

Gender and Entrepreneurial Performance, the Case of Brazilian Manufacturing Sector

Banchayehu Girma

Debre Berhan University, E-mail: banchayehugrm1@gmail.com

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Abstract

Using two rounds of Brazil's enterprises' panel data collected by the World Bank (WB) through surveys conducted in 2003 and 2009, the researcher analyze the gender-based firm performance gap. Researcher has mainly focused on the manufacturing sector. The study used pooled cross section data. The logarithm of sales, logarithm of number of employees, and labor productivity are regressed on a gender dummy and a rich set of control variables. Logistic regression used to analyze gender-based export propensity gap. Finally, Blinder and Oaxaca's decomposition used to shed light on the contribution of each explanatory variable to the gender-based firm performance gap. The explanatory variables partially explain the gender-based gap in firm size, and labor productivity. The gender-based export propensity gap vanishes when these explanatory variables are considered. Among others, the following factors have contributed to women-owned firms performing less in terms of the above-mentioned firm performance measurements: - having less international recognition, lower firm age, working fewer hours, forms of ownership (being limited to sole ownership), having less access to training, and concentration in big cities.

Plain English summary:- Are women owned firms perform less than men owned firms even after considering other explanatory variables? Women entrepreneurs have lower firm performance in terms of sales, number of employees, labor productivity, and export propensity. However, after considering other explanatory variables, there is no gender based export propensity. Some parts of gender-based performance gap are explained by the difference in international recognition, firm age, working hours, ownership type, access to training, and location difference between male and female entrepreneurs. The analysis conducted on two rounds of Brazil's enterprises' panel data collected by the World Bank. This study has import implication for policy makers, Governmental and Non-Governmental organizations working of gender equality and enterprises.

Keywords: *Brazil, Gender, Enterprises, Entrepreneurial Performance*

1. Introduction

The low rate of business ownership among women is a global phenomenon. Several studies in different regions have consistently found that women are less likely to own businesses (EIGE, 2014; OECD, 2012; Sabarwal and Terrell, 2008). Furthermore, the literature shows that female entrepreneurs tend to run smaller firms than their male counterparts (Bardasi et al., 2011; Fairlie and Robb, 2009; Gottschalk and Niefert, 2011; Robb and Watson, 2012; Sabarwal and Terrell, 2008). Several studies (Loscocco et al., 1991; Rosa et al., 1996; Watson, 2002) have documented that women-owned firms perform less than men-owned firms. For example, Fairlie and Robb (2009), show that in the United States (US), women-owned firms are more likely to close and have lower profits, number of employees, and sales than their male counterparts. Likewise, the findings of Aterido and Hallward-Driemeier (2011) and Rijkers and Costa (2012) indicate that women-owned firms are much smaller in size and less productive than men-owned firms. Some studies argue that women entrepreneurs perform less in terms of all performance measurements, even when personal and firm characteristics, and human and financial capital are controlled (Loscocco et al., 1991; Rosa et al., 1996; Watson, 2002). Other studies show that the gender-based performance gap vanishes when other explanatory variables are considered (Kepler and Shane, 2007; Robb and Watson, 2012).

Prior studies provide little explanation as to why women-owned businesses perform relatively poorly. Some studies suggest that human and financial capital, business and personal characteristics, mainly explain the gender-based firm performance gap. For instance, a study in Eastern Europe and Central Asia (ECA) found that women entrepreneurs have less access to financial services, and are charged a higher interest rate (Muravyev et al., 2009). Others have found that the age and sector of women-owned firms explain the gender-based firm performance gap (Robb and Watson, 2012). Others argue that household responsibilities entrusted to women entrepreneurs affect their firm performance by reducing their effectiveness and working hours in their business (Fairlie and Robb, 2009; Hundley, 2000).

This study examines whether there is a gender-based difference in firm performance in Brazil and the role that different variables play in explaining it. This study focused on Brazil's manufacturing sector. Brazil is the 5th largest country in the world and the 7th largest economy in terms of GDP (Brazil, 2013). The country has a highly unequal income distribution (Kumar et al., 2005). Women accounted for more than half of the total population. Although Brazil has been working to improve their gender disparity for a long time, women have higher unemployment rates, are concentrated in jobs requiring fewer qualifications, and carry the main responsibilities of the household. Contrary to the crucial role of the manufacturing sector in economic development, its contribution to Brazil's economy has declined over time due to several constraints.

This study contributes to the existing literature by exploring the role of gender in firm performance in an important country like Brazil, which hasn't been studied so far. Since, women represent more than half of the population and entrepreneurship plays a key role in economic development, this study provides insight into women's participation and their firm performance. Second, in contrast to some studies on gender-based differences

in entrepreneurial performance, this study examines multiple dimensions of firm performance measurements (sales, number of employees, labor productivity, and export propensity) and, therefore, provides a well-rounded and comprehensive analysis of the role of gender in firm performance. Third, the researcher investigates the contribution of each firm performance explanatory variables to the gender-based gap in firm performance. In general, this study serves as a stepping stone for other studies, that may focus on topics and issues related to gender-based firm performance gaps. Therefore, academics, consultants, and government agencies may use this study as a platform for further researches.

Summary statistics indicate that Brazilian women entrepreneurs have lower firm performance in terms of both sales and number of employees and labor productivity and lower export propensity. To identify the underlying reasons for such a gender-based performance gap, the researcher first explore the determinants of business success by estimating linear regression models and logit for several firm performance measurements, and then use the decomposition technique to identify whether each factor is important, and how much of the gap in outcome is explained by these factors. Linear regression models and logit model help in identifying the owner characteristics, firm characteristics, human capital, and financial capital that predict firm performance.

The main findings of this study are summarized as follows: A) women-owned firms perform less in terms of the number of employees, sales, and labor productivity. However, after considering the other explanatory variables, there is no gender-based performance gap in terms of export propensity. B) Some parts of the gender-based performance gap are explained by the difference in endowment between male and female entrepreneurs.

2. Literature Review

2.1. Previous Empirical Evidences on Firm Performance with Respect to Gender

Entrepreneurs play key roles in economic development and the wellbeing of society in several ways. They create jobs, drive and shape innovation, and introduce competition that leads to continuous improvement and increased productivity. The economy's entrepreneurial capacity needs individuals with capability and willingness to start a business, willingness to take risks, and positive attitude towards the existing opportunities. Additionally, families, investors, and customers should be willing to support entrepreneurs. Furthermore, all parts of the society, including women, individuals of all ages, of all educational levels, the poor and the disadvantaged groups of society, should participate in entrepreneurship. When the economy neglects one of the societal groups in its entrepreneurship, it does not fully utilize the available opportunities (Kelley et al., 2010).

