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Female-Owned Firms in Latin America

Characteristics, Performance, and Obstacles to Growth

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Abstract

This paper examines the characteristics and performance of female-owned firms in Latin America. Data from firm surveys show that female-owned firms tend to be smaller than male-owned firms in terms of employees, sales, costs, and physical capital. Female-owned firms also have lower profits than male-owned firms, but for larger firms this difference disappears after controlling for labor and capital inputs. Medium-size and large female-owned firms are as productive as male-owned firms of the same size, although micro and small female-owned firms are less productive than male-owned firms. There is no evidence that the differences between female and male-owned firms are due to differences in access to finance or regulatory burdens. However, this paper finds a negative correlation between child care and household obligations and female-owned firm size and performance.

This paper—a product of the Finance and Private Sector Development Team, Development Research Group—is part of a larger effort in the department to understand the role of gender-related issues in private sector development. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The author may be contacted at mbruhn@worldbank.org.

Female-Owned Firms in Latin America: Characteristics, Performance, and Obstacles to Growth

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1. Introduction

A long-standing literature has examined female entrepreneurship, as well as differences across female and male-owned firms, in developed countries. (See Parker, 2009, for an overview of this literature.) More recently, there has also been an increased interest in female-run firms in developing countries and their potential for creating growth in these countries. Many microfinance programs focus on female borrowers, encouraging women to set up firms, and several government programs are also geared towards promoting female entrepreneurship.

However, compared to the developed country evidence, there is little systematic evidence on the characteristics and performance of female-owned firms in developing countries[2]. Moreover, obstacles faced by female business owners in developing countries could differ from obstacles in developed countries and could also differ across countries or regions within the developing world, depending on the institutional, cultural, and religious background of the region. For this reason, it is important to study the characteristics, performance, and obstacles of female-owned firms separately for different regions.

This paper examines female entrepreneurship in Latin America. It first uses nationally representative labor market surveys to characterize how female firm ownership in Latin America varies across firm size and industry in eight Latin American countries. In all countries, female firm owners are concentrated in the smallest firms, as measured by employees, reaching up to 50 percent of micro firm owners. The percentage of female firm owners is much smaller among larger firms, going down to 12 percent. With respect to industries, the percentage of female firm owners is highest in trade, followed by manufacturing and services.

The paper then relies on firm level surveys from a number of Latin American countries to investigate differences in characteristics and performance across female-and male-owned firms. These firm surveys cover a range of different firms, from micro firms to large manufacturing firms. All surveys show that female-owned firms are not only smaller in terms of their number of employees, as was evident in the labor market surveys, but also in terms of sales, costs, and the value of physical capital. The magnitude of the difference in employees ranges from 9 to 36 percent, and the magnitude of the difference in sales ranges from 23 to 104 percent. Female-owned firms also have lower average and median profits than male-owned firms. Average profits are between 15 and 20 percent of a standard deviation lower for female-owned firms than for male-owned firms. Finally, female firm owners tend to have fewer years of education than male firm owners, and they work about 25 percent fewer hours than male firm owners.

[2] Exceptions include Bardasi and Getahun (2008), De Mel, McKenzie, and Woodruff (2009), and World Bank (2008).

The paper then asks whether female-owned firms are less productive than male-owned firms. The productivity analysis shows that this is true for micro and small firms. However, there is no difference in productivity between medium-sized and large female- and male-owned firms.

The paper considers a number of different obstacles that could be the reason why female-owned firms are smaller than male-owned firms. Most of these obstacles do, however, not appear to differ across female- and male-owned firms. First, I do not find any consistent evidence that female-owned firms have less access to external finance than male-owned firms. Second, female firm owners are no more likely to perceive a host of institutional and market related factors to be obstacles to firm operation and growth than male-owned firms. The only significant difference in perceived obstacles is that female firm owners are up to 50 percent more likely than male firms owners to report that having to care for children and household obligations poses an obstacle to firm operation and growth.

Additional analysis using matched household-firm data for Mexican micro firms also suggests that child care obligations could be restricting the growth of female-owned firms. The results of this analysis show that the differences in size and profits between female- and male- owned firms are larger in households where children under the age of 12 are present. The presence of children accounts for 30 to 40 percent of the differences in size and profits between female- and male-owned firms. Data from Mexico and Bolivia also indicate that women are two to three times more likely than men to operate a business from inside their home. This suggests that household obligations could be restricting the location, size and industry choices of female entrepreneurs[3].

Finally, the paper examines differences in risk aversion as another factor that could explain why female-owned firms tend to be smaller than male owned firms. Data from Mexico, however, do not show any differences in the level of risk aversion of female and male entrepreneurs.

This paper is related to Sabarwal and Terrell (2009) who study the performance of female-owned firms in Latin America. They also find that female-owned firms are smaller than male-owned firms in many dimensions. However, their paper differs from this paper in the sense that they only use data on formal firms with over 5 employees. Moreover, the data they use does not clearly distinguish between female-owned firms and family-owned firms, since the data only indicates whether one of the principal owners if female. The results are thus not directly comparable to the results of this paper. In addition, the data used in Sabarwal and Terrell does not allow them to examine child care and household obligations as an obstacle to firm

[3] Note that this evidence does not necessarily imply that female firms would grow if women's child care and household obligations were reduced. The correlations observed in this paper are equilibrium outcomes, which could reflect an efficient division of labor in the household instead of reflecting an obstacle to female-owned firm growth. Investigating whether female-owned firms would grow if women's child care and household obligations were reduced requires examining the effect of an exogenous change in child care and/or household obligations on female firm growth, such as the introduction of a child care program. The findings in this paper suggest that this is an important area for future research.

performance and growth, whereas my findings point to these obligations being an important obstacle for the development of female-owned firms in Latin America.

The rest of this paper is organized as follows. Section 2 examines the distribution of female business ownership across firm size and industries. Section 3 describes differences in characteristics and performance of female- and male-owned firms. Section 4 investigates possible reasons for the differences across female- and male-owned firms. Section 5 concludes.

2. Female Businesses Ownership by Firm Size and Industry

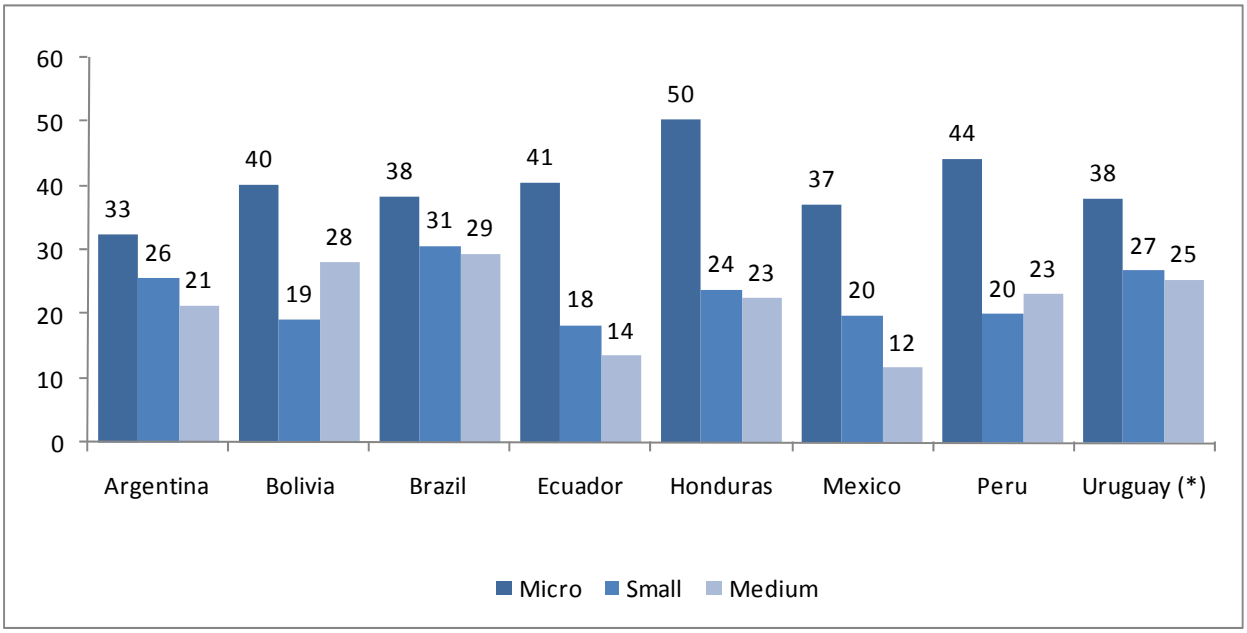
This section examines how female business ownership varies across firm size, industry, and countries within Latin America. The statistics in this section are based on national household surveys that, in most cases, are representative for the whole country. For Brazil and Peru, these surveys are only representative for the largest cities.

