

An Initial Review of the Characteristics and Determinants of Female Entrepreneurs in Puerto Rico

Características y determinantes de mujeres empresarias en Puerto Rico: una mirada inicial

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Abstract

This paper outlines the characteristics and determinants of Puerto Rican female entrepreneurs in 2007. This study utilizes data from the Adult Population Survey (APS) for 2007 from the Global Entrepreneurship Monitor (GEM) Project. We find that female entrepreneurs in Puerto Rico are most likely sole owners of their business establishment, face many local competitors, and do not generally export their goods or services outside of the Island. The primary motivation for business start-up was business opportunism along with a personal goal of greater independence at the workplace. Education serves as a fundamental determinant of female entrepreneurship.

Keywords:

Women; entrepreneurship; female entrepreneurship; GEM; Puerto Rico.

JEL classification:

D12, F23, L26,

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Resumen

Este artículo describe las características y determinantes de mujeres empresarias en Puerto Rico para el 2007. El estudio utiliza los datos de la Encuesta de la Población Adulta del Proyecto de Global Entrepreneurship Monitor (GEM, por sus siglas en inglés). Se encontró que las mujeres empresarias en Puerto Rico tienden a ser dueñas únicas de sus negocios, tienen muchos competidores locales, y usualmente no exportan sus bienes o servicios fuera de la Isla. La motivación primaria para empezar el negocio fue tener una oportunidad de negocio junto a una meta personal de mayor independencia en el lugar de trabajo. La educación es un determinante fundamental de ser empresaria en Puerto Rico.

Palabras claves:

Mujeres; emprendimiento; GEM; Puerto Rico.

Clasificación JEL:

D12, F23, L2

1. Introduction

Carla Haeussler-Baudillo is a successful female Puerto Rican entrepreneur and a role model. One day back in 1993, Mrs. Haeussler-Baudillo decided to bake some *merengues*³ to avoid boredom while her husband was watching a football game on television. After several attempts, she came up with just the right taste for her sweets and this first batch of *merengues* was sold in one day in her mom's upscale café. By her fifth year of operation, "Carla's Sweets" had grown annual revenues to \$650,000 (Business Week, 1999). In the ensuing two decades, with the support of her family - many entrepreneurs in their own right -, Mrs. Haeussler-Baudillo grew her \$6 million dollar business into an international confectionary company employing 70 people, in a single manufacturing plant. With daily shipments from the Island during the business week, Carla's Sweets now sells online and her products have made their way onto Wal-Mart shelves. The self-proclaimed "New Queen of Merengue" is an example of Puerto Rican female entrepreneurship in action.

In recent years there has been a dramatic expansion of scholarly interest and activity in the field of women's entrepreneurship given their perceived contribution toward a country's economic development (Verheul, van Stel & Thurik, 2006). Yet, the topic of female entrepreneurship is vastly understudied, despite the fact that they are "one of the fastest rising populations of entrepreneurs and that they make a significant contribution to innovation, job, and wealth creation in economies across the globe" (de Bruin, Brush & Welter, 2006; Verheul, et al., 2006).⁴ For instance, according to the Center for Women's

3 *Merengues* are sugar and egg white sweets.

4 It is interesting to note that 14% of papers in the leading entrepreneurship journals have used this same argument for positioning their research (Ahl, 2006).

Business Research (2004), between 1997 and 2004 in the United States nearly half (48%) of all privately held firms were 50% or more women-owned firms (DeTienne & Chandler, 2007). This knowledge gap is even more palpable in the field of female entrepreneurship in Puerto Rico where very little research has been done. This paper seeks to begin to redress this near omission from the literature.

The primary objectives of this study are to provide an exploratory view of the baseline characteristics and determinants of Puerto Rican entrepreneurial women. Within this context, Puerto Rican entrepreneurs are compared regionally and nationally with regards to gendered participation rates. In addition, within Puerto Rico, the profile of (self-)employed women is compared with their counterparts across various endogenous and exogenous variables. Lastly, characteristics that influence the opportunity recognition and thus business creation are explored to determine whether they are significant in the probability of women pursuing entrepreneurship in Puerto Rico.

This paper utilizes data from the Adult Population Survey (APS) for 2007 from the Global Entrepreneurship Monitor (GEM) Project.⁵ GEM is an ongoing large-scale academic project designed to study the causes and implications of entrepreneurial behavior across many countries (Reynolds, Bosma, Autio, Hunt, De Bono, Servais, Lopez-Garcia, & Chin, 2005). For 2007, the data consists of a stratified representative sample of individuals in 39 countries, including the United States, Latin America, and Puerto Rico.⁶

The main results show that there is not a significant difference between Puerto Rican female and male entrepreneurs in terms of the baseline characteristics for entrepreneurship. These results support previous studies that have found no significant statistical gender differences in terms of entrepreneur characteristics. Moreover, the results suggest that the probability of women having a business in Puerto Rico is U-shaped with regard to education as respondents with some secondary school or graduate degree as compared with women with a four-year college education are more likely to own a business.