As participation of all groups of society in entrepreneurship is necessary for the economy, women's participation is one of the major focuses of this study. The lower rate business ownership among women is a worldwide phenomenon (EIGE, 2014; ILO, 2015; Sabarwal and Terrell, 2008). Women have not only less entrepreneurial participation rate, but also have less performance compared to their men's counterparts. In terms of firm size, women entrepreneurs run smaller firms than their men counterparts

in almost all countries in the world (Bardasi et al., 2011; Bruhn, 2009; Fairlie and Robb, 2009; Rijkers and Costa, 2012; Gottschalk and Niefert, 2011; Loscocco et al., 1991; Rijkers and Costa, 2012; Robb and Watson, 2012; Sabarwal and Terrell, 2008; Watson, 2002). Gottschalk and Niefert (2011), based on 4700 startup firms, found evidence that women-owned firms perform less than the men-owned ones. The study in the case of Sub Saharan Africa (SSA) also documented that women-owned firms have less productivity than men's (Aterido and Hallward-Driemeier, 2011). The study of four developing countries (Bangladesh, Ethiopia, Indonesia, and Sri Lanka) have found similar results that women-owned firms are much smaller in size and less productive than men-owned ones (Rijkers and Costa, 2012). In terms of export propensity, some studies found that women are less likely to participate in export than their men counterparts (Orser et al., 2010).

2.2. Why Women Owned Firms Perform Less

Researchers found that several factors have contributed to the less performance of women-owned firms compared to men-owned. Among others, culture, norm, difference in preferences (between women and men), discrimination, and access to financial and human capitals, and personal and business characteristics are the main ones. Human capital includes education, access to training, participation in research and development, and professional experience. Women entrepreneurs have low educational qualifications and professional experience compared to their men counterparts. Further, women entrepreneurs are less likely to conduct research that improves their products or services. For these reasons, women-owned firms perform less than the men-owned ones (Aterido and Hallward-Driemeier, 2011; Gottschalk and Niefert, 2011; Hundley, 2000; Rijkers and Costa, 2012).

With regards to access to financial services, women entrepreneurs are less likely to use loans due to one or more of the following reasons: discrimination by financial institutions, risk averting behavior, and the fact that they run small and less effective firms (Agier and Szafarz, 2013; Muravyev et al., 2009). The difference in access to financial capital (among women and men entrepreneurs) is considered as the main explanatory factor for gender-based performance gap (Aidis et al., 2007).

The difference in preference and motivation (between men and women entrepreneurs) is also considered as a reason for gender-based firm performance gap. Women entrepreneurs are more concerned with the risk associated with the firm's fast growth rate, hence, deliberately choose to run firms with slow and steady growth rate. Since women have more household responsibilities, they are limited to owning and/or operate smaller size firms (Cliff, 1998; Orser and Hogarth-Scott, 2002). According to the study conducted in the case of New York, the following are the reasons for lower growth rate of women-owned firms: women may have less contact and network with input providers and customers, and their deliberate choice of firms with less growth rate after making cost and benefit analysis (Morris et al., 2006).

In many studies, the difference in gender-based sector distribution is considered as a reason for gender-based firm performance gap (Aterido and Hallward-Driemeier, 2011; Loscocco et al., 1991; Rijkers and Costa, 2012). Others argue that the difference in the level of responsibility (division of labor at the household level) also explains gender-

based firm performance gap. Prior studies on the difference in gender-based entrepreneurs' satisfaction with respect to work-family balance found that women entrepreneurs raise their satisfaction by creating instrument enrichment between their family and business roles. On the other hand, men entrepreneurs raise their satisfaction by receiving family support at home (Eddleston and Powell, 2012). Another study also concluded that women have relatively higher responsibilities and obligations at the household level than men, which in turn limits the scope of their participation and the intensity of work effort in their business. Consequently, the difference in the household level obligation is considered as one of the main reasons for women-owned firms performing less than the men-owned ones (Bruhn, 2009; Fairlie and Robb, 2009; Hundley, 2000).

2.3. Overview of Brazil

Brazil is the 5th largest country in the world with population size of 194 million in 2012. Brazil's GDP is the 7th largest and its economy is diverse (Brazil, 2013). However, the country has higher unequal income distribution than the average in Latin American (LA) or other upper and middle-income countries (Kumar et al., 2005).

In Brazil, women constitute over half the total population. Gender equality and women empowerment are part of Brazil's development goals (Brazil, 2017). Brazil has set gender quota for parliament candidacy, issued public policies on gender parity, and created agencies that deal with the issue of gender equality (such as the national agency of women's right, regional agencies of women's conditions, and police station specialized in women's affairs). During the last two decades, Brazil went through some important demographic, cultural, and social changes (Bruschini, 2007). Consequently, gender parity has been improved, particularly in terms of education and labor force participation. Research showed that currently, on average, women are more educated than men (Brazil, 2017; Bruschini, 2007). Based on WB data, the proportion of women in the workforce has risen from 51.1% in 2000 to 53.2% in 2017. Yet, women have higher unemployment rate, and concentrated in less qualified jobs. Further, they are burdened with double responsibilities professionally and at the household (Bruschini, 2007). Participation of women in decision making in Brazil is less than men, wherein they hold only 37.3% of management positions, and Brazil is ranked 31st out of 187 countries in this specific dimension (ILO, 2015). Furthermore, gender-based wage inequality has been an outstanding issue for long. On average, women earn 20 percent less, and the gap increases as the level of education advances (Nopo, 2012). In general, women face more challenges in joining the labor force (Brazil, 2017). The 2017 World Economic Forum Gender Gap Index (GGI) ranked Brazil 94th out of 189 countries with a score of 0.4071.

The manufacturing sector is an engine of economic development (Naude and Szirmai, 2012). This sector played important roles in Brazil's economic development during the 1930s through 1980s. During the last two decades, however, the contribution of the manufacturing sector has been declining due to several problems the sector has been facing. Infrastructure, high competition from trade liberalization, and the negative effect of currency appreciation and the 2008 global crisis are among the challenges (Domingues et al., 2017). Based on the World Bank Development Index (WBDI), share

of Brazil's manufacturing sector to GDP has declined from 14.73% in 2005 to 10.15% in 2017.

In a nutshell, the gender-based firm performance gap in Brazil is not researched. Brazil stands among the top largest nations with women as more than half of its total population. Gender-based labor force participation gap, wage gap, and the difference/burden in household responsibilities, have been long standing issues in Brazil. The contribution of the main sector, manufacturing, has been declining due to several challenges. This study, therefore, will examine if gender-based firm performance gap exists in Brazil's manufacturing sector. During the study, this paper also review and show the determinants of manufacturing sector performance.

3. Methodology

3.1. Description of Data

The researcher use an unbalanced panel of Brazilian manufacturing firms drawn from the 2003 and 2009 World Bank Enterprise Survey (WBES) conducted by the World Bank (WB). The 2003 survey targeted only the manufacturing sector, whereas the 2009 survey targeted the manufacturing and service sectors. Firms that operate in sectors subject to government price regulation and prudential supervision (such as banks, electric power, rail transport, water and wastewater), agriculture, real estate, and renting activities were excluded from the sample. The sample included firms with five or more employees. The WB used a stratified random sampling method with national registry firms. Sample stratification was based on sector, size and location. The initial sample size was 3,444 firms: 1190 firms surveyed in 2003, 1350 firms surveyed in 2009, and 904 firms surveyed in both 2003 and 2009. By dropping publicly owned service sector firms and those with missing information on the sex of top manager and other basic variables, the sample is further reduced to 2264 (280 women-owned, and 1984 men-owned). The objectives of the WB survey were to identify obstacles faced by the private sector, to provide significant indicators of favorable conditions for investment, build firm-level panel data that allow impact assessment of reforms, and assess the changes in the business environment over time. The WBES contains questions on obstacles to entrepreneurship, such as lack of infrastructure, crime, macroeconomic policies, corruption, the quality of the legal system, and financing. It also collected information on performance variables, such as current sales, number of employees, and information about three years earlier for both variables. Furthermore, the survey contains information on a rich set of firm characteristics. For example, age of firm, working hours, form of firm ownership, experience of a top manager, employees and managers' level of education, industrial sector, capacity utilization, access to training, and credit. The main data limitations are: a) inability to identify sex under co-ownership, b) lack of detailed demographic information on top managers or entrepreneurs, and C) a significant number of missing answers to some variables, especially those of performance measurements. Further information on the sample characteristics can be found in the report on the sampling and implementation procedures provided by the WB.