I chose to use household surveys rather than firm surveys in this section since most surveys that cover a large number of firms in different industries and across different firm sizes do not include information on firm owner's gender. Based on the household surveys, I construct a sample of individuals that when asked about their economic activity say that they are either self-employed or business owners. If they are business owners, the surveys also ask them how many employees the firm has. For all individuals, the industry in which they work is also available.

Figure 1 displays the percentage of micro, small, and medium-size firm-owners that are women, averaged over all industries. Micro firms are defined as having less than five employees (including the owner). This category thus also includes the self-employed. The percentage of female business owners in micro firms ranges from 33 percent in Argentina to 50 percent in Honduras. As firm size increases, the percentage of female business owners drops in all countries. Only between 18 and 31 percent of small firms owners are women, where small firms are defined as having 5 to 10 employees.

A drawback of using national household surveys is that they capture few large firm owners. The largest category (medium size firms) is thus defined as firms that have more than 11 employees. For Bolivia and Peru, there are only a handful of firms in this category, leading to imprecise estimates of the percentage of female ownership. Other than for these two countries, the data show consistently that female ownership declines as the firm size category increases. Medium size firms have the lowest percentage of female owners, going down to 12 percent in Mexico.

Figure 1: Percentage of Female Firm Owners by Size Group

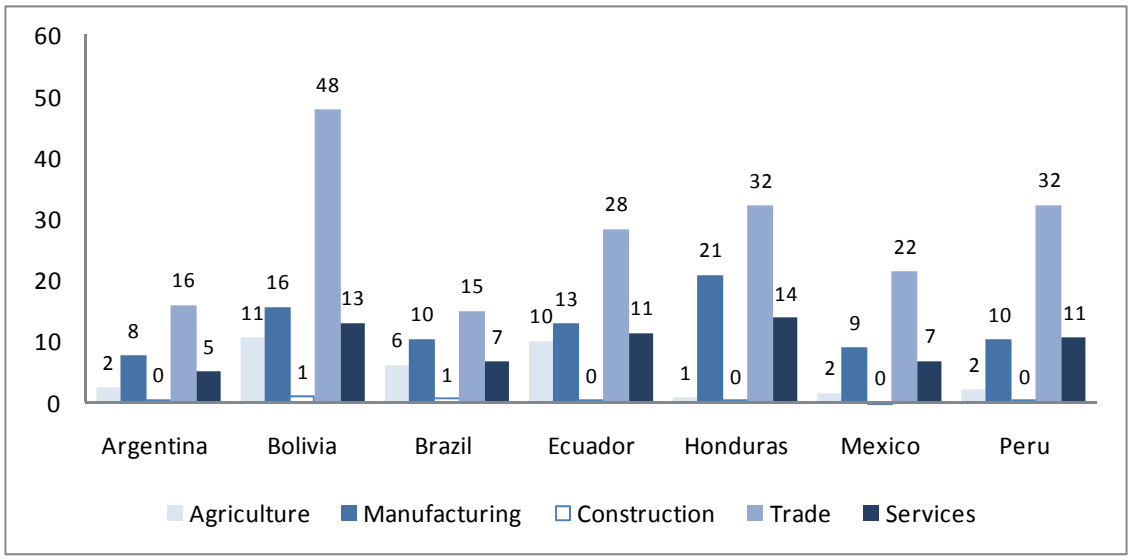


Note: Micro firms are defined as having less than 5 employees (including the owner), small firms have 5 to 10 employees, and medium size firms have more than 11 employees. For Uruguay only, small firms have between 5 and 9 employees and medium size firms have more than 10 employees. The year is 2008 or a year close to 2008.
Source: Author's calculations based on household surveys from local statistical agencies.

Figure 2 shows the percentage of female firm owners in different industries. In all countries, the highest concentration of female firm owners is in trade. Up to 48 percent of firm owners in this industry are women. Manufacturing is the industry with the second largest percentage of female firm owners, followed closely by services. In most countries, few firm owners in agriculture are women, with the exception of Bolivia, Brazil, and Ecuador. In all countries, there is only a negligible fraction of female firm owners in the construction industry.

Overall, the household survey data indicates that there is substantial variation in the percentage of female firm owners across firm size categories and across industries. Female firm owners are concentrated in the smallest firms and are predominantly in the trade sector.

Figure 2: Percentage of Female Firm Owners by Industry



Source: Author's calculations based on household surveys from local statistical agencies.

3. Characteristics and Performance of Female-Owned Firms vs. Male-Owned Firms

3.a. Data Description

This section relies on four different firm level data sets from a number of Latin American countries data to compare characteristics and performance of female-owned and male-owned firms. The first dataset is a 2002 nationally representative micro firm survey from Mexico, the *Encuesta Nacional de Micronegocios* (ENAMIN). The second and third datasets are World Bank surveys of micro and small firms in Bolivia and Peru, from the year 2007 and 2008, respectively. These surveys cover only a small number of industries and are not designed to be representative of these industries. The fourth dataset encompasses the 2003 World Bank Enterprise Surveys for Brazil, Ecuador, El Salvador, Guatemala, Honduras, and Nicaragua. Unlike the other three datasets, the Enterprise Surveys focus on larger firms and include only few firms with less than 5 employees. The Enterprise Surveys cover only the manufacturing industry and are nationally representative for manufacturing firms. Firms in the Enterprise Survey are all formal, whereas the three micro firm surveys interview formal and informal firms.

All these datasets were chosen because they allow me to identify whether the principal owner of the firm is male or female. The three micro firm surveys interview the owner and also include several owner characteristics, such as education and family background. The Enterprise Surveys do not necessarily interview the firm owner, but they include a question about the gender of the firm's principal owner[4]. They do not provide other owner characteristics. All surveys also provide information on the firm performance, financing, as well as obstacles the firm faces.

[4] Another round of World Bank Enterprise Surveys was conducted in a large set of Latin American countries in 2006. However, the 2006 surveys do not ask for the gender of the principal owner. Instead, they ask whether any of the principal owners is female, which could also be the case for family firms. There is no way of distinguishing

The reason for using multiple, complementary datasets is that it allows me to investigate whether the differences across female and male-owned firms vary across countries and firm types. Moreover, as will become clear in the discussion below, each dataset has its own strengths and weaknesses in terms of sample size, coverage, and questions that could be relevant to identifying obstacles for female entrepreneurs.

Each of the datasets covers a different set of industries. The Enterprise Surveys cover only manufacturing firms. The Mexican data covers all industries, but the Bolivian and Peruvian data only cover activities that are commonly performed by micro or small firms in each respective country. Appendix Table A1 contains a list of industries represented in each dataset, with the corresponding share of female-owned firms. In line with the statistics in Section 2, in the nationally representative Mexican data, the largest share of female firms is in the trade sector (45.3 percent), followed by manufacturing and services. The Enterprise Survey data, which is representative of large, formal firms in the manufacturing industry, indicates that there is quite a lot of variation in female-ownership within the manufacturing industry. The highest concentration of female-owned firms (32.2 percent) is in clothing manufacture, while there are few female-owned firms in textile manufacture (5.4 percent).

Table 1 compares averages and standard deviations for the variables used in this section across the different datasets. With 1.37 employees on average, firms in the Mexican data are smaller than the firms in the other datasets. Second largest are the firms in the Bolivian data, with 3.89 employees on average, followed by the firms in the Peruvian data, with 6.97 employees on average. With 85 employees on average, firms in the Enterprise Surveys stand out as being much larger than the firms in the other datasets. When looking at sales or profits as a measure of firm size, the Mexican data again includes the smallest firms, followed by the Bolivian data, the Peruvian data, and then the Enterprise Surveys.

