArthur, J.W. and Sachs, J.D. (2002) The growth competitiveness index: Measuring technological advancement and the stages of development. In: M.E Porter, J.D. Sachs *et al* (eds.) *The Global Competitiveness Report 2001–2002*. New York: Oxford University Press.

Minniti, M., Allen, E. and Langowitz, N. (2006) *Global Entrepreneurship Monitor, 2005. Report on Women and Entrepreneurship*. Babson Park, MA: Babson College and the London Business School.

Reynolds, P., Bosma, N., Autio, E., Hunt, S., Bono, N.D. and Servais, I. (2005) Global Entrepreneurship Monitor: Data collection design and implementation 1998–2003. *Small Business Economics* 24(3): 205–231.

Sala-i-Martin, X. and Artadi, E.V. (2004) The global competitiveness index. In: M. Porter, K. Schwab, X. Sala-i-Martin and A. López-Claros (eds.) *The Global Competitiveness Report 2004–2005*. New Hampshire: Palgrave Macmillan, pp. 51–80.

Shane, S. and Venkataraman, S. (2000) The promise of entrepreneurship as a field of research. *Academy of Management Journal* 25: 217–226.

Terjesen, S., Elam, A.B. and Brush, C.G. (forthcoming) Gender and new venture creation. In: K. Hindle and K. Klyver (eds.) *Handbook of Research Into New Venture Creation*. Northampton, MA: Edward Elgar.

Van Stel, A., Carree, M. and Thurik, R. (2005) The effect of entrepreneurial activity on national economic growth. *Small Business Economics* 24(3): 311–321.

Verheul, I., Van Stel, A. and Thurik, R. (2006) Explaining female and male entrepreneurship at the country level. *Entrepreneurship & Regional Development* 18(2): 151–183.

Weeks, J.R. and Seiler, D. (2001) Women's Entrepreneurship in Latin America: An Exploration of Current Knowledge. Inter-American Development Bank. Sustainable Development Department Technical Paper Series MSM-111.

Wennekers, S., van Stel, A., Thurik, R. and Reynolds, P.D. (2005) Nascent entrepreneurship and the level of economic development. *Small Business Economics* 24(3): 293–309.

Wooldridge, J. (2002) *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: The MIT Press.

Appendix A

See Table A1.

Table A1: Countries included in global entrepreneurship monitor (2001–2008)

Country	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*HINCOME*
Angola	—	—	—	—	—	—	—	1	—
Argentina	1	1	1	1	1	1	1	1	—
Australia	1	1	1	1	1	1	—	—	1
Austria	—	—	—	—	1	—	1	—	1
Belgium	1	1	1	1	1	1	1	1	1
Bolivia	—	—	—	—	—	—	—	1	—
Bosnia & Herzegovina	—	—	—	—	—	—	—	1	—
Brazil	1	1	1	1	1	1	1	1	—
Canada	1	1	1	1	1	1	—	—	1
Chile	—	1	1	—	1	1	1	1	—
China	—	1	1	—	1	1	1	—	—
Colombia	—	—	—	—	—	1	1	1	—
Croatia	—	1	1	1	1	1	1	1	—
Czech Republic	—	—	—	—	—	1	—	—	1
Denmark	1	1	1	1	1	1	1	1	1
Dominican Republic	—	—	—	—	—	—	1	1	—
Ecuador	—	—	—	1	—	—	—	1	—
Egypt	—	—	—	—	—	—	—	1	—
Finland	1	1	1	1	1	1	1	1	1
France	1	1	1	1	1	1	1	1	1
Germany	1	1	1	1	1	1		1	1
Greece	—	—	1	1	1	1	1	1	1
Hong Kong SAR	—	1	1	1	—	—	1	—	1
Hungary	1	1	—	1	1	1	1	1	1
Iceland	—	1	1	1	1	1	1	1	1
India	1	1	—	—	—	1	1	1	—
Indonesia	—	—	—	—	—	1	—	—	—
Iran	—	—	—	—	—	—	—	1	—
Ireland	1	1	1	1	1	1	1	1	1
Israel	1	1	—	1	—	—	1	1	1