The paper proceeds as follows. Section 2 provides the background or context of the Puerto Rico business and entrepreneurial environment including the presentation of our research questions. Section 3 discusses the relevant literature, with emphasis on opportunity identification and associated variables. Section 4 describes the data sources, sample selection, variables of interest and the methodology employed within our multivariate analysis. Our results, including descriptive statistics and a discussion thereof, are presented in Section 5. Concluding remarks are presented in the last section of the paper.

5 GEM started in 1999 as a partnership between the London Business School and Babson College to assess the entrepreneurial activity, aspirations, and attitudes of individuals of 10 countries. As of 2011, GEM has grown to include over 100 nations around the globe. For a detailed description of the Project the reader is encouraged to access: <http://www.gemconsortium.org>.

6 2007 is the first year the APS was conducted in Puerto Rico.

2. The Puerto Rican Business and Entrepreneurial Context

While there is still much debate as to the efficacy of self-employment or entrepreneurship to help develop and grow the economy within the Latin American context (Birkbeck, 1978; Portes & Walton, 1981; Tokman, 1992; De Soto, 2000; Acs & Amorós, 2008; Terjesen & Amorós, 2010; Amorós, 2011), Latin American governments have often bypassed the entrepreneurs in favor of large domestic companies, multinationals, and industrial sectors as the most expedient path toward employment growth and national development. This large business bias is widespread, most notably in the largest Latin American economies such as Mexico, Brazil, and Argentina, among others. However, reliance on large companies and/or export sectors do not adequately disperse the risk of extensive economic downturns as recently experienced in the global economic crisis of 2008 and beyond.

Most entrepreneurship scholars subscribe to the notion that healthy economies require healthy ecosystems for entrepreneurship. Moreover, GEM suggests that an optimal combination and interrelation of macro- and micro-level components might lead to an entrepreneurship system that would promote economic development in any country. At the micro-level, GEM identifies entrepreneurs' attitudes, activities, and aspirations as the three pillars of that system (Amorós, 2011).

The World Bank provides one cross-country measure of "healthy" macro-level ecosystems within its ease of doing business reports. In 2010, Puerto Rico was the easiest place in Latin America to start a business and the sixteenth easiest location of 183 countries in the world to start a business (World Bank, 2011). Hence, the institutional environment in Puerto Rico provides relatively open access to entrepreneurial business start-ups. Indeed, Puerto Rico operates like a United States (US) state in many respects, with the biggest exception that islanders and island businesses are not required to pay US federal personal or corporate income tax. This ease of institutional business entry is a key goal of Latin American institutionalists such as Hernando De Soto (1989) who argue that small-scale entrepreneurship in Latin America is a key component to generate wealth and jobs and sustain economic vitality. Furthermore, the promotion of entrepreneurship in Latin America offers the opportunity to diversify employment and income-earning alternatives for a large portion of the economically active population (Pisani & Patrick, 2002).

As of August 2011, the Federal Reserve Bank of New York, to which Puerto Rico belongs, highlighted the current business and economic environment of Puerto Rico: 1) population is down 2.2 percent from 2000 to 2010, representing the first 10-year decline in the population on record (going back more than a century); 2) island's median household income is more than 60 percent below the mainland US; 3) educational attainment of Puerto Rican adults is moderately below the US average; 4) the government is a major employer, employing 30% of Islanders (roughly ten times the corresponding proportions on the mainland); 5) unemployment has grown more than 13 percent since 2005; and 6) the Puerto Rican economy appeared to stabilize in the second half of 2010⁷ (Federal Reserve Bank of New York, 2011).

⁷ Puerto Rico's Government Development Bank economic index has risen slightly from its low point in January 2011 but has not shown any significant growth.

Davis and Rivera-Batiz (2005) argue that several distorting effects impact employment and entrepreneurship levels in Puerto Rico, levels which are about half of the US average. With regard to employment, Davis and Rivera-Batiz (2005) suggest the dominance and largesse of the public (and welfare) sector inhibits and dis-incentivizes employment growth and entrepreneurship. They argue that "private sector work experience is a more powerful incubator of entrepreneurial skills and ambitions than jobs in the public" sector (Davis & Rivera-Batiz, 2005, p. 8). With regard to entrepreneurship, Ruiz-Vargas (2000) found that financing entrepreneurship in Puerto Rico favored the foreign-born over the native born, a home-grown penalty, the result of financial discrimination based upon educational attainment and business organization. Moreover, much of the most educated Puerto Ricans are attracted to government rather than private sector employment. Furthermore, the "corrupt" permitting process, historical tax code distortions, buy local laws, and adherence to the US minimum wage all dampen competition and employment (Davis & Rivera-Batiz, 2005).