About 30 percent of firms are female-owned in the Mexican and Peruvian data. In the Bolivian data, this number is higher (46 percent); while in the Enterprise Surveys, the number is much lower (15 percent). Appendix Figure A1 shows that, in the Mexican, Bolivian, and Peruvian datasets, the distribution of female-owned firms across firm size as measured by the number of employees is very similar to the one displayed in Figure 1 in Section 2. The percentage of female-owned firms reaches up to 55 percent in the smallest size category, but tends to decline with firm size. Note, however, that the datasets for Bolivia and Peru are not representative and that Table A1 can thus only be used to describe the sample, but not to draw conclusions about the percentage of female firms in these countries overall. Appendix Figure A1 also indicates that, among the relatively large manufacturing firms in the Enterprise Surveys, the percentage of female-owned firms again drops with firm size. Firms in the largest size category (over 100 employees) have very low shares of female ownership, varying from 4 percent in Ecuador and to 14 percent in El Salvador.

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family firms from other firms in the data. The percentage of female owned firms as measured in the 2006 Enterprise Surveys is about twice as big as measured in the 2003 Enterprise Surveys, suggesting that any gender based statistics and differences generated from 2006 surveys might be confounded with characteristics of family owned firms. Sabarwal and Terrell (2009) use the 2006 Enterprise Surveys to examine differences in firm characteristics and firm performance across firms with partial female ownership and firms without any female ownership.

Table 1: Descriptive Statistics

	Averages and Standard Deviations			
	Mexico	Bolivia	Peru	Enterprise Surveys
Panel A: Firm characteristics				
Firm age	9.57	13.55	12.96	19.32
	(9.15)	(10.67)	(10.02)	(15.58)
Employees	1.37	3.89	6.97	85.59
	(0.90)	(5.43)	(6.21)	(239.75)
Property value (in thousands)	8.89	9.54		418.25
	(16.98)	(52.45)		(2393.17)
Machinery value (in thousands)	3.12	4.97		456.34
	(7.67)	(14.12)		(2590.59)
Sales (last month)	1.15	1.36	6.66	1944.25
	(2.30)	(2.94)	(14.71)	(5047.84)
Operating costs (last month)		0.88	5.27	1533.88
		(2.33)	(10.91)	(4123.64)
Profits (last month, in thousands)	0.38	0.47	1.40	410.36
	(0.41)	(0.97)	(6.64)	(1293.68)
Firm is registered with the authorities	0.31	0.55	0.65	
	(0.46)	(0.50)	(0.48)	
Adopted new technology during past 3 years				0.60
				(0.49)
Panel B: Owner characteristics				
Female	0.29	0.46	0.29	0.15
	(0.45)	(0.50)	(0.45)	(0.35)
Hours worked	45.13	59.78	59.02	
	(23.11)	(29.65)	(23.51)	
Owner's years of schooling	8.06	10.55	11.94	
	(4.93)	(4.54)	(3.51)	
Owner participated in business training		0.25		
		(0.43)		
Owner's mother has no schooling		0.35		
		(0.48)		
Number of firms	8,293	265	582	2,175

Note: Property and machinery values in the Mexican and Bolivian data are conditional on having property or machinery, respectively. All monetary values are in US Dollars.

Source: Encuesta Nacional de Micronegocios (ENAMIN), 2002, Bolivian World Bank Micro Enterprises Survey, 2007, Peruvian World Bank Micro Enterprises Survey, 2008, World Bank Enterprise Surveys for Brazil, Ecuador, El Salvador, Guatemala, Honduras, and Nicaragua, 2003.

3.b. Gender Differences in Firm Characteristics

This section examines whether female-owned firms are different from male-owned firms in terms of size, profitability and other business and owner characteristics. Table 2 displays the differences in the average characteristics across female- and male-owned firms, along with their statistical significance. All differences control for city, region, or country fixed effects, in order to eliminate any possible confounding factors associated with the fact that some areas have a larger share of female entrepreneurs. Most of the outcome variables are in logs in order to ensure that the results are not being driven by outliers.

Table 2 shows that female-owned firms tend to be younger than male-owned firms, although this difference is only statistically significant in the Mexican and Peruvian data. In line with the results on firm size from Section 2, female-owned firms have fewer employees than male-owned firms. In the Mexican data, where most firms only have a handful of employees, the difference in employees is 9.4 percent. In the Bolivian data and in the Enterprise Surveys, female-owned firms have about 30 percent fewer employees than male-owned firms. There is no statistically significant difference in employees across female-owned and male-owned firms in the Peruvian data. However, female-owned firms in the Peruvian data are smaller than male-owned firms in terms of sales and operating costs. In the other datasets, female-owned firms also have lower sales and lower operating cost than male-owned firms. Depending on the dataset, the magnitude of the difference in sales varies from 22.6 to 103.7 percent[5]. All datasets except for the Peruvian data include information on property and machinery owned by the firms. Both property and machinery values are more than 50 percent lower for female-owned firms than for male-owned firms[6].

The profit data displayed in Table 2 indicates that female-owned firms also have lower profits than male-owned firms in all datasets. Note that profits are not measured in logs here since this variable includes negative values[7]. The magnitude of the difference in average profits ranges from 15 to 20 percent of a standard deviation. The difference is statistically significant in all countries except Bolivia, possibly due to the small sample size of the Bolivian data. Since the profit variable has a lot of variation in it, I also ran a median regression for profits to check the robustness of the results to outliers, thus comparing median profits rather than average profits. The difference in median profits is also negative and is statistically significant for all datasets except the Peruvian data.

[5] The differences in firm size across female- and male-owned firms are robust to controlling for firm age, suggesting that they do not simply reflect differences in the firms' vintage.

[6] In the Mexican data, only 15 percent of firms own property, and 87 percent of firms own machinery or tools. In the Bolivian data, these numbers are 44 percent and 98 percent, respectively. All firms in the Enterprise Surveys own property and machinery. The property and machinery values are conditional on owning property or machinery, respectively.

[7] In order to ensure that results are not driven by extreme outliers, the sample excludes the firms that have profit values in the top and bottom 1 percentile for the firm's region, industry, and size.

Table 2: Differences in Characteristics of Female- and Male-Owned Firms

	Difference in Averages (Female - Male)			
	Mexico	Bolivia	Peru	Enterprise Surveys
Panel A: Firm characteristics				
Ln firm age	-0.538***	0.017	-0.227***	-0.025
	(0.031)	(0.098)	(0.074)	(0.054)
Ln employees	-0.094***	-0.361***	-0.029	-0.319***
	(0.009)	(0.105)	(0.076)	(0.063)
Ln property value	-0.609***	-0.794**		-0.545***
	(0.075)	(0.311)		(0.124)
Ln machinery value	-1.213***	-2.273***		-0.748***
	(0.055)	(0.229)		(0.122)
Ln sales (last month)	-0.226***	-1.037***	-0.260**	-0.597***
	(0.032)	(0.170)	(0.128)	(0.097)
Ln operating costs (last month)		-1.270***	-0.247*	-0.613***
		(0.189)	(0.143)	(0.097)
Profits (last month, in thousands)	-0.061***	-0.191	-1.035**	-191.47***
	(0.009)	(0.120)	(0.514)	(67.15)
Profits (last month, in thousands)	-0.062***	-0.160***	-0.109	-13.34***
- median regression	(0.000)	(0.035)	(0.083)	(5.65)
Firm is registered with the authorities	-0.067***	-0.174***	-0.008	
	(0.011)	(0.061)	(0.043)	
Adopted new technology during past 3 years				-0.058**
				(0.030)
Panel B: Owner characteristics				
Ln hours worked	-0.265***	-0.227***	-0.037	
	(0.020)	(0.086)	(0.052)	
Owner's years of schooling	-0.740***	-1.806***	-0.323	
	(0.119)	(0.548)	(0.334)	
Owner participated in business training		-0.141***		
		(0.051)		
Owner's mother has no schooling		0.087		
		(0.060)		
Number of firms	8,293	265	582	2,175

Note: Property and machinery values in the Mexican and Bolivian data are conditional on having property or machinery, respectively. All monetary values are in US Dollars. All regressions include city, region, or country fixed effects. Robust standard errors in parentheses. Significance levels: *** 1 percent, ** 5 percent, * 10 percent.
Source: Encuesta Nacional de Micronegocios (ENAMIN), 2002, Bolivian World Bank Micro Enterprises Survey, 2007, Peruvian World Bank Micro Enterprises Survey, 2008, World Bank Enterprise Surveys for Brazil, Ecuador, El Salvador, Guatemala, Honduras, and Nicaragua, 2003.

