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Contesting the underperformance thesis of women entrepreneurs: firm-level evidence from South Africa

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Biographical Statements

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Abstract

This paper provides one of the first known evaluations of whether enterprises in which women are owners underperform male-owned enterprises in the developing world. Until now, the widespread assumption, mostly from developed world studies, has been that enterprises in which women are owners underperform male-owned enterprises. To evaluate this in developing countries where there is a dearth of studies, cross-sectional data is reported from a 2007 World Bank Enterprise Survey (WBES) of 937 South African enterprises. The finding is that enterprises that are women-owned or jointly owned by men and women perform better than those owned solely by men, after controlling for other determinants of firm performance as well as potential sample selection bias. The outcome is a call to transcend the underperformance thesis regarding women entrepreneurs and for greater resources to be devoted to the promotion of women's entrepreneurship and women's involvement in firm ownership.

Keywords: entrepreneurship; enterprise development; gender; firm performance; development economics; South Africa.

1. Introduction

Do the gender characteristics of firm owners have an influence on the success of enterprises? If so, do enterprises that are women-owned or jointly owned by men and women perform better than those owned solely by men? This issue is important to answer. Until now, a widespread assumption in development circles has been that women-owned enterprises are more likely to be poorer performing, not least because they are more likely to be necessity-driven enterprises which women establish as a last resort due to their exclusion from jobs in the formal labour

market. Indeed, this view has been supported in various studies. As Klapper and Parker (2011) conclude in their review of the literature, the majority of studies assert that women-owned firms underperform male-owned firms, even when controlling for other determinants of performance, such as firm age and sector. However, in a developed world context, recent studies in the US and Australia have found that this is not necessarily the case (Robb and Watson, 2012; Zolin et al., 2013), albeit by examining alternative measures of performance such as closure rates and returns on assets. Stimulated by such developed world findings, the intention in this paper is to evaluate in the context of the developing world the persistent and dominant view that women-owned enterprises are more likely to be poorer performing. If underperformance is a myth, then the implication is that it is inappropriate that women-owned enterprises receive less support and investment.

To commence, therefore, section two will review the existing literature that variously views female ownership as having either negative or positive impacts on firm performance. To evaluate the resultant propositions regarding the relationship between firm performance and female ownership, the third section introduces the data, namely the World Bank Enterprise Survey (WBES) on 937 enterprises in South Africa and the Heckman two-step modelling framework adopted for our study so as to control for the potential sample selection bias in order to obtain reliable estimates of the relationship between the involvement of women in enterprise ownership and firm performance. In the fourth section, we present the results, which reveal that women's involvement in firm ownership results in significantly higher firm performance in terms of both annual sales and productivity growth rates. The fifth section then discusses the theoretical and policy implications. This will show the need for a re-theorization of women's involvement in enterprise ownership by displaying the positive correlation between their involvement and firm performance in the South African context. The resultant outcome will be a call for a shift towards a more positive approach towards women's entrepreneurship based on the recognition that women's involvement in firm ownership has a positive impact on firm performance.

2. Gender and firm performance: competing perspectives

Despite growing interest by the policy community, the role played by women in economic development in general, and firm growth and performance in particular, remains underdeveloped as a subject. Indeed, it is only in the past few decades that greater understanding has begun to emerge of the motivations, constraints and issues which confront women entrepreneurs (Terjesen and Amorós, 2014; Williams, 2009; Williams and Gurtoo, 2011a,b; Williams and Martinez, 2014; Williams and Yousef, 2013; Williams et al., 2012, 2016a), as well as the impacts of women's involvement in firm ownership on firm performance (De Vita et al., 2014; Minnitia and Naude, 2010). Until now, two competing theories have been proposed regarding the impacts of female ownership on firm performance, namely a dominant view that female ownership is deleterious to firm performance and an alternative view that it has positive impacts. Here, each is reviewed in turn.