Based on the World Bank Development Index (WDI) 2009, the manufacturing sector contributes 13.06% of Brazil's GDP. Since, there was no within-firm changes in ownership between 2003 and 2009 for a meaningful panel model analysis, the data were

pooled into a single analysis sample. Regarding gender, the key variable of this research, the classification of male and female ownership is difficult in the case of co-ownership. Based on previous studies (Asiedu et al., 2013; Hansen and Rand, 2014), it is possible to specify a firm as women-owned if it has at least one female owner. In addition, some previous studies (Asiedu et al., 2013; Bardasi et al., 2011; Henrekson and Du Rietz, 1999; Watson, 2002) argue that the gender of the top manager (decision maker) is more meaningful in measuring the gender-based firm performance gap. In this study, the firm is specified as women-owned if and only if it has at least one female owner and the top manager is a woman. For 99 percent of observations, if the top manager is women, the firm has at least one female owner. In addition, the researcher cross-checked and conferred that the results would not be affected by whether the specification ownership is based on either the sex of the owner and manager, or only the sex of the manager.

3.2. Method of Analysis

The analysis begins with a descriptive comparison of female and male business owners, and then turns to a series of equations in which the logarithm of sales, the logarithm of the number of employees, sales growth rate, employee growth rate, and labor productivity (total revenue/number of employees), are regressed on a gender dummy and a rich set of control variables that reflect human and financial capital, as well as personal and business characteristics. Logistic regression was also used to show the relationship between export propensity and the explanatory variables. Furthermore, Blinder and Oaxaca's decomposition shed light on the contribution of each explanatory variable to the gender-based firm performance gap. Finally, the existence of gender-based access and the demand for credit differences are investigated using the Heckman Probit model.

3.2.1. Descriptive Analysis

This study used descriptive analysis, such as mean, standard deviation, t-test, and graph to show the difference between women-owned and men-owned firms in terms of number of employees, sales, sales growth, employee growth, labor productivity, export propensity, experience, access to credit and training, sector distribution, age of firm, and ownership type.

Firm performance was measured in terms of firm size (number of employees and total revenue), labor productivity (total revenue/number of employees), and export propensity. These variables report firms' economic conditions and many researchers have broadly used them to measure firm performance (Fairlie and Robb, 2009; Gottschalk and Niefert, 2011; Kepler and Shane, 2007). The variables reported in monetary terms were deflated using Brazil's GDP deflator obtained from the WB, with 2003 as the base year.

3.2.2. Econometric Analysis

Gender based firm performance gap measured using the following regression equation:

$$Y_{ijy} = \beta_0 + \beta_1 W_{ijy} + \beta_2 X_{1ijy} + \beta_3 X_{2ijy} + \beta_4 X_{3ijy} + Y_y + \varepsilon_{ijy} \quad 3.1$$

Where Y_{ijy} is, alternatively, the log of the number of employees, the log of sales, and the log of labor productivity for firm i in industry j and year y . W_{ijy} is the gender of owner firm i , in industry j and year y ; X_{1ijy} is a vector human and financial capital variables that

includes the top manager's experience, workers' training, percentage of degree holder workers, share of women workers, and access to credit; X_{2ijy} are business characteristics such as firm age, form of firm ownership, foreign ownership, location, competition and international recognition; X_{3ijy} are personal characteristics such as hours devoted to the business, capacity utilization; and sectors such as food, textiles, shoes and leather, chemical, machinery and equipment, auto parts, furniture and others; Y_y is a year dummy. The researcher enter X_{1ijy} , X_{2ijy} , and X_{3ijy} sequentially in the equation, and by examining how the gender coefficient changes with the inclusion of additional controls, the researcher assess the power of each set of variables to explain the gender gap in firm performance.

The researcher also used logistic regression to investigate the existence of a gender-based gap in export propensity, after considering other explanatory variables. The logistic regression equation was estimated as follow logistic:

$$\Pr(D_i = 1) = F(\beta_0 + \beta_1 W_{ijy} + \beta_2 X_{1ijy} + \beta_2 X_{2ijy} + \beta_2 X_{3ijy} + \beta_4 Y_y + \epsilon_{ijy}) \quad 3.2$$

where, F is the cumulative density of the logistic distribution, i refers to a firm, D_i takes the value one if the firm sells or exports any of its goods outside Brazil otherwise, it is zero.

The Blinder-Oaxaca (BO) decomposition technique is utilized to analyze the extent to which each explanatory variable explains the gender-based firm performance gap (Blinder, 1973; Oaxaca, 1973). The standard BO decomposition for the linear regression model reduces the performance gap (the mean outcome difference $\bar{Y}_M - \bar{Y}_W$) into two components. First, the gap is the result of the difference in performance explanatory variables between men-owned (\bar{X}_M) and women-owned firms (\bar{X}_W), Second, the gap is the result of the difference in the coefficients of the separate linear regression equation for men (B_M) and women (B_W).

$$\bar{Y}_M - \bar{Y}_W = (\bar{X}_M - \bar{X}_W)B_M + \bar{X}_W (B_M - B_W) \quad 3.3$$

The difference in coefficients captures the behavioral or gender-based differences in the responses to each variable. However, this technique has been criticized by some researchers. The standard BO decomposition has three components: the portion of the differential attributable to differing endowments (E), differing coefficients (C), and an unexplained portion of the difference (U). According to Jones (1983), empirical findings show that decomposition has only two parts: the endowment term (E) and the residual term (C+U=D). Because the values of C and U change with the choice of left out categories and variable measurement decision, the residual term cannot decompose and uniquely determine each part (C&U), (for more discussion see Cain, 1986; Fortin et al., 2011; Jones, 1983).

Oaxaca and Ransom (1994) also criticized the choice of coefficients for the first component of the decomposition when calculating it. They apply four methods to estimate wage discrimination in terms of race and gender. They found that using a single race or gender wage structure as a norm for measuring discrimination and productivity differences was too extreme. Therefore, they proposed using the coefficient of estimates from a pooled sample of the two groups to provide the best estimate. Fairlie and Robb

(2009) also pointed out the sensitivity of the Standard Blinder-Oaxaca decomposition method to specification errors.