With respect to other firm characteristics, the Enterprise Surveys include information on whether a firm adopted a new technology during the past three years. Female-owned firms are 5.8 percent less likely to have adopted a new technology. As mentioned above, the Enterprise Surveys do not contain any owner characteristics other than gender. The other surveys, however, provide the owner's number of hours worked during the past week and also the owner's year of schooling. Both are statistically significantly smaller for female owners than male owners in Mexico and Bolivia. Women work about 25 percent fewer hours than men and have 0.75 fewer years of schooling than men in Mexico and 1.8 fewer years of schooling in Bolivia. The differences in hours worked and schooling are smaller in Peru and are not statistically significant, although they are still negative. The Bolivian data also provides information on whether the firm owner has ever participated in any business training. Women are 14 percent less likely to have done so than men. Another variable collected in the Bolivian data is whether the business owner's mother has any formal education. This variable is a proxy for family background and could shed light on whether female business owners are from more or less disadvantaged families than men. There is, however, no statistically significant difference in mother's formal education status across female and male business owners.

Overall, the data indicate that female-owned firms are smaller than male-owned firms along all dimensions and that they are less profitable than male-owned firms. Table 3a investigates whether female firms are also less productive than male-owned firms. The table displays the regression results of an OLS regression of sales on the female owner dummy, controlling for the inputs into the production process. The regressions are based on a Cobb-Douglas production function of the form $Y = (AL)^{1-\alpha-\beta}H^{\alpha}K^{\beta}$. Here, L stands for the labor input and is measured by the number of employees and hours worked by the owner. H stands for human capital and is approximated by the owner's years of schooling. K stands for capital. The regressions control for three different types of capital separately, property, machinery, and material inputs. Note that not all firms in the Bolivian, Mexican, and Peruvian data have property, machinery, or material inputs. I address this in the regressions by replacing the log values of these variables with zero when their non-log value is zero and then adding a dummy for whether the non-log value is zero. A measure of technology, A, is only available in the Enterprise Surveys, which ask the respondents whether the firm adopted a new technology during the past three years. All regressions in Table 3a control for industry fixed effects since the production function is likely to vary across industries.

In the Mexican data, female- and male-owned firms are, on average, statistically significantly less productive than male-owned firms. The size of the difference is on the order of 9 percent. In the Bolivian data and the Enterprise Surveys, this difference is much smaller (1 to 2 percent) and it is not statistically significant. The Peruvian data displays the largest difference in productivity across female-owned and male-owned firms, 15.5 percent. Note, however, that the Peruvian data do not include information on property and machinery values. Machinery value is positively

correlated with sales in the other dataset, implying that excluding it from the regression could bias the difference in productivity between female-owned and male-owned firms upwards.

Table 3a: OLS Productivity Regressions

	Dependent variable: Log sales			
	Mexico	Bolivia	Peru	Enterprise Surveys
Female dummy	-0.089***	-0.013	-0.155**	-0.022
	(0.034)	(0.152)	(0.073)	(0.032)
Ln employees	0.170***	0.502***	0.657***	0.383***
	(0.038)	(0.072)	(0.068)	(0.021)
Ln property value	0.017	0.076		0.042***
	(0.014)	(0.047)		(0.009)
Ln machinery value	0.032***	0.138***		0.076***
	(0.008)	(0.040)		(0.010)
Ln material costs	0.120***	0.452***	0.443***	0.574***
	(0.012)	(0.052)	(0.037)	(0.016)
Adopted new technology during past 3 years				-0.005
				(0.024)
Ln hours worked	0.029	0.003	0.038	
	(0.019)	(0.100)	(0.063)	
Owner's years of schooling	0.009***	0.021*	0.015	
	(0.003)	(0.012)	(0.010)	
R-squared	0.086	0.757	0.695	0.947
Number of firms	8,293	265	582	2,175

Note: These regressions are based on a Cobb-Douglas production function of the form $Y = (AL)^{1-\alpha-\beta}H^{\alpha}K^{\beta}$, where A stands for technology, L stands for labor, H for human capital, and K for physical capital. Ln property, ln machinery and ln material cost are replaced with zero when their non-log values are zero and the regressions include dummies indicating whether the non-log values are zero. All monetary values are in US Dollars. All regressions include industry fixed effects, as well as city, region, or country fixed effects. Robust standard errors in parentheses. Significance levels: *** 1 percent, ** 5 percent, * 10 percent.
Source: Encuesta Nacional de Micronegocios (ENAMIN), 2002, Bolivian World Bank Micro Enterprises Survey, 2007, Peruvian World Bank Micro Enterprises Survey, 2008, World Bank Enterprise Surveys for Brazil, Ecuador, El Salvador, Guatemala, Honduras, and Nicaragua, 2003.

Table 3b displays the differences in productivity across female-owned and male-owned firms obtained by running quantile regressions instead of OLS regressions. The results show that the differences in productivity are largest for firms that are at the 25th percentile of sales and smallest for firms that are at the 75th percentile of sales. At the 25th percentile of sales, female-owned firms are between 6.4 percent and 20.3 percent less productive than male-owned firms[8]. At the median, the differences in productivity range only from 1.8 percent to 16.9 percent. At the 75th percentile of sales, the differences in productivity turn positive in the Enterprise Surveys and the

[8] Although the difference of 20.3 percent that comes from the Bolivian data is not statistically significant, possibly due to the small sample size.

Bolivian data, but they at are not statistically significant. In the Mexican data, female-owned firms at the 75th percentile of sales are 7.3 percent less productive than male-owned firms. The regressions for the Peruvian data are the only ones that show a large difference in productivity for firms at the 75th percentile of sales. However, the results for this dataset are likely to be biased due to the lack of information on machinery values.

Table 3b: Quantile Productivity Regressions

	Mexico	Bolivia	Peru	Enterprise Surveys
25th percentile	-0.131***	-0.203	-0.119*	-0.064***
	(0.046)	(0.197)	(0.065)	(0.023)
50th percentile	-0.087**	-0.169	-0.105	-0.018
	(0.035)	(0.212)	(0.064)	(0.032)
75th percentile	-0.073*	0.185	-0.204***	0.020
	(0.044)	(0.151)	(0.071)	(0.043)
Number of firms	8,293	265	582	2,175

Note: The table displays the coefficients on the female dummy in separate productivity regressions that are based on a Cobb-Douglas production function of the form $Y = (AL)^{1-\alpha-\beta}H^{\alpha}K^{\beta}$, where A stands for technology, L stands for labor, H for human capital, and K for physical capital. The outcome variable is ln sales. Control variables and the respective notes are the same as for Table 3a. Robust standard errors in parentheses. Significance levels: *** 1 percent, ** 5 percent, * 10 percent.
Source: Encuesta Nacional de Micronegocios (ENAMIN), 2002, Bolivian World Bank Micro Enterprises Survey, 2007, Peruvian World Bank Micro Enterprises Survey, 2008, World Bank Enterprise Surveys for Brazil, Ecuador, El Salvador, Guatemala, Honduras, and Nicaragua, 2003.

Taken together, the results in Table 3a and Table 3b suggest that only micro and small female-owned firms are less productive than male-owned firms. This is true for the firms in the Mexican data, which are predominantly micro firms and for the firms at the 25th percentile of sales in the Bolivian data and the Enterprise Surveys, as well as for firms at the 50th percentile of sales in the Bolivian data. The larger female-owned firms (in terms of sales) in the Bolivian data and in the Enterprise Surveys are equally productive as male-owned firms.

4. Possible Reasons for Differences across Female- and Male-Owned Firms

This section examines a number of factors that could be causing the differences in firm size and other characteristics across female- and male-owned firms. It first examines difference in external financing and then considers other obstacles to firm operation and growth.