These findings are still prevalent in the contemporary Puerto Rican business scenario as evidenced in the most recent Global Competitiveness Report 2010-2011. On the one hand, Puerto Rico ranked #41 (out of 139) among the most competitive economies of the world. This ranking is up one place compared to the previous year. However, on the other hand, inefficient government bureaucracy is the most problematic factor for doing business in the Island.

The global financial crisis of 2008 prompted the Puerto Rican government to pass draconian austerity measures (Ley 7) in 2009, which drastically impacted government employment including the relieving of all government employees with less than 10 years of tenure (approximately 12,000 employees), the suspension of wage increases for the remaining government workers, and inducements for more senior employees to retire. For the "laid-off", the government suggested entrepreneurship as a means for survival, perhaps economic betterment.⁸ While our study is positioned one year before the financial crisis and two years before the radical changes in government employment, we believe it provides for a foundational assessment of the female entrepreneurial landscape in Puerto Rico pre-financial crisis of 2008 and beyond.

Within this backdrop, we seek to explore the characteristics and determinants of female entrepreneurship in Puerto Rico. Hence we offer the following research questions:

RQ#1: What are the baseline characteristics of Puerto Rico female entrepreneurship? [Is this baseline different from males and the general wage and salaried female population?]

RQ#2: What are the determinants of Puerto Rico female entrepreneurship? [Are these determinants different from males and the general wage and salaried female population?]

⁸ Governments around the world have supported programs to provide credit and additional training so the unemployed become entrepreneurs. The belief of those governments is that the level of entrepreneurship is low and requires government attention. Among these programs we can mention: the US Small Business Administration's loan programs, the French Unemployed Entrepreneurs Programme, the English Enterprise Allowance Scheme, and the German Labour Promotion Act (Georgellis & Wall, 2005).

3. Relevant Literature

After Blanchflower and Oswald (1998), we undertake a parsimonious definition of entrepreneurship as individuals who work for themselves for a profit. We also use entrepreneurship and self-employment interchangeably (Clark & Drinkwater, 2010). GEM distinguishes between new business owners or entrepreneurs and others who are self-employed. GEM recognizes those business owners who have paid salaries for more than three months, but not longer than 42 months, as entrepreneurs.⁹ Established business owners (those who have paid salaries for a period longer than 42 months) are considered self-employed and not entrepreneurs in the new venture sense (Bosma, Acs, Autio, Coduras & Levie, 2009).

Mainstream entrepreneurship research argues that the exploitation of opportunities is the essence of entrepreneurship (Casson & Wadeson, 2007; De Carolis & Saparito, 2006; Eckhardt & Shane, 2003; Shane & Venkataraman, 2000). The search and recognition of business and economic opportunities are influenced by self-perceptions and personal ambitions. Both of these concepts are regarded as gendered due to the underlying assumption that men and women do not behave equally (DeTienne & Chandler, 2007).

Individuals' self-perceptions may lead to entrepreneurial intentions; hence entrepreneurship is a process (Bosma et al., 2009).¹⁰ In turn, these intentions are related to personal perceptions with respect to the supportiveness of a given society, the business environment, and one's own abilities (Bird, 1989; Weick, 1995). Anna, Chandler, Jansen and Mero (2000) have proposed that women might self-impose barriers by perceiving the lack of proper opportunities and know-how to start or grow their own businesses. Justo, Cruz, de Castro, and Coduras (2007) add that the enterprise life cycle and gendered expectations of work and family also impact female entrepreneurship.

Very close to self-perceptions, personal ambitions are also elements that influence opportunity recognition. Gatewood, Shaver, and Gartner (1995) argue that the way entrepreneurs think about themselves and their situation will influence their willingness to persist toward the achievement of their goals. Here societal roles and values might hinder women's ambitions to pursue entrepreneurial ideas on their own.

At the same time, the environment in which women are located might also influence their perceptions and ambitions. Culture, as the underlying system of values peculiar to a specific group or society, shapes the development of certain personality traits and motivates individuals in a society to engage in behaviors that may not be evident in other societies (Mueller & Thomas, 2000). Moreover, the country's administrative heritage, as a result of its political environment, may also shape entrepreneurship (George & Zahra, 2002). For Latin America, Terjesen and Amorós (2010) suggest a very negative environment exists for female entrepreneurship.