To overcome these problems, I use an approach similar to (Fairlie and Robb, 2009; Gottschalk and Niefert, 2011; Oaxaca and Ransom, 1994). Specifically, I use an alternative technique that computes only the first part of the decomposition and the coefficients pooled model (B). The contributions of gender differences in characteristics are as follows:

$$\bar{Y}_m - \bar{Y}_w = (\bar{X}_m - \bar{X}_w)B \quad 3.4$$

Where \bar{Y}_j is the means of outcome variables of gender j and \bar{X}_j is the means of firm characteristics, B is a vector of pooled coefficient estimates, and $J = M$ or W for men and women, respectively. The researcher do not report estimates for an unexplained component of the decomposition because it partly captures the contributions from group differences in immeasurable characteristics and is difficult to interpret.

In this study, the researcher used standard BO decomposition for the baseline analysis. The researcher then check the robustness of the BO result using two alternative decomposition methods, Cotton and Neumark. Further, the researcher used the Fairlie non-linear decomposition method, which allows using the coefficient estimates from the logit model directly in the decomposition specification to study export propensity (Fairlie, 2005).

4. Result and Discussion

4.1. Descriptive Result

The basic characteristics of the sampled firms are summarized in table 4.1 and 4.2, which report summary statistics for the dependent and some key explanatory variables for women- and men-owned firms in the pooled sample. The tables report the overall mean and corresponding standard deviation as well as the mean and standard deviation for male and female entrepreneurs, respectively. Column 5 represents the difference between women-owned and men-owned firms for each variable and the P-value from a t-test for the null hypothesis that the difference is zero. The descriptive statistics for all other variables are presented in Appendix table A.1 and A.2.

Table 4.1.: Summary of descriptive statistics for Firm performance measurements

	Observation (1)	Full sample mean (2)	Men entrepreneurs (3)	Wome n entrepreneurs (4)	Differe nce from men
Performance measurements					
Employee s	2264	134.43 (462.31)	144.52 (489.03)	62.93 (167.18)	-.81.58 [0.00]
Sales	2264	151945. 9	168486. 1	34746. 97	- 133739. 1

		(892547.6)	(950341.5)	(163580)	[0.00]
Labor productivity	2264	1118.36 (216.23)	1219.49 (246.56)	401.75 (865.13)	-817.74 [0.00]
Export Propensity	2264	.22 (.41)	.23 (.42)	.13 (.33)	-.1 [0.00]
		2264	1984	280	

Standard deviations of variables appear in parentheses and p-values for differences in means appear in square brackets.

The descriptive result in table 4.1 shows that the average firm in the sample generates 151,945.9 Brazilian Real (BRL) in sales and employs about 134 workers; labor productivity is 1,118.36 BRL and export participation rate is 22%. Generally, male-owned firms perform better in all performance measurements.

Brazil has 4.1 million registered companies with women's lower participation rate and high concentration in the informal sector (UNCTAD, 2013). They are less likely to participate in business ownership and management, as women encumbered only 37.3% of the management positions (ILO, 2015). Brazil's manufacturing sector is primarily owned and managed by men. Of the 2,264 sampled firms, men owned and managed 1,984 (87.63%), whereas women owned and managed 280 (12.37%). In addition, women-owned firms are substantially smaller in size, in terms of both the number of employees and sales. The average numbers of employees in men-owned and women-owned firms were 144 and 63, respectively. In addition, women entrepreneurs are less likely to participate in exports than their male's counterparts are. The participation rate of female business owners' in direct exports is only 13%, while that of men is 23%. Further, the sale of women-owned firms (34,746.97 BRL) is significantly lower than that of men-owned firms (168,486.1 BRL). Women-owned firms have also less labor productivity than their men counterparts, which are 401.75 BRL and 1,219.49 BRL respectively.

The disadvantage of women-led firms along all outcome variables is mirrored in the gender gaps, which are also evident for many explanatory variables (see table 4.2). For instance, women-owned firms are managed by less experienced managers than men-owned ones. On average, male firm managers have 15-years' experience, whereas female firm managers have 13 years of experience. Referring to Orser et al. (2010), the researcher used a dummy variable for experience, and considered 10 years or more as experienced and less than 10 years as less experienced manager. Accordingly, 56% of men-owned firms are managed by a well experienced manager, whereas this figure is 50% for women-owned firms. In addition, 60% of permanent workers received formal training (61% for men-owned and 50% for women-owned firms). The table highlights that women-owned firms use slightly more credit services than men-owned firms do, although the gender difference is statistically insignificant. However, after accessing loans, the loan size borrowed by women is less than one-third that of men's loans. The average real loan size of women-owned firm is 5,044.32 BRL, whereas it is 18,193.06 BRL for men-owned firms. Larger firms have a higher probability of obtaining larger loans (see the graph in the Appendix A.1).

Table 4.2 shows that women-owned firms operate fewer hours than men-owned. As regards to sector distribution, men-owned firms are more likely to operate in medium high technology intensive sectors, like machinery and equipment, and auto parts than women-owned. While only 7% of women-owned firms participate in machinery and equipment sector, the proportion of men-owned firms is 13%, which the difference is statistically significant. Women-owned firms are more likely to be involved in garment sector than men-owned. In terms of firm age, women-owned firms tend to be younger than the men-owned. The average firm age is 19.2 years, which that of men-owned is 19.7 years and that of women-owned is 15.7 years. Since foreign-owned firms tend to have more knowledge, capital and exposure than the domestic owners, they are expected to perform better. The working capital of men-owned firms is financed more by foreign individuals than women-owned firms. In addition, the summary result shows that women are often single owners than their men's counterparts. In contrast, women entrepreneurs have better capacity utilization than their men's counterparts.

In general, these statistics show that women entrepreneurs are disadvantaged in terms of most firm performance explanatory variables and consequently perform less than their male counterparts. This suggests that the explanatory variables may explain at least part of the gender-based performance gap. A simple descriptive analysis of the gender-based gap in firm performance failed to establish a clear pattern. An analysis of a multivariate framework that accounts for confounding factors is needed. In addition, the Blinder and Oaxaca decomposition may shed light on the contribution of each explanatory variable to the gap; and these issues are addressed in the next section.

Table 4.2.: Summary of descriptive statistics for some basic variables

	Observation (1)	Full sample mean (2)	Men entrepreneurs (3)	Women entrepreneurs (4)	Difference from men (5)
Human and financial capital, and personal and business characteristics					
Top manager experience	2264	.55 (.5)	.56 (.5)	.5 (.5)	-.06 [0.04]
Training to workers	2264	.6 (.49)	.61 (.49)	.5 (.5)	-.11 [0.00]
Access to credit	2264	.45 (.54)	.45 (.5)	.46 (.76)	.01 [0.86]
Hours devoted in the business	2264	55.85 (30.18)	56.47 (31.13)	51.44 (21.85)	-5.03 [0.00]
Capacity Utilization	2264	76.06 (18.01)	75.7 (17.86)	78.65 (18.87)	2.95 [0.00]
Food	2205	.09 (.29)	.09 (.29)	.07 (.01)	-.02 [0.16]
Textiles	2205	.08 (.26)	.08 (.27)	.06 (.23)	-.02 [0.16]
Garments	2205	.25	.22	.46	.24

