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Gender-based characteristics of micro, small and medium-sized enterprises in an emerging country: is this a man's world?

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Abstract

Purpose – Worldwide, Ecuador is one of the countries with the most entrepreneurial activity from micro, small, and medium-sized enterprises (MSMEs). However, the effect of adopting the US dollar (dollarization), over which the central bank has no control, combined with being mainly an exporter of primary products, as well as strategic currency devaluation by neighboring economies, has created a difficult situation, especially for Ecuadorian women's MSMEs. This paper therefore aims to study the relationship between female ownership and Ecuadorian MSMEs' financial, economic and social outcomes.~~to identify MSMEs' characteristics of companies in accordance with firm-specific drive~~

Design/methodology/approach – ~~Our~~ We compile ~~final database comprises~~ a near-population panel of 617,804 firm-year observations ~~s. This subsample~~ representings an unbalanced panel of 112,917 MSMEs during the 2007–2016 sampling window. Panel (fixed effects) regression is used to test our hypotheses concerning the antecedents to firm financial performance, economic and social outcomes. Cox proportional hazards modeling is used to assess the impact of antecedents on firm survival. ~~A repeated measures ANOVA is conducted for each ownership ratio (female, male, company, domestic), and regression coefficients calculated are significant, confirming that firm-size group differences exist.~~

Findings – First, firms providing more social benefits (e.g. employment, higher wages) ~~face~~ have higher survival rates. Second, female ownership is negatively related with microenterprise financial performance, but positively associated with small-enterprise financial performance~~–~~. Third, female-owned enterprises tend to provide higher wages per employee for all firm sizes. Fourth, although female-owned microenterprises are less efficient, they tend to provide more for their employees, and possibly communities, through the economic stimulus they provide, in terms of the size of the financial outcomes.

Originality – This paper shows that, although this is a "man's world," women are learning earlier, developing faster professionally, and overcoming stereotypes to focus on activities that generate both economic performance and social outcomes. Governmental policies that have contributed to MSMEs' growth and women's participation are identified. Our findings suggest ways to improve and support both the creation of more women-owned MSMEs in emerging countries, such as Ecuador, and the survival of existing male- and female-owned MSMEs.

Keywords: Gender; Performance; Micro, small, and medium-sized enterprises; Emerging countries.

Paper type: Research paper.

1. Introduction

Micro, small, and medium-sized enterprises (MSMEs) are key components of the economy in emerging markets. Their role includes not only job creation and stimulating innovation but also employment growth and poverty alleviation (Ipinnaiye *et al*., 2017; Maksimov *et al*., 2017). MSMEs represent an even larger share of the total number of firms in developing countries. Pagés (2010) reported that around 94% of the service sector in Mexico and more than 80% of registered manufacturing establishments in Argentina, Bolivia, El Salvador, and Mexico have fewer than 10 employees.

Corporación Andina de Fomento (CAF) (for details, see Elorza, 2017) states that, in Latin America, MSMEs represent 90% of the productive units, generating almost 60% of the region's jobs and representing a quarter of the regional gross domestic product (GDP). In this sense, Ecuador is not an exception; it is, however, considered one of the countries with the most MSMEs worldwide (GEM, 2019). According to *Superintendencia de Compañías, Valores y Seguros* (SCVS)[1], 95% of the Ecuadorian business environment consists of MSMEs, and MSMEs have generated around 46% of the country's formal employment from 2013 to 2018 (SCVS, 2018).

Women account for the majority of entrepreneurial activity in some of the least developed countries, mainly out of necessity (Adom *et al*., 2017). Their work contributes to raising the living standards of their families and communities. However, as a result of gender inequality, entrepreneurship is more challenging for women than for men around the globe. Although academic evidence has shown a positive correlation between the percentage of women on boards of directors and companies' financial performance (Conyon and He, 2017), direct participation by women in emerging countries' economic realm remains limited. Hence, the aim of this paper is to study the relationship between female ownership and MSMEs' financial, economic and social outcomes in Ecuador.

This paper tracks the progress of private-sector enterprises during 2007–2016, focusing on firm characteristics such as financial, economic, and social outcomes, size, and survival rate. To achieve this, a near-population panel of Ecuadorean firm financial data reported to the SCVS from 2007 to 2016 is analyzed.

Among the main contributions to the existing body of knowledge, this study provides important evidence of the characteristics and performance of Ecuadorian formal MSMEs during 2007–2016. To our knowledge, no similar research has used a near-population panel for a developing country, such as Ecuador, over a 10-year period. In this context, this paper reveals the challenges, trends, and growth patterns of not only MSMEs in Ecuador but also of female-owned companies, specifically, in Ecuador.

Based on these analyses, we ~~assess~~ mention~~the effectiveness of~~ the government policies that may have~~aimed at~~ strengthening Ecuadorian MSMEs. This paper also highlights the continuing challenges that MSMEs face and identifies future recommendations for improving the creation of MSMEs both by men and women. The remainder of this paper is organized as follows. Section 2 reviews the literature on MSMEs, Section 3 describes the data, variables, and methodology used, and the results are presented in Section 4 and discussed in Section 5. Finally, the conclusions and the limitations of our research are presented in Section 6.

2. Theoretical background

2.1 Feminist approaches

The movements related to the struggle for equality between men and women have their origin in the French Revolution at the end of the 18th century. The term "feminist," meanwhile, became popular a century later, encompassing the concept of an emancipated woman. Feminism is traditionally divided into three waves: the first, in France at the end of the 18th century; the second from the mid-19th and mid-20th centuries; and the third in the second half of the 20th century until the beginning of the 21st century. However, with the passage of time, feminism has become prominent in terms of the legal and constitutional approach and morality debates concerning women as individuals, which has led to a fourth wave, with deeply diversified types of feminism (Cobo, 2012; Fisher *et al.*, 1993).

These theoretical models apply a specific intellectual view of society and use certain categories (gender, patriarchy, androcentrism, etc.) in order to illuminate certain dimensions of reality that cannot be identified from other interpretative frameworks of social reality (Cobo, 2012). Feminist theory, like other social and political theoretical approaches, has different points of view and different branches. However, it has one common objective: the empowerment of women (Scott *et al.*, 2012).

In this paper, we focus on liberal feminist theory and the role that gender and social norms play in explaining potential differences in business performance. Under this approach, the main motivation for running a business is not the business opportunity but to generate or complement the family income (Arraiz, 2018). In this sense, women tend to run smaller and less growth-oriented businesses in order to reconcile family and professional life (Sharafizad and Coetzer, 2016). However, recent studies have shown that the earnings gap between men and women is due not to gender differences but to differences in capital constraints, locations, industry preferences, etc. (Delecourt and Ng, 2021; Rodríguez-Gutiérrez *et al.*, 2014).

The liberal feminist theory also hypothesizes that, due to discrimination or socialization, women are less likely to have access to education, business experience, financial capital, etc., which is why they run less successful businesses than men (Arraiz, 2018; Teixeira and Sharifu, 2017). Moreover, most businesses owned by women are usually small in size because of their limited resources at their disposal. When evaluating successful businesses, Lee and Huang (2018) pointed out that the social-welfare benefits of a venture and its activities should also be evaluated, not only the growth and economic success.

2.2 MSMEs in Latin America

MSMEs in Latin America are a primary generator of employment, as in all emerging economies (Bekele and Worklu, 2008), and their development is a key policy concern in most countries, particularly developing countries (Oppedal-Berge *et al.*, 2015). In Latin American emerging markets, microenterprises comprise 88.4% and SMEs 11.1% of existing companies; in total, MSMEs represent 99.5% of all companies (CEPAL, 2018). This distribution has remained relatively stable over the last decade, although there has been a relative increase in SMEs and a slight reduction in microenterprises.

The role of MSMEs in developing countries differs in various ways from their role in developed countries (Coad and Pawan, 2012; Durst *et al.*, 2021). Latin American MSMEs continue to show the weaknesses that have characterized them for decades. For example, these companies remain outsiders to the most dynamic markets, their contribution to exports remains quite limited, their products often have low added value, and they are rarely integrated into associative models for generating economies of scale (CEPAL, 2018). As a result, they are unable to accelerate their innovation processes, and their production processes continue to operate with technology that is obsolete and inefficient (Vrgovic *et al*., 2012). In many cases, MSMEs are used as a last resort (Beck *et al*., 2005), driven by their proprietors' needs, when jobs are scarce (Acs, 2006). As a result, the labor productivity of these endeavors is typically low (Bloom *et al.*, 2010; OIT, 2018), which leads to poor financial performance (CEPAL, 2018).

In Latin America, there is a particularly high mortality rate among businesses, especially smaller companies, with a failure rate of 50% for two-year-old companies (CEPAL, 2018). In comparison, the survival rate of MSMEs is higher in the developed countries of Europe, with approximately 75% surviving beyond the first two years (OIT, 2009).

In emerging markets, MSMEs face several challenges, including access to financing and the availability of human capital and current technology (Bloom *et al*., 2010; Molina-Ycaza and Sánchez-Riofrío, 2016; Oppedal-Berge *et al*., 2015). One advantage for MSMEs in developing markets is that they have a more flexible structure compared to large companies, which facilitates the rapid and accurate transfer of customer knowledge throughout the company; this information can then be implemented in the firm's strategy (Rodríguez-Gutiérrez *et al*., 2014).

2.3 Ecuadorian context

Since the financial crisis beginning in the late 1990s, which resulted in the decision in 2000 to adopt the U.S. dollar as the country's official currency, Ecuador has enacted multiple economic and social reforms aimed at improving institutional reliability, expanding the economy, and distributing wealth more evenly in order to reduce economic inequality (Ramos-Carvajal *et al.*, 2018). Dollarization was successful in stabilizing the financial crisis in 2000. However, the 25,000-to-1 conversion rate from sucres to dollars resulted in severe economic losses for the average Ecuadorean. From 2000 to 2006, different economic, social, and political changes occurred. In terms of economic changes, the expected results of dollarization were achieved: the stabilization of inflation, the growth of the economy; and a reduction in interest rates. However, in terms of social changes, there was an increase in unemployment, underemployment, and poverty. As a result, migration from Ecuador increased, and the remittances of Ecuadorian migrants were, for many years, the second most important source of income for the country. In terms of political changes, due to previous social changes, during 2000–2006, Ecuador had three different presidents, which increased the country's instability and uncertainty (BID, 2008).

From 2007, a new regime held power for 10 years. Public investment and debt represented the main engine of Ecuador's economic growth. This investment was oriented both toward the provision of public goods and toward services in education, health, and social protection,

as well as toward the execution of strategic infrastructure projects to boost the country's competitiveness (BID, 2018).

Currently, Ecuador is considered one of the countries with the most MSMEs worldwide (GEM, 2019). According to SCVS (2018), these companies generated around 46% of the country's formal employment in the 2013–2017 period. For an enterprise to prevail in its first three years (the most complicated period of its existence), professional support, training, specialized human resources, sources of financing, and access to technology are necessary (Molina-Ycaza and Sánchez-Riofrío, 2016; Zambrano *et al.*, 2018). When these factors are not present, the risk of failure is increased. In Ecuador, eight out of 10 startups fail at the three-year threshold (GEM, 2019).

In Ecuador, the higher percentage of smaller firms could increase disparities in total-factor productivity (TFP) because they are less productive than larger firms (Ruiz-Arranz and Deza, 2018). Camino-Mogro *et al.* (2018) found evidence of a positive correlation between Ecuadorian firm productivity and firm size, with larger firms having twice the productivity of MSMEs in the manufacturing sector. Ruiz-Arranz and Deza (2018) argued that the symptoms of low productivity in Andean cCountries, including Ecuador, could be business dwarfism, informality, poor development of the non-traditional export sector, and lower financial deepening.

Guided by the importance of MSMEs and women's contribution to economic development, the Ecuadorian government has undertaken several initiatives to boost MSMEs' growth. For example, MSMEs enjoy preferential treatment for government purchases. Moreover, a special committee (Consejo Consultivo Productivo Tributario) has been created to improve mainly MSMEs' competitiveness. Despite these initiatives, the Ecuadorian entrepreneurship failure rate has remained the same (for three years) from business initiation) (GEM, 2019). According to a report issued by the Instituto Nacional de Estadística y Censos (INEC), 93% of business closures are microenterprises and small businesses, compared to 5% for medium-sized companies and 2% for large companies (SCVS, 2018).

2.4 Gender, MSME ownership and performance

The entrepreneurial spirit of women has received special attention in recent years due to the increase in the number of women who own businesses (Rodríguez-Gutiérrez *et al.*, 2014; van der Zwan *et al.*, 2012; Wolfe *et al.*, 2020). However, most research on women entrepreneurs has focused on developed countries, while there is limited knowledge about women entrepreneurs in emerging economies with inadequate regulations and inefficient systems (Mas-Tur *et al.*, 2015; Welsh *et al.*, 2018). Moreover, there is limited empirical evidence for MSMEs led by females in developing countries such as Ecuador (see, for example, Ackah *et al.*, 2017; Adom *et al.*, 2017).

Gender differences in business are viewed through a variety of lenses, including socialization, discrimination, and access to opportunity (Akehurst, 2012). Currently, most business activities globally are led by male entrepreneurs, which leads to a gendered definition of entrepreneurship (Lee and Marvel, 2013). Consequently, there is substantial

literature on the gender gaps observed in firm performance, as depicted in **Error! Reference source not found.**.

[Insert Table I here]

Therefore, in order to assess the impact of female ownership on firm performance, we have divided firm performance into financial, economic, and social outcomes. Firm financial outcomes reflect a firm's growth and ~~firm~~ financial profits. Economic outcomes consider the growth of the overall economy. Finally, social outcomes concern ~~mirror~~the values shared amongst organizational members (Fuentes-Fuentes *et al.*, 2015; Lee and Huang, 2018). We expect differences in performance because of how female business owners define success. Self-fulfillment, balancinge work and family, goal achievement, and social contributions are all considered ~~listed as~~ measures of success (Butter, 2001; Calas *et al.*, 2009).

Regarding financial outcomes, some researchers have found mixed or null relationships between gender and company performance (Johnsen and McMahon, 2005; Watson, 2012), a significant number of studies have shown that the financial performance of companies owned by women is poorer than that of companies owned by men (Coad and Pawan, 2012; Fairlie and Robb, 2009; Lee and Marvel, 2013; Oppedal-Berge *et al.*, 2015). Some studies have attributed this difference to the fact that the sectors in which women have generally established their businesses are more competitive and lower value-added (Agier and Szafarz, 2013), offering fewer opportunities for growth (Rodríguez-Gutiérrez *et al.*, 2014). Most of these enterprises are confined to traditional businesses in sectors such as the trade of small items, the processing and sale of food, hairdressing, and the sale of clothing, i.e. activities that typically have lower capital requirements, but which are also generally low performers and have limited growth opportunities (Hailu Gudeta and van Engen, 2018; Rodríguez-Gutiérrez *et al.*, 2014).Other studies have stated that, due to differences in early socialization, education, and the deep cultural roots of these experiential differences, women and men develop different traits, attitudes, interests, and values, which translate into different approaches to business (Arraiz, 2018; Lee and Huang, 2018). Thus, based on the literature reviewed, we propose the following hypothesis:

H1: Female ownership is negatively related with firms' financial outcomes

Regarding economic and social outcomes, Arraiz (2018) stateds that adequately resourced male and female entrepreneurs (including time) are equally effective managers. However, a key difference is the number of hours spent on household activities. Women with family responsibilities experience lower income and reduced desire to expand the business, although they are more likely to hire additional employees (Adom *et al.*, 2018). Moreover, women emphasize social value goals over financial value creation. Individuals who start ventures in post-materialistic societies are more likely to have social and environmental value goals, and less likely to have financial value creation goals (Hechavarria *et al.*, 2017). For example, in Grimes *et al.*'s (2018) research, women-owned businesses were found to be twice as likely to qualify for B certification, and three times as likely to be certified, especially where the norms, mimetic pressures, and prevalence of women-owned business are low. Since

economic and social outcomes consider the impact of the SMEs oin the overall economy and all their stakeholders, we propose the following hypothesis:

H2: Female ownership is positively related with economic and social outcomes.

3. Methodology

3.1 Data and sample

All firm-level data were obtained from the SCVS. This government entity is responsible for collecting ~~accurate~~ audited yearly financial and ownership data from all legal companies in Ecuador, which refers essentially to any firm, from a microenterprise such as a family firm to a large publicly-traded corporation. The data collected are essential for, amongst other things, assessing business taxes. Even the smallest company in Ecuador, registered with the SCVS, is mandated by law to adhere to strict accounting standards, verified by an independent accounting and/or legal professional. Hence, it should be noted that these data refer to public and private, domestic and international MSMEs operating within the borders of Ecuador. For foreign firms, the financial data refer only to the local affiliate, not the parent company (SCVS, 2019). This database comprises panel data that contain financial and accounting information obtained through the financial statements that companies report to the SCVS on an annual basis. These administrative data are also reported to the Internal Rents Services (SRI), which is the tax authority of Ecuador, and data validation is carried out between both institutions to avoid information disparities.

Our final database comprises 650,264 firm-year observations. This represents an unbalanced panel of 110,948 MSMEs during the 2007–2016 sampling window [2]. Firm financial information was adjusted for inflation with 2010 being the base year. Due to small amounts of missing data on variables of interest, the number of firms is reduced to between 91,436 and 102,659 depending on the analysis (see Tables in Results for details on sample size). We are unable to speculate on the number of firms that do not report their data, as required by law. ~~However, the number of firms is different for each year (due to entries and exits).~~ Figure 1 presents the change in the ownership shares of female, male, and company owners.

[Insert Figure 1 here]

3.2 Measurement

To study the impact of female ownership on the financial, economic and social outcomes of MSMEs in Ecuador, our models use a variety of different dependent variables, and estimation techniques vary accordingly. Financial performance variables include: *return on assets*: (the ratio of net income to total assets); *return on sales*: (-ratio of net income to sales excluding extraordinary items);, and *sales growth* (percentage change in net sales from the previous year). The first two performance measures give an indication of the viability and

sustainability of the business (Thornhill and White, 2007). *Sales growth* provides evidence regarding the firm's competitiveness in the marketplace (Quinn and Rohrbaugh, 1983). We also examine the survival of MSMEs using a time-to-failure model. The dependent variable, the hazard ratio, which captures the risk of failure of an organization, provides a key performance indicator that captures the extent to which covariates contribute to (or mitigate) the risk of business failure.