Italy	1	1	1	1	1	1	1	1	1	1	1	32
Jamaica	—	—	—	—	1	1	—	—	1	1	—	
Japan	1	1	1	1	1	1	1	1	1	1	—	
Jordan	—	—	—	1	—	—	—	—	—	—	—	
Kazakhstan	—	—	—	—	—	—	—	1	—	—	—	
Korea	1	1	—	—	—	1	—	—	1	1	1	
Latvia	—	—	—	—	1	—	1	1	1	1	—	
Macedonia	—	—	—	—	—	—	—	—	—	1	—	
Malaysia	—	—	—	—	—	—	1	—	—	—	—	
Mexico	1	1	—	—	1	1	1	—	1	1	1	
Netherlands	1	1	1	1	1	1	1	1	1	1	1	
New Zealand	1	1	1	1	1	1	—	—	—	—	1	
Norway	1	1	1	1	1	1	1	1	1	1	1	
Peru	—	—	—	1	—	1	1	1	1	1	—	
Philippines	—	—	—	—	—	—	1	—	—	—	—	
Poland	1	1	—	1	—	—	—	—	—	—	—	
Portugal	1	—	—	1	—	—	—	1	1	—	—	
Puerto Rico	—	—	—	—	—	—	—	—	1	1	—	
Romania	—	—	—	—	—	—	—	—	1	1	1	
Russia	1	1	—	—	—	—	1	1	1	1	1	
Serbia	—	—	—	—	—	—	—	1	1	1	—	
Singapore	1	1	1	1	1	1	1	—	—	—	1	
Slovenia	—	1	1	1	1	1	1	1	1	1	1	
South Africa	1	1	1	1	1	1	1	—	—	1	—	
Spain	1	1	1	1	1	1	1	1	1	1	1	
Sweden	1	1	1	1	1	1	1	1	1	—	1	
Switzerland	—	1	1	—	1	—	—	1	1	—	1	
Taiwan	—	1	—	—	—	—	—	—	—	—	1	
Thailand	—	1	—	—	—	1	1	1	—	—	—	
Turkey	—	—	—	—	—	—	1	1	1	1	—	
Uganda	—	—	1	1	—	—	—	—	—	—	—	
United Arab Emirates	—	—	—	—	—	—	1	1	1	—	—	
United Kingdom	1	1	1	1	1	1	1	1	1	1	1	
United States	1	1	1	1	1	1	1	1	1	1	1	
Uruguay	—	—	—	—	—	—	1	1	1	1	—	
Venezuela	—	—	1	—	1	—	—	1	—	—	—	
Total	29	37	31	34	35	42	42	42	43			

Appendix B

See Table B1.

Table B1: Latin American countries: 2001–2008 data

Country	*Data*	*Year*								
		2001	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*Average*
Argentina	*FRATIO*	0.99	0.58	1.01	1.72	1.44	2.00	1.71	0.86	1.29
	FNEC	2.76	7.18	6.49	3.27	2.85	2.19	3.90	8.26	4.61
	FOPP	2.74	4.13	6.55	5.63	4.10	4.37	6.68	7.10	5.16
	GDP	8904.14	7995.25	8803.83	9758.83	10 871.85	12 053.97	13 317.80	14 354.45	10 757.52
	CI	4.11	3.35	3.66	3.54	3.56	4.01	3.87	3.87	3.75
Bolivia	*FRATIO*	—	—	—	—	—	—	—	1.73	1.73
	FNEC	—	—	—	—	—	—	—	10.10	10.10
	FOPP	—	—	—	—	—	—	—	17.48	17.48
	GDP	—	—	—	—	—	—	—	4332.64	4332.64
	CI	—	—	—	—	—	—	—	3.42	3.42
Brazil	*FRATIO*	1.23	0.63	1.26	0.95	0.98	0.73	0.97	2.25	1.12
	FNEC	3.40	6.86	4.94	5.67	5.22	5.51	6.40	3.37	5.17
	FOPP	4.18	4.29	6.22	5.40	5.13	4.00	6.22	7.57	5.38
	GDP	7346.47	7561.67	7697.90	8231.33	8603.36	9086.32	9703.16	10 298.15	8566.05
	CI	4.26	3.95	4.09	4.05	3.69	4.03	3.99	4.13	4.02
Chile	*FRATIO*	—	0.82	1.38	—	2.31	1.44	1.63	1.80	1.57
	FNEC	—	4.99	6.46	—	2.43	2.87	3.76	3.48	4.00
	FOPP	—	4.11	8.94	—	5.61	4.14	6.13	6.28	5.87
	GDP	—	10 191.46	10 712.64	—	12 240.51	13 032.00	13 921.20	14 688.30	12 464.35
	CI	—	4.86	4.89	—	4.91	4.85	4.77	4.72	4.83
Colombia	*FRATIO*	—	—	—	—	—	1.29	0.97	1.05	1.10
	FNEC	—	—	—	—	—	7.55	9.00	9.10	8.55
	FOPP	—	—	—	—	—	9.75	8.75	9.52	9.34
	GDP	—	—	—	—	—	7317.34	7968.17	8336.99	7874.17
	CI	—	—	—	—	—	4.04	4.04	4.05	4.04