Shoes and leather	2205	(.43) .11	(.41) .11	(.5) .12	[0.00] .01
Chemicals	2205	(.31) .07	(.31) .07	(.02) .05	[0.46] -.02
Machinery and Equipment	2205	(.25) .13	(.26) .13	(.22) .07	[.25] -.06
Auto parts	2205	(.33) .09	(.34) .09	(.26) .05	[0.00] -.02
Furniture	2205	(.29) .18	(.29) .19	(.22) .11	[.25] -0.18
Other manufacturing sectors	2205	(.39) .01	(.39) .01	(.31) .004	[0.00] -.003
Age of firm	2264	(.08) 19.2	(.08) 19.7	(.06) 15.7	[0.51] -3.99
Form of firm ownership	2264	(16.93) .92	(17.22) .93	(14.21) .88	[0.00] -.05
loan size	1609	(.26) 16681.2	(.25) 18193.0	(.33) 5044.32	[0.01] -
		4 (137445.9)	6 (145381.6)	6 (38503.03)	4 13148.7
					[0.00]
		2264	1984	280	

Standard deviations of variables appear in parentheses and p-values for differences in means appear in square brackets. The descriptive analysis part of the paper discusses the characteristics and owner characteristics of both women- and men-owned firms.

4.2. Econometrics Result

4.2.1. Gender and Firm Performance

In this section the researcher formally examine the relationship between gender and firm performance in the Brazilian manufacturing sector. Firm performance was measured in terms of firm size (number of employees and total revenue), labor productivity (total revenue/number of employees), and export propensity. These variables report firms economic conditions, and many researchers have broadly used them to measure firm performance (Fairlie and Robb, 2009; Gottschalk and Niefert, 2011; Kepler and Shane, 2007). The variables reported in monetary terms were deflated using Brazil's GDP deflator obtained from the WB, with 2003 as the base year.

Table 4.3, & 4.4 presents the coefficients of the dummy for women's ownership, estimated using OLS regression and logistic regression, wherein the dependent variable is a measure of performance, and the group of control variables increases progressively from column 1 to column 4. Human and financial capitals are controlled in column 2, business characteristics are controlled in column 3, and personal characteristics and sectors are additionally controlled in column 4. The difference in the gender coefficient

from one column to the next indicates the gender gap accounted for by the inclusion of an additional set of variables. The gender coefficients of the variables of interest from step-by-step estimations are reported in table 4.3, and 4.4, whereas the results of the other main explanatory variables for each firm's performance measurement are added in table 4.5.

The result in table 4.4 shows that the considered explanatory variables can explain the majority of gender-based export propensity gap. After considering other explanatory variables, the gender gap in export propensity fell from 10% to 3% and the gap became statistically insignificant. However, the coefficient of the indicator variable 'women' remains negative and statistically significant for most outcomes, even after controlling all observable characteristics (see table 4.3, & 4.4). The results show that female entrepreneurs perform 29% less in the number of employees, 57% less in sales, and 27% less in labor productivity. The findings of this study in terms of the number of employees and sales are consistent with those of previous studies (Bardasi et al., 2011; Fairlie and Robb, 2009; Loscocco et al., 1991; Rosa et al., 1996; Sabarwal and Terrell, 2008; Watson, 2002). The findings confirm that gender differences in the observable characteristics of owners and firms do not fully explain the poor performance of women-owned firms in terms of sales, number of employees, and labor productivity. After controlling for human and financial capital, and owner and business characteristics, the gender gap in the number of employees fell from 46% to 29% but remains statistically significant (compare columns 1 and 4). Similarly, the difference in sales falls dramatically from 1.13 to .57 log point and remains statistically significant (see table 4.3). Labor productivity also falls from 65% to 27% but remains statistically significant.

Table 4.3.: Gender, and number of employees and sales

Dependent variable	Ln (number of employees)				Ln (sales)			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Gender	-.46*** (.06)	-.37*** (.07)	-.28** * (.06)	-.29*** (.06)	1.13** * (.12)	-.74*** (.12)	-.55*** (.11)	-.57*** (.11)
Human and financial characteristics	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Business characteristics	No	No	Yes	Yes	No	No	Yes	Yes
Personal characteristics	No	No	No	Yes	No	No	No	Yes
	226	226	N	Ye	2264	2264	2264	2205
	4	4	o	s	0.04	0.21	0.34	0.46
	0.0	0.1						

ticsand sector Sample size R- square	2	7	2264	2205	0.33	0.38
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Table 4.4.: Gender, and labor productivity and export propensity

Dependent variables	Ln (labor productivity)				Export propensity			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Gender	.65** *	.36** *	.26** *	.27** *	.1**	.06** *	-.03	-.03
	(.09)	(.09)	(.09)	(.09)	(.02)	(.02)	(.003)	(.02)
Human and financial characteristics	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Business characteristics	No	No	Yes	Yes	No	No	Yes	Yes
Personal characteristics	No	No	No	Yes	No	No	No	Yes
ticsand sector Sample size	2264	2264	2264	2205	2264	2264	2264	2127
R- square	0.02	0.13	0.18	0.21	0.00	0.00	0.00	0.00
In sample prediction Accuracy					77.87	78.71	81.89	82.09

Notes:- The coefficients of a dummy for women's ownership are shown in the table. Human and financial characteristics (top manager experience, training, percentage of degree holder employees, share of female workers, access to credit), business characteristics (age of firm, age squared, form of firm ownership, location, competition, international recognition), personal characteristics (hours devoted to business, capacity utilization), and sector. Regressions include a year dummy, and standard errors clustered at the firm level in parentheses *** significant at 1%, **

significant at 5%, and * significant at 10%.

The findings in table 4.3 & 4.4 shows that the aspects of human and financial capital partially explain the lower performance of women-owned firms in terms of the number of employees, sales, labor productivity and export propensity than their male counterparts. Similarly, business characteristics partially explain the gender gap of performance in terms of the number of employees, sales, labor productivity, and export propensity (compare Columns 2 & 3). Personal characteristics and sectors increase the gender gap in all firm performance measurements (compare Columns 3 and 4). Thus, these characteristics favor women entrepreneurs. The main reason for this is that women entrepreneurs have better capacity utilization, and their sector distribution is favorable in terms of the number of employees and sales performance.

In terms of the role of control variables, table 4.5, shows that most firm performance explanatory variables have a consistent and significant influence on firm performance measurements. For instance, foreign ownership and access to training positively and significantly affected all performance measurements. The fact that working capital for women-owned firms is less likely to be financed by foreign individuals partly explains why their firms perform less than their male counterparts. Training is human capital characteristic expected to have a positive impact on firm performance. Entrepreneurs with a large stock of human capital, such as vocational training are expected to place their enterprises in a better place to adapt to constantly changing business environments. Since such training is expected to enhance employees' technical knowledge, access to training able to positively influence firm performance measurements. As expected the results show that access to training has a positive impact on all performance measurements. The performance of firms that provide training to their employees is higher in terms of the number of employees, sales, labor productivity, and export propensity by 51%, 81%, 32%, and 11%, respectively compared those that did not provide training. The fact that workers in women-owned firms have less access to training may partly explain why their firm performance is lower than their male counterparts.