4.a. Differences in External Financing

A possible reason why female-owned firms are smaller in terms of employees, property, machinery, and sales than male-owned firms could be that female-owned firms have less access

to external finance, thus restricting their investment and growth. Table 4a displays the averages for several measures of access to external finance among female-owned firms[9]. These averages indicate that the majority of female-owned firms in the Bolivian and Peruvian data rely on internal funds for financing working capital (78 percent). In the Enterprise Surveys, which cover larger firms, this number is lower, 46.9 percent. Female-owned firms in the Enterprise Surveys are much more likely to rely on bank funds for financing working capital than female-owned firms in the Bolivian and Peruvian data. The Enterprise Surveys also include information on the source for funds for financing investment. 56 percent of these funds are internal, and 20.4 percent come from banks. The fraction of female-owned firms that have a loan from a financial institution varies greatly across datasets, ranging from a low 8 percent in the Mexican data, to 52.4 percent in the Peruvian data.

Table 4a: Access to External Finance – Averages for Female-Owned Firms

	Mexico	Bolivia	Peru	Enterprise Surveys
% of working capital financed with internal funds		78.9	77.9	46.9
% of working capital financed by banks		3.2	7.8	23.3
% of investment financed with internal funds				56.0
% of investment financed by banks				20.4
Participates in a ROSCA		28.1		
Has a loan from a financial institution	8.09#	24.0	52.4	46.7

Note: #In the Mexican data, this measure refers to ever having had a loan since starting the business, rather than currently having a loan.
Source: Encuesta Nacional de Micronegocios (ENAMIN), 2002, Bolivian World Bank Micro Enterprises Survey, 2007, Peruvian World Bank Micro Enterprises Survey, 2008, World Bank Enterprise Surveys for Brazil, Ecuador, El Salvador, Guatemala, Honduras, and Nicaragua, 2003.

Table 4b shows the corresponding statistical difference in the measures of access to external finance across female-owned and male-owned firms. For ease of comparison with Table 4a, these differences do not control for region or industry effects. However, the results do not change significantly when including region and industry fixed effects. The differences in Table 4b do not support the hypothesis that female-owned firm have less access to finance than male-owned firms. There are no statistically significant differences in the use of bank finance for working capital or investment. In the Mexican and Peruvian data, there is also no statistically significant difference in the percentage of female-owned and male-owned firms that have a loan from a financial institution. In the Enterprise data, female-owned firm are 5.2 percent more likely to hold a bank loan than male-owned firms. In the Bolivian data, female-owned firms are significantly less likely to have a loan from a financial intuition. However, female firm owners are more likely to participate in a Rotating Savings and Credit Association (ROSCA), an informal savings and borrowing arrangement among individuals. Female-owned firms in the Bolivian data may thus be substituting informal financing for formal financing. The survey does not include the necessary information to gauge whether this is due to the fact that they do not have access to formal financing. A recent World Bank report complemented the Bolivian survey

[9] Appendix Table A2 disaggregates the statistics for the Enterprise Surveys by country, so that it displays all statistics separately for Brazil, Ecuador, El Salvador, Guatemala, Honduras, and Nicaragua. The statistics in Appendix Table A2 illustrate that the findings from Table 4b and Table 5 are not driven by outliers.

data with qualitative data from focus groups (World Bank, 2008). These focus groups revealed that many female business owners tend to mistrust credit institutions and fear the consequences of taking on debt, suggesting that the low use of finance among female-owned firms in Bolivia is due to demand-side constraints.

Table 4b: Access to External Finance
Differences in External Finance of Female- and Male-Owned Firms

	Mexico	Bolivia	Peru	Enterprise Surveys
% of working capital financed with internal funds		6.2	-4.2	-0.8
% of working capital financed by banks		1.0	0.9	-0.7
% of investment financed with internal funds				-1.4
% of investment financed by banks				1.9
Participates in a ROSCA		16.3***		
Has a loan from a financial institution	-0.88	-12.8***	2.9	5.2*

Note: #In the Mexican data, this measure refers to ever having had a loan since starting the business, rather than currently having a loan. Significance levels: *** 1 percent, ** 5 percent, * 10 percent.
Source: Encuesta Nacional de Micronegocios (ENAMIN), 2002, Bolivian World Bank Micro Enterprises Survey, 2007, Peruvian World Bank Micro Enterprises Survey, 2008, World Bank Enterprise Surveys for Brazil, Ecuador, El Salvador, Guatemala, Honduras, and Nicaragua, 2003.

The Mexican data and the Enterprise Surveys include information on the reasons why firms do not have a loan from a financial institution. Table 5 shows that only a relatively small fraction of female-owned firms does not have a loan because their loan application was rejected. Moreover, in the Mexican data, female-owned firm are less likely than male-owned firms to have a loan application rejected. In the Enterprise Surveys, there is no difference in loan rejection rates across female- and male-owned firms. Table 5 also illustrates that 91.4 percent of female-owned firms in the Mexican data and 48.8 percent of female-owned firms in the Enterprise Survey data do not have a loan because they did not apply for a loan. For the Mexican data, this number is 1.4 percent higher than for male-owned firms, but the size of the difference is small relative to the average of 91.4 percent. Among firms that did not apply for a loan, there is some evidence that a number of female-owned firms may be credit constrained. Female-owned firms in the Enterprise Surveys are 10.8 percent more likely to not have applied for a loan due to cumbersome application procedures. However, this result is reversed in the Mexican data, where women are 1.4 percent less likely to not apply for a loan due to cumbersome application procedures.

Overall, the data do not provide systematic evidence for the hypothesis that female-owned firms have less access to external finance than male-owned firms. This leads me to examine other possible reasons for why female-owned firms in Latin America tend to be smaller than male-owned firms.

Table 5: Reasons for Not Having a Loan

	Avg. for Female-Owned Firms		Difference (Female - Male)	
	Mexico[#]	Enterprise Surveys	Mexico[#]	Enterprise Surveys
Loan application was rejected	0.5	5.5	-0.5***	-0.3
Did not apply for loan	91.4	48.8	1.4**	-4.7
Reasons for not applying for a loan				
No need	69.7	38.5	2.4**	-6.9
Cumbersome application procedures	8.8	18.9	-1.4*	10.7***
Stringent collateral requirements		12.2		2.2
Interest rates are too high	14.4	25.7	-0.6	-6.6*
Corruption in the allocation of bank credit		1.4		0.5
Did not expect to be approved	2.6	2.7	-0.7*	-0.3
Amount and/or maturity not convenient	1.6		-0.3	
Other	2.8	0.0	0.6	0.0

Note: [#]In the Mexican data, all measure refers to ever having applied for a loan since starting the business. Significance levels: *** 1 percent, ** 5 percent, * 10 percent.
Source: Encuesta Nacional de Micronegocios (ENAMIN), 2002, Bolivian World Bank Micro Enterprises Survey, 2007, Peruvian World Bank Micro Enterprises Survey, 2008, World Bank Enterprise Surveys for Brazil, Ecuador, El Salvador, Guatemala, Honduras, and Nicaragua, 2003.

4.b. Other Obstacles to Firm Operation and Growth

This section relies on a series of perception-based questions to investigate whether female and male-owned firms face different types of obstacles to firm operation and growth. The Bolivian, Peruvian, and Enterprise Survey data ask the respondents to gauge whether a series of different factors represent an obstacle to the firm's operation and growth. Table 6 displays the percentage of female-owned firms that perceive each factor as an obstacle, along with the corresponding difference to male-owned firms[10]. For ease of comparison with the average percentages, the differences do not control for region or industry effects. However, the results do not change significantly when including region and industry fixed effects.

Many of the variables listed in Table 6 are equally perceived as obstacles by female-owned and male-owned firms. Moreover, for most variables where there is a statistically significant difference, female-owned firms are actually less likely to perceive the variable as an obstacle than male-owned firms. For example, in the Bolivian data, female-owned firms are 10.9 percent less likely to perceive access to finance as an obstacle than male-owned firms.

There are only three variables that a greater percentage of female-owned firms perceive to be an obstacle than male-owned firms. The first is that, in the Enterprise Surveys, female-owned firms are 3.9 percent more likely to see macroeconomic instability as an obstacle than male-owned firms. However, a total of about 90 percent of firms report macroeconomic instability to be an obstacle, implying that the economic relevance of the 3.9 percent difference is quite small. The

[10] Appendix Table A3 displays the results separately for the different countries covered in the Enterprise Surveys.

data in Appendix Table A3, which displays the obstacles separately for all the countries covered in the Enterprise Surveys, shows that the difference in the perception of macroeconomic instability as an obstacle is driven by the observations from Ecuador and El Salvador. In these two countries, female-owned firms are about 20 percent more likely than male-owned firms to report that macroeconomic instability is an obstacle. These differences persist even after controlling for industry fixed effects.