To assess the economic contribution of MSMEs, we examine their *total profits* generated and *labor productivity* (net sales per employee). Both of these factors contribute to the growth of the overall economy as profits contribute to renewal and investment, while increasing *labor productivity* improves resource utilization. Social contribution is measured by *total wages* (wage expense), *wage rate* (average wages per employee), and *total employment* (number of employees). All three of these variables contribute to the extent to which value created by MSMEs is shared amongst organizational members, which subsequently helps to support families and communities.

Several control variables are included in the models. For the models examining the impact of female ownership on financial outcomes (*return on assets*, *return on sales*, *sales growth*), we control for determinants of industry profitability: *industry growth* (the percentage change in industry sales from the previous year); *minimum efficient scale* (total industry sales–/ number of firms); and *industry concentration* [computed as the sum of squared firm market shares, i.e. $\sum$ (*total sales*$_i$–/ *industry sales*$_j$)^2 for all firms (*i*) in each industry (*j*)]. We also include:~~d~~ the log of *total sales* to account for differences in firm size within the micro, small, and medium categories;~~,~~ *export intensity* and *import intensity* (the share of export sales and import purchases to total sales, respectively) and *foreign ownership* share to account for the benefits and risks of integration with the global ~~market~~economy (Bernard *et al.*, 2012; Vogel and Wagner, 2010);~~,~~ *leverage* (total debt to assets) and *liquidity* (current assets to liabilities) to account for firm financial resources and slack;~~,~~ and firm *age* to account for differences in experience. Models focusing on MSMEs' social impacts (with *total wages*, *wage rate*, and *total employment* as dependent variables) exclude~~d~~ industry performance variables, but include industry fixed effects (dummy variables), as explained below. Models examining the exit hazard of MSMEs include~~d~~ all of the above control variables, since anything that can impact firm performance can impact its chances of survival, and also control for profitability (*return on assets*), since this is a leading alternate explanation for observed failure rates.

3.3 Panel regression estimations

The majority of our findings are based on panel regression with firm fixed effects. Since our data consist~~s~~ of a small number of repeated observations (up to 10 years) on a large sample of firms, we must account for potential correlation between error terms and the firm-level predictor variables (Allison, 2009). These correlations arise when unobserved, firm-specific variance is correlated both with predictors and outcomes, which can be attributed to the lack of independence between repeated observations from the same unit of analysis (in this case, firms). In proportion to the magnitude of these correlations, ordinary least squares regression on a pooled sample will result in biased estimates of coefficients. We conduct a Hausman test on the coefficients derived from the regression models with fixed and random

firm-level disturbances, respectively, which reveals that the random-effect model's assumption of uncorrelated disturbances is violated (Hausman, 1978). Hence, we report the results of fixed regression in this study.

The fixed effects regression model is specified as:

$$Outcome\ variable = \beta_0 + \beta_c \times controls + \beta_1 \times female\ ownership + \beta_2 \times female\ ownership \times firm\ size\ indicators + \mu_i + e_{it}$$

where β_0 is the intercept of each model, β_c is a vector of coefficients for the control variables, and β_1 and β_2 are the coefficients of primary interest. μ_i and e_{it} capture the firm-level disturbances and independently and identically distributed (IID) error terms, respectively. Outcome variables used in this model are *return on assets*, *return on sales*, ~~*roa*~~, ~~*ros*~~, *sales growth*, *total profits*, *total sales*, *labor productivity*, *total wages*, and *wage rate*. Industry-level control variables included with each of these outcomes are *growth*, *minimum efficient scale*, and *industry concentration*, while firm-specific variables are *foreign ownership* share, log of *total sales*, *export*, and *import intensity*, *leverage*, *liquidity*, and *age*. Note that the control variable log of *total sales* must be omitted from the model with *total sales* as the dependent variable. Industry controls are primarily concerned with the effect of industry on firm performance, and are thus omitted from the models for *total wages*, and *wage rate*. Instead, these latter two models include industry indicator variables (i.e. fixed effects) to control for sectoral differences in wages and employment levels (e.g. high employment and low wages in primary industries, and low employment and higher wages in real estate, financial, or administrative services).

For each of the models used to analyze the impact of female ownership and other covariates for firm performance and economic and social outcomes, a linear regression model is used. The one exception is the use of negative binomial regression for the model with employment as the outcome variable. Since employment is an over-dispersed count variable (i.e. number of employees), linear regression's assumption of normally distributed error terms would be violated. The negative binomial model, which assumes a distribution that matches that of count data and predicts non-negative outcomes, is typically used in this situation to produce unbiased estimates (Cameron and Trivedi, 2013). The model we estimate is given by:

$$E(employment_{it}) = \exp(\alpha_i + \beta_c x_{ct} + \beta_x x_{it})$$

where employment is the count variable (number of employees), α groups all observed and unobserved firm-level heterogeneity, and x_{ct} and x_{it} are vectors of control and predictor variables, respectively (c.f. Guimaraes, 2008), including *female ownership*, *firm size*, and other firm-level controls (log of *total sales*, *foreign ownership*, *export intensity*, *import intensity*, *leverage*, *liquidity*, and *age*). This model is estimated via the maximum likelihood function, and the fixed effects are modeled as part of the dispersion parameter that varies by individual (i.e. firm).

In all models, we check variance inflation factors for evidence of multicollinearity problems. We find that the highest VIF is for the total sales control variable, at between 5 and

6. Hence, interpretations of this coefficient should be made with caution. Otherwise, all VIFs were below 3.5, and each model had an average VIF below 2.0. Hence, we do not find evidence that multicollinearity threatens the validity of our coefficient estimates pertaining to our hypotheses.

3.4 Time to event (exit hazard) analysis

The Cox proportional hazards model (Cox, 1972) is used to estimate the coefficients of the covariates that we predict will impact the rate of firm exit from the sample (i.e. firm failure). Cox regression is a semi-parametric time-to-event technique that is most useful when the goal is to estimate the impact of subject characteristics (Hosmer and Lemeshow, 1999), in our case the characteristics of firms, including the relative proportion of female ownership, firm size, and other characteristics. It is semi-parametric in the sense that no assumptions are made concerning the distribution of the baseline hazard function faced by units of analysis under observation, and it deals adequately with the issue of right-censoring (i.e. firms that are in our sample, but fail after our observation window, which ends in 2016) (Silviano and Juan, 2008). This is a popular method for examining firm survival since the forces impacting the "normal" lifecycle of an organization are dependent upon a host of conditions in the environment, as well as both the random and systematic intentions of business founders. Similar to the fixed effect regression models used in this paper, coefficient estimates derived from Cox regression are robust, though less efficient. The survival model estimated is given as:

$$h(t|x_j) = h_0(t)\, exp\, (\beta_x x_j)$$

where h is the hazard faced by the j^{th} firm at time=t, and β is a vector of coefficients associated with specified covariates (controls and predictors); h_0 refers to the baseline hazard function, but does not need to be estimated when estimating the model's coefficients.

4. Results

Means, standard deviations, and pairwise correlations between variables included in all models are shown in Table II. Large correlations (i.e. above 0.2) may cause collinearity concerns, though this is not necessarily the case. In our data, larger correlations exist primarily between the size indicators and those variables used to determine the size classifications (i.e. sales and number of employees) as well as between total financial indicators, such as *total sales*, *total profits*, *total wages*, and *wage rates*. Since these variables are not included together in any model, and their correlation is expected, they do not cause much concern regarding the robustness of the results. Nonetheless, we checked the variance inflation factors (VIF) for each model, finding that no individual VIF exceeds 7 and the average VIF does not exceed 2 in any case. The only large VIF is that for log of *total sales*, which is not surprising since it is used to determine the size variables. All other individual VIFs are below 2. We estimated the relevant models without the log of *total sales*, finding

that our results of interest do not change our interpretations of the findings. Thus, we find no substantive evidence that collinearity should be a concern for the accuracy of our findings.

[Insert Table II here]

4.1 Female ownership share and MSMEs' performance

Estimates for models 1–4, shown in Table III, provide evidence that female ownership share has a very slight impact on MSMEs' financial performance. For example, a fully female-owned firm (i.e. *female ownership* = 1, or 100%) has a 0.5% lower *return on sales* than a firm with no female ownership, on average. We find no evidence of a difference between different levels of female ownership on our other profitability measure (*return on sales*), though *sales growth* is about 10% lower for fully female-=owned firms. These results, however, depend somewhat on the size of the firm. The effect of female -ownership on SMEs' firm performance and growth appears to be positive, in comparison with that of micro-enterprises. To gain a better understanding of the effect sizes of these interactions, we conduct simple slopes tests using contrasts, and generate plots of the marginal effects, as shown in Figure 2. The general conclusion we draw from these post-estimate procedures is that the impact of female ownership on MSMEs is positive for small firms, as assessed by both *return on assets* and *return on sales*.

[Insert Table III here]

[Insert Figure 2 here]

Table III and Figure 2 also provide evidence of differences in the economic impact of MSMEs with differing degrees of female- ~~o~~ownership. Female ownership appears to have a positive impact on *total sales* and *total profits*, though this is primarily the case with microenterprises. Female ownership has a negative impact, on average, on medium-–sized firms. Moreover, as depicted in Figure 3, female ownership appears to have a negative impact on *labor productivity*, but ~~in fact~~ these results are not statistically significant.

——In terms of the social impacts, as assessed according to job and wage creation, and as shown in Table IV~~4~~ and Figure 3, female-owned enterprises tend to provide higher wages per employee for all firm sizes, but *total wages* are lower for predominantly female-owned medium-sized enterprises, perhaps being smaller in size relative to medium-sized firms with higher male- or company-ownership.

[Insert Table IV here]

[Insert Figure 3 here]

Finally, we examine whether female ownership has~~d~~ any impact the survival rate of MSMEs. These results are shown in Table V,~~5~~ and plots of the survival rates are depicted in Figure 4. Firm survival is important, given the social and economic benefits they provide,

though in a more competitive economy it is more desirable for the most efficient firms to survive. Our results indicate that female-owned firms have a higher probability of exit, in general, but medium-sized firms' survival is slightly better, with higher female ownership (see panel 3 of Figure 4). This is consistent with our prediction that firms that provided more social benefits (i.e. e.g. employment or higher wages) would face lower exit hazards (e.g. i.e. higher survival rates). Models 14–16 provide some additional evidence that there is a slightly lower hazard for firms with higher a *wage rates*, and for firms with both higher female ownership and higher *total wages*/ *employment*.

[Insert Table V here]

[Insert Figure 4 here]

5. Discussion

This paper tracks the progress of private-sector MSMEs during 2007–2016, focusing on financial, economic, and social outcomes for companies of varying degrees of male and female ownership. The characteristics of MSMEs are the following. First, around 63% of MSMEs are male-majority-owned. However, the number of female-owned companies is growing slightly faster than the number of male-owned companies (Figure 1).

Second, evidence shows that female ownership share has a very slight impact with a firm's financial outcomes (H1). From the results, we conclude that female ownership is negatively related with microenterprise performance, but positively associated with small-enterprise performance, while the result for medium-sized firms depends on whether performance is assessed by *return on assets* (positive) or by *return on sales* (negative). This latter finding suggests there may be differences in the asset intensity of businesses in which females are more involved, but this requires further analysis before a definite conclusion can be drawn. The current literature indicates that MSMEs run by men have greater profitability ratios than MSMEs with female ownership (Agier and Szafarz, 2013; Coad and Pawan, 2012; Oppedal-Berge *et al.*, 2015; Rodríguez-Gutiérrez *et al.*, 2014). From a gender perspective, a business run by women should not be evaluated only by measurement of "growth and economic success" (Lee and Huang, 2018, p. 1). That is why we also included economic and social outcomes.

Third, concerning economic outcomes (H2), an interesting interpretation of these findings, compared with those looking at firms' financial performance, is that although female-owned microenterprises are less efficient, they tend to provide more for their employees, and possibly communities, through the economic the stimulus they provide, in terms the size of the financial outcomes. Our results reflect that female microenterprises are the main engine for economic development, especially in developing countries. According to Maksimov *et al.* (2017), this is true because most poor women are self-employed, which creates an opportunity for poverty alleviation.

Fourth, concerning social outcomes (H2), Maksimov et al. (2017) pointed out that female-owned companies pay higher wages to their employees than male-owned companies because

they need to secure a reliable workforce through higher wages in order to safeguard continuous efficiency gains. A similar trend is found in Ecuador; female-owned companies of all sizes tend to provide higher wages per employee. This contribution may help in supporting employees' families and communities. Fifth, concerning firm survival, female-owned firms have greater chances of exit. However, firms that provide more social benefits (e.g. higher *wage rate*, higher *female ownership*, and higher *total wages*/ *employment*) show higher survival rates. The creation of MSMEs generates financial, economic, and social benefits. If run by women, economic and social benefits are usually a priority. However, if it is male-run, the financial benefits are usually the priority (Oppedal-Berge *et al.*, 2015).

Some challenges that constrained the success of Ecuadorian MSMEs are as follows. First, there is a lack of governmental policies to motivate micro and small companies' creation, survival, and growth. Empirical evidence shows that entrepreneurship policy, including for small and low-tech firms, could enhance a country's overall performance (Fritsch and Changoluisa, 2017; Sutter, *et al.*, 2019). For example, currently, all formal companies registered with the SCVS, no matter their size, have to fulfill all legal and taxation requirements mandated by law.

Further, there is no specific, well-planned support for female-owned MSME creation or investment. Some of the problems that these enterprises face include inadequate access to financing and property, a lack of technology, inadequate training and support services, and the lack of a family-friendly institutional environment to balance both family and business activities, among others (CIEC, 2018; Molina-Ycaza and Sánchez-Riofrío, 2016; Seguino, 2019; Villaseca *et al.*, 2021). Additionally, the Ecuadorian institutional environment has been constantly changing over the past 12 years. New laws, taxes, reforms to those laws, and reforms to those taxes, amongst other things, have all come about. All these changes have provoked some suspicion, especially for foreign private investors.

6. Conclusions, limitations, and future research

This study provides important evidence of the characteristics and performance of Ecuadorian formal MSMEs during 2007–2016. To our knowledge, no similar research has used a near-population panel for a developing country, such as Ecuador, over a 10-year period. In this context, this paper reveals the challenges, trends, and growth patterns of not only MSMEs in Ecuador but also of female-owned and male-owned companies, specifically, in Ecuador. Female owned firms' performance should not be evaluated based only on their financial outcomes. From a feminist perspective, female business owners have a more comprehensive vision of what performance is, which is why economic and social measures should be included to measure the performance of companies led by women (Arraiz, 2018; Lee and Huang, 2018).

The implications for academics include empirical evidence that integrates financial, economic and social dimensions of business performance to assess women's success. Moreover, we analyze the impact of female ownership on these three performance dimensions. We need a more holistic view when measuring companies success and not just measuring by financial performance.

The findings from this study reveal that more development policies in Ecuador are needed to address women's participation in the business arena. The implications for government leaders include, f~~. F~~irst, building an institutional framework that conciliates family and work to improve female participation. Women may not sacrifice the attention they give to their homes and families for the sake of growing their business (Adom *et al*., 2017). Second, access to adequate financing is vital. According to CIEC (2018), 57% of people without a bank account in Ecuador are women. Third, companies must offer equal working conditions for men and women. Up to now, Ecuadorian women have earned less, while working more, than their male peers (*El Comercio*, 2018). Fourth, public and private entities, such as schools and universities, need to empower women and educate Ecuadorians in general through affirmative action, gender mainstreaming, and other social initiatives to remove cultural paradigms that restrict opportunities for women.

The next recommendations are related to promoting not only female-led MSME creation but also MSME creation in general: Ecuador needs to reduce and digitalize all legal and administrative procedures for MSME creation, development, and closure. Also, special treatment for micro and small companies is needed; currently, all MSMEs (new and old) registered with the SCVS have almost the same (without size consideration) administrative, financial, and labor procedures. Finally, soft loans are needed to promote infrastructure investment as well as more business projects related to innovation and technology.

These results should be interpreted within the limits ~~and features~~ of this research. ~~Our analyses are exploratory, and hence the relationships observed are not causal. Indeed, d~~Differences between male-owned and female-owned firms are likely to be due to factors that require additional study, using surveys to gather primary data, e.g. what the role of gender differences is in credit availability, traditional household roles, and workplace discrimination. What is somewhat remarkable about our results, however, is that in simultaneously controlling for bias in industrial sector choices, firm size, gender of ownership, and unobserved firm heterogeneity, the differences in performance between male-owned and female-owned businesses are quite muted, suggesting that the findings of other studies ~~are~~ may be ~~either~~ biased by missing levels of analysis or that the conditions that lead to gender differences are not as prevalent in Ecuador. A third explanation, which we think is compelling, is that women and men, being biased towards different types of businesses, are generally substituting industries of comparable profitability (e.g. real estate for women, finance and insurance for men). As with any large-sample correlational analysis, the opportunity to consider the impact of firm-level variables such as resources, capabilities and strategic choices is limited.

~~Another limitation, also related to the exploratory nature of this study, is type 1 error inflation resulting from the inclusion of numerous statistical tests. When interpreting the results, a Bonferroni-type adjustment could be performed, for example by multiplying the observed *p*-values by three independent ANOVAs, one for each firm size. However, the choice of adjustment is always somewhat arbitrary and overall simply suggests that the smallest of the observed differences between men- and women-majority-owned firms are even smaller than reported here~~.

Despite these limitations, this work suggests that the MSME reality in developing countries is more complex than the current literature, which is still evolving, shows. We hope

that this study contributes to enriching this literature and motivates more researchers in developing countries to present their own realities and pick up future lines of research.