Capacity utilization also positively influences all firm performance measurements, although it is not statistically significant in terms of labor productivity and export propensity. Capacity utilization indicates how efficiently resources are utilized, and can be measured by the ratio of output produced to the maximum output that would be possible to produce if all available resources are utilized. Women have better capacity utilization, so the contribution of this variable to the gender gap in firm performance is negative. The influence of credit access is positive and statistically significant in terms of all performance measurements except for labor productivity. As reported in table 4.5, a firm with access to credit has 22% more employees, 33% more sales, and 7% more likely to participate in exports than firms without such access. This result is consistent with prior findings that firms with access to credit perform better than those without credit access (Brown et al., 2011). Firm age positively correlates with the number of employees, sales, labor productivity, and export propensity (see table 4.5). The fact that women-owned firms are relatively young, contributes to the gender gap in terms of the number of employees, sales, labor productivity, and export propensity. Firms in more

competitive areas are larger (in terms of sales), possibly because large firms have more chances to survive competition. Location significantly affects all performance measurements. Firms in large cities have fewer employees, lower sales, less labor productivity, and are less likely to participate in exports than firms in small cities. The results show that firms in large cities have 8% fewer employees, 30% fewer sales, 28% less labor productivity, and 8% less likely to participate in exports than firms in small cities. This finding shows that larger, more productive, and exporter firms are concentrated in small cities (areas with a population less than one million).

Table 4.5.: Gender and firm performance

Variables	Employees (1)	Sales (2)	Productivity (5)	Export propensity (6)
Gender	-.29*** (.06)	-.57 (.11)	-.27*** (.09)	-.03 (.02)
Top manager experience	.01 (.05)	-.01 (.08)	-.12 (.06)	.11*** (.02)
Training to workers	.51*** (.04)	.81*** (.08)	.32*** (.06)	.11*** (.02)
Percentage of degree holder workers	.002 (.002)	.01*** (.004)	.01*** (.004)	.003*** (.001)
Share of female workers	.002 (.001)	-.002 (.002)	.005*** (.002)	.001 (.0005)
Access to credit	.22*** (.05)	.33*** (.12)	.06 (.06)	.07*** (.02)
Age of firm	.03*** (.003)	.05*** (.005)	.02*** (.004)	.01*** (.001)
Age square	-.0001*** (.00003)	- .0002*** (.0001)	.0001*** (.00004)	-.00003*** (.00001)
Firm ownership	.39*** (.07)	.66*** (.13)	.28*** (.11)	.1*** (.02)
Foreign ownership	.61*** (.16)	1.27*** (.24)	.61*** (.23)	.3*** (.09)
Location	-.08*** (.05)	-.3*** (.08)	-.28*** (.11)	-.08*** (.02)
Competition	.02 (.07)	.26* (.14)	-.12 (.11)	.002 (.03)
International recognition	.55*** (.07)	.93*** (.11)	.38*** (.09)	.14*** (.03)
Hours devoted in the business	.01*** (.001)	.01*** (.001)	.002** (.001)	.001*** (.0003)
Capacity utilization	.01*** (.001)	.01*** (.022)	.003 (.002)	.0003 (.0004)

Food sectors	.17 (.12)	-.63*** (.19)	.35*** (.14)	.09* (.05)
Textiles	-.19* (.1)	.2 (.19)	.3** (.15)	.05 (.05)
Shoes and leather	.21*** (.08)	.23 (.14)	-.05 (.11)	.19*** (.05)
Chemicals	-.43*** (.12)	.49** (.22)	.81*** (.18)	.03 (.05)
Machinery and equipment	-.28*** (.1)	.02 (.19)	.23 (.16)	.14*** (.06)
Furniture	.06 (.08)	-.2 (.17)	-.2 (.13)	.08 (.05)
Log likelihood/R ²	.38	.4	.21	-900.44
Sample size	2205	2205	2205	2205

For export propensity marginal effects reported and their standard error clustered at firm level ***significant at 1%, ** significant at 5%, and * significant at 10%.

The regression further indicates that the number of employees, sales, labor productivity, and export propensity are higher for partnerships than sole proprietorships, which is consistent with previous evidence in the US context. Coleman and Robb (2009) found that partnership firms have higher equity and debt investments than sole ownership firms. In addition, firm working hours and international recognition status are positively and significantly related to the number of employees, sales, labor productivity, and export propensity. Some research findings suggest that women entrepreneurs perform less than men because they spend more time on household activities and less time managing their businesses (Fairlie and Robb, 2009; Hundley, 2000). The traditional family model also persists in Brazil, wherein women are the main agent responsible for household activities (Bruschini, 2007). Accordingly, the descriptive results this study show that women spend fewer hours in their business than their male counterparts. The researcher conclude that the difference in working hours, international recognition, and form of firm ownership explain why women-owned firms have fewer employees, lower sales, less labor productivity, and are less likely to participate in export.

In this study, garments, the sector in which women are highly concentrated, is the reference category. This sector has a higher number of employees than textiles, chemicals, machinery, and equipment. By contrast, the garment sector is less likely to participate in exports than food, shoes, leather, machinery and equipment. In addition, the garment sector has less labor productivity than the food, chemical, and other manufacturing sectors. The researcher concludes that the sector distribution difference between male and female entrepreneurs is in favor of female entrepreneurs in terms of firm size. This result is consistent with the finding of Bardasi et al. (2011), indicating that in Latin America, women entrepreneurs are concentrated in sectors where the average firm size and value-added of their firms are higher than those of their male counterparts. However, women's higher concentration in the garment sector may partly explain their firms' lower export participation rates and less labor productivity.

Because of the difficulty in measuring preferences, motivation to start a business, and risk aversion, the differences in these variables were not controlled in this study. These variables provide a benchmark for how women-owned businesses perform less than men-owned business. The central question that arises from the preceding analysis is why women-owned enterprises are smaller and less productive, and on average, have lower export participation rate? The researcher attempts to answer this question within data constraints. Regression analysis shows that the explanatory variables considered explain some of the gender gaps in firm performance. In the next section, the researcher discusses exact contribution of each explanatory variable and the overall explanatory power of these variables to gender-based firm performance gaps.

4.4.2. Explanation for Gender Based Firm Performance Difference

Table 4.6 reports estimates from Oaxaca-Blinder and Fairlie (for export propensity) decomposition technique to gender-based firm performance gap. The detailed contributions of gender-based differences in each explanatory variable to firm performance are reported. Appendix table A.3 reports the results from three decomposition methods, namely Oaxaca-Blinder, Cotton, and Neumark's decompositions. Since each decomposition methods are slightly different in their assumptions, the results have very small differences in magnitude, whereas the qualitative results are the same.

The decomposition results confirm that the explanatory variables cannot fully explain the gender-based performance difference in terms of number of employees, sales, labor productivity and export propensity. The explanatory variables explain 36.57% of the gender-based gap in the number of employees, 48.03% of the gender-based sales gap, 57.6% of the labor productivity gap, and 74.73% of the export propensity gap. The "unexplained" portion of gender-based gaps in firm performance may be the result of the omission of important immeasurable and difficult-to-measure variables such as risk aversion behavior, preference for growth, motivation to start a business, networks, household responsibilities and gender-based discrimination.