The other two variables that a higher percentage of female-owned firms perceive to be an obstacle than male-owned firms are both related to child care and household obligations. Unfortunately, information on these obstacles is only available for the Bolivian data. 59.5 percent of female-owned firms in the Bolivian data report that having to care for small children or family is an obstacle to their firm's operation and growth. Similarly, 71.1 percent of female-owned firms in the Bolivian data perceive family obligations or household chores as an obstacle. Both numbers are about 23 percentage points higher than for male-owned firms. In absolute and in relative terms, these are by far the greatest differences in perceived obstacles across female- and male-owned firms.

Table 6: Obstacles to Firm Operation and Growth

	% that perceive … as an obstacle					
	Average for Female-Owned Firms			Difference (Female - Male)		
	Bolivia	Peru	Enterprise Surveys	Bolivia	Peru	Enterprise Surveys
Access to land	59.5		45.1	-6.5		3.9
Labor regulation	31.4	61.9	65.2	-2.6	4.4	-2.5
Skills and education of available workers	55.4	62.5	77.4	-3.0	-9.0**	2.1
Business licensing and operating permits			53.3		-2.7	-3.6
Access to finance (e.g. collateral)	71.1	75.6	76.2	-10.9**	-2.7	1.0
Cost of finance (e.g. interest rates)	68.6	79.8	82.8	-19.6***	-6.0*	-0.7
Economic and regulatory policy uncertainty	83.5	91.1	88.4	-6.1	-0.5	-1.2
Macroeconomic instability	89.3	94.6	92.2	-1.7	-0.8	4.1**
Corruption	80.2	92.3	88.1	-9.4**	1.0	3.1
Crime, theft and disorder	91.7	93.5	81.5	4.9	-2.7	1.1
Anti-competitive or informal practices			84.3			3.2
Legal system/conflict resolution	32.2	54.2	65.2	-7.4	0.8	-2.0
Having to care for small children or family	59.5			23.4***		
Family obligations or household chores	71.1			21.8***		

Note: Significance levels: *** 1 percent, ** 5 percent, * 10 percent.
Source: Encuesta Nacional de Micronegocios (ENAMIN), 2002, Bolivian World Bank Micro Enterprises Survey, 2007, Peruvian World Bank Micro Enterprises Survey, 2008, World Bank Enterprise Surveys for Brazil, Ecuador, El Salvador, Guatemala, Honduras, and Nicaragua, 2003.

The data on perceived obstacles to firm operation and growth in this section does not suggest that female-owned firms face more severe obstacles than male-owned firms in most areas. The only

factors that many more female-owned firms report to be obstacles than male-owned firms are having to care for small children and having to fulfill other family obligations and household chores. These could thus be important reasons for why female-owned firms tend to be smaller and less profitable than male-owned firms. The following section investigates whether there is indeed a relationship between child care obligations and characteristics and performance of female-owned firms.

4.c. Child Care Responsibilities and Household Chores

This section uses the 2002 Mexican ENAMIN data to examine whether child care obligations are correlated with smaller size and lower performance of female-owned firms. The sample of micro firm owners surveyed in the ENAMIN is drawn from a larger sample of individuals surveyed in the Mexican labor market survey (ENE). The ENE includes information on all household members. By linking the ENAMIN to the ENE, I can thus calculate whether a firm owner lives in a household where children are present. The data show that 56 percent of firm owners live in a household that has at least one child under the age of 12.

Table 7 displays the results of regressing different firm characteristics on a dummy variable for female firm ownership, a dummy variable for having children under the age of 12 in the household, and the interaction of the two. The regressions also control for age, education, and marital status, as well as region dummies to avoid any bias in the results due to these factors. The coefficient on the female dummy represents the difference in the outcome variables across female-owned and male-owned firms in households where there are no children under the age of 12 present. The sum of the coefficient on the female dummy and on the interaction term represents the difference in outcome variables across female-owned and male-owned firms in households with children under the age of 12.

The results for employees as the outcome variable show that female-owned firms have 5.3 percent fewer employees than male-owned firms in households where there are no children under the age of 12. In households, where there are children under the age of 12, this difference increases to 8.7 percent. Similarly, the difference in machinery value across female- and male-owned firms is also greater in households with children under the age of 12. For sales, the pattern is again similar, although the difference between female- and male-owned firms in households with children under the age of 12 is not statistically significant. With respect to profits, I examine the difference in average and in median profits. The difference in average profits does not vary with the presence of children under 12. However, the difference in median profits across female- and male-owned firms is 2.5 percentage points higher in households with children under 12 (up from 4.4 percent).

The evidence in Table 7 suggests that the difference in size and performance of female- and male-owned firms is 30 to 40 percent larger when children under 12 are present in the household. A possible interpretation of this finding is that women need to care for these children at the same

time as they are running their business, putting a strain on the time and resources they can devote to the business. This interpretation is in line with the finding from Section 4.b that female-owned firms are more likely to perceive child care responsibilities as an obstacle to firm operation and growth than male-owned firms. However, the results in this section are correlations and are thus not necessarily causal. More research is needed to determine whether child care responsibilities lead women to own smaller and less profitable firms. Finally, note that the differences in size and performance across female- and male-owned firms are still present in households where there are no children under the age of 12, although the differences are smaller in magnitude.

Table 7: Child Care Responsibilities and Differences in Firm Characteristics

	Coefficients on		
	Female dummy	Children under 12 in household dummy	Female * Children under 12
Ln employees	-0.053***	0.005	-0.034*
	(0.014)	(0.012)	(0.018)
Ln machinery value	-0.884***	0.018	-0.342***
	(0.075)	(0.055)	(0.099)
Ln sales (last month)	-0.164***	-0.011	-0.056
	(0.048)	(0.036)	(0.064)
Profits (last month, in thousands)	-0.055***	0.009	-0.002
	(0.014)	(0.012)	(0.019)
Profits (last month, in thousands)	-0.044***	0.006	-0.025***
- median regression	(0.010)	(0.008)	(0.014)

Note: Robust standard errors in parentheses. Significance levels: *** 1 percent, ** 5 percent, * 10 percent.
Source: Encuesta Nacional de Micronegocios (ENAMIN), 2002, and Encuesta Nacional de Empleo (ENE), 2002-I.

In addition to child care responsibilities, other household obligations could also prevent female business owners from devoting more attention and resources to their business, limiting the firm's growth. A recent World Bank report finds that female-owned firms in Bolivia are twice as likely to operate inside the owner's home as male-owned firms (World Bank, 2008). This finding is based on the same Bolivian data as is used in this paper. Table 8 shows the corresponding percentages of female- and male-owned firms that operate inside the home. The number is only 10 percent for male-owned firms, but it is 23.2 percent for female-owned firms.

Table 8: Percentage of Firms Operating Inside the Owner's House

	Female-Owned Firms	Male-Owned Firms	Difference (Female - Male)
Bolivia	23.2	10.1	13.1***
Mexico	30.3	11.1	18.8***

Note: *** 1 percent, ** 5 percent, * 10 percent.
Source: Bolivian World Bank Micro Enterprises Survey, 2007, Encuesta Nacional de Micronegocios (ENAMIN), 2002.

The Mexican ENAMIN data also includes information on whether the business is located in the owner's home or not. As shown in Table 8, the difference in the percentage of firms operating inside the owner's home is even greater in the Mexican data than in the Bolivian data. In the Mexican data, 11.1 percent of male-owned firms operate inside the home, while 30.3 percent of female-owned firms operate inside the home. The difference in the Mexican data remains unchanged even after controlling for whether children under the age of 12 are present in the household. This suggests that household chores other than caring for children influence the location of female-owned businesses. This result is in line with Cunningham and Gomez (2004) who show that their finding that female home-based workers (most of whom are self-employed) have lower earnings and work fewer hours than male home-based workers is largely related to marital status, not to the presence of children. It thus appears that household obligations constrain women to set up businesses that can be operated from within the home. This restricts their choice of industry and potentially also the decision to formalize the firm, which can in turn have consequences for the performance of the business.