Endnotes

1. Superintendencia de Compañías, Valores y Seguros (SCVS) is a public institution whose role is to oversee the daily operation of formal companies in Ecuador; it can also propose reforms to laws in order to improve the business environment.
2. The period between 2007 and 2016 was a period of important structural changes in the Ecuadorian economy, particular regarding firm formalization. Only one political party, with the same president, ruled during this time. In 2017, however, a new government was voted in with different ideas to those of the last 10 years.

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Gender-based characteristics of micro, small, and medium-sized enterprises in an emerging country: is this a man's world?

Abstract

Purpose – Worldwide, Ecuador is one of the countries with the most entrepreneurial activity from micro, small, and medium-sized enterprises (MSMEs). However, the effect of adopting the US dollar (dollarization), over which the central bank has no control, combined with being mainly an exporter of primary products, as well as strategic currency devaluation by neighboring economies, has created a difficult situation, especially for Ecuadorian women's MSMEs. This paper therefore aims to study the relationship between female ownership and Ecuadorian MSMEs' financial, economic and social outcomes.

Design/methodology/approach – We compile a near-population panel of 617,804 firm-year observations representing an unbalanced panel of 112,917 MSMEs during the 2007–2016 sampling window. Panel (fixed effects) regression is used to test our hypotheses concerning the antecedents to firm financial performance, economic and social outcomes. Cox proportional hazards modeling is used to assess the impact of antecedents on firm survival.

Findings – First, firms providing more social benefits (e.g. employment, higher wages) have higher survival rates. Second, female ownership is negatively related with microenterprise financial performance, but positively associated with small-enterprise financial performance. Third, female-owned enterprises tend to provide higher wages per employee for all firm sizes. Fourth, although female-owned microenterprises are less efficient, they tend to provide more for their employees, and possibly communities, through the economic stimulus they provide, in terms of the size of the financial outcomes.

Originality – This paper shows that, although this is a "man's world," women are learning earlier, developing faster professionally, and overcoming stereotypes to focus on activities that generate both economic performance and social outcomes. Governmental policies that have contributed to MSMEs' growth and women's participation are identified. Our findings suggest ways to improve and support both the creation of more women-owned MSMEs in emerging countries, such as Ecuador, and the survival of existing male- and female-owned MSMEs.

Keywords: Gender; Performance; Micro, small, and medium-sized enterprises; Emerging countries.

Paper type: Research paper.

1. Introduction

Micro, small, and medium-sized enterprises (MSMEs) are key components of the economy in emerging markets. Their role includes not only job creation and stimulating innovation but also employment growth and poverty alleviation (Ipinnaiye *et al*., 2017; Maksimov *et al*., 2017). MSMEs represent an even larger share of the total number of firms in developing countries. Pagés (2010) reported that around 94% of the service sector in Mexico and more than 80% of registered manufacturing establishments in Argentina, Bolivia, El Salvador, and Mexico have fewer than 10 employees.

Corporación Andina de Fomento (CAF) (for details, see Elorza, 2017) states that, in Latin America, MSMEs represent 90% of the productive units, generating almost 60% of the region's jobs and representing a quarter of the regional gross domestic product (GDP). In this sense, Ecuador is not an exception; it is, however, considered one of the countries with the most MSMEs worldwide (GEM, 2019). According to *Superintendencia de Compañías, Valores y Seguros* (SCVS)[1], 95% of the Ecuadorian business environment consists of MSMEs, and MSMEs have generated around 46% of the country's formal employment from 2013 to 2018 (SCVS, 2018).

Women account for the majority of entrepreneurial activity in some of the least developed countries, mainly out of necessity (Adom *et al*., 2017). Their work contributes to raising the living standards of their families and communities. However, as a result of gender inequality, entrepreneurship is more challenging for women than for men around the globe. Although academic evidence has shown a positive correlation between the percentage of women on boards of directors and companies' financial performance (Conyon and He, 2017), direct participation by women in emerging countries' economic realm remains limited. Hence, the aim of this paper is to study the relationship between female ownership and MSMEs' financial, economic and social outcomes in Ecuador.

This paper tracks the progress of private-sector enterprises during 2007–2016, focusing on firm characteristics such as financial, economic, and social outcomes, size, and survival rate. To achieve this, a near-population panel of Ecuadorean firm financial data reported to the SCVS from 2007 to 2016 is analyzed.

Among the main contributions to the existing body of knowledge, this study provides important evidence of the characteristics and performance of Ecuadorian formal MSMEs during 2007–2016. To our knowledge, no similar research has used a near-population panel for a developing country, such as Ecuador, over a 10-year period. In this context, this paper reveals the challenges, trends, and growth patterns of not only MSMEs in Ecuador but also of female-owned companies, specifically, in Ecuador.

Based on these analyses, we mention the government policies that may have strengthening Ecuadorian MSMEs. This paper also highlights the continuing challenges that MSMEs face and identifies future recommendations for improving the creation of MSMEs both by men and women. The remainder of this paper is organized as follows. Section 2 reviews the literature on MSMEs, Section 3 describes the data, variables, and methodology used, and the results are presented in Section 4 and discussed in Section 5. Finally, the conclusions and the limitations of our research are presented in Section 6.

2. Theoretical background

2.1 Feminist approaches

The movements related to the struggle for equality between men and women have their origin in the French Revolution at the end of the 18th century. The term "feminist," meanwhile, became popular a century later, encompassing the concept of an emancipated woman. Feminism is traditionally divided into three waves: the first in France at the end of the 18th century; the second from the mid-19th and mid-20th centuries; and the third in the second half of the 20th century until the beginning of the 21st century. However, with the passage of time, feminism has become prominent in terms of the legal and constitutional approach and morality debates concerning women as individuals, which has led to a fourth wave, with deeply diversified types of feminism (Cobo, 2012; Fisher *et al.*, 1993).

These theoretical models apply a specific intellectual view of society and use certain categories (gender, patriarchy, androcentrism, etc.) in order to illuminate certain dimensions of reality that cannot be identified from other interpretative frameworks of social reality (Cobo, 2012). Feminist theory, like other social and political theoretical approaches, has different points of view and different branches. However, it has one common objective: the empowerment of women (Scott *et al.*, 2012).

In this paper, we focus on liberal feminist theory and the role that gender and social norms play in explaining potential differences in business performance. Under this approach, the main motivation for running a business is not the business opportunity but to generate or complement the family income (Arraiz, 2018). In this sense, women tend to run smaller and less growth-oriented businesses in order to reconcile family and professional life (Sharafizad and Coetzer, 2016). However, recent studies have shown that the earnings gap between men and women is due not to gender differences but to differences in capital constraints, locations, industry preferences, etc. (Delecourt and Ng, 2021; Rodríguez-Gutiérrez *et al.*, 2014).

The liberal feminist theory also hypothesizes that, due to discrimination or socialization, women are less likely to have access to education, business experience, financial capital, etc., which is why they run less successful businesses than men (Arraiz, 2018; Teixeira and Sharifu, 2017). Moreover, most businesses owned by women are usually small in size because of their limited resources at their disposal. When evaluating successful businesses, Lee and Huang (2018) pointed out that the social-welfare benefits of a venture and its activities should also be evaluated, not only the growth and economic success.

2.2 MSMEs in Latin America

MSMEs in Latin America are a primary generator of employment, as in all emerging economies (Bekele and Worklu, 2008), and their development is a key policy concern in most countries, particularly developing countries (Oppedal-Berge *et al.*, 2015). In Latin American emerging markets, microenterprises comprise 88.4% and SMEs 11.1% of existing companies; in total, MSMEs represent 99.5% of all companies (CEPAL, 2018). This distribution has

remained relatively stable over the last decade, although there has been a relative increase in SMEs and a slight reduction in microenterprises.

The role of MSMEs in developing countries differs in various ways from their role in developed countries (Coad and Pawan, 2012; Durst *et al.*, 2021). Latin American MSMEs continue to show the weaknesses that have characterized them for decades. For example, these companies remain outsiders to the most dynamic markets, their contribution to exports remains quite limited, their products often have low added value, and they are rarely integrated into associative models for generating economies of scale (CEPAL, 2018). As a result, they are unable to accelerate their innovation processes, and their production processes continue to operate with technology that is obsolete and inefficient (Vrgovic *et al*., 2012). In many cases, MSMEs are used as a last resort (Beck *et al*., 2005), driven by their proprietors' needs, when jobs are scarce (Acs, 2006). As a result, the labor productivity of these endeavors is typically low (Bloom *et al.*, 2010; OIT, 2018), which leads to poor financial performance (CEPAL, 2018).

In Latin America, there is a particularly high mortality rate among businesses, especially smaller companies, with a failure rate of 50% for two-year-old companies (CEPAL, 2018). In comparison, the survival rate of MSMEs is higher in the developed countries of Europe, with approximately 75% surviving beyond the first two years (OIT, 2009).

In emerging markets, MSMEs face several challenges, including access to financing and the availability of human capital and current technology (Bloom *et al*., 2010; Molina-Ycaza and Sánchez-Riofrío, 2016; Oppedal-Berge *et al*., 2015). One advantage for MSMEs in developing markets is that they have a more flexible structure compared to large companies, which facilitates the rapid and accurate transfer of customer knowledge throughout the company; this information can then be implemented in the firm's strategy (Rodríguez-Gutiérrez *et al*., 2014).

2.3 Ecuadorian context

Since the financial crisis beginning in the late 1990s, which resulted in the decision in 2000 to adopt the US dollar as the country's official currency, Ecuador has enacted multiple economic and social reforms aimed at improving institutional reliability, expanding the economy, and distributing wealth more evenly in order to reduce economic inequality (Ramos-Carvajal *et al.*, 2018). Dollarization was successful in stabilizing the financial crisis in 2000. However, the 25,000-to-1 conversion rate from sucres to dollars resulted in severe economic losses for the average Ecuadorean. From 2000 to 2006, different economic, social, and political changes occurred. In terms of economic changes, the expected results of dollarization were achieved: the stabilization of inflation; the growth of the economy; and a reduction in interest rates. However, in terms of social changes, there was an increase in unemployment, underemployment, and poverty. As a result, migration from Ecuador increased, and the remittances of Ecuadorian migrants were, for many years, the second most important source of income for the country. In terms of political changes, due to previous social changes, during 2000–2006, Ecuador had three different presidents, which increased the country's instability and uncertainty (BID, 2008).

From 2007, a new regime held power for 10 years. Public investment and debt represented the main engine of Ecuador's economic growth. This investment was oriented both toward the

provision of public goods and toward services in education, health, and social protection, as well as toward the execution of strategic infrastructure projects to boost the country's competitiveness (BID, 2018).

Currently, Ecuador is considered one of the countries with the most MSMEs worldwide (GEM, 2019). According to SCVS (2018), these companies generated around 46% of the country's formal employment in the 2013–2017 period. For an enterprise to prevail in its first three years (the most complicated period of its existence), professional support, training, specialized human resources, sources of financing, and access to technology are necessary (Molina-Ycaza and Sánchez-Riofrío, 2016; Zambrano *et al.*, 2018). When these factors are not present, the risk of failure is increased. In Ecuador, eight out of 10 startups fail at the three-year threshold (GEM, 2019).In Ecuador, the higher percentage of smaller firms could increase disparities in total-factor productivity (TFP) because they are less productive than larger firms (Ruiz-Arranz and Deza, 2018). Camino-Mogro *et al.* (2018) found evidence of a positive correlation between Ecuadorian firm productivity and firm size, with larger firms having twice the productivity of MSMEs in the manufacturing sector. Ruiz-Arranz and Deza (2018) argued that the symptoms of low productivity in Andean countries, including Ecuador, could be business dwarfism, informality, poor development of the non-traditional export sector, and lower financial deepening.

Guided by the importance of MSMEs and women's contribution to economic development, the Ecuadorian government has undertaken several initiatives to boost MSMEs' growth. For example, MSMEs enjoy preferential treatment for government purchases. Moreover, a special committee (*Consejo Consultivo Productivo Tributario*) has been created to improve mainly MSMEs' competitiveness. Despite these initiatives, the Ecuadorian entrepreneurship failure rate has remained the same (for three years from business initiation) (GEM, 2019). According to a report issued by the *Instituto Nacional de Estadística y Censos* (INEC), 93% of business closures are microenterprises and small businesses, compared to 5% for medium-sized companies and 2% for large companies (SCVS, 2018).

2.4 Gender, MSME ownership and performance

The entrepreneurial spirit of women has received special attention in recent years due to the increase in the number of women who own businesses (Rodríguez-Gutiérrez *et al*., 2014; van der Zwan *et al*., 2012; Wolfe *et al*., 2020). However, most research on women entrepreneurs has focused on developed countries, while there is limited knowledge about women entrepreneurs in emerging economies with inadequate regulations and inefficient systems (Mas-Tur *et al*., 2015; Welsh *et al*., 2018). Moreover, there is limited empirical evidence for MSMEs led by females in developing countries such as Ecuador (see, for example, Ackah *et al*., 2017; Adom *et al*., 2017).

Gender differences in business are viewed through a variety of lenses, including socialization, discrimination, and access to opportunity (Akehurst, 2012). Currently, most business activities globally are led by male entrepreneurs, which leads to a gendered definition of entrepreneurship (Lee and Marvel, 2013). Consequently, there is substantial literature on the gender gaps observed in firm performance, as depicted in **Error! Reference source not found.**.

[Insert Table I here]

Therefore, in order to assess the impact of female ownership on firm performance, we have divided firm performance into financial, economic, and social outcomes. Firm financial outcomes reflect a firm's growth and financial profits. Economic outcomes consider the growth of the overall economy. Finally, social outcomes concern the values shared amongst organizational members (Fuentes-Fuentes *et al.*, 2015; Lee and Huang, 2018). We expect differences in performance because of how female business owners define success. Self-fulfillment, balancing work and family, goal achievement, and social contributions are all considered measures of success (Butter, 2001; Calas *et al.*, 2009).

Regarding financial outcomes, some researchers have found mixed or null relationships between gender and company performance (Johnsen and McMahon, 2005; Watson, 2012), a significant number of studies have shown that the financial performance of companies owned by women is poorer than that of companies owned by men (Coad and Pawan, 2012; Fairlie and Robb, 2009; Lee and Marvel, 2013; Oppedal-Berge *et al*., 2015). Some studies have attributed this difference to the fact that the sectors in which women have generally established their businesses are more competitive and lower value-added (Agier and Szafarz, 2013), offering fewer opportunities for growth (Rodríguez-Gutiérrez *et al*., 2014). Most of these enterprises are confined to traditional businesses in sectors such as the trade of small items, the processing and sale of food, hairdressing, and the sale of clothing, i.e. activities that typically have lower capital requirements, but which are also generally low performers and have limited growth opportunities (Hailu Gudeta and van Engen, 2018; Rodríguez-Gutiérrez *et al*., 2014).Other studies have stated that, due to differences in early socialization, education, and the deep cultural roots of these experiential differences, women and men develop different traits, attitudes, interests, and values, which translate into different approaches to business (Arraiz, 2018; Lee and Huang, 2018). Thus, based on the literature reviewed, we propose the following hypothesis:

H1: Female ownership is negatively related with firms' financial outcomes

Regarding economic and social outcomes, Arraiz (2018) stated that adequately resourced male and female entrepreneurs (including time) are equally effective managers. However, a key difference is the number of hours spent on household activities. Women with family responsibilities experience lower income and reduced desire to expand the business, although they are more likely to hire additional employees (Adom *et al.*, 2018). Moreover, women emphasize social value goals over financial value creation. Individuals who start ventures in post-materialistic societies are more likely to have social and environmental value goals, and less likely to have financial value creation goals (Hechavarria *et al*., 2017). For example, in Grimes *et al*.'s (2018) research, women-owned businesses were found to be twice as likely to qualify for B certification, and three times as likely to be certified, especially where the norms, mimetic pressures, and prevalence of women-owned business are low. Since economic and social outcomes consider the impact of the SMEs on the overall economy and all their stakeholders, we propose the following hypothesis:

H2: Female ownership is positively related with economic and social outcomes.

3. Methodology

3.1 Data and sample

All firm-level data were obtained from the SCVS. This government entity is responsible for collecting audited yearly financial and ownership data from all legal companies in Ecuador, which refers essentially to any firm, from a microenterprise such as a family firm to a large publicly-traded corporation. The data collected are essential for, amongst other things, assessing business taxes. Even the smallest company in Ecuador, registered with the SCVS, is mandated by law to adhere to strict accounting standards, verified by an independent accounting and/or legal professional. Hence, it should be noted that these data refer to public and private, domestic and international MSMEs operating within the borders of Ecuador. For foreign firms, the financial data refer only to the local affiliate, not the parent company (SCVS, 2019). This database comprises panel data that contain financial and accounting information obtained through the financial statements that companies report to the SCVS on an annual basis. These administrative data are also reported to the Internal Rents Services (SRI), which is the tax authority of Ecuador, and data validation is carried out between both institutions to avoid information disparities.

Our final database comprises 650,264firm-year observations. This represents an unbalanced panel of 110,948 MSMEs during the 2007–2016 sampling window [2]. Firm financial information was adjusted for inflation with 2010 being the base year. Due to small amounts of missing data on variables of interest, the number of firms is reduced to between 91,436 and 102,659 depending on the analysis (see Tables in Results for details on sample size). We are unable to speculate on the number of firms that do not report their data, as required by law. Figure 1 presents the change in the ownership shares of female, male, and company owners.

[Insert Figure 1 here]

3.2 Measurement

To study the impact of female ownership on the financial, economic and social outcomes of MSMEs in Ecuador, our models use a variety of different dependent variables, and estimation techniques vary accordingly. Financial performance variables include: *return on assets* (the ratio of net income to total assets); *return on sales* (ratio of net income to sales excluding extraordinary items); and *sales growth* (percentage change in net sales from the previous year). The first two performance measures give an indication of the viability and sustainability of the business (Thornhill and White, 2007). *Sales growth* provides evidence regarding the firm's competitiveness in the marketplace (Quinn and Rohrbaugh, 1983). We also examine the survival of MSMEs using a time-to-failure model. The dependent variable, the hazard ratio,

which captures the risk of failure of an organization, provides a key performance indicator that captures the extent to which covariates contribute to (or mitigate) the risk of business failure.