As reported in table A.1 and A.2, managers of women-owned firms are less experienced, and their employees are less likely to have a graduate degree when compared to men-owned firms. However, the influence of these variables on most performance measurements is insignificant. Consequently, the contribution of these variables to the gender-based performance gap is very small. In contrast, the explanatory power of gender-based differences in access to training is strong. The gender-based difference in this variable explains 3.84%-29.39% of the gender-based gap in firm performance. Possible reasons for not having access to training might be resource constraints, unwillingness, and/or misunderstanding of its benefits. Generally, a lack of training in women-owned firms restricts employees from developing their skills and knowledge, which, in turn, adversely affects productivity and business success.

Table 4.6.: Decompositions of Male/Female gap in detail in firm performance

Dependent variable	Ln employ ee (1)	Ln sales (2)	Labor productivit y (5)	Export Propensi ty (6)
Male mean	3.94	9.58	5.69	.23

Female mean	3.47	8.44	5.05	.13
Male/Female Gap	.48	1.14	.64	.1
Top manager experience	-.005	-.01	-.01	-.001
Training to workers	.99%	1.28%	-1.35	-1.2%
	.06	.09	.03	.004
	11.7%	8%	5.12%	3.84%
Percentage of degree holder workers	.004	.02	.02	.006
The share of female workers	.91%	2.56	3.3%	5.32%
Access to credit	-.04	.08	.13	-.01
	-9.45%	6.95%	19.86%	-12.64%
Age of firm	-.001	-.001	-.0002	-.002
	.15%	-.08%	.04%	1.95%
Form of firm ownership	.09	.15	.06	.03
	19.28%	13.34%	8.96%	25.64%
Foreign ownership	.02	.04	.015	.005
	4.45%	3.21%	5.52%	4.93%
Location	.01	.03	.01	.006
Competition	2.61%	2.25%	2.05%	5.52%
	.02	.07	.04	.02
International recognition	4.23%	5.77%	6.59	17.06%
	-.003	-.001	.002	-.001
Hours devoted in business	-.54%	-.08%	.3%	-1.26%
Capacity utilization	.06	.1	.04	.01
	12.12%	8.56%	6.09%	14.42%
Sector	.03	.05	.01	.01
	5.86%	4.08%	1.97%	7.8%
	-.02	-.02	-.01	-.0003
	-3.59%	-2.19%	-1.18%	.29%
	-.05	-.03	.02	.01
	-	-2.75%	3.62%	8.62%
All included variables	11.05%			
	.175	.55	.37	.08
	36.57%	48.03%	57.6%	74.73%

The samples and regression specifications are the same as those in table 4.3, 4.4, and 4.5 for the pooled sample model, significant effects are in bold.

As discussed in the descriptive part of this study, in Brazil, women business owners have the same possibility of accessing credit as men business owners. As a result, the contribution of this variable to the gender-based performance gap is almost zero. Regarding to firm age, descriptive statistics show that women-owned firms are younger. On average, the age of women-owned firms is 15.7, whereas that of men is 19.7. The

difference in firm age explains the lower sales volume, number of employees, labor productivity, and export propensity of women-owned firms. The contribution of firm age to the gap is 19.28% for number of employees, 13.34% for sales, 8.96% for labor productivity, and 25.64% for export propensity.

Gottschalk and Niefert (2011), a study conducted in Germany, found that women are less likely to start business with partnerships, and such differences explain gender-based performance differences in terms of sales and firm growth rate. This study finding also shows that, on average, female entrepreneurs are more likely to be sole proprietorships than their male counterparts. The difference in the form of ownership explains 4.45% of the gender-based number of employee gaps, 3.21% of the sales gaps, 5.52% of the labor productivity gaps, and 4.93% of the export propensity gaps. Further, women-owned firms are financed domestically, whereas male-owned firms are relatively owned and financed by foreigners. This variable explains 2.61% of the gender-based number of employee gap, 2.25% of the sales gap, 9.91% of the employees' growth rate gap, 2.05% of the labor productivity gap, and 5.52% of the export propensity gap. Generally, foreign owners are expected to have more exposure, experience, and knowledge, which may contribute positively to firm performance.

Location is another variable that explains the gender-based performance gap in terms of sales, number of employees, labor productivity, and export propensity. As showed in table 4.6, this variable explains 5.77% of the gender-based sales gap, 4.23% of the gender-based gap in the number of employees, 6.59% of the gap in labor productivity, and 17.06% of the gender gap in export propensity. This is because sales, number of employees, labor productivity, and export participation rate are higher than the average in small cities, where men are overrepresented. There is no significant difference between male and female entrepreneurs in terms of competitive advantage. Consequently, this variable makes almost no contribution to the gender-based performance gap.

There was a significant difference between male and female entrepreneurs in terms of international recognition. 22% of male owners report that their firms have international recognition, whereas it is 11% for female entrepreneurs. The difference in international recognition explains the gender-based firm performance gaps of 12.12%, 8.56%, 6.09%, and 14.42% in terms of the number of employees, sales, labor productivity, and export propensity, respectively. However, the gender-based working hour difference explains a small portion of the firm performance gap (1.71%-7.8%). This is because the influence of this variable on firm performance is very small in terms of sales, number of employees, labor productivity and export propensity. The difference in the mean of capacity utilization widens the gender-based firm performance gap because, on average, female entrepreneurs have better capacity utilization than their male counterparts.

The gender-based sector distribution difference is another explanatory factor for the gender-based gap in firm performance. According to Hundley (2000), the business sector accounts for a large fraction of the gender-based firm performance gap. Women entrepreneurs are less likely to be involved in sophisticated technology-based firms. They are over-represented in less technology-intensive service sectors. According to Fairlie and Robb (2009), possible reasons for gender-based differences in industry

distribution are capital constraints, skill differences, gender-based discrimination, and differences in preferences. This study finding indicates that gender-based differences in industry distribution negatively contribute to the gender-based firm performance gap in terms of number of employees, and sales by 11.05% and 2.75%, respectively. The results suggest that women-owned firms have favorable industrial distribution in terms of sales and number of employees. The main reason is that, even if women entrepreneurs are concentrated in less sophisticated sectors, these sectors have better performance in terms of the number of employees and sales. According to Bardasi et al. (2011) and Rijkers and Costa (2012), women entrepreneurs operate small firms, because they are concentrated in smaller sectors. In contrast, this study finding shows that women are concentrated in the non-small-size sector but own smaller firms within the sector.

5. Conclusion

Using an unbalanced panel of Brazil's manufacturing sector data collected by the WB in 2003 and 2009, the researcher investigated whether a gender-based firm performance gap exists. On average female-owned firms are disadvantageous in terms of many firm performance explanatory variables. For instance, women-owned firms have less access to training, operate fewer hours, are less likely to have international recognition, are highly concentrated in low-technology-intensive manufacturing sectors, and are over-concentrated in large cities, compared to men-owned firms. Furthermore, women-owned firms are younger and have sole proprietorship legal status compared to men-owned firms. The explanatory variables partially explain the gender-based differences in firm size, labor productivity, and export propensity. When explanatory variables are controlled, the gender-based firm performance gap falls from 46% to 29% in the number of employees, and from 1.13 to .57 log point in sales, from 65% to 27% in labor productivity; however, women-owned firms have smaller sales, fewer employees, and lower labor productivity. This study finding shows that the gender-based export propensity gap vanishes when the explanatory variables are controlled.