⁹ This period of time has been selected by GEM after a careful theoretical and operational review (Amorós, 2011).

¹⁰ The perception of entrepreneurship as a process is one of the main principles of GEM Project's philosophy (Amorós, 2011).

Research has demonstrated that female and male entrepreneurs may differ. The genders may differ in terms of their personal and business profiles. Specifically, genders may differ on starting, running, and structuring their businesses, product development, and goal attainment (Verheul, et al., 2006).

In sum, opportunity recognition and thus, business creation may be influenced by diverse variables such as the environment, prior knowledge of individuals in business (or social networks)¹¹, personal ambitions, and self-perceptions. Given the lack of research, our focus targets female entrepreneurship, its basic characteristics, and determinants as a first step forward in filling this gap within the Puerto Rican context.

4. Data and Methodology

This paper utilizes data from the Adult Population Survey (APS) for 2007 from the GEM Project.¹² For 2007, data consists of a stratified representative sample of individuals in 39 countries, including from the Western Hemisphere, Puerto Rico, the US, and eight Latin American countries (Argentina, Brazil, Chile, Colombia, Dominican Republic, Peru, Uruguay, and Venezuela).

In 2007, the GEM survey was conducted through telephone interviews of about 2,000 individuals or more from each country.¹³ The questionnaire includes an array of questions related to the individual's demographics, business characteristics as well as attitudes and awareness of entrepreneurship in each country. While the respondents selected for phone interviews are selected at random, the exclusion of households without a phone may introduce some upward income bias within the sample (e.g. including only those households with the ability to own a phone). This is a stated limitation of the GEM data, nonetheless, we believe our study does shed initial light on the profile and determinates of female business owners notwithstanding the sample acquisition method. Hence, the final Puerto Rican sample only includes the responses from 1,998 randomly selected individuals from the universe of phone owners.

In order to perform our analyses and answer both research questions, we selected 15 variables of the 2007 GEM survey (see Appendix for variable definitions). First, for determining the baseline of characteristics for Puerto Rican female entrepreneurship (research question #1) and after a detailed literature review and data availability, we have selected the following nine variables (see the Appendix for definitions and coding): sole owner, competitors, international business, reason for business, opportunity type, knowledge of others who had started a business, future business opportunities, possession of requisite business acumen, and whether or not the fear of failure would

11 For this study these two concepts are used interchangeably.

12 GEM Project consists of two tools: 1) the Adult Population Survey (APS) and 2) the National Expert Survey (NES). The APS tracks entrepreneurial attitudes, activities, and aspirations of individuals. The NES monitors nine aspects of a country's socio-economic environment that might significantly impact national entrepreneurship.

13 Interviewing individuals differentiates GEM from other entrepreneurial databases, which focus on the businesses' start-ups (Amorós, 2011).

inhibit business initiation.¹⁴ The null hypothesis of mean differences of these variables between the genders (research question #1) was tested using univariate *t*-tests (cross-tabulations).

Then, for assessing whether there are distinctive characteristics or determinants of female business ownership in Puerto Rico (research question #2), a binary logistic regression was estimated. This method estimates the probability of an event happening, in our case being a female entrepreneur.

The dependent variable is business owners (entrepreneurs according to GEM) in Puerto Rico (OWNER-GENDER). This variable was computed adding the values of OWNER and GENDER. Then, responses were coded 1 if the owner was a female and 0 if the owner was a male. The sample size was reduced to 67 observations because only completed cases for all variables were used for this analysis. A stepwise logistic procedure was used to identify the significant independent variables, which explained the probability of being a female entrepreneur in Puerto Rico. A significance level of 95% was used to determine which variables entered and remained in the model. Equation (1) shows the model based on the literature review:

$$OG_i = \alpha + \beta_1 \text{KNOWENT} + \beta_2 \text{OPPORT} + \beta_3 \text{SUSKILL} + \beta_4 \text{FEARFAIL} + \beta_5 \text{CONTROL} + \varepsilon \quad (1)$$

Where¹⁵:

- OG = is the dependent variable (OWNER-GENDER) and represents observations i's of business owners in PR. This dichotomous variable is coded 1 if the owner is a female and 0 if the owner is a male.
- KNOWENT = knowledge of others who started a business, i.e. social networks
- OPPORT = future business opportunity
- SUSKILL = possession of requisite business acumen
- FEARFAIL = fear of failure
- CONTROL = Control variables for age, education, and income

5. Results and Discussion

Table 1 provides the sample size per country and gender for Puerto Rico and the other Western Hemispheric nations undertaken by GEM in 2007. These other countries are reported as a comparator for Puerto Rico. Females represent a slight majority of total

14 Although female entrepreneurship might be determined with a range of determinants (Verhaul et al., 2006), we have limited the analysis to these variables which were available in the data of GEM.