To assess the economic contribution of MSMEs, we examine their *total profits* generated and *labor productivity* (net sales per employee). Both of these factors contribute to the growth of the overall economy as profits contribute to renewal and investment, while increasing *labor productivity* improves resource utilization. Social contribution is measured by *total wages* (wage expense), *wage rate* (average wages per employee), and *total employment* (number of employees). All three of these variables contribute to the extent to which value created by MSMEs is shared amongst organizational members, which subsequently helps to support families and communities.

Several control variables are included in the models. For the models examining the impact of female ownership on financial outcomes (*return on assets*, *return on sales*, *sales growth*), we control for determinants of industry profitability: *industry growth* (the percentage change in industry sales from the previous year); *minimum efficient scale* (total industry sales/ number of firms); and *industry concentration* [computed as the sum of squared firm market shares, i.e. $\sum$ (*total sales*$_i$/ *industry sales*$_j$)^2 for all firms (*i*) in each industry (*j*)]. We also include: the log of *total sales* to account for differences in firm size within the micro, small, and medium categories; *export intensity* and *import intensity* (the share of export sales and import purchases to total sales, respectively) and *foreign ownership* share to account for the benefits and risks of integration with the global economy (Bernard *et al.*, 2012; Vogel and Wagner, 2010); *leverage* (total debt to assets) and *liquidity* (current assets to liabilities) to account for firm financial resources and slack; and firm *age* to account for differences in experience. Models focusing on MSMEs' social impacts (with *total wages*, *wage rate*, and *total employment* as dependent variables) exclude industry performance variables, but include industry fixed effects (dummy variables), as explained below. Models examining the exit hazard of MSMEs include all of the above control variables, since anything that can impact firm performance can impact its chances of survival, and also control for profitability (*return on assets*), since this is a leading alternate explanation for observed failure rates.

3.3 Panel regression estimations

The majority of our findings are based on panel regression with firm fixed effects. Since our data consist of a small number of repeated observations (up to 10 years) on a large sample of firms, we must account for potential correlation between error terms and the firm-level predictor variables (Allison, 2009). These correlations arise when unobserved, firm-specific variance is correlated both with predictors and outcomes, which can be attributed to the lack of independence between repeated observations from the same unit of analysis (in this case, firms). In proportion to the magnitude of these correlations, ordinary least squares regression on a pooled sample will result in biased estimates of coefficients. We conduct a Hausman test on the coefficients derived from the regression models with fixed and random firm-level disturbances, respectively, which reveals that the random-effect model's assumption of uncorrelated disturbances is violated (Hausman, 1978). Hence, we report the results of fixed regression in this study.

The fixed effects regression model is specified as:

$$Outcome\ variable = \beta_0 + \beta_c \times controls + \beta_1 \times female\ ownership + \beta_2 \times female\ ownership \times firm\ size\ indicators + \mu_i + e_{it}$$

where β_0 is the intercept of each model, β_c is a vector of coefficients for the control variables, and β_1 and β_2 are the coefficients of primary interest. μ_i and e_{it} capture the firm-level disturbances and independently and identically distributed (IID) error terms, respectively. Outcome variables used in this model are *return on assets*, *return on sales*, *sales growth*, *total profits*, *total sales*, *labor productivity*, *total wages*, and *wage rate*. Industry-level control variables included with each of these outcomes are *growth*, *minimum efficient scale*, and *industry concentration*, while firm-specific variables are *foreign ownership* share, log of *total sales*, *export*, and *import intensity*, *leverage*, *liquidity*, and *age*. Note that the control variable log of *total sales* must be omitted from the model with *total sales* as the dependent variable. Industry controls are primarily concerned with the effect of industry on firm performance, and are thus omitted from the models for *total wages* and *wage rate*. Instead, these latter two models include industry indicator variables (i.e. fixed effects) to control for sectoral differences in wages and employment levels (e.g. high employment and low wages in primary industries, and low employment and higher wages in real estate, financial, or administrative services).

For each of the models used to analyze the impact of female ownership and other covariates for firm performance and economic and social outcomes, a linear regression model is used. The one exception is the use of negative binomial regression for the model with employment as the outcome variable. Since employment is an over-dispersed count variable (i.e. number of employees), linear regression's assumption of normally distributed error terms would be violated. The negative binomial model, which assumes a distribution that matches that of count data and predicts non-negative outcomes, is typically used in this situation to produce unbiased estimates (Cameron and Trivedi, 2013). The model we estimate is given by:

$$E(employment_{\mathrm{it}}) = \exp\left(\alpha_i + \beta_c x_{ct} + \beta_x x_{it}\right)$$

where employment is the count variable (number of employees), α groups all observed and unobserved firm-level heterogeneity, and x_{ct} and x_{it} are vectors of control and predictor variables, respectively (c.f. Guimaraes, 2008), including *female ownership*, *firm size*, and other firm-level controls (log of *total sales*, *foreign ownership*, *export intensity*, *import intensity*, *leverage*, *liquidity*, and *age*). This model is estimated via the maximum likelihood function, and the fixed effects are modeled as part of the dispersion parameter that varies by individual (i.e. firm).

In all models, we check variance inflation factors for evidence of multicollinearity problems. We find that the highest VIF is for the total sales control variable, at between 5 and 6. Hence, interpretations of this coefficient should be made with caution. Otherwise, all VIFs were below 3.5, and each model had an average VIF below 2.0. Hence, we do not find evidence that multicollinearity threatens the validity of our coefficient estimates pertaining to our hypotheses.

3.4 Time to event (exit hazard) analysis

The Cox proportional hazards model (Cox, 1972) is used to estimate the coefficients of the covariates that we predict will impact the rate of firm exit from the sample (i.e. firm failure). Cox regression is a semi-parametric time-to-event technique that is most useful when the goal is to estimate the impact of subject characteristics (Hosmer and Lemeshow, 1999), in our case the characteristics of firms, including the relative proportion of female ownership, firm size, and other characteristics. It is semi-parametric in the sense that no assumptions are made concerning the distribution of the baseline hazard function faced by units of analysis under observation, and it deals adequately with the issue of right-censoring (i.e. firms that are in our sample but fail after our observation window, which ends in 2016) (Silviano and Juan, 2008). This is a popular method for examining firm survival since the forces impacting the "normal" lifecycle of an organization are dependent upon a host of conditions in the environment, as well as both the random and systematic intentions of business founders. Similar to the fixed effect regression models used in this paper, coefficient estimates derived from Cox regression are robust, though less efficient. The survival model estimated is given as:

$$h(t|x_j) = h_0(t)\ exp\ (\beta_x x_j)$$

where h is the hazard faced by the j^{th} firm at time=t, and β is a vector of coefficients associated with specified covariates (controls and predictors); h_0 refers to the baseline hazard function, but does not need to be estimated when estimating the model's coefficients.

4. Results

Means, standard deviations, and pairwise correlations between variables included in all models are shown in Table II. Large correlations (i.e. above 0.2) may cause collinearity concerns, though this is not necessarily the case. In our data, larger correlations exist primarily between the size indicators and those variables used to determine the size classifications (i.e. sales and number of employees) as well as between total financial indicators, such as *total sales*, *total profits*, *total wages*, and *wage rate*. Since these variables are not included together in any model, and their correlation is expected, they do not cause much concern regarding the robustness of the results. Nonetheless, we checked the variance inflation factors (VIF) for each model, finding that no individual VIF exceeds 7 and the average VIF does not exceed 2 in any case. The only large VIF is that for log of *total sales*, which is not surprising since it is used to determine the size variables. All other individual VIFs are below 2. We estimated the relevant models without the log of *total sales*, finding that our results of interest do not change our interpretations of the findings. Thus, we find no substantive evidence that collinearity should be a concern for the accuracy of our findings.

[Insert Table II here]

4.1 Female ownership share and MSMEs' performance

Estimates for models 1–4, shown in Table III, provide evidence that female ownership share has a very slight impact on MSMEs' financial performance. For example, a fully female-owned firm (i.e. *female ownership* = 1, or 100%) has a 0.5% lower *return on sales* than a firm with no female ownership, on average. We find no evidence of a difference between different levels of female ownership on our other profitability measure (*return on sales*), though *sales growth* is about 10% lower for fully female-owned firms. These results, however, depend somewhat on the size of the firm. The effect of female ownership on SMEs' firm performance and growth appears to be positive, in comparison with that of micro-enterprises. To gain a better understanding of the effect sizes of these interactions, we conduct simple slopes tests using contrasts and generate plots of the marginal effects, as shown in Figure 2. The general conclusion we draw from these post-estimate procedures is that the impact of female ownership on MSMEs is positive for small firms, as assessed by both *return on assets* and *return on sales*.

[Insert Table III here]

[Insert Figure 2 here]

Table III and Figure 2 also provide evidence of differences in the economic impact of MSMEs with differing degrees of female ownership. Female ownership appears to have a positive impact on *total sales* and *total profits*, though this is primarily the case with microenterprises. Female ownership has a negative impact, on average, on medium-sized firms. Moreover, as depicted in Figure 3, female ownership appears to have a negative impact on *labor productivity*, but these results are not statistically significant.

In terms of the social impacts, as assessed according to job and wage creation, and as shown in Table IV and Figure 3, female-owned enterprises tend to provide higher wages per employee for all firm sizes, but *total wages* are lower for predominantly female-owned medium-sized enterprises, perhaps being smaller in size relative to medium-sized firms with higher male- or company-ownership.

[Insert Table IV here]

[Insert Figure 3 here]

Finally, we examine whether female ownership has any impact the survival rate of MSMEs. These results are shown in Table V, and plots of the survival rates are depicted in Figure 4. Firm survival is important, given the social and economic benefits they provide, though in a more competitive economy it is more desirable for the most efficient firms to survive. Our results indicate that female-owned firms have a higher probability of exit, in general, but medium-sized firms' survival is slightly better with higher female ownership (see panel 3 of Figure 4). This is consistent with our prediction that firms that provide more social benefits (e.g. employment or higher wages) would face lower exit hazards (e.g. higher survival rates). Models 14–16 provide some additional evidence that there is a slightly lower hazard for firms

with higher a *wage rate*, and for firms with both higher female ownership and higher *total wages/ employment*.

[Insert Table V here]

[Insert Figure 4 here]

5. Discussion

This paper tracks the progress of private-sector MSMEs during 2007–2016, focusing on financial, economic, and social outcomes for companies of varying degrees of male and female ownership. The characteristics of MSMEs are the following. First, around 63% of MSMEs are male-majority-owned. However, the number of female-owned companies is growing slightly faster than the number of male-owned companies (Figure 1).

Second, evidence shows that female ownership share has a very slight impact with a firm's financial outcomes (H1). From the results, we conclude that female ownership is negatively related with microenterprise performance, but positively associated with small-enterprise performance, while the result for medium-sized firms depends on whether performance is assessed by *return on assets* (positive) or by *return on sales* (negative). This latter finding suggests there may be differences in the asset intensity of businesses in which females are more involved, but this requires further analysis before a definite conclusion can be drawn. The current literature indicates that MSMEs run by men have greater profitability ratios than MSMEs with female ownership (Agier and Szafarz, 2013; Coad and Pawan, 2012; Oppedal-Berge *et al*., 2015; Rodríguez-Gutiérrez *et al*., 2014). From a gender perspective, a business run by women should not be evaluated only by measurement of "growth and economic success" (Lee and Huang, 2018, p. 1). That is why we also included economic and social outcomes.

Third, concerning economic outcomes (H2), an interesting interpretation of these findings, compared with those looking at firms' financial performance, is that although female-owned microenterprises are less efficient, they tend to provide more for their employees, and possibly communities, through the economic the stimulus they provide, in terms the size of the financial outcomes. Our results reflect that female microenterprises are the main engine for economic development, especially in developing countries. According to Maksimov *et al.* (2017), this is true because most poor women are self-employed, which creates an opportunity for poverty alleviation.

Fourth, concerning social outcomes (H2), Maksimov et al. (2017) pointed out that female-owned companies pay higher wages to their employees than male-owned companies because they need to secure a reliable workforce through higher wages in order to safeguard continuous efficiency gains. A similar trend is found in Ecuador; female-owned companies of all sizes tend to provide higher wages per employee. This contribution may help in supporting employees' families and communities. Fifth, concerning firm survival, female-owned firms have greater chances of exit. However, firms that provide more social benefits (e.g. higher *wage rate*, higher *female ownership*, and higher *total wages/ employment*) show higher survival rates. The creation of MSMEs generates financial, economic, and social benefits. If run by women,

economic and social benefits are usually a priority. However, if it is male-run, the financial benefits are usually the priority (Oppedal-Berge *et al.*, 2015).

Some challenges that constrained the success of Ecuadorian MSMEs are as follows. First, there is a lack of governmental policies to motivate micro and small companies' creation, survival, and growth. Empirical evidence shows that entrepreneurship policy, including for small and low-tech firms, could enhance a country's overall performance (Fritsch and Changoluisa, 2017; Sutter, *et al*., 2019). For example, currently, all formal companies registered with the SCVS, no matter their size, have to fulfill all legal and taxation requirements mandated by law.

Further, there is no specific, well-planned support for female-owned MSME creation or investment. Some of the problems that these enterprises face include inadequate access to financing and property, a lack of technology, inadequate training and support services, and the lack of a family-friendly institutional environment to balance both family and business activities, among others (CIEC, 2018; Molina-Ycaza and Sánchez-Riofrío, 2016; Seguino, 2019; Villaseca *et al.*, 2021). Additionally, the Ecuadorian institutional environment has been constantly changing over the past 12 years. New laws, taxes, reforms to those laws, and reforms to those taxes, amongst other things, have all come about. All these changes have provoked some suspicion, especially for foreign private investors.

6. Conclusions, limitations, and future research

This study provides important evidence of the characteristics and performance of Ecuadorian formal MSMEs during 2007–2016. To our knowledge, no similar research has used a near-population panel for a developing country, such as Ecuador, over a 10-year period. In this context, this paper reveals the challenges, trends, and growth patterns of not only MSMEs in Ecuador but also of female-owned and male-owned companies, specifically, in Ecuador. Female owned firms' performance should not be evaluated based only on their financial outcomes. From a feminist perspective, female business owners have a more comprehensive vision of what performance is, which is why economic and social measures should be included to measure the performance of companies led by women (Arraiz, 2018; Lee and Huang, 2018).

The implications for academics include empirical evidence that integrates financial, economic and social dimensions of business performance to assess women's success. Moreover, we analyze the impact of female ownership on these three performance dimensions. We need a more holistic view when measuring companies success and not just measuring by financial performance.

The findings from this study reveal that more development policies in Ecuador are needed to address women's participation in the business arena. The implications for government leaders include, first, building an institutional framework that conciliates family and work to improve female participation. Women may not sacrifice the attention they give to their homes and families for the sake of growing their business (Adom *et al*., 2017). Second, access to adequate financing is vital. According to CIEC (2018), 57% of people without a bank account in Ecuador are women. Third, companies must offer equal working conditions for men and women. Up to now, Ecuadorian women have earned less, while working more, than their male peers (*El Comercio*, 2018). Fourth, public and private entities, such as schools and universities,

need to empower women and educate Ecuadorians in general through affirmative action, gender mainstreaming, and other social initiatives to remove cultural paradigms that restrict opportunities for women.

The next recommendations are related to promoting not only female-led MSME creation but also MSME creation in general: Ecuador needs to reduce and digitalize all legal and administrative procedures for MSME creation, development, and closure. Also, special treatment for micro and small companies is needed; currently, all MSMEs (new and old) registered with the SCVS have almost the same (without size consideration) administrative, financial, and labor procedures. Finally, soft loans are needed to promote infrastructure investment as well as more business projects related to innovation and technology.

These results should be interpreted within the limits of this research. Differences between male-owned and female-owned firms are likely to be due to factors that require additional study, using surveys to gather primary data, e.g. what the role of gender differences is in credit availability, traditional household roles, and workplace discrimination. What is somewhat remarkable about our results, however, is that in simultaneously controlling for bias in industrial sector choices, firm size, gender of ownership, and unobserved firm heterogeneity, the differences in performance between male-owned and female-owned businesses are quite muted, suggesting that the findings of other studies may be biased by missing levels of analysis or that the conditions that lead to gender differences are not as prevalent in Ecuador. A third explanation, which we think is compelling, is that women and men, being biased towards different types of businesses, are generally substituting industries of comparable profitability (e.g. real estate for women, finance and insurance for men). As with any large-sample correlational analysis, the opportunity to consider the impact of firm-level variables such as resources, capabilities and strategic choices is limited.

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Despite these limitations, this work suggests that the MSME reality in developing countries is more complex than the current literature, which is still evolving, shows. We hope that this study contributes to enriching this literature and motivates more researchers in developing countries to present their own realities and pick up future lines of research.

Endnotes

1. *Superintendencia de Compañías, Valores y Seguros* (SCVS) is a public institution whose role is to oversee the daily operation of formal companies in Ecuador; it can also propose reforms to laws in order to improve the business environment.
2. The period between 2007 and 2016 was a period of important structural changes in the Ecuadorian economy, particular regarding firm formalization. Only one political party, with the same president, ruled during this time. In 2017, however, a new government was voted in with different ideas to those of the last 10 years.

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Table I. Are there any differences between MSMEs run by men and those run by women in developing countries?