4.d. Differences in Risk Aversion

Another reason why female-owned firms are smaller on average than male-owned firms could be that female firm owners may be more risk averse than male firms owners. This could lead female firm owners to forgo profitable investments and to be reluctant to expand their business. Evidence based on US data suggests that women are less likely to take financial risks than men (Jianakoplos and Bernasek, 1998, and Sunden and Surette, 1998), although this has been called into question by Schubert et al (1999). However, these studies are not limited to entrepreneurs and since owning a business is per se a risky undertaking, the women who select into business ownership may not be more risk averse than men.

Unfortunately, none of the surveys used in the other sections of this paper measure the level of risk aversion of the firm owner. I will thus rely on an Innovations for Poverty Action survey of micro, small, and medium size businesses in Puebla, Mexico, to investigate differences in risk aversion. In this survey, the firm's principal decision maker was asked to rate their willingness to take risks on a scale from 0 to 10, with 10 being the highest willingness to take risks. 28 percent of principal decision makers in the data are women. Table 9 displays the average willingness to take general risks, health risks, as well as financial risks. Women score slightly higher on all variables than men, although the differences are small and not statistically significant. There is thus no evidence that women are more risk averse than men.

Table 9: Willingness to Take Risks

	Women	Men	Difference (Women - Men)
General risk taking	8.04	7.87	0.17
Health risk taking	6.00	5.61	0.39
Financial risk taking	6.23	6.01	0.22

Source: Innovations for Poverty Action SME Survey for Puebla, Mexico, 2007.

5. Conclusion

This paper examines female entrepreneurship in Latin America. It first shows that up to 50% of microenterprise owners in Latin America are women. However, the share of female owners declines with firm size and is a low as 12 percent for firms with more than 11 employees. The paper then asks how the characteristics and performance of female-owned firms in Latin America compare to those of male-owned firms. Firm-level surveys from a number of countries show that female-owned firms are smaller than male-owned firms in terms of employees, physical capital, sales, and costs. They also have lower profits than male-owned firms.

The productivity analysis in this paper reveals that, among micro and small-sized firms, female-owned firms are less productive than male-owned firms. However, there is no difference in productivity across medium and large sized female- and male-owned firms.

The paper considers several possible factors that could be the reason why female-owned firms tend to be smaller than male-owned firms. There is no consistent evidence that female-owned firms have less access to finance than male-owned firms. Moreover, female firm owners are not more likely to perceive a host of other factors related to regulation and market conditions as an obstacle to firm operation and growth than male firm owners. The only large difference is that female firm owners are much more likely to view child care and household obligations as obstacles to firm operation and growth.

Combined household and micro firm data from Mexico also points to child care obligations restricting the growth of female-owned firms. This data shows that the differences in size and profits between female- and male-owned firms are larger for women who live in households where children under the age of 12 are present. The presence of children accounts for about 30 to 40 percent of the size and profit difference between female- and male-owned firms. Additional results from Mexico and Bolivia also show that female-owned firms are two to three times more likely to operate inside the owner's home than male-owned firms. This suggests that household obligations could restrict location, size, and industry choices for female-firm owners, possibly leading to performance differences.

The findings of this paper suggest that policy should focus on promoting the growth of existing female-owned firms rather than encouraging the creation of more female-owned firms. The percentage of female firm owners among micro firms is already high in most countries, but it appears to be more difficult for women to grow their firms into small and medium-sized businesses. The obstacles to the growth of female-owned firms that need to be addressed now seem to have less to do with access to finance or regulation, but rather with child care and family obligations. However, more research is needed to investigate whether providing child care facilities can foster the growth of female-owned firms in Latin America.

References

Bardasi, Elena and Abay Getahun. 2008. *Unlocking the Power of Women.* Chapter prepared for the Ethiopia ICA. Toward the Competitive Frontier: Strategies for Improving Ethiopia's Investment Climate. World Bank, Washington D.C.

Cunningham, Wendy V. and Carlos Ramos Gomez. 2004. "The Home as Factory Floor: Employment and Remunerations of Home-Based Workers." World Bank Policy Policy Research Working Paper No. WPS 3295.

De Mel, Suresh, David McKenzie, and Christopher Woodruff. 2009. "Are Women More Credit Constrained? Experimental Evidence on Gender and Microenterprise Returns." Forthcoming, AEJ Applied.

Jianakoplos, Nancy A.and Alexandra Bernasek. 1998. "Are Women More Risk Averse?" *Economic Inquiry*, 36: 620–30.

Parker, Simon P. 2009 (forthcoming). Female Entrepreneurship. In Simon Parker ed. *The Economics of Self Employment and Entrepreneurship.* Cambridge University Press: Cambridge.

Sabarwal, Shwetlana and Katherine Terrell. 2009. "Access to Credit and Performance of Female Entrepreneurs in Latin America." Mimeo. World Bank.

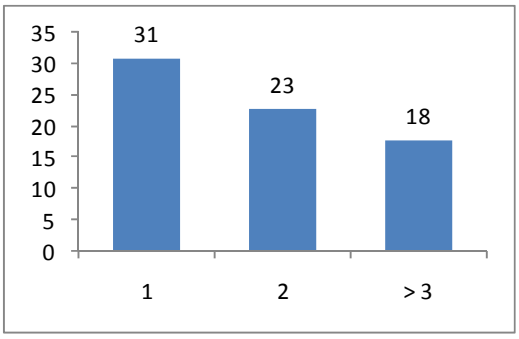
Schubert, Renate, Martin Brown, Matthias Gysler, and Hans Wolfgang Brachinger. 1999. "Financial Decision-Making: Are Women Really More Risk-Averse?" The American Economic Review, Vol. 89, No. 2, Papers and Proceedings of the One Hundred Eleventh Annual Meeting of the American Economic Association (May, 1999), pp. 381-385.

World Bank. 2008. Reducing Gender Based Differences in Formality and Productivity. World Bank: Washington, DC.

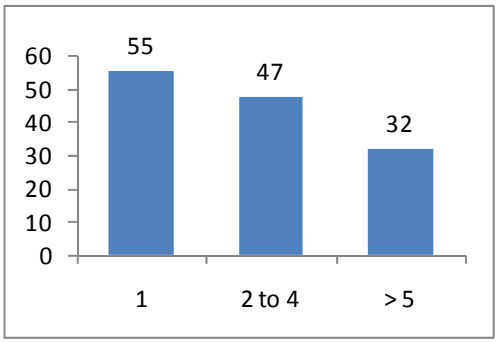
Appendix

Figure A1: Percentage of Female-Owned Firms by Number of Employees (Including the Owner)