15 See the Appendix for the definitions of the variables.

respondents of the selected countries and are somewhat oversampled for Puerto Rico, Uruguay, and Colombia. In Puerto Rico, this oversampling might be due to the methodology used in conducting the survey, where women are more likely to be at home and answer the telephone survey than men.

Table 1. 2007 GEM Sample Size by Country and Gender

Country	Females		Males		Total
	Number	%	Number	%	Number
Argentina	949	47.0	1,069	53.0	2,018
Brazil	959	48.0	1,041	52.0	2,000
Chile	2,028	50.6	1,980	49.4	4,008
Colombia	1,359	64.7	743	35.3	2,102
Peru	809	40.5	1,191	59.5	2,000
Puerto Rico	1,445	72.4	551	27.6	1,998
United States	1,087	50.2	1,079	49.8	2,166
Uruguay	1,339	67.0	661	33.0	2,000
Venezuela	1,049	58.5	745	51.4	1,794
Total	11,024	54.9	9,060	45.1	20,084

Source: GEM

Table 2 depicts the percentage of respondents who own businesses.¹⁶ The rate of business ownership in Puerto Rico (4.7%) pales in comparison to the other countries in the Western Hemisphere. Certainly, the government as a magnet for employment (pre-2008 financial crisis) and principal employer may influence this low total entrepreneurship participation rate. Furthermore, Puerto Rico falls in between an efficiency-driven economy and an innovation-driven economy (according to the Global Competitiveness Report)¹⁷ that is also heavily subsidized from Washington, D.C. (Kelley, Bosma, & Amorós, 2011). As such, the proportion of new and nascent enterprises may also be relatively lower. Despite this low proportion, the rate in which females entrepreneurs participate in the Puerto Rican economy vis-à-vis men in our dataset is favorable (53.7%).¹⁸ This result contradicts previous research where high female entrepreneurial activity is a reflection of high total activity rates (Verheul, et al., 2006).

¹⁶ The respondents were asked whether they owned a company at the time of the survey.

¹⁷ According to the Global Competitiveness Forum Report (2011) a nation can be classified as factor, efficiency, or innovation driven. This classification is based on the previous work of Porter (1990).

¹⁸ Caution must be exercised with this result given the numerical bias towards females in the sample.

Table 2. 2007 Percentage of Business Owners by Country and Female-Owned

Country	Business Owners (%)	Business Owners Female (%)
Argentina	20.5	32.7
Brazil	23.1	46.8
Chile	18.3	39.3
Colombia	31.1	56.0
Peru	34.3	58.3
Puerto Rico	4.7	53.7
United States	14.8	36.0
Uruguay	13.0	46.4
Venezuela	14.2	52.4

Source: GEM

In Table 3, we provide basic descriptive statistics for age, education, and income—demographic variables— separated by gender (female, male), and sectoral participation (entrepreneur, wage and salaried)¹⁹. For entrepreneurs, there was no statistical difference between women and men with regard to age and household income. On average, entrepreneurs are middle-aged, and relatively affluent. Education was significantly different for men and women²⁰ where women possessed much higher levels of advanced college training. This result is in line with the statistics of the Federal Reserve Bank of New York (2011) that report that 31 percent of young women (age 25-44) hold college degrees, which is roughly on par with the US average.

Table 3. Descriptive Statistics for Puerto Rico (2007)

Variable	Entrepreneur		Wage & Salaried/Not Employed		All (%)
	Female (%)	Male (%)	Female (%)	Male (%)	
Age (Years)					
18-24	5.0	0.0	12.6	20.5	14.3
25-34	17.5	15.6	14.6	16.4	15.1
35-44	27.5	31.3	18.4	16.4	18.3
45-54	27.5	21.9	22.1	20.3	21.7
55-64	22.5	31.3	32.3	26.5	30.5

(continued)

19 Variable descriptions and GEM codes are included as an appendix to the paper.

20 A cross-tabulation resulted in a significant difference (Pearson Chi-Square = 9.672, p = 0.022).

Table 3. Descriptive Statistics for Puerto Rico (2007). (continued)

Variable	Entrepreneur		Wage & Salaried/Not Employed		All (%)
	Female (%)	Male (%)	Female (%)	Male (%)	
Education					
Some High School	2.3	7.9	15.0	10.4	13.4
High School	20.5	21.1	25.3	25.6	25.2
College	9.1	31.6	17.1	21.1	18.3
Graduate School	68.2	39.5	42.5	42.9	43.1
Income					
Lowest (third)	22.2	16.7	45.5	34.5	41.4
Middle (third)	30.6	22.2	25.8	27.7	26.3
Highest (third)	47.2	61.1	28.8	37.8	32.3
N	44	38	1401	511	1998

As a comparison, the remainder of the GEM sample is also provided in Table 3. Generally, Puerto Rican entrepreneurs are older, work more, are better educated, and are more affluent than non-business owners.