		MSME characteristics	Examples	Countries
Firm characteristics	Ambitions	MSMEs run by men are more ambitious in terms of economic performance and growth compared to MSMEs with female ownership. MSMEs run by women are more motivated by organizational efficiency and emphasize social goals.	Coad and Pawan (2012); Maksimov *et al.* (2017)	India Seven LDCs across Africa, Asia, and the Middle East
	Industry	Women who own and control MSMEs tend to establish their companies in traditional industrial sectors (for example, the commercial sector).	Agier and Szafarz (2013); Rodríguez-Gutiérrez *et al.* (2014)	Brazil Mexico
	Structure	The organizational structure of MSMEs with female ownership is more decentralized than those with male ownership. MSMEs controlled by women are more flexible than those controlled by men.	Rodríguez-Gutiérrez *et al.* (2014)	Mexico
	Challenges and obstacles	For men entrepreneurs: financing. For women entrepreneurs: financing; time management; family responsibilities; lack of business education; cultural and religious complications; fewer employment opportunities than men.	Hailu Gudeta and van Engen (2018); Molina-Ycaza and Sánchez-Riofrío (2016); Muhammad *et al.* (2017); Oppedal-Berge *et al.* (2015)	Ethiopia Latin American countries Pakistan Tanzania
Employment	Employment	MSMEs with female ownership hire more employees and pay those employees more.	Coad and Pawan (2012); Maksimov *et al.* (2017)	India Seven LDCs across Africa, Asia, and the Middle East
Financing	Credit lines	Women entrepreneurs have reduced credit lines compared to men with similar characteristics.	Agier and Szafarz (2013)	Brazil

	Growth	MSMEs run by men have greater growth ratios than MSMEs with female ownership.	Agier and Szafarz (2013); Coad and Pawan (2012); Oppedal-Berge *et al.* (2015)	Brazil India Tanzania
Performance	Profitability and Survival	MSMEs run by men have greater profitability ratios than MSMEs with female ownership. Male owned businesses have slightly higher survival rates. This is attributed to both differences in initial capital availability, and experience prior to starting a venture.	Agier and Szafarz (2013); Boden and Nucci (2000); Coad and Pawan (2012); Oppedal-Berge *et al.* (2015); Rodríguez-Gutiérrez *et al.* (2014)	

Table II. Descriptive statistics and pairwise correlations.

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10
Industry MES[1]	14.811	13.558										
Industry concentration	0.120	0.238	0.020*									
Industry growth	0.084	0.139	-0.088*	-0.141*								
Micro (dummy)	0.582	0.493	-0.195*	0.007*	0.009*							
Small (dummy)	0.305	0.460	0.102*	0.010*	0.000	-0.779*						
Medium (dummy)	0.114	0.318	0.157*	-0.025*	-0.014*	-0.435*	-0.226*					
Return on assets	0.041	0.198	-0.011*	0.003*	0.022*	-0.187*	0.149*	0.076*				
Return on sales	0.022	0.090	-0.050*	-0.008*	0.036*	-0.145*	0.116*	0.059*	0.614*			
Sales growth	0.765	2.006	-0.018*	0.019*	0.023*	-0.038*	0.056*	-0.022*	0.126*	0.112*		
Total revenue	375,769	774,721	0.183*	-0.034*	0.006*	-0.556*	0.016*	0.840*	0.102*	0.080*	-0.010*	
Total profits	16,313	73,063	0.037*	0.011*	0.006*	-0.268*	0.021*	0.385*	0.235*	0.355*	0.020*	0.446*
Labor productivity	41,216	137,258	0.079*	-0.021*	0.020*	-0.314*	0.069*	0.388*	0.074*	0.073*	0.037*	0.480*
Total wages	50,245	181,899	0.050*	0.016*	-0.012*	-0.315*	0.047*	0.421*	0.044*	0.025*	-0.038*	0.488*
Wage rate	4.338	4.157	0.161*	0.028*	-0.044*	-0.646*	0.466*	0.333*	0.091*	0.063*	0.044*	0.422*
Employment	11.435	21.976	0.034*	-0.002	-0.013*	-0.288*	0.026*	0.411*	0.038*	0.024*	-0.019*	0.465*
Foreign ownership	0.100	0.281	0.061*	-0.006*	0.020*	-0.050*	0.011*	0.061*	-0.025*	-0.011*	-0.014*	0.072*
Leverage	0.000	0.126	0.001	0.002	-0.002	0.003*	-0.002	-0.001	-0.004*	-0.002	-0.000	-0.002
Liquidity	186.23	425.19	-0.067*	-0.002	-0.003*	0.319*	-0.242*	-0.147*	-0.065*	-0.092*	-0.075*	-0.192*
Export intensity	0.020	0.128	0.016*	-0.003	0.010*	-0.064*	0.014*	0.079*	-0.002	0.000	0.035*	0.089*
Import intensity	12.86	8502.77	-0.000	-0.001	-0.001	-0.002	0.002	-0.001	-0.000	-0.000	0.001	-0.000
Firm age	10.53	9.54	-0.000	-0.056*	0.005*	-0.068*	0.003*	0.102*	-0.018*	0.037*	-0.177*	0.112*
Female ownership	0.269	0.352	-0.040*	-0.024*	-0.000	0.040*	-0.013*	-0.043*	-0.002	0.002	-0.005*	-0.050*

Variables	11	12	13	14	15	16	17	18	19	20	21
Labor productivity	0.306*										
Total wages	0.205*	0.122*									
Wage rate	0.138*	0.220*	0.322*								
Employment	0.170*	-0.039*	0.560*	0.217*							
Foreign ownership	0.066*	0.098*	0.054*	0.012*	0.008*						
Leverage	-0.001	-0.001	-0.001	-0.001	-0.002	0.007*					
Liquidity	-0.080*	-0.106*	-0.121*	-0.404*	-0.103*	-0.027*	-0.002				
Export intensity	0.014*	0.042*	0.092*	0.067*	0.120*	0.068*	-0.001	-0.034*			
Import intensity	-0.000	-0.000	0.000	0.001	0.001	0.005*	0.000	-0.001	-0.000		
Firm age	0.083*	0.017*	0.103*	0.054*	0.087*	0.016*	0.002	-0.056*	0.015*	–0.001	
Female ownership	-0.037*	-0.045*	-0.033*	-0.010*	-0.046*	-0.130*	0.001	0.004*	-0.024*	–0.001	0.008*

Notes: Pearson correlations (two-tailed), * significant at $p<0.05$. [1]MES = minimum efficient scale.

Table III. Female ownership share, financial performance, and economic impact of MSMEs.

	1. Controls	2. Return on assets (ROA)	3. Return on sales (ROS)	4. Sales growth (%)	5. Total sales	6. Profits	7. Labor productivity
Industry growth	–0.014***	–0.017***	–0.015***	0.665***	32,245***	1,889***	–5,670*
Industry MES[1]	–0.000	–0.000**	0.000	0.002*	1,383***	191.1***	–222.0***
Industry concentration	–0.009**	–0.011***	–0.005***	–0.268***	18,847***	1,072	3,092
Log of total sales	0.013***	0.010***	0.006***	0.263***	*Omitted*	779.7***	2,637***
Foreign ownership (%)	–0.012***	–0.014***	–0.004***	–0.171***	21,682***	–1,827***	23,237***
Export intensity	–0.016***	–0.010***	–0.005***	0.346***	25,814***	–2,133***	5,340***
Import intensity	–0.005**	–0.007***	–0.003***	0.259***	64,034***	2,420***	7,353***
Leverage	–0.012**	–0.009**	0.001	0.007	–3,160	243.0	–148.5
Current ratio	0.000***	0.000***	0.000***	0.000***	–21.72***	2.476***	3.083***
Firm age	–0.006***	–0.006***	–0.003***	–0.084***	944.9***	518.8***	–2,837***
Firm size:							
Small		0.047***	0.004***	–0.461***	314,074***	13,797***	46,310***
Medium		0.067***	0.012***	–0.873***	1,494,493***	75,772***	183,080***
Female ownership		–0.004**	0.001	–0.102***	13,365***	–163.9	2,928***
Female ownership × Small		0.008***	0.001	0.023	–30,815***	–839.2	–16,758***
Female ownership × Medium		0.009**	–0.002	0.078*	–116,535***	–13,037***	–62,198***
Constant	–0.007***	–0.004**	0.005***	–0.360***	–65,907***	–11,785***	12,576***
N	529,140	529,170	537,657	476,724	537,657	537,657	537,657
Firms	102,400	102,416	102,659	92,701	102,659	102,659	102,659
F test	2,501.18***	1,828.60***	2,124.19***	5,599.80***	30,558.34***	2,877.25***	4,160.15***

Notes: *N*= number of firm-year observations, *p<0.10, **p<0.05, ***p<0.01. [1]MES = minimum efficient scale.

Table IV. Female ownership share and social impact of MSMEs.

	8. Total wages	9. Wage rate	10. Total employment
Log of total sales	1,328***	0.335***	0.019***
Foreign ownership (%)	1,545	0.137***	–0.104***
Export intensity	18,783***	–0.029	0.196***
Import intensity	–2,208**	0.050**	–0.048***
Leverage	–590.1	–0.075*	–0.009*
Current ratio	–0.433	–0.000***	–0.000***
Firm age	2,605***	0.075***	0.014***
Firm size:			
Small	26,901***	0.973***	0.374***
Medium	135,270***	1.104***	0.963***
Female ownership	1,047	0.097***	–0.013
Female ownership × Small	–692.7	0.068***	–0.011
Female ownership × Medium	–12,354***	0.120***	–0.056
Constant	8,274	1.215	1.990***
N	560, 267	560,267	566,533
Firms	98,569	98,569	103,663
F test	18,44.14***	9,457.31***	
Wald-chi^2			25,057.43***

Notes: *N*= number of firm-year observations. Industry fixed effects included (not shown due to space constraints). Models 8 and 9 are linear regressions with firm fixed effects, while model 10 involves a negative binomial regression due to employment being a count variable. *p<0.10, **p<0.05, ***p<0.01.

Table V. Female ownership, social impact, and exit hazard of MSME businesses.

	11. Controls	12. Female ownership	13. Performance	14. Total wages	15. Wage rate	16. Employment
Industry growth	0.053***	0.053***	0.053***	0.053***	0.053***	0.053***
Industry MES[1]	1.003***	1.003***	1.003***	1.003***	1.003***	1.003***
Industry concentration	1.379***	1.381***	1.380***	1.382***	1.382***	1.382***
Log of total sales	0.963***	0.963***	0.963***	0.963***	0.968***	0.963***
Foreign ownership (%)	1.103***	1.114***	1.114***	1.113***	1.111***	1.112***
Export intensity	1.282***	1.283***	1.283***	1.292***	1.298***	1.316***
Import intensity	1.308***	1.307***	1.307***	1.306***	1.307***	1.304***
Leverage	1.049	1.048	1.048	1.048	1.048	1.048
Current ratio	1.000***	1.000***	1.000***	1.000***	1.000***	1.000***
Profitability	0.643***	0.643***	0.638***	0.644***	0.627***	0.643***
Firm size:						
Small	0.778***	0.779***	0.780***	0.779***	0.801***	0.781***
Medium	1.034	1.069	1.069**	1.065**	1.099***	1.087***
Female ownership		1.084***	1.085***	1.087***	1.081***	1.091***
Female ownership × Small		0.779	0.999	1.006	0.992	1.012
Female ownership × Medium		1.069**	0.875**	0.902	0.867**	0.910
Female ownership × Profitability			1.029			
Total wages				1.000		
Female ownership × Total wages				0.999**		
Wage rate					0.986***	
Female ownership × Wage rate					1.002	
Employment						0.999*
Female ownership × Employment						0.999
N	512,050	512,050	512,050	511,995	511,995	512,050
Firms (exits)	91,436 (28,983)	91,436 (28,983)	91,436 (28,983)	91,415 (28,972)	91,415 (28,972)	91,436 (28,983)
Log-likelihood	–296,797.25 ***	–29,6786.08***	–296,786.02***	–296,657.25.88***	–296,650.4 ***	–296,779.98***

Notes: *N*= number of firm-year observations, *p<0.10, **p<0.05, ***p<0.01. [1]MES = minimum efficient scale.

Figure 1. Female, male, and company ownership share by firm size.

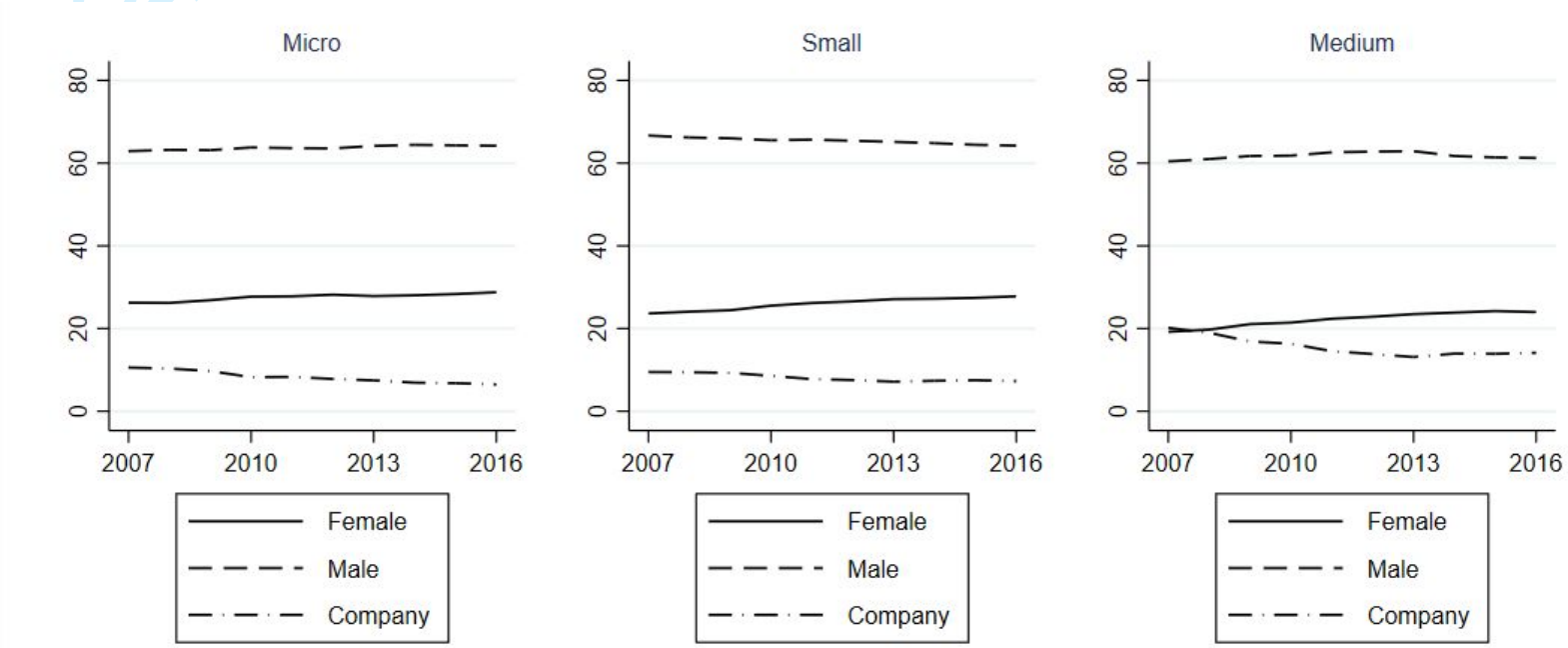


Figure 2. Combined impact of female ownership and firm size on return on assets, return on sales, total sales, and total profits.

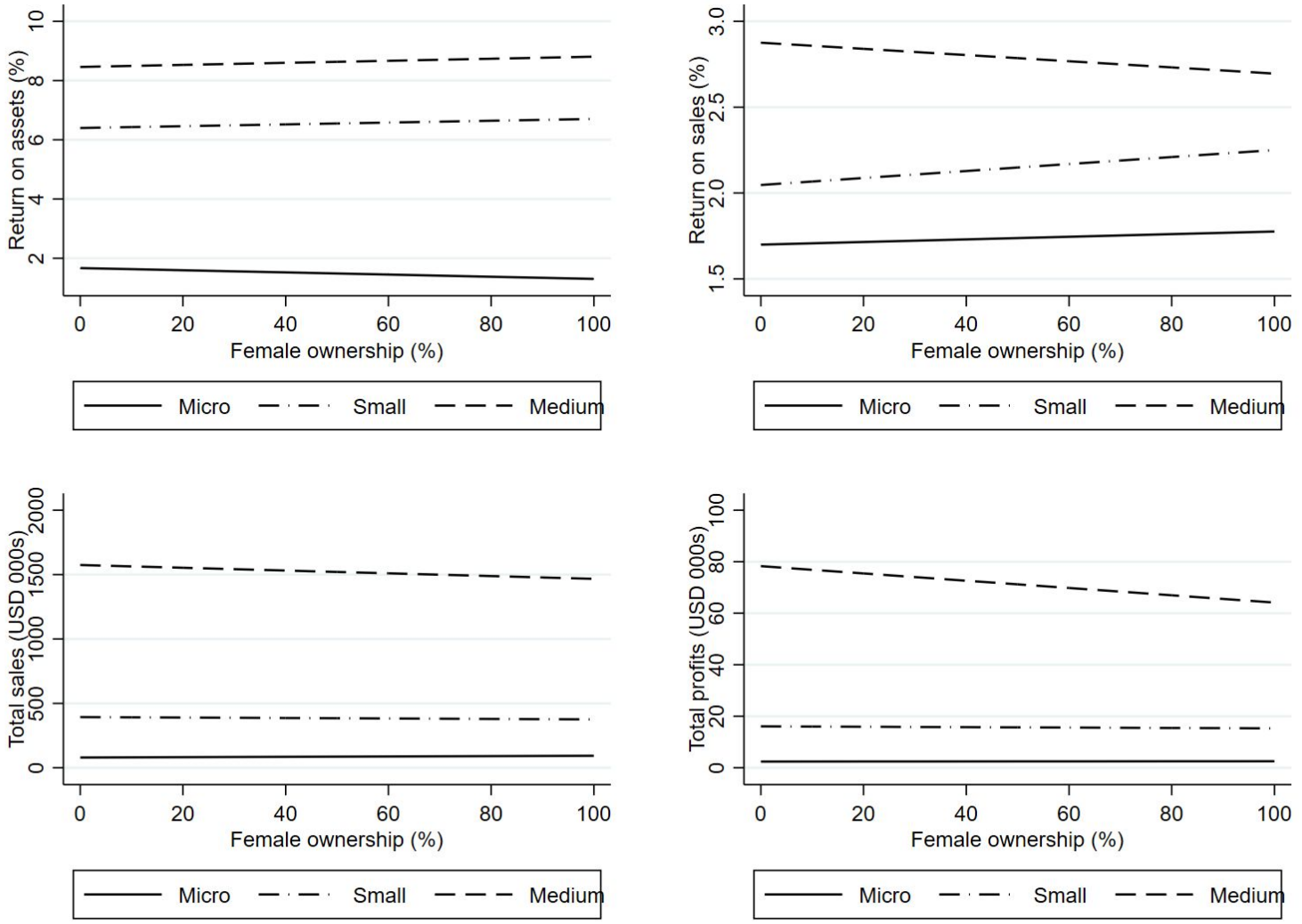


Figure 3. Combined impact of female ownership and firm size on labor productivity, total wages, and employment.