This study revealed that gender differences in access to training, firm age, the form of firm ownership, foreign ownership, firm location, international recognition, and firm operating hours partially explain why women-owned firms have less performance than men-owned firms. However, gender differences in capacity utilization and sector distribution favor of women entrepreneurs. The decomposition results show that the explanatory variables explain a gender-based performance gap of 36.57%, 48.03%, 57.6%, and 74.73% in the

number of employees, sales, labor productivity, and export propensity, respectively.

Direction to future research

This research doesn't address causal and effect issues, and future studies using panel data can address this issue.

Appendix

Table A.1.: Summary statistics for pooled Sample

	Observati on(1)	Full sample mean (2)	Men en- treprene urs (3)	Female en- treprene urs (4)	Differen cefrom men en- treprene urs (5)
Performance measurements					
Employees	2264	134.43 (462.31)	144.52 (489.03)	62.93 (167.18)	-81.58 [0.00]
Sales	2264	151945. 9 (892547. 6)	168486. 1 (950341. 5)	34746.9 7 (163580)	-133739.1 [0.00]
Labor productivity	2264	1118.36 (216.23)	1219.49 (246.56)	401.75 (865.13)	-817.74 [0.00]
Export propensity	2264	.22 (.41)	.23 (.42)	.13 (.33)	-.1 [0.00]
Human and financial capital					
Top manager experience	2264	.55 (.5)	.56 (.5)	.5 (.5)	-.06 [0.04]
Training to workers	2264	.6 (.49)	.61 (.49)	.5 (.5)	-.11 [0.00]
The percentage of degree holder workers	2264	7.65 (10.81)	7.89 (11.08)	5.9 5 (8.51)	-1.94 [0.00]
Access to credit	2264	.45 (.54)	.45 (.5)	.46 (.76)	.01 [0.86]
Female workers	2264	38.2 (30.7)	35.38 (29.25)	58.22 (33.2)	22.84 [0.00]
Personal characteristics					

Hours devoted in the business	2264	55.85 (30.18)	56.47 (31.13)	51.44 (21.85)	-5.03 [0.00]
Capacity utilization	2264	76.06 (18.01)	75.7 (17.86)	78.65 (18.87)	2.95 [0.01]

Table A.2.: Summary of descriptive statistics for pooled sample B

Manufacturing sector

Manufacturing Sector	Observation (1)	Full sample mean (2)	Men Entrepreneurs (3)	Female Entrepreneurs (4)	Difference from Female Entrepreneurs (5)
Food	2205	.09 (.29)	.09 (.29)	.07 (.01)	-.02 [0.16]
Textiles	2205	.08 (.26)	.08 (.27)	.06 (.23)	-.02 [0.16]
Garments	2205	.08 (.26)	.08 (.27)	.06 (.23)	-.02 [0.16]
Shoes and Leather	2205	.11 (.31)	.11 (.31)	.12 (.02)	.01 [0.46]
Chemicals	2205	.07 (.25)	.07 (.26)	.05 (.22)	-.02 [.25]
Machinery and equipment	2205	.13 (.33)	.13 (.34)	.07 (.26)	-.06 [0.00]
Auto part	2205	.09 (.29)	.09 (.29)	.05 (.22)	-.04 [0.00]
Furniture	2205	.18 (.39)	.19 (.39)	.11 (.31)	-.18 [0.00]
Other manufacturing sector	2205	.01 (.08)	.01 (.08)	.004 (.06)	-.003 [0.51]
Firm characteristics					
Age of firm	2264	19.2 (16.93)	19.7 (17.22)	15.7 (14.21)	-3.99 [0.00]
Form of firm ownership	2264	.92 (.26)	.93 (.25)	.88 (.33)	-.05 [0.01]
Foreign ownership	2264	.03 (.17)	.03 (.18)	.01 (.1)	-.02 [0.00]
Location	2264	.38 (.48)	.36 (.48)	.51 (.5)	.15 [0.00]
Competition	2264	.84 (.36)	.84 (.37)	.85 (.35)	.01 [0.57]

International recognition	2264	.2 (.4)	.22 (.41)	.11 (.31)	-.11 [0.00]
Issues related with					
Subjective perception about financial	2234	2.51 (1.38)	2.52 (1.37)	2.5 (1.42)	-.01 [0.86]
Financing capital by retained earning	2264	46.14 (40.98)	46.3 (41.05)	45 (40.52)	-1.3 [0.31]
Financing capital by bank credit	2264	25.76 (33.57)	26.16 (33.75)	22.92 (32.22)	-3.23 [0.75]
Loan size	1609	16681.24 (137445.9)	18193.06 (145381.6)	5044.32 (38503.03)	-13148.74 [0.00]
		2264	1984	280	

Table A.3.: Decomposition result of Oaxaca-Blinder (OB), Cotton's and Reimers' (CR) and Neumark's decompositions

Performance measurements Decomposition technique	Number of employees OBCR Neumark			OB	Sales CR	Neumark
Unexplained	.304	.303	.278	.59	.605	.543
Explained	.175	.176	.201	.55	.539	.599
Percent of unexplained	63.43%	63.2%	58.1%	51.97	52.9%	47.6%
Percent of explained	36.57%	36.8%	41.9%	48.03	47.1%	52.4%
Performance measurements Decomposition technique	Labor productivity					
	OB	CR	Neumark			
Decomposition technique	OB	CR	Neumark			
Unexplained	.27	.28	.25			
Explained	.37	.36	.39			
Percent of unexplained	42.4%	44.1	38.9			
Percent of explained	57.6%	55.9	61.1			

Figure A.1.: Gender and loan size

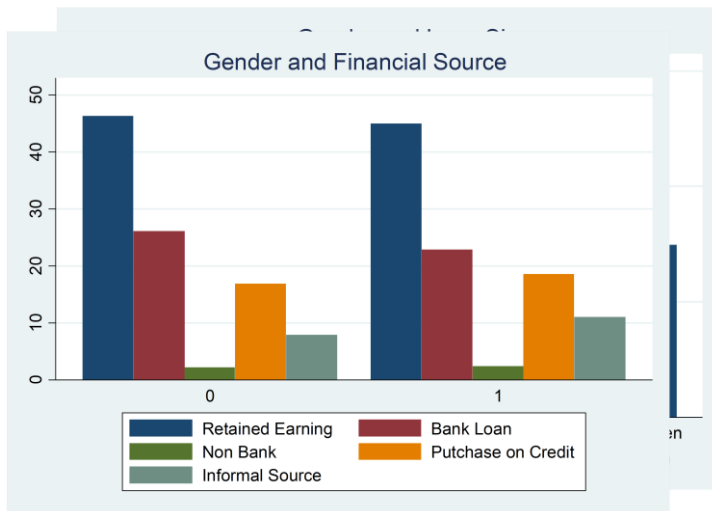


Figure A.2.: Gender and financial source

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