For women, three of the four demographic categories are statistically different between entrepreneurs and the wage and salaried/not employed. There was no significant difference as far as age between female entrepreneurs and non-entrepreneurs. As expected, entrepreneurs are significantly engaged in economic activity vis-à-vis the wage and salaried/not employed (Pearson Chi-Square = 55.192, $p = 0.000$). Additionally, female entrepreneurs possessed higher levels of education (Pearson Chi-Square = 13.260, $p = 0.004$) and earned more income (Pearson Chi-Square = 8.548, $p = 0.014$) than wage and salaried/not employed females. Similar to women, male entrepreneurs were more affluent and more engaged in economic activities than their male wage and salaried/not employed counterparts. Unlike female entrepreneurs, male entrepreneurs were not significantly different than their wage and salaried/not employed male counterparts with regard to education, but male entrepreneurs were more likely to be older than wage and salaried/not employed males.

Building upon our demographic work in the previous section which concluded that female entrepreneurs in Puerto Rico are typically middle-aged, with high levels of educational attainment, and come from affluent households, we added entrepreneur specific context to the baseline characteristics of female entrepreneurs in Puerto Rico along nine variables of interest to answer research question #1 (see Table 4).

Table 4. Baseline Characteristics of Puerto Rican Entrepreneurs

Characteristic	Female		Male	
	N	%	N	%
Sole Owner				
Yes	28	71.8	24	82.8
No	11	28.2	5	17.2
Local Competitors				
Many	21	53.8	22	75.9
Few or None	18	46.2	7	24.1
Engage in International Business				
Yes	11	28.2	11	37.9
No	28	71.8	18	62.1
Reason for Pursuing Business Opportunity				
Take advantage of business opportunity	18	54.5	14	48.3
No better choice for work	5	15.2	6	20.7
Combination of above	9	27.3	7	24.1
Have a job, but seek better opportunity	1	3.0	2	6.9
Motive for Undertaking Business Opportunity				
Greater independence	9	47.4	5	35.7
Increased personal time	6	31.6	4	28.6
Just to maintain income	4	21.1	4	28.6
None of these	0	0.0	1	7.1
Knowledge of Others who had Started a Business				
Yes	22	52.4	22	57.9
No	20	47.6	16	42.1
Future Business Opportunities				
Yes	16	39.0	12	32.4
No	25	61.0	25	67.6
Possession of Requisite Business Acumen				
Yes	38	90.5	31	81.6
No	4	9.5	7	18.4
Fear of Failure				
Yes	10	23.8	8	21.1
No	32	76.2	30	78.9

Note: Italics indicate significant differences between genders by category ($p \leq .10$). See Appendix for variable definitions.

According to the GEM survey (see Table 4), Puerto Rican female entrepreneurs primarily own (71.8%) their own business without partners. Just over half of female entrepreneurs report that their businesses face many local competitors, a situation significantly less intense than their male peers. While Puerto Rico is physically isolated from the US mainland, more than one-quarter of female-owned businesses export goods and services off the island—an impressive record of achievement. Survival (or necessity-driven) entrepreneurship abounds in the development economics literature (Portes, Castells, & Benton, 1989), yet only about one in seven Puerto Rican female entrepreneurs explicitly state “no better choice for work” as their reason for pursuing enterprise ownership. It was the spark of business opportunity, independence, and increased personal time that spurred on many of these new ventures.

As social networks may be an important component of business engagement, economic vitality, and dynamic component for the international expansion in Puerto Rico (Orengo, 2012), about half of female entrepreneurs knew of someone who had started their own business between 2005 and 2007. Yet more than six in ten female entrepreneurs were pessimistic about short-run business opportunities. This pessimism did not reach into their self-reported ability to conduct business, where more than nine in ten felt confident in their business skill set. Nevertheless, about one fifth of female entrepreneurs noted a fear of potential failure was a concern for future business ventures.