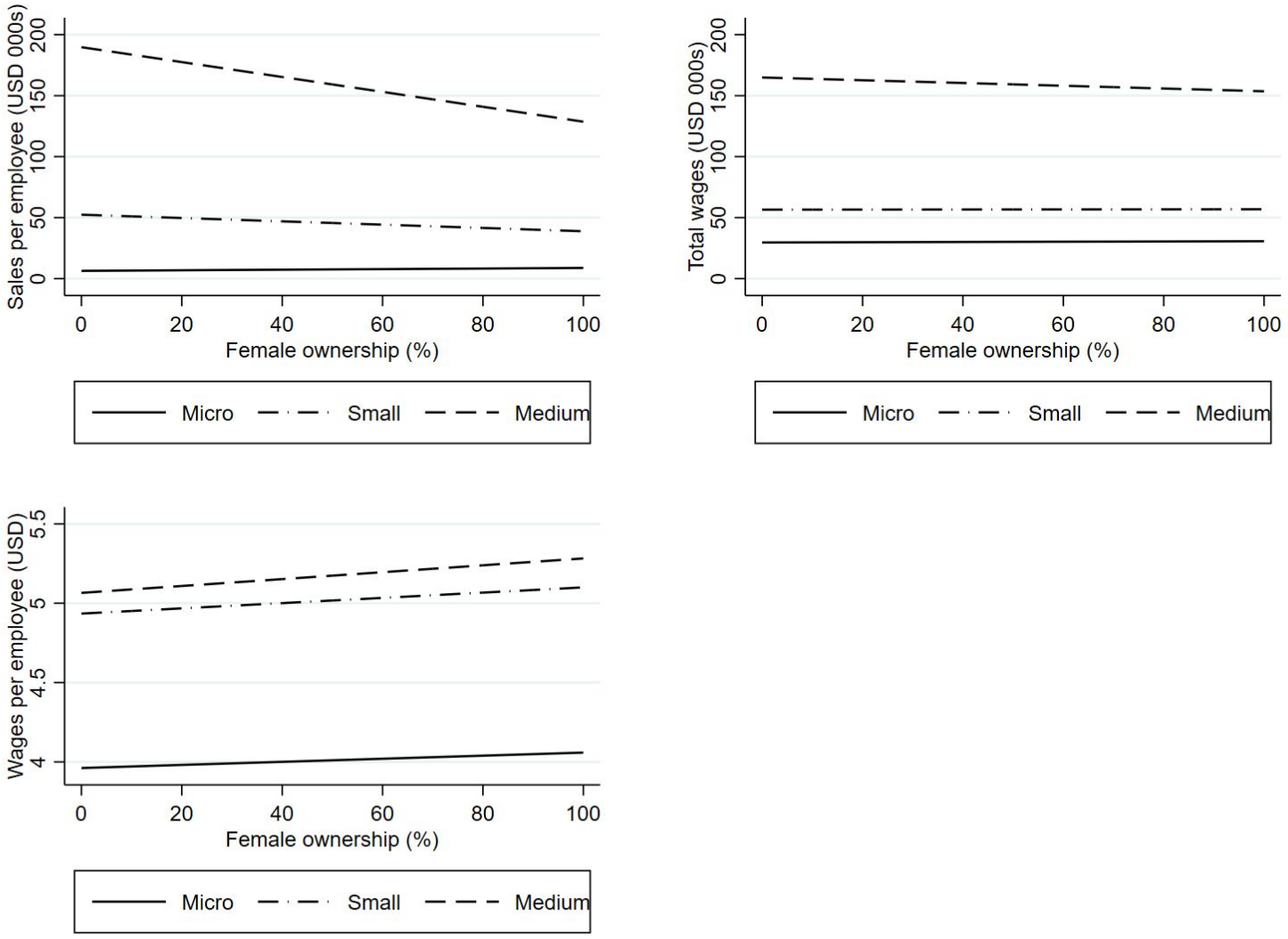
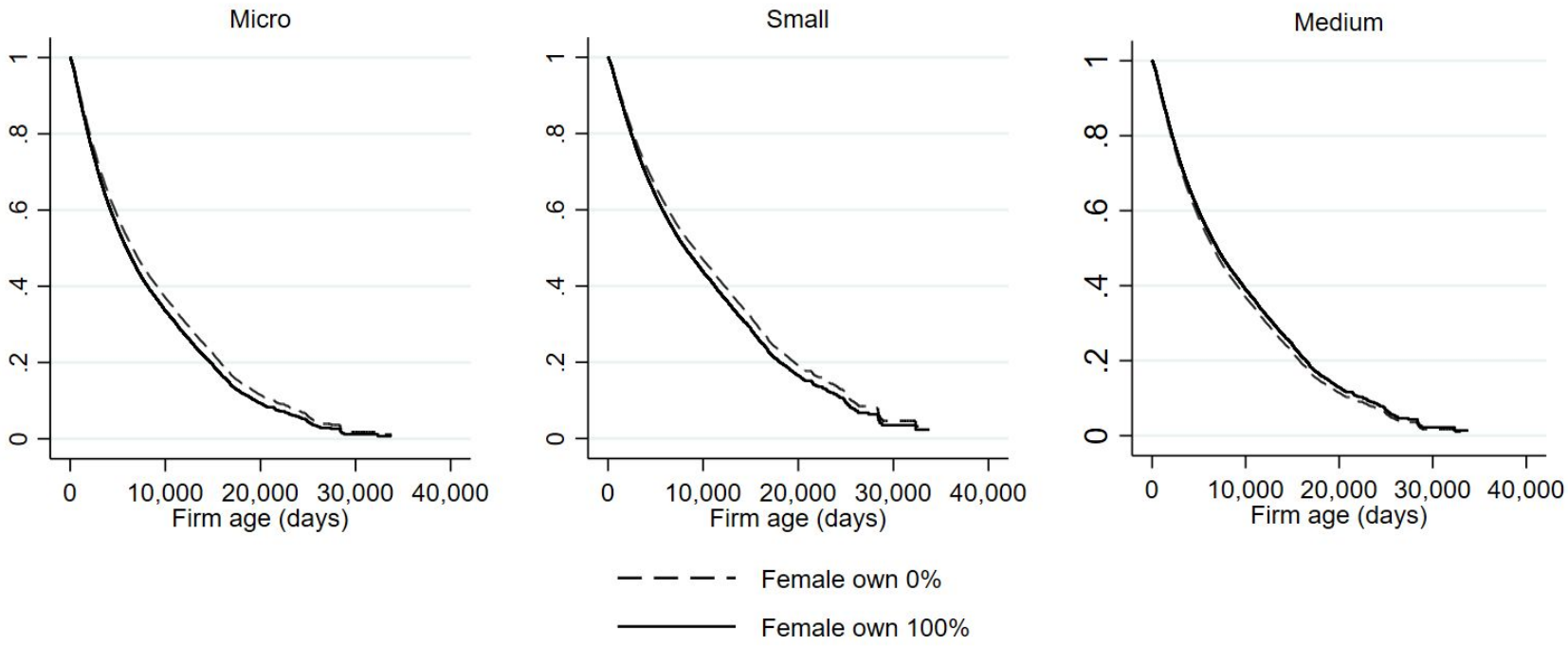


Figure 4. Micro, small, and medium firm survival at high and low levels of female ownership.



EDITOR

Dear Prof. Ondřej Dvouletý, Associate Editor, Journal of Entrepreneurship in Emerging Economies

First of all, thank you very much for offering us the possibility of sending our paper once re-elaborated. Nevertheless, we feel that the effort has been worth it.

We have tried to address all of the suggestions made by you and the reviewers and we recognise that the paper has improved with these changes. We have explained in each of the reports the changes made and how we have proceeded with each of the comments or suggestions. We hope we have done a good job but be sure that we have done our best.

Now we try to answer your own questions about the paper.

1. **First, you need to provide even more details regarding the methodology you used. I propose you back up your methodological section with proper references. Kindly explain to the readers in simple words what you did, why and how. Particularly, I suggest the expansion of your methodological approach for more advanced statistical methods, as some of the reviewers point out.**

We have completely changed our methodological approach with this revision. In the initial submission, we were primarily reporting descriptive statistics, with the significance of differences indicated wherever relevant. We recognize that this approach is not preferred by the journal. We have thus completely redone our methodology using very conventional approaches to modeling the impact of covariates and factors on the characteristics and performance of Ecuadorian MSMEs. As we now explain in the new methodology section, we use standard panel data regression techniques except in the case of our survival models, which use the ubiquitous Cox regression model. The panel regressions are fixed effects, as is typically the case for large N (firms) small t (repeated observations) data. Besides, a Hausmann test indicated strongly that a random effects model would not be appropriate given the correlation of the error terms with covariates which are extremely common in the case in repeated observations. For most of our dependent variables, a simple linear model is used, but in the case of count data (number of employees) we use the non-negative binomial model to account for our 0-constrained, count-distributed, dependent variable. Cox regression is a relatively straightforward method of analyzing time-to-event data, where the underlying baseline hazard function is unknown. All our methodological choices are supported by the literature which we now cite.

2. Second, elaborate on the context and limitations of your study and make sure that all statements are properly cited. Double-check that you interpret your findings in line with the context of your study.

As suggested, we have added a new section called *2.2 Ecuadorian context* on page 4 and we had double-check that all our statements are properly cited. We re-elaborated the results

and discussion sections (on page 11 and 12) and interpreted our findings in line with the context and limitations of our study.

I also propose adding data sources for your Tables so we clearly know what kind of data you are using.

All of the data we use in our models comes from the financial statements of firms, and firm ownership data, either taken directly from the Superintendencia de Compañías, Valores y Seguros (SCVS), or calculated from the same. We indicated this in our methodology section. Since there is technically only one source for our data, we do not indicate in each table but we highlighted it in the methodology section.

3. Explore JEEE to see whether there have not been any recent papers dealing with a similar topic. It might be good to follow up on the existing discussion in the journal.

As suggested, we have added some interesting references that follow up on the existing discussion in the journal:

Durst, S., Palacios Acuache, M.M.G. and Bruns, G. (2021), "Peruvian small and medium-sized enterprises and COVID-19: Time for a new start!", Journal of Entrepreneurship in Emerging Economies, Vol. 13 No. 4, pp. 648-672. https://doi.org/10.1108/JEEE-06-2020-0201

Quagrainie, F.A., Adams, S., Kabalan, A.A.M. and Dankwa, A.D. (2021), "Micro-entrepreneurship, sustainable development goal one and cultural expectations of Ghanaian women", Journal of Entrepreneurship in Emerging Economies, Vol. 13 No. 1, pp. 86-106. https://doi.org/10.1108/JEEE-11-2019-0174

Villaseca, D., Navío-Marco, J. and Gimeno, R. (2021), "Money for female entrepreneurs does not grow on trees: start-ups' financing implications in times of COVID-19", Journal of Entrepreneurship in Emerging Economies, Vol. 13 No. 4, pp. 698-720. https://doi.org/10.1108/JEEE-06-2020-0172

4. Please, let your manuscript proofread by a native speaker/colleague.

As suggested, we hired a professional to help us with proofreading. I attached the certificate, as "supplementary file not for review" (because it has my name):

Thank you again for your feedback, kindness and patience. We hope this new version of the paper has really improved. Nevertheless, we are open to continue improving our work in order to have this paper published in JEEE.

Kind regards,

The authors

REVIEWER Nº1

1. Originality: Does the paper contain new and significant information adequate to justify publication?: I would like to thank the journal that inviting me to read and review this interesting article. The paper is exciting, however, I forwarded comments, suggestions, and questions as per the guideline of the journal.

This paper considered gender characteristics towards emerging economics. The article is interesting and a little bit noble by assessing the gender characteristics against the survival of the enterprises. It covers 9 years of data in Ecuador.

Thank you very much for your constructive comments and suggestions to improve the quality of our paper. Following the suggestions, we included important modifications in the manuscript. Below, we will give a point-to-point replay to the comments. We hope we have been able to address your points correctly.

2. Relationship to Literature: Does the paper demonstrate an adequate understanding of the relevant literature in the field and cite an appropriate range of literature sources? Is any significant work ignored?: The literature is not adequate to describe the variables that consider in the study such as firm characteristics (size, survival rate, and industry), labor overview, and financial performance. I strongly recommend the researcher review articles/literature related to the study variables. That will motivate the reader to understand very well your paper.

Thanks the reviewer for this remark. Following your recommendation, we added a new section called *2.1 Feminist approaches* on page 3 that are related to the study variables. We also added me some interesting references that follow up on the existing discussion in the journal:

Durst, S., Palacios Acuache, M.M.G. and Bruns, G. (2021), "Peruvian small and medium-sized enterprises and COVID-19: Time for a new start!", Journal of Entrepreneurship in Emerging Economies, Vol. 13 No. 4, pp. 648-672. https://doi.org/10.1108/JEEE-06-2020-0201

Quagrainie, F.A., Adams, S., Kabalan, A.A.M. and Dankwa, A.D. (2021), "Micro-entrepreneurship, sustainable development goal one and cultural expectations of Ghanaian women", Journal of Entrepreneurship in Emerging Economies, Vol. 13 No. 1, pp. 86-106. https://doi.org/10.1108/JEEE-11-2019-0174

Villaseca, D., Navío-Marco, J. and Gimeno, R. (2021), "Money for female entrepreneurs does not grow on trees: start-ups' financing implications in times of COVID-19", Journal of Entrepreneurship in Emerging Economies, Vol. 13 No. 4, pp. 698-720. https://doi.org/10.1108/JEEE-06-2020-0172

3. Methodology: Is the paper's argument built on an appropriate base of theory, concepts, or other ideas? Has the research or equivalent intellectual work on which the paper is based been well designed? Are the methods employed appropriate?: The researcher(s) try to use different techniques to get adequate data. Hence, my questions are:

a. Which specific sampling technique(s) were employed by the researcher?

b. I can't find a list of acronyms. What does it mean? (SCVS, ROA)

c. How many micro, small, and medium enterprises are included in the sample? Not mentioned.

d. In the methodology there is a statement ''……..statistical tests to detect the significance of observed differences, including repeated measures ANOVA, logistic panel regression, and dependent tests of means……''. However, I can't find logistic panel regression results in the table? Especially, the significant level of the variables is not indicated.

e. Why did the researcher(s) fail to mention the enterprises' exit from the industry or the attrition rate? This can be a base to analyze the survival rate of MSMEs'.

f. What is your baseline to use 70.4% of total observations

We have completely replaced the methodology section, as below, and we believe this addresses these issues, and the other issues raised by the editor and other three reviewers:

In the initial submission, we were primarily reporting descriptive statistics, with the significance of differences indicated wherever relevant. We recognize that this approach is not preferred by the journal. We have thus completely redone our methodology using very conventional approaches to modeling the impact of covariates and factors on the characteristics and performance of Ecuadorian MSMEs. As we now explain in the new methodology section, we use standard panel data regression techniques except in the case of our survival models, which use the ubiquitous Cox regression model. The panel regressions are fixed effects, as is typically the case for large N (firms) small t (repeated observations) data. Besides, a Hausmann test indicated strongly that a random effects model would not be appropriate given the correlation of the error terms with covariates which are extremely common in the case of repeated observations. For most of our dependent variables, a simple linear model is used, but in the case of count data (number of employees) we use the non-negative binomial model to account for our 0-constrained, count-distributed, dependent variable. Cox regression is a relatively straightforward method of analyzing time-to-event data, where the underlying baseline hazard function is unknown. All our methodological choices are supported by the literature which we now cite.

4. Results: Are results presented clearly and analysed appropriately? Do the conclusions adequately tie together the other elements of the paper?: Good: All listed variables are treated in the analysis and result sections. But, the researcher(s) not

properly discussed the research finding with prior results. I can't find a statement related to comparing and contrasting the study finding with previous findings.

We re-elaborated the results and discussion sections (on page 11 and 12) and interpreted our findings in line with the context and limitations of our study. We have added different statements comparing and contrasting the study finding with previous findings. For example on page 11 and 12:

> *"Second, evidence shows that female ownership share has a very slight impact with a firm's financial outcomes (H1). From the results, we conclude that female ownership is negatively related with microenterprise performance, but positively associated with small-enterprise performance, while the result for medium-sized firms depends on whether performance is assessed by return on assets (positive) or by return on sales (negative). This latter finding suggests there may be differences in the asset intensity of businesses in which females are more involved, but this requires further analysis before a definite conclusion can be drawn. The current literature indicates that MSMEs run by men have greater profitability ratios than MSMEs with female ownership (Agier and Szafarz, 2013; Coad and Pawan, 2012; Oppedal-Berge et al., 2015; Rodríguez-Gutiérrez et al., 2014). From a gender perspective, a business run by women should not be evaluated only by measurement of "growth and economic success" (Lee and Huang, 2018, p. 1). That is why we also included economic and social outcomes.*
>
> *Third, concerning economic outcomes (H2), an interesting interpretation of these findings, compared with those looking at firms' financial performance, is that although female-owned microenterprises are less efficient, they tend to provide more for their employees, and possibly communities, through the economic the stimulus they provide, in terms the size of the financial outcomes. Our results reflect that female microenterprises are the main engine for economic development, especially in developing countries. According to Maksimov et al. (2017), this is true because most poor women are self-employed, which creates an opportunity for poverty alleviation…"*

5. Implications for research, practice and/or society: Does the paper identify clearly any implications for research, practice and/or society? Does the paper bridge the gap between theory and practice? How can the research be used in practice (economic and commercial impact), in teaching, to influence public policy, in research (contributing to the body of knowledge)? What is the impact upon society (influencing public attitudes, affecting quality of life)? Are these implications consistent with the findings and conclusions of the paper?: Yes, the research focused on the actors of the society or pillars of society (females and male too). Does the paper bridge the gap between theory and practice?