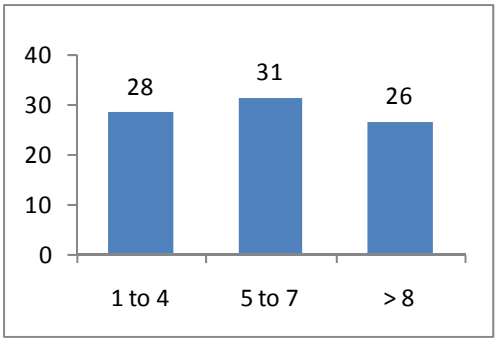
Mexico Data



Bolivia Data



Peru Data



Enterprise Survey Data

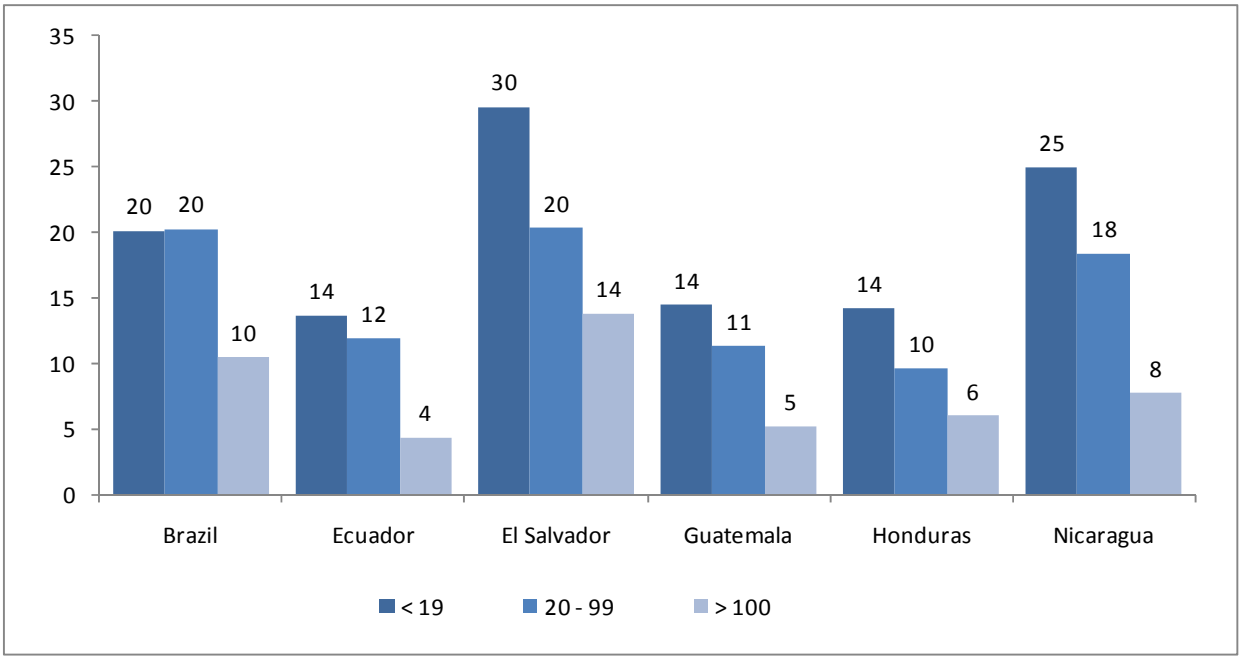


Table A1: Percentage of Female-Owned Firms by Industry

A1a: Mexico Data

Industry	% female
Trade	45.3
Manufacturing	33.1
Services	31.7
Communication and transportation	1.9
Construction	0.1

A1b: Bolivia Data

Industry	% female
Camelid wool products	83.3
Selling groceries	75.8
Selling prepared food	73.9
Clothing manufacture	65.3
Handicrafts and furniture	5.9
Transportation	2.6

A1c: Peru Data

Industry	% female
Selling food	51.5
Restaurants and hotels	45.2
Textile and clothing manufacture	38.6
Transportation	25.0
Metal products manufacture	15.7
Wood products and furniture manufacture	15.6
Shoe and leather manufacture	15.2

A1d: Enterprise Survey Data

Industry	% female
Clothing	32.2
Minerals and oil (incl. glass, ceramics and brick)	16.8
Food	15.3
Chemicals and plastic	12.9
Leather	11.4
Wood products	10.2
Machinery and equipment	9.1
Textiles	5.4

Table A2: Access to External Finance and Reasons for not having a Loan by Country

	Average for Female-Owned Firms					
	Brazil	Ecuador	El Salvador	Guatemala	Honduras	Nicaragua
% of working capital financed with internal funds	43.7	21.7	42.4	64.1	39.5	54.4
% of working capital financed by banks	27.0	33.4	20.5	15.5	22.7	14.5
% of investment financed with internal funds	59.4	45.0	35.5	55.7	50.0	61.2
% of investment financed by banks	13.8	55.0	32.9	28.3	21.4	23.0
Has a loan	39.5	44.4	71.1	44.1	58.3	50.8
Did not apply for loan	53.1		27.8	56.8	42.8	46.8
Loan application was rejected	8.4		2.6	0.0	0.0	3.4
Reasons for not applying for a loan						
No need	42.5		50.0	36.8	20.0	25.9
Cumbersome application procedures	14.9		20.0	26.3	20.0	25.9
Stringent collateral requirements	13.8		10.0	0.0	0.0	18.5
Interest rates are too high	25.3		0.0	31.6	60.0	25.9
Corruption in the allocation of bank credit	0.0		10.0	5.3	0.0	0.0
Did not expect to be approved	2.3		10.0	0.0	0.0	3.7
	Difference (Female - Male)					
	Brazil	Ecuador	El Salvador	Guatemala	Honduras	Nicaragua
% of working capital financed with internal funds	-0.8	-19.0	3.0	3.0	-6.1	-1.4
% of working capital financed by banks	-0.8	5.2	-9.4*	3.9	-3.2	2.8
% of investment financed with internal funds	0.7	6.1	-10.2	-5.6	-3.5	-3.9
% of investment financed by banks	0.6	14.6	-0.2	10.0	-5.6	3.4
Has a loan	6.4	6.1	1.9	-1.9	4.4	2.8
Did not apply for loan	-7.6*	6.1	-0.9	6.0	-0.5	-0.9
Loan application was rejected	1.4		-1.0	-4.2***	-3.9**	-1.9
Reasons for not applying for a loan						
No need	-2.0		-12.2	-20.9*	-14.7	-10.2
Cumbersome application procedures	7.0*		14.6	20.2*	8.0	15.6*
Stringent collateral requirements	6.7*		-0.8	-10.8***	-14.7***	-4.2
Interest rates are too high	-11.4**		-5.4	9.3	25.3	-0.9
Corruption in the allocation of bank credit	-0.8**		10.0	5.3	.	-3.1*
Did not expect to be approved	-0.1		-6.2	-3.1**	-4*	2.7

Note: Significance levels: *** 1 percent, ** 5 percent, * 10 percent.
Source: World Bank Enterprise Surveys, 2003.

Table A3: Obstacles to Operation and Growth by Country

	Average for Female-Owned Firms					
	Brazil	Ecuador	El Salvador	Guatemala	Honduras	Nicaragua
Access to land	53.9	11.1	42.1	41.2	41.7	30.5
Labor regulation	88.0	33.3	28.9	61.8	58.3	32.2
Skills and education of available workers	91.6	44.4	73.7	73.5	50.0	52.5
Business licensing and operating permits	73.7	33.3	23.7	44.1	50.0	23.7
Access to finance (e.g. collateral)	87.4	44.4	47.4	67.6	66.7	74.6
Cost of finance (e.g. interest rates)	94.0	66.7	50.0	73.5	83.3	79.7
Economic and regulatory policy uncertainty	97.0	88.9	63.2	88.2	75.0	83.1
Macroeconomic instability (inflation, exchg. rate)	97.6	88.9	78.9	88.2	91.7	88.1
Corruption	91.6	55.6	73.7	100.0	91.7	84.7
Crime, theft and disorder	85.0	33.3	81.6	94.1	83.3	71.2
Anti-competitive or informal practices	94.0	44.4	71.1	79.4	75.0	76.3
Legal system/conflict resolution	76.0	44.4	39.5	61.8	66.7	55.9
	Difference (Female - Male)					
	Brazil	Ecuador	El Salvador	Guatemala	Honduras	Nicaragua
Access to land	6.3	1.8	18.6*	-2.9	6.8	-7.5
Labor regulation	-0.9	11.2	-6.3	4.3	1.6	2.9
Skills and education of available workers	4.1*	10.7	8.2	-0.8	-19.1	4.9
Business licensing and operating permits	0.9	15.9	-12.3	-2.2	-1.1	-5.6
Access to finance (e.g. collateral)	2.5	-12.5	-4.1	9.4	8.6	1.0
Cost of finance (e.g. interest rates)	0.5	-3.1	-8.8	8.4	0.2	-1.1
Economic and regulatory policy uncertainty	0.1	9.8	-3.8	1.3	-6.5	-1.6
Macroeconomic instability (inflation, exchg. rate)	0.5	23.8**	20.1**	1.6	10.8	5.9
Corruption	2.8	4.4	6.0	7.3***	8.5	1.1
Crime, theft and disorder	1.8	-0.4	0.0	1.8	2.4	1.0
Anti-competitive or informal practices	4.9**	-9.0	-3.2	2.0	8.7	-0.2
Legal system/conflict resolution	-2.1	1.4	-12.0	3.5	8.8	0.6

Note: Significance levels: *** 1 percent, ** 5 percent, * 10 percent.
Source: World Bank Enterprise Surveys, 2003.