These results do not show a significant difference between genders based on these nine variables except for the competitive environment. Our results support previous studies that have found no significant differences between gender in terms of achievement, motivation, autonomy, persistence, aggression, independence, non-conformity, goal-orientation, leadership, or locus of control (Birley, 1989).

Our results suggest that education differentiates gender-based entrepreneurship where college educated Puerto Rican women are 82.4% less likely to engage in entrepreneurship activities than Puerto Rican women with high school educations or less. In essence, the females who are college educated at the bachelor degree level are risk-adverse to owning and operating business concerns. This is not true of those Puerto Rican females educated up to the high school level as well as those possessing graduate school educations creating a U-shaped distribution of female entrepreneurship. No other variables are significant in the analysis (see Table 5).

A possible explanation for these results rests in the fact that many young women in Puerto Rico finish a vocational degree which provides them with a non-professional career that might lead them to open businesses, such as cosmetology, hair dressing, and nail technician. To this equation we can add the high proportion of single and adolescent women who start families at a younger age on the Island, and thus need to provide support to a family with a short-term career that might lead to micro-enterprise new ventures. This phenomenon may follow the general social context in Latin America where women-owned businesses are an extension of the family (Terjesen & Amorós, 2010) where familial obligations such as child care may go hand in hand with self-employment (Pisani

& Yoskowitz, 2012). This however only explains one tail of the U-shaped distribution by education. Women with graduate degrees are also heavily engaged in entrepreneurial activities where incomes reflect higher earnings in connection with business ownership. This relationship between education and entrepreneurship is not a peculiarity of the Puerto Rican scenario. Similar results were reported in Colombia using the GEM data for 2009 (Escadon Barbosa and Arias Sandoval, 2011). Perhaps this indicates a self-selection of high ability women, where graduate education serves as a proxy for high ability in an educational environment where four-year college degrees are commonplace. Supporting this probable explanation are the opportunity-driven nature of female entrepreneurship in Puerto Rico and the general belief among Puerto Rican entrepreneurial women that they possess the requisite skills to run a business in a perceived highly competitive economic environment. Additionally, Puerto Rican female entrepreneurs appear to be well connected within the large entrepreneurial eco-system through embedded relationships and networks with similarly positioned business owners. Lastly, many Puerto Rican female entrepreneurs are ready to engage the outside business environment through the conduct of business off the Island.

Table 5. Determinants of Female Entrepreneurship Among Puerto Rican Entrepreneurs

Variable	β Coefficient	S.E.	Wald	Sig.	Exp(β)
Constant	2.565	1.797	2.036	0.154	12.996
Education			5.405	0.067*	
College	-1.740	1.006	2.992	0.084*	0.176
Graduate School	0.306	0.720	0.180	0.671	1.358
Income			0.306	0.858	
Middle	-0.409	0.834	0.241	0.623	0.664
High	-0.391	0.763	0.263	0.608	0.676
Age	-0.042	0.028	2.203	0.138	0.959
KNOWENT	0.236	0.622	0.144	0.704	1.266
OPPORT	-0.158	0.652	0.059	0.809	0.854
SUSKILL	-1.008	0.986	1.046	0.306	0.365
FEARFAIL	-0.142	0.794	0.032	0.858	0.868

Cox & Snell R²= 0.182

Nagelkerke R²= 0.243

Note: See Appendix for variable definitions. For the statistical analysis Education was re-coded into three categories: some education up to high school (reference category); up to college education; and graduate education. For Income, the reference category is lower income (low).

We also estimated a logistic regression by gender to uncover significant differences between Puerto Rican entrepreneurs and the general population within the survey (research question #2). The dependent variable was business ownership (yes=1) and demographic predictor variables for age, education, and income are included. For women, we found that entrepreneurs were significantly different with regards to income, where women from the highest income group were 1.80 times more likely to be entrepreneurs than women from the poorest income group ($p = 0.024$, Nagelkerke $R^2 = 0.079$). Similarly, wealth made a difference for men, as richer households were 1.82 more likely to be entrepreneurs than poor households ($p = 0.043$). Clearly, access to wealth facilitates new venture creation and persistence. In an environment where there is evidence of bias against business financing for the native-born, wealth may serve as a reservoir for capital formation and springboard for new venture development where indigenous financial institutions are reluctant to do so (Ruiz-Vargas, 2000). For men, age was also significant with each additional year increasing the likelihood of becoming an entrepreneur by 3.1% ($p = 0.034$, Nagelkerke $R^2 = 0.067$), perhaps a function of accumulated business experience that assists in the new venture launch where educational attainment is lower than for women.