Dominican Republic	*FRATIO*	—	—	—	—	—	1.81	1.61	1.61	1.71
	FNEC	—	—	—	—	—	5.01	5.90	5.90	5.46
	FOPP	—	—	—	—	—	9.07	9.51	9.51	9.29
	GDP	—	—	—	—	—	8116.45	8558.88	8558.88	8337.67
	CI	—	—	—	—	—	3.65	3.72	3.72	3.69
Ecuador	*FRATIO*	—	—	2.18	—	—	—	2.50	—	2.34
	FNEC	—	—	7.47	—	—	—	4.47	—	5.97
	FOPP	—	—	16.25	—	—	—	11.17	—	13.71
	GDP	—	—	6151.14	—	—	—	7518.33	—	6834.74
	CI	—	—	3.18	—	—	—	3.58	—	3.38
Jamaica	*FRATIO*	—	—	—	1.96	1.80	—	1.04	—	1.60
	FNEC	—	—	—	4.57	6.23	—	6.94	—	5.91
	FOPP	—	—	—	8.95	11.23	—	7.25	—	9.14
	GDP	—	—	—	7064.03	7436.16	—	7876.29	—	7458.83
	CI	—	—	—	3.47	4.10	—	3.89	—	3.82
Mexico	*FRATIO*	1.42	2.02	—	2.27	2.99	—	5.16	—	2.77
	FNEC	4.21	2.96	—	0.97	0.87	—	1.76	—	2.15
	FOPP	5.98	5.98	—	2.20	2.60	—	9.09	—	5.17
	GDP	10772.70	10939.97	—	12563.46	13456.65	—	14581.57	—	12462.87
	CI	4.29	4.07	—	3.92	4.18	—	4.23	—	4.14
Peru	*FRATIO*	—	—	1.81	—	2.29	1.66	1.96	—	1.93
	FNEC	—	—	13.75	—	11.92	9.79	7.78	—	10.81
	FOPP	—	—	24.90	—	27.35	16.26	15.24	—	20.94
	GDP	—	—	6000.91	—	7094.14	7809.37	8584.95	—	7372.34
	CI	—	—	3.78	—	3.94	3.87	3.95	—	3.89
Puerto Rico	*FRATIO*	—	—	—	—	—	9.32	—	—	9.32
	FNEC	—	—	—	—	—	0.25	—	—	0.25
	FOPP	—	—	—	—	—	2.33	—	—	2.33
	GDP	—	—	—	—	—	21145.16	—	—	21145.16
	CI	—	—	—	—	—	4.50	—	—	4.50

Table B1: *continued*

Country	*Data*	*Year*								
		2001	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*Average*
Uruguay	*FRATIO*	—	—	—	—	—	0.91	1.22	2.50	1.54
	FNEC	—	—	—	—	—	4.45	2.99	2.08	3.17
	FOPP	—	—	—	—	—	4.04	3.65	5.21	4.30
	GDP	—	—	—	—	—	10 584.77	11 674.10	12 707.25	11 655.37
	CI	—	—	—	—	—	3.96	3.97	4.04	3.99
Venezuela	*FRATIO*	—	—	1.06	—	1.50	—	1.53	—	1.36
	FNEC	—	—	12.58	—	9.22	—	6.58	—	9.46
	FOPP	—	—	13.30	—	13.84	—	10.04	—	12.39
	GDP	—	—	7499.87	—	9992.03	—	12 176.38	—	9889.43
	CI	—	—	3.35	—	3.22	—	3.63	—	3.40