Comments/Suggestions/questions

Not elaborated very well! The literature section in the article has a limitation. Theories were not discussed and elaborated on properly. The gap is not supported by the pieces of literature.

Thanks the reviewer for this remark. As suggested, we added a new section called *2.1 Feminist approaches* on page 3 and we focus on liberal feminist theory and the role that gender and social norms play in explaining potential differences in business performance.

6. Quality of Communication: Does the paper clearly express its case, measured against the technical language of the field and the expected knowledge of the journal's readership? Has attention been paid to the clarity of expression and readability, such as sentence structure, jargon use, acronyms, etc.: In the main text (result part) data are not consistent with the tables. The P-value is not incorporated in the table.

We agree with the reviewer. We have now indicated p-values in the new tables according to the style which seems to be preferred by the journal, using sequential cut-offs, i.e. *p<0.10, **p<0.05, ***p<0.01.

The authors would like to thank again reviewer#1 for his/her helpful and constructive comments that certainly contributed improving the final version of the paper. If more work is needed, please do not hesitate to tell us.

REVIEWER Nº 2

After I read your manuscript, this manuscript is generally quite good, especially regarding the sources of literature that you cite from publications of reputable journal articles, quite relevant and quite new. There are several points that I pay attention to for you to revise, including:

1) On page 1 lines 14-16 for the sentence "The aim of this paper is to identify MSMEs' characteristics of companies in accordance with firm-specific drivers of growth and performance." -> I think the main objective of this research is inconsistent with the title of your research which emphasizes more on gender.

Thank you for this remark, we changed the main objective for *"... the aim of this paper is to study the relationship between female ownership and MSMEs' financial, economic and social outcomes in Ecuador."*

2) On page 2 lines 46-47 for the sentence "Our goal is to identify MSMEs' characteristics in accordance with firm-specific drivers of growth and performance" --> in my opinion, there is no explanation that underlies the need for the research objectives both in terms of research gaps and practical problems.

We agree with the reviewer that is why we changed the objective to: *"This paper therefore aims to study the relationship between female ownership and Ecuadorian MSMEs' financial, economic and social outcomes"*. Moreover, we improved all the theoretical section that support our goal. For example, we added a new section called: *"2.4 Gender, MSME ownership and performance"* here we connect the research objective with the research gap and practical problems. We have now added two hypotheses and improve all methodological section. This part now looks like this:

> ...
>
> *Therefore, in order to assess the impact of female ownership on firm performance, we have divided firm performance into financial, economic, and social outcomes. Firm financial outcomes reflect a firm's growth and financial profits. Economic outcomes consider the growth of the overall economy. Finally, social outcomes concern the values shared amongst organizational members (Fuentes-Fuentes et al., 2015; Lee and Huang, 2018). We expect differences in performance because of how female business owners define success. Self-fulfillment, balancing work and family, goal achievement, and social contributions are all considered measures of success (Butter, 2001; Calas et al., 2009)...*

3) On page 3 line 7, the theoretical background does not state and explain what theory underlies the MSME characteristic phenomenon related to gender which is also in accordance with research problems, research questions, and research goals/purposes.

Thanks the reviewer for this remark. As suggested, we added a new section called *2.1 Feminist approaches* on page 3 and we focus on liberal feminist theory and the role that gender and social norms play in explaining potential differences in business performance.

4) On page 3 after the explanation of "MSME in emerging markets" in general it is necessary to make a special sub-heading for the context of research in order from Latin America to Ecuador. From here obtained a more structured explanation.

We agree with the reviewer so we have done as suggested. The new structure now looks like this:

2.1 Feminist approaches
2.2 MSMEs in Latin America
2.3 Ecuadorian context
2.4 Gender, MSME ownership and performance

5) In table 1 there needs to be an additional column that explicitly indicates which country the previous research was carried out in order to really ensure the support of previous research in developing countries (emerging market).

Thanks for this comment. We did as requested and we added an additional column in table 1 with the country of previous research. All countries belong either to Latin America or an emerging country or region.

6) On page 5 lines 25-26 for the sentence "...2007-2016 sampling window" it is necessary to add an explanation of just using this time range because when compared to the current time (the year 2021) it is too long. There needs to be a strong justification that in that time span there is a research gap in terms of the 2007-2016 research time, which is important to study.

Thanks for this comment. We decided to use the period between 2007-2016 because this period was a period of important structural changes in the Ecuadorian economy and in particular in firm formalization. More specific, in 2017 was an electionary process that ends in a new government with different ideas to the last ten years. As suggested we added a strong justification on endnote #2 on page 7. Now it reads like this:

2. *The period between 2007 and 2016 was a period of important structural changes in the Ecuadorian economy, particular regarding firm formalization. Only one political party, with the same president, ruled during this time. In 2017, however, a new government was voted in with different ideas to those of the last 10 years.*

7) On page 5 line 56 for the sentence "...All data were analyzed using STATA" --> It is necessary to add reasons why using this software related to research problems, research questions, and research goals/purposes.

Thanks for your comment. There is nothing particularly important about our choice of software since we are using very conventional statistical techniques. Indeed, these results could be obtained using R, SPSS or any other statistical package. We merely indicated that we used Stata for the sake of full disclosure and replicability. Reviewers ask for this sometimes, so we generally include it.

8) On page 6 lines 51-52 for the sentence "The growth shown in Insert table III reflects that micro-companies grew and converted into small companies" --> it's still not clear why this can be interpreted that micro turns into small...is there any previous research that supports this statement?

We agree with this observation, this interpretation was not correct. We have deleted all this part and added *figure 1* which shows *Female, male, and company ownership share by firm size.*

9) On page 7 line 7/8 for the sentence "...were qualitatively similar" --> processing quantitative data analysis, why is there the word qualitative here?

Thanks for your comment. By *qualitatively*, we only meant that while the estimates were not identical, their interpretations and the conclusions drawn from them remained the same. However, this line no longer appears in our paper since we have completely improved our methodology and results.

10) On page 7 lines 46-47 for the phrase "High-tech industries such as information and communications are not a priority for Ecuadorian MSMEs." --> is there any literature support for this statement?

Thanks for this observation. Due to the comments of the other three reviewers, we deleted the industry section because it was too much information for only one paper, and we focus on the relationship between female ownership and Ecuadorian MSMEs' financial, economic and social outcomes.

11) On page 11 line 11/12 for the phrase "private sector enterprises" --> does this include MSME? because private enterprise has a broad definition.

Thanks for this observation. Now we rewrite the sentence as: "*This paper tracks the progress of private sector of micro enterprises, small and medium firms during 2007–2016…*"

12) On page 11 line 30 to page 12 line 60 --> what is the connection between this explanation and the research problem, research questions, and research goal/purpose?

Thanks for this observation. We deleted this part and connect the research problem, research questions and research goal/purpose with the discussion. We added three more paragraphs at the beginning of the *discussion section* (page 11-12) instead of the paragraphs mentioned by the reviewer.

13) Your manuscript does not explicitly state the implications of the research results using the word implication.

Following your suggestions, we added the implications for academics and government leaders. You can read them in the sixth section: Conclusions, limitations, and future research, in the second paragraph. Now, it looks like this:

> *The implications for academics include empirical evidence that integrates financial, economic and social dimensions of business performance to assess women's success. Moreover, we analyze the impact of female ownership on these three performance dimensions. We need a more holistic view when measuring companies success and not just measuring by financial performance.*
>
> *The findings from this study reveal that more development policies in Ecuador are needed to address women's participation in the business arena. The implications for government leaders include, first, building an institutional framework that conciliates family and work to improve female participation. Women will not sacrifice the attention they give to their homes and families for the sake of growing their business (Adom et al., 2017). Second, access to adequate financing is vital. According to CIEC (2018), 57% of people without a bank account in Ecuador are women. Third, companies must offer equal working conditions for men and women. Up to now, Ecuadorian women have earned less, while working more, than their male peers (El Comercio, 2018). Fourth, public and private entities, such as schools and universities, need to empower women and educate Ecuadorians in general through affirmative action, gender mainstreaming, and other social initiatives to remove cultural paradigms that restrict opportunities for women.*

Additional Questions:

1. ***Originality: Does the paper contain new and significant information adequate to justify publication?: Yes, I have checked this manuscript using i-Thenticate and the result shows the similarity percentage rate is 8%. In addition, this study shows an overview of the characteristics of MSMEs in Ecuador as part of the emerging economy associated with gender.***

Thank you for your detailed review and checking.

2. Relationship to Literature: Does the paper demonstrate an adequate understanding of the relevant literature in the field and cite an appropriate range of literature sources? Is any significant work ignored?: Yes, this manuscript uses relevant, fairly recent literature sources and comes from reputable journal articles. Yes, the theoretical background section does not explicitly state what theory underlies the phenomenon that underlies this research and or underlies the research goal/purpose.

Thank you for this suggestion. As recommended, we have improved the theoretical background and we added a section called *2.1 Feminist approaches* on page 3 and we focus on liberal feminist theory and the role that gender and social norms play in explaining potential differences in business performance.

3. Methodology: Is the paper's argument built on an appropriate base of theory, concepts, or other ideas? Has the research or equivalent intellectual work on which the paper is based been well designed? Are the methods employed appropriate?: No, the theoretical background section does not explicitly state what theory underlies the phenomena that underlie this research and or underlies the research goal/purpose.

No, this paper does not explain the suitability of the use of processing tools and data analysis with the type of research and research problems, research questions and research goals/purposes.

Thanks for this suggestion. We have completely changed our methodological approach with this revision. In the initial submission, we were primarily reporting descriptive statistics, with the significance of differences indicated wherever relevant. We recognize that this approach is not preferred by the journal. We have thus completely redone our methodology using very conventional approaches to modeling the impact of covariates and factors on the characteristics and performance of Ecuadorian MSMEs. As we now explain the in the new methodology section, we use standard panel data regression techniques except in the case of our survival models, which use the ubiquitous Cox regression model. The panel regressions are fixed effects, as is typically the case for large N (firms) small t (repeated observations) data. Besides, a Hausmann test indicated strongly that a random effects model would not be appropriate given the correlation of the error terms with covariates. This is of course very common in the case in repeated observations. For most of our dependent variables, a simple linear model is used, but in the case of count data (number of employees) we use the non-negative binomial model to account for our 0-constrained, count-distributed, dependent variable. Cox regression is a relatively straightforward method for analyzing time-to-event data, where the underlying baseline hazard function is unknown. Being semi-parametric, the efficiency of Cox regression is not optimal, but our sample size is certainly large enough to overcome any efficiency loss. All our methodological choices are supported by the literature which we now cite.

4. Results: Are results presented clearly and analyzed appropriately? Do the conclusions adequately tie together the other elements of the paper?: No, on page 11 line 30 to page 12 line 60--> what does this explanation have to do with the research problem, research question, and research goal/purpose?. Yes, the conclusions adequately tie together the other elements of the paper.

Thank you for your comment. This statement has been addressed before on point 12.

5. Implications for research, practice and/or society: Does the paper identify clearly any implications for research, practice and/or society? Does the paper bridge the gap between theory and practice? How can the research be used in practice (economic and commercial impact), in teaching, to influence public policy, in research (contributing to the body of knowledge)? What is the impact upon society (influencing public attitudes, affecting quality of life)? Are these implications consistent with the findings and conclusions of the paper?: No, I did not find the word implication in the manuscript. No, this manuscript does not state the theory underlying the research. Nothing (the research be used in practice (economic and commercial impact), in teaching, to influence public policy, in research (contributing to the body of knowledge). None (the impact upon society (influencing public attitudes, affecting quality of life).

Thank you for this suggestion. As recommended, we have already addressed this part on point 13.

The authors would like to thank again reviewer#2 for his/her helpful and constructive comments that certainly contributed improving the final version of the paper. If more work is needed, please do not hesitate to tell us.

REVIEWER N°3:

The manuscript has novelty and offers interesting findings concerning the role of gender on business performance, productivity and survival in a developing country.

Thank you very much for your constructive comments and suggestions to improve the quality of our paper. Following the suggestions, we included important modifications in the manuscript. Below, we will give a point-to-point replay to the comments. We hope we have been able to address your points correctly.

The methodology section is too short.

We agree with reviewer so we have re-elaborated this section as suggested. From page 7 to 10 the new structure of the methodology section looks like this:

3.1 Data and sample
3.2 Measurement
3.3 Panel regression estimations
3.4 Time to event (exit hazard) analysis

What is SCVS?

In the second paragraph of the "Introduction" is the *Superintendencia de Compañías, Valores y Seguros* acronym and the footnote (2) which mentions what is that institution. It reads like this: "*Superintendencia de Compañías, Valores y Seguros (SCVS) is a public institution whose role is to oversee the daily operation of formal companies in Ecuador; it can also propose reforms to laws in order to improve the business environment*".

Please explain more deeply the survey where you are getting your data from. Not just mention it.

As suggested, we added this explanation in the "Research Method" section:

"This database is a panel data that contains financial and accounting information obtained through the financial statements that companies report to the SCVS on an annual basis. These administrative data are also reported to the Internal Rents Services (SRI), which is the tax authority of Ecuador, so there is a data validation between both institutions to avoid information disparities".

Please elaborate on the statistical methods and the variables you are working with.

The procedures and variables you are using are not clear from your methodology section.

We have completely changed our methodological approach with this revision. In the initial submission, we were primarily reporting descriptive statistics, with the significance of differences indicated wherever relevant. We recognize that this approach is not preferred by

the journal. We have thus completely redone our methodology using very conventional approaches to modeling the impact of covariates and factors on the characteristics and performance of Ecuadorian MSMEs. As we now explain the in the new methodology section, we use standard panel data regression techniques except in the case of our survival models, which use the ubiquitous Cox regression model. The panel regressions are fixed effects, as is typically the case for large N (firms) small t (repeated observations) data. Besides, a Hausmann test indicated strongly that a random effects model would not be appropriate given the correlation of the error terms with covariates which are extremely common in the case in repeated observations. For most of our dependent variables, a simple linear model is used, but in the case of count data (number of employees) we use the non-negative binomial model to account for our 0-constrained, count-distributed, dependent variable. Cox regression is a relatively straightforward method of analyzing time-to-event data, where the underlying baseline hazard function is unknown. Being semi-parametric, the efficiency of Cox regression is not optimal, but our sample size is certainly large enough to overcome any efficiency loss. All our methodological choices are supported by the literature which we now cite.

More organization is required to present the results.

Consequential to the alteration of our methodology, our new results section (page 10-12) completely replaces the older, with very conventional tables of results, in the format that appears to be preferred by the journal.

While the author claim that this is a descriptive analyzes, it would be important to put some context and try to explain the main findings concerning gender differences (e.g., why businesses owned by women pay more to their employees)

Thanks the reviewer for this remark. Following your recommendation, we added two new sections called "*2.1 Feminist approaches"* and *"2.4 Gender, MSME ownership and performance"* on page 3 and 5 respectively that are related to the main findings concerning gender differences. Moreover, in the "discussion section" we explain the main findings concerning gender differences. For example (pg. 12): "*Fourth, concerning social outcomes (H2), Maksimov et al. (2017) pointed out that female-owned companies pay higher wages to their employees than male-owned companies because they need to secure a reliable workforce through higher wages in order to safeguard continuous efficiency gains. A similar trend is found in Ecuador; female-owned companies of all sizes tend to provide higher wages per employee."*

The "Research findings" section intends to discuss the main findings, nevertheless it should be noted that:

-The context and history of Ecuador's business climate should be done somewhere else in the text.

As suggested, we have added a new section called *2.2 Ecuadorian context* on page 4.

-In August 2008, the Organic Law of the National System of Public Procurement was created" Please note that such a system has been widely criticized, with some even arguing that it facilitates corruption.

Thank you for this comment. Due to the comments of the other three reviewers, we deleted this part because it was too much information for only one paper, and we focus on the relationship between female ownership and Ecuadorian MSMEs' financial, economic and social outcomes.

-Page 11, line 60. "China's increased cooperation". You mean cooperation or indebtment at high interest rates".

Thank you again for this comment. Well, since that is not the objective of the paper, we have not analyzed deeply Ecuadorian relationship with China and due to the comments of the other three reviewers, we deleted this part because it was too much information for only one paper, and we focus on the relationship between female ownership and Ecuadorian MSMEs' financial, economic and social outcomes.

-Page 12, lines 4-9. Do your data support this claim? Anyhow, it is, to some extent, contradictory that in this part you argue that new businesses have been created and those already existing have grown, whereas earlier in the text you mention that the fall of oil prices and the economic measures taken by the government (let's be clear more taxes) had negative effects on businesses.

We agree with the reviewer. Probably, it was a writing error. Anyways, due to the new structure of the paper we deleted this part.

-Page 1, lines10-17. You pay too much attention to business environment in Ecuador, while neglecting the research problem you are dealing with.

Thank you for this comment. We moved this part to the theoretical background and add a *"2.3 Ecuadorian context section"*. Now, we focus our introduction in the research problem and gap.

-Page 2, lines 55-56. Are you really doing that in this paper? You even argue in the conclusions that this is a descriptive but not an explanatory study.

We agree with the reviewer, we changed from *"...we assess the effectiveness of government policies aimed at strengthening Ecuadorian MSMEs"* to *"... we mention the government policies that may have strengthening Ecuadorian MSMEs"*.

There are several mistakes in the use of citations, principally in the Introduction.

As suggested, we hired a professional to help us with citations and proofreading.

Please improve the manuscript organization and the use of headings. As it is now, it is not possible to distinguish which part belongs to what part.