6. Conclusion

This study outlines the characteristics and determinants of entrepreneurial Puerto Rican women and illustrates the distinctive characteristics and attributes of female business owners in Puerto Rico. The aim of the paper is to shed some additional light into this understudied area in the mainstream literature: women entrepreneurs and Puerto Rico.

The results do not show a significant difference between genders in terms of ownership, international business, reason for pursuing a business, and motive for pursuing the business opportunity. In general, business owners in Puerto Rico are sole owners, have many competitors, and do not export a large proportion of their firm's activity, although many do export. The primary reason for pursuing the business was opportunity-driven and the most important motive for pursuing that opportunity was obtaining greater independence. There is a clear overlap in business acumen among women and men within the Puerto Rican context. Nevertheless, women with a four-year college degree are much less likely to start a new business venture vis-à-vis high school educated Puerto Rican women, illustrating a U-shaped relationship between education and entrepreneurship. This is an important finding where scarce public resources may target those groups that are most likely to engage the entrepreneurial eco-system. These resources may include business training, business networking, and access to business financing.

Given the limitations of the sample and some variable proxies, this study might be further extended in the future. A larger sample might provide a better profile of business owners in Puerto Rico, especially females. Moreover, more refined variables might support the mainstream entrepreneurship research arena that opportunity recognition, self perceptions, personal ambitions, and social networks indeed are fundamentals for pursuing businesses. Despite these limitations, the study does shed some initial light on the profile of female business owners in Puerto Rico and provides a basis of comparison with males.

Our results may be of interest to public, educational, and social institutions in Puerto Rico managing policies, programs or incentives to encourage and support female entrepreneurship. For example, high schools may be a unique incubator for female entrepreneurship, particularly for businesses in the trades. Graduate school training may be supplemented with new venture training, idea recognition, and business-related seminars. Perhaps future entrepreneurial success and role models such as Carla Haeussler-Baudillo, the Puerto Rican “Queen of Merengue”, may not need to get bored between football intermissions, but rather be created through purposeful design and policies elevating entrepreneurship to a national priority that puts women front and center in the economic development of Puerto Rico.

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Appendix. Variable Definitions

Name	GEM Code	Description
PANEL A – Baseline Characteristics of Entrepreneurs		
Sole Owner	OMOWNERS	Number of people owning and managing the business. Three categories: One; Two; Three
Competitors	OMCOMPET	Respondents' perceptions on the existence of others businesses offering the same product or services to potential customers. Three categories: Many or Few/No business competitor
International Business	OMEXPORT	Respondents' proportion of customers living outside the country. Yes/No Answers
Reason for Business	OMREASON	Respondents' reason for pursuing business opportunity. Four categories: Take advantage of business opportunity; No better choices for work; Combination of both of the above; Have a job but seek better opportunities
Opportunity Type	OMTYPE	Of those respondents taking advantage of business opportunity, the most important motive for pursuing it. Four categories: Greater independence; Increased personal income; Just to maintain income; None of these
PANEL B – Regression Variables		
Dependent variable		
Owner	OWNMGE	Respondents who, at the time of the survey, were the owner of a company that they manage, self-employed or selling any goods or services to others. YES/NO Answers

(continued)

Appendix. Variable Definitions. (continued)

Name	GEM Code	Description
Gender	GENDER	Respondents' gender
Independent variables		
Social Networks	KNOWENT	Respondents were asked whether they knew someone personally who started a business in the 2 years preceding the survey. YES/NO Answers
Opportunity Perception	OPPORT	Respondents were asked whether they believe that, in the 6 months following the survey, good business opportunities would exist in the area they lived YES/NO Answers
Self-Perception	SUSKILL	Respondents were asked whether they believed to have the knowledge, skill and experience required to start a business. YES/NO Answers
Fear of Failure	FEARFAIL	Respondents were asked whether fear of failure would prevent them from starting a business. YES/NO Answers
Age	AGE	Respondents' year of birth. Six categories: 18 – 24 yrs; 25 – 34 yrs; 35 – 44 yrs; 45 – 54 yrs; 55 – 64 yrs; 65 – 74 yrs.
Education	GEMEDUC	Respondents' highest degree. These responses were harmonized across all the countries into a five-category variable. Categories: Some secondary school; Secondary degree; Post-secondary degree; Graduate experience; No education. The categories were aggregated into three: education up to high school, college, and graduate school.
Household Income	GEMHHINC	Respondents' household income; divided in three categories based on the income distribution of their country of origin. Three categories: Lower 33%; Middle 33%; Upper 33%

Note: This table provides the name, the GEM code and a brief description of the question in the survey. The GEM code was adopted for the variables' name for this study. All the variables are either dichotomous or categorical in nature, except age which was aggregated into six classes.