Thank you for this comment. The headings now look like this:

1. **Introduction**
2. **Theoretical background**
   - *2.1 Feminist approaches*
   - *2.2 MSMEs in Latin America*
   - *2.3 Ecuadorian context*
   - *2.4 Gender, MSME ownership and performance*
3. **Methodology**
   - *3.1 Data and sample*
   - *3.2* Measurement
   - *3.3 Panel regression estimations*
   - *3.4 Time to event (exit hazard) analysis*
4. **Results**
   - *4.1 Female ownership share and MSMEs' performance*
5. **Discussion**
6. **Conclusions, limitations, and future research**

The manuscript would greatly benefit from language proofreading.

Thanks the reviewer for this remark. As suggested, we hired a professional to help us with this (attached certification).

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CERTIFICATE OF EDITING

29 October 2021

To whom it may concern: this letter confirms that the author below completed a service request with one of the Peerwith experts for English-language editing.

Author:

for the manuscript
"Gender characteristics of micro, small, and medium-sized enterprises in an emerging country: is this a man's world?"

Editor / Peerwith expert:
Jim Bowden, http://peerwith.expert/jimbowden

Peerwith is an online marketplace for author services, matching academics seeking support for their work with experts who can help with language, visuals, consulting, or anything else that scientists need.

Additional Questions:

2. Relationship to Literature: Does the paper demonstrate an adequate understanding of the relevant literature in the field and cite an appropriate range of literature sources? Is any significant work ignored?: The manuscript includes solid and contemporary literature. Nevertheless, there are several mistakes in the citation of sources.

We agree with the reviewer. As mentioned before, we have addressed this problem by hiring a language expert.

"Worldwide, Ecuador is one of the countries with the most MSMEs entrepreneuria". This citation is supporting a strong statement, nevertheless, the link of the citation supporting it is unavailable.

Thanks for this observation. Now we update the link of this statement: https://www.gemconsortium.org/file/open?fileId=50078

Page 6, lines 44-45. Any formal literature supporting such claim?

We agree with this observation, and this interpretation was not correct. Due to the comments of the other three reviewers, we deleted this part because it was too much information for only one paper, and we focus on the relationship between female ownership and Ecuadorian MSMEs' financial, economic and social outcomes.

The authors would like to thank again reviewer#3 for his/her helpful and constructive comments that certainly contributed improving the final version of the paper. If more work is needed, please do not hesitate to tell us.

REVIEWER N°4:

Thank you very much for your constructive comments and suggestions to improve the quality of our paper. Following the suggestions, we included important modifications in the manuscript. Below, we will give a point-to-point replay to the comments. We hope we have been able to address your points correctly.

Abstract

- ***In the last sentence of "Originality/value" section it seems like the last part of this sentence is missing.***

Thanks for this suggestion. We have changed the sentence to: *"Our findings suggest ways to improve and support both the creation of more women-owned MSMEs in emerging countries, such as Ecuador, and the survival of existing male- and female-owned MSMEs".*

Introduction

- ***You should correct the way in citing paper at the beginning of line 10 page 2. Also, there is a year missing in the reference on line 14 and line 43 on page 2.***

  Thanks the reviewer for this remark. As suggested, we hired a professional to help us with all citations and proofreading of the document (attached certification).

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CERTIFICATE OF EDITING

29 October 2021

To whom it may concern: this letter confirms that the author below completed a service request with one of the Peerwith experts for English-language editing.

Author:

for the manuscript
"Gender characteristics of micro, small, and medium-sized enterprises in an emerging country: is this a man's world?"

Editor / Peerwith expert:
Jim Bowden, http://peerwith.expert/jimbowden

Peerwith is an online marketplace for author services, matching academics seeking support for their work with experts who can help with language, visuals, consulting, or anything else that scientists need.

- ***I would also recommend is writing a separate paragraph (just before the last paragraph) where authors list their contributions to the existing body of knowledge. Although authors have already described this in the "Originality/value" in Abstract and in the opening paragraph of the Conclusion section, I would like to see this written explicitly in Introduction section as well (authors can simply move mentioned paragraph from Conclusion section to Introduction section).***

Thanks the reviewer for this remark. As suggested, we added, just before the last paragraph of the introduction, a paragraph that says like this:

"Among the main contributions to the existing body of knowledge, this study provides important evidence of the characteristics and performance of Ecuadorian formal MSMEs during 2007–2016. To our knowledge, no similar research addresses the near-population panel of a developing country, such as Ecuador, over a 10-year period. In this sense, this paper reveals the challenges, trends, and growth patterns of not only MSMEs in Ecuador but also female-owned and male-owned companies, specifically, in that country."

- ***In the first sentence of the last paragraph of this chapter, authors say "Based on these analyses, we assess the effectiveness of government policies aimed at strengthening Ecuadorian MSMEs.". This is however, misleading – based on this sentence a reader would expect a policy evaluation paper of some specific policies targeted at MSMEs in Ecuador. Since this is not the case, this sentence should be removed.***

We agree with the reviewer, due to the suggestion of another reviewer as well, we have changed that sentence to *"... we mention the government policies that may have strengthening Ecuadorian MSMEs"*. On page 13-14, we are mentioning these policies in the implications for government leaders.

Theoretical background

MSMEs in emerging markets

- ***Since this sub-chapter mostly deals with MSMEs in Latin America in Ecuador, I would suggest renaming the title of this sub-chapter accordingly.***

We agree with the reviewer. Now the title reads like this: "MSMEs in Latin America"

- ***I find the first sentence of the last paragraph of this sub-chapter "In Ecuador, the higher percentage of smaller firms could increase disparities in total-factor productivity (TFP)." somewhat confusing. First, is this a citation or your own thoughts (backed-up by some data)? Second, shouldn't it be the other way around? In the very next sentence you mention that larger firms have twice the productivity of MSMEs – then the conclusion would be that this disparity would decrease if there are more MSMEs, which is in opposition with the highlighted sentence above?***

Thanks for this comment. We understand the confusion. In Ecuador, MSMEs are less productive than larger firms. That is why, if there are more MSMEs then the TFP would decrease. We explain better in the manuscript and we have added a new citation. The text now looks like this:

"In Ecuador, the higher percentage of smaller firms could increase disparities in total-factor productivity (TFP) because they are less productive than larger firms (Ruiz-Arranz and Deza, 2018). Camino-Mogro, Armijos-Bravo, and Cornejo-Marcos (2018) found evidence of a positive correlation between Ecuadorian firm productivity and firm size, with larger firms having twice the productivity of MSMEs in the manufacturing sector."

Ruiz-Arranz, M. and Deza, M. C. (2018), *Creciendo con productividad: Una agenda para la Región Andina,* Inter-American Development Bank, Washington D. C.

Gender of MSME ownership in emerging markets

- ***I quite like this sub-chapter and wouldn't change anything.***

Thank you very much for your comment.

Research method

- ***I would suggest deleting the sentence "The data collected is essential for, amongst other things, assessing business taxes.", as if contributes nothing to the rest of the paper.*** Thank you very much. We have done as suggested.
- ***I would also delete the sentence "However, the number of firms is different for each year (due to entries and exits).", as this is somewhat obvious without any explicit statement.*** Thank you very much. We have done as suggested.
- ***I would also like to see more information on how authors ended up with their final sample i.e., which data cleaning procedures they employed. In line 23 page 5 they reference the subsample of firms, which I guess, is a part of larger sample? Were there any data cleaning criteria? Is this subsample representative of total sample (population)?***

Thanks the reviewer for these comments. We believe that this and similar comments are an unfortunate byproduct of our not explaining the information source thoroughly. *Superintendencia de Compañías, Valores* y Seguros (Supercias or SCVS) is a lot like the SEC in the US, except that by law all firms, public and private (no matter their size), must report their financial statements and ownership information annually. In fact, there are diminishingly few firms that would be considered public in the sense that American corporations are public. Hence, our sample is as close to a population of Ecuadorian MSMEs as possible. We have given specific information on the total number of firm-year observations, and firms, in our "Methodology section", and furthermore disclose these same numbers for each of the models we run. The sample used in our hypothesis testing is at least 82% of the full sample, and up to 92% in some of our models. We do not feel that this should be a very serious concern, given that similar studies usually encounter at least this degree of missing data. On the other hand, the only way a firm would have been missed by our data collection is if the firm did not report their financial and ownership information to the Superintendencia de Compañías, Valores y Seguros, as required by law,

or an error in central data repository. We cannot estimate the probability that any data were missed for these latter two reasons. Missing data is unlikely, unless again a firm does not report what it is required to. Please note that industry variables included as controls in our models are computed directly from the firm data, aggregated by industry, using conventional means as outlined in the Methodology section, with supporting citations to the literature. So we are not merging with any data outside that provided by the SCVS.

- ***Is data on firm ownership part of the same dataset as firm financials and other firm characteristics? How were you able to differentiate domestic and foreign ownership – did you have the info on the owner's citizenship, or somehow else?***

All data were obtained from the *Superintendencia de Compañías, Valores y Seguros* (SCVS). Financial data were obtained from the audited financial statements of all firms. Ownership data was obtained from a separate database, linked by company number. This database contained information on the ownership shares of each owner, of each company. It also indicated whether or not the owner was a 'local', that is citizen or permanent resident, and the country of citizenship/residency. This is how we computed the share of local and foreign ownership. Gender was hand coded by several research assistants. Spanish-origin names, comprising the vast majority of the sample, were coded by natives of Ecuador. We checked for agreement amongst those coders with a sample of approximately 1,000 entries, and found the results to be identical. This is not surprising as there are clear markers for the gender of a Spanish name. Native speakers of Chinese and Arabic names codes the much smaller sample of those names. In all cases, there were a small number of names for which the gender could not be obtained through conventional means. Chinese names were especially difficult in this regard, though they comprise only a very small portion of the sample. In all cases where gender could not be determined, we simply coded the ownership as 'other' for the gender. This information is clearly indicated in the graphs depicted in Figure 1.

- ***Authors define a firm to be women-owned if 80% of equity ownership is by women. I find this number to be very arbitrary. Although authors mention they ran robustness check with 70% and 60% as cutoffs, that still doesn't solve this problem. Why also not checking for 50% or 51%? Authors need to back up their initial cutoff with either theory or previous studies or (international) legal definition of women-ownership. Intuitively, why not start with 51% as initial cutoff and then run robustness check with higher values of this cutoff?***

We have taken a different approach with this paper. While it was convenient to reduce our ownership data to a binary variable for the sake of comparing male to female ownership, it also reduces the dataset substantially and is unnecessary with our new methodological approach. We are now measure female ownership only by using a continuous variable.

Hence, all arbitrariness with regard to ownership has now been eliminated.

Analytical results

- ***Nothing to comment here.***

Firm characteristics

As it now stands, this is separate chapter. However, based on what was written in previous chapter "Analytical results", this should be a sub-chapter of the "Analytical results" chapter. The same is with "Labor overview" and "Financial overview".

Thank you for your comments. As suggested by you and the other three reviewers, the headings now look like this:

1. Introduction
2. Theoretical background
2.1. Feminist approaches
2.2. MSMEs in Latin America
2.3. Ecuadorian context
2.4. Gender, MSME ownership and performance
3. Methodology
3.1. Data and sample
3.2. Measurement
3.3. Panel regression estimations
3.4.Time to event (exit hazard) analysis
4. Results
4.1. Female ownership share and MSMEs' performance
5. Discussion
6. Conclusions, limitations, and future research

- ***Paragraph that starts on line 35 page 6 has nothing to do with firm size, and should be moved elsewhere.*** Thanks for your comment, as suggested we deleted this part.
- ***Regarding the sub-sub-chapter on survival, there are several issues:***
  - ***-Here, authors are not actually talking about firm survival per se, but rather of firm entry and firm exit. Thus, the title of this sub-sub-chapter should be changed accordingly.***

    Thank you for this comment. We changed the subtitle to *"Time to event (exit hazard) analysis"*
  - ***-The sentence "The growth shown in Insert table III reflects that micro companies grew and converted into small companies." is basically not true. How can we from this table disentangle firms that have grown from e.g., micro to small firms, from firms that have started-off as small firms? This sentence needs to be removed of changed accordingly.***

We agree with this observation, this interpretation was not correct. We have deleted all this part and added figure 1 which shows Female, male, and company ownership share by firm size.

-In Figure 1 and Figure 2 a scale should be added to y-axis.

Thank you very much. We have done as suggested.

-Also, in a Note 1 below Figure 1 authors state that "New entrants are calculated by constitution date, not whether they are reporting. Note that many firms do not have constitution dates, so these numbers may underestimate the number of new entrants.". However, in line 18 page 7 they state "This procedure was repeated using new-firm entrance as the dependent variable, where entrant = 1 for the first observation of a firm, if its constitution fell within the 2007-2016 study period.". So, in a regression they are defining entry and first year an observation is made for any firms, while in Figure 1 they are using constitution date. Why not be consistent with this calculation and simply use first year of observation as entry year in both cases?

Since we are now using a Cox regression model to calculate survival, our reference for survival time is the constitution date, which is available for 81% of the firms in our total sample. Missing data may be a limitation, but not more so than for similar studies, we believe.

-What are independent variables in panel regression models? Have you tried running random effects model to include ownership effects?

Yes, we ran both random and fixed effects, and found with a Hausman test that the random effects model did not produce unbiased estimates of the coefficients. Hence, we report robust (i.e. fixed-effect) coefficients in our manuscript. This method is very similar to that used in similar research and is typically the method of choice when dealing with large N (# firms), small t (repeated observations) panels. While this method is less efficient than a random-effect model, the coefficients are robust, and the reduced efficiency is not generally a concern when the sample size is sufficiently large, as it is here.

-Regarding the sub-sub-chapter on industries, it is very unclear when you use terms like "industry of investment" or "… prefer to invest". Judging by the context, it seems like you mean "industry of investment"="industry where firm start their business" and "… prefer to invest"="prefer to open their business", but this needs to be rephrased. Thank you very much for your suggestion. Due to the comments of the other three reviewers, we deleted this part because it was too much information for only one paper, and we focus on the relationship between female ownership and Ecuadorian MSMEs' financial, economic and social outcomes.

- Also regarding industries, I am missing a discussion on some other factors that are also contributing to the trend that women are opening their businesses in more low-technological sectors. For example, see the recent work of Srhoj et al. (https://rdcu.be/cq2uE) for this discussion.

Thank you very much for your suggestion. As explained above, we focus on the relationship between female ownership and Ecuadorian MSMEs' financial, economic and social outcomes and deleted the industry section.

Labour overview

- ***In the opening paragraph authors mention the earthquake that hit Ecuador in 2016. However, this has surely had huge effects on domestic economy and should be much more emphasized, as it had surely affected results in 2016. I would even go as far as suggesting to completely remove this year from analysis, or at least to run a robustness check without this year to see if results change. Nevertheless, it should be again mentioned in limitation of the research.***

You raise an interesting issue here, and so we ran the results again without 2016 data. While the coefficients change slightly, they do not change in a way that is consistent with there being a 'bad year' for firm performance. Moreover, the significance levels do not change in any way that would alter our interpretations. Though firms may be unequally impacted by the earthquake which primarily impacted the coastal regions of Manabi, killed 700 people, and destroyed mostly ocean-front residential properties, we do not think there is a reason to suspect that firms of different size and ownership-characteristics would be impacted differently. Perhaps survival of some firms would decline substantially, but this would not have been reported until 2017, outside the window of observation. Specifically, if a firm has survived to 2016, we treat it as right-censored. Overall, we cannot speculate whether the non-significant differences in our coefficient estimates are due to unusual circumstances in the year 2016, or due to the change in sample size, especially the reduction of one full year of data, bringing our number of annual observations from 10 to 9. Since our number of years is already not very large for a fixed effect regression, we prefer to keep the 10 observations and report the results according to those. We would be quite happy to provide the results of the reduced sample, if desired.

- ***Figure 3 is completely missing from the manuscript (at least from the proofs I obtained for review)?***

Thank you very much. We had double-check that all our figures and tables are properly cited.

Labour productivity

- ***This should be a sub-sub-chapter to a "Labour overview" sub-chapter, same as "Employment".***

Thank you very much for your suggestion. Due also to recommendations of the other three reviewers, in order to avoid sub-sub and sub chapters, we focus on the relationship between female ownership and Ecuadorian MSMEs' financial, economic and social outcomes. The labor productivity is now inside the economic outcomes and employment inside social outcomes.

- ***Information about what "N" represents should be moved to a Note below Table VI.***

Thank you for this suggestion. All tables are footnoted with "*N***= number of firm-year observations", where relevant.**

- ***It would be also helpful to see the results of the linear regression model in a table.***

Consequential to completely revising our methodology, our results section now contains tables with all relevant regression information.

Financial overview

- ***Authors have not provided information whether the monetary values have been deflated and what is the reference year in this case?***

Thank you for mentioning this. In our newly revised results, financial data are deflated based on CPI, with base year of 2010. We added this statement in the methodology section.

Financial ratio

- ***This should be a sub-sub-chapter to a "Financial overview" sub-chapter, same as "Growth and profits".***

Thank you very much, as recommended; now "financial ratios" and "growth and profits" are included inside the financial outcomes of the firms.

Research findings

- ***Authors claim that "This paper tracks the progress of private sector enterprises during 2007– 2016, focusing on antecedents to survival, sales, employment growth, and financial performance for both female- and male-owned companies."; however, as they point out correctly in limitations section, their analysis is exploratory one and any relationship should not be considered causal. Hence, this word "antecedents" is inappropriate to use in this context.***

Thanks for this observation. We kept the antecedent part (in the abstract of the

paper). However, due also to comments from other three reviewers, we decided to improve our methodology and assess the impact of female ownership on Ecuadorian MSMEs' financial, economic and social outcomes.

- ***Authors also claim that "Despite various incentives for the growth of Ecuadorian MSMEs, their survival is still dependent on random external factors rather than planned internal (country) factors.", however, they have not actually shown this dependence on any random external factors. Hence, additional evidence needs to be presented for this claim, or it should be down-toned only to a level of speculation.***

We agree with the reviewer, and we deleted this statement to avoid misinterpretations.

The authors would like to thank again reviewer#4 for his/her helpful and constructive comments that certainly contributed improving the final version of the paper. If more work is needed, please do not hesitate to tell us.