Female ownership harms firm performance perspective

A commonly held view is that female-owned businesses display lower level of firm performance than male-owned firms (Amine and Straub, 2009; Chaganti and Parasuraman, 1996; Justo and

DeTienne, 2008; Liedholm, 2002; Nichter and Goldmark, 2009). This under-performance of female-owned businesses is explained firstly, in terms of discrimination against them by financial lending institutions (for a review of this literature, see Riding and Swift, 1990) with Muravyev et al. (2009) and Aterido et al. (2013) emphasizing that female-owned firms are less likely to secure a bank loan than male-owned firms, and secondly, by other systemic factors such as poorer education and the limited time available to women compared with men due to their responsibility for the domestic realm (Aldrich, 1989; Brush et al., 2006; McCormick, 2001). Indeed, this is reinforced by the finding that women-owned businesses are smaller, less likely to grow, less profitable and begin with less capital investment than those owned by men (McCormick, 2001; Stevenson and St-Onge, 2005). The assumption, therefore, is that if these biases against women could be overcome, then women-owned enterprises would display either the same level of performance as men or even better.

Other studies moreover, examine gender differences in aversion to risk (Collorette and Aubry, 1990; Downing and Daniels, 1992; Jianakoplos and Bernasek, 1998). One argument in relation to the gender composition of boards is that the existence of women chairpersons and/or a greater share of women on the board of directors may directly influence the financial performance of firms through firms' risk attitudes. Empirical evidence on this consistently reports a negative association between female board membership and firm performance measured as variability in firm outcome variables such as investment, sales, profits and return on equity (Minguez-Vera and Martin, 2011; Parrotta and Smith, 2013).

Indeed, examining the evidence for this negative association between women's involvement in firm ownership and firm performance, a recent study in Turkey reveals a robust negative association between female ownership and firm performance as captured by annual sales growth rates and annual employment growth rates (Williams and Kedir, 2017). Reporting data from Argentina and Peru, albeit only on unregistered firms, Amin (2011) similarly provides support for the female-owned firm under-performance hypothesis. As Klapper and Parker (2011) argue, however, the majority of studies confirming the female-underperformance thesis either use standard measures of firms performance such as sales and employment growth rates, rather than for example returns on assets, and/or do not include all of the necessary control variables to ensure the robustness of the findings. To evaluate this underperformance thesis of women entrepreneurs, therefore, the following hypothesis can be evaluated:

Female ownership harms firm performance hypothesis (H1): Enterprises with female involvement in the ownership witness lower levels of firm performance than those in which there is no involvement of women in the ownership of the enterprise, after controlling for other key determinants of firm performance and the endogeneity of firm registration status.

Female ownership enhances firm performance perspective

In contrast to the negative view of women's involvement in enterprise ownership on firm performance, there is emerging evidence, albeit largely from developed economies such as the USA and Australia, that women's involvement does not harm performance in terms of either closure rates or returns on assets (Robb and Watson, 2012; Conroy and Weiler, 2016). It might be the case, nevertheless, that such a depiction of the impacts of women's involvement in ownership on firm performance is context-specific. That is to say, in countries where there is less

discrimination against women by financial institutions, not least due to anti-discrimination legislation, and there is no evidence of any variations between men and women in their access to bank financing (Eriksson et al., 2009; van Hulten, 2012; Watson et al., 2009), and where women are better educated and the gender division of domestic labour is less stark, one might indeed witness a lesser likelihood that women's involvement in ownership will have deleterious impacts on firm performance (Pablo-Martí et al., 2014). Nelson (2012), moreover, reviewing previous studies of the gendering of risk aversion, reveals mixed results and how there exist exaggerated beliefs about the greater risk aversion of women that are based on gender stereotypes. Until now, however, most studies displaying that women's involvement is not deleterious to firm performance have focused on advanced economies and/or on the performance benefit of women's representation in company boards (De Bruin et al, 2006; Robb and Watson, 2012; Zolin et al., 2013), with Merelo (2011) finding positive impacts of women's leadership style on firm performance, and Adams and Ferreira (2009) in the US that female directors display better attendance and monitoring than male directors.

Nevertheless, studies have been also conducted in developing economies which reveal similar findings regarding the impacts of women's involvement in ownership on firm performance (Desphende and Sharma, 2013; Sasidharan and Raj, 2013). Some fail to find that the gender of ownership has any influence on either the profitability of small and medium enterprises (Badran, 2014; Robert and Obeng, 2008), that female-owned business have similar rates of return on assets to male-owned businesses (Chaganti and Parasuraman, 1996), that gender cannot be proven to be an explanatory factor (Marlow and MacAdam, 2013), or that owners' gender is an explanatory variable of performance only once other variables are included in a model (Díaz-García and Jiménez-Moreno, 2010). Malaya (2006), for example, examines firms in Metro Manila in the Philippines and finds no variations in firm performance attributed to gender. Others, however, find significant positive benefits in terms of sales growth resulting from women's involvement in ownership compared with male-owned firms in Guatemala (Kevane and Wydick, 2001), as does Kenge (2016) in a study of small and medium enterprises in 2007 and 2010 in South Africa, who reveals that the firms jointly owned by men and women perform better than those owned by men. To evaluate this more positive proposition regarding women's involvement, therefore, the following hypothesis can be evaluated:

Female ownership enhances firm performance hypothesis (H2): Enterprises with female involvement in ownership witness higher levels of firm performance than those in which there is no involvement of women in the ownership of the enterprise, after controlling for other key determinants of firm performance and the endogeneity of firm registration status.

3. Data, Variables and Methods

Data

To evaluate these hypotheses regarding the relationship between women's involvement in firm ownership and firm performance, we here report data collected by the World Bank Enterprise Survey (WBES) on 937 enterprises in South Africa in 2007. The WBES collects data using a stratified random sample of non-agricultural formal private sector businesses with five or more employees which is stratified by firm size, business sector and geographic region. The firm size strata in the WBES are 5-19 (small) 20-99 (medium), and 100+ employees (large-sized firms),

while sector is broken down into manufacturing, services, transportation and construction. Public utilities, government services, health care, and financial services sectors are not included. Geographical regions within the country are selected based on which cities/regions collectively contain the majority of economic activity. The sampling frame is derived from the universe of eligible firms, normally obtained from the country's statistical office or another government agency such as the tax or business licensing authorities.

Variables

Dependent variables.

There are two key firm performance measures which serve as our dependent variables and are expressed in terms of logs, namely: (1) real annual sales growth (using GDP deflators) (%): All values for sales are converted to USD using the exchange rate in the corresponding fiscal year of the survey. Sales are deflated to 2009 using the USD deflator; and (2) Annual productivity growth (%): this is a derived variable that measures annualised growth in labour productivity where labour productivity is real sales (using GDP deflators) divided by full-time permanent workers. Annual productivity growth is the change in labour productivity reported in the current fiscal year from a previous period of two years ago. Here, an annualised measure is used.

Key independent variable

To evaluate the influence of female ownership on firm performance, we use a binary variable indicating the extent of female participation in ownership. This is a dummy variable which takes a value of 1 if female ownership exists in a given firm and 0 otherwise.

Control Variables

In addition to female ownership, it is necessary to control for other key determinants of firm performance. Here, other characteristics are examined which previous studies reveal to significantly influence firm performance, namely registration status, firm size, legal status and ownership structure, export orientation, sector, access to finance, the level of technological innovation, human capital factors and other business environment factors.

Conventionally, it is assumed that firms unregistered at start-up will have lower levels of firm performance than those registered from the outset (La Porta and Schleifer, 2014). Recent research, however, reveals a significant positive relationship between delaying registration and firm performance because the benefits of registration do not outweigh the benefits of delaying registration in many developing economies (Williams et al., 2016b). Registration status is here captured by a dummy variable indicating whether or not a firm started unregistered. This firm-level measure is defined by examining responses to the question, 'Was this establishment formally registered when it began operations?' This is a dummy variable with value 1 indicating that the firm started operations in the country without formal registration and 0 when the firm was formally registered.

Firm size is also viewed as determining firm performance, with larger firms performing better than smaller ones (Hsieh and Olken, 2014; La Porta and Shleifer, 2014), not least due to the lower average unit costs in larger firms. Firm size is a categorical variable with value 1 for small firms with less than 20 employees, value 2 for medium size firms between 20 and 99 employees, and value 3 for large firms with more than 100 employees.

Different types of ownership structure and legal status are often viewed as strongly correlated with firm performance, including whether a firm is state- or privately-owned, foreign-

or domestic-owned and an open- or closed-shareholding, partnership or sole proprietorship (Barbera and Moores, 2013). Given that unregistered start-ups may have different ownership structures and legal statuses than registered start-ups, controlling for this is important. Here, legal status is a categorical variable indicating whether the enterprise is an open shareholding, a closed shareholding, a sole proprietorship, a partnership, a limited partnership, or any other form. In addition, whether the organisation is foreign- or domestic-owned is examined using a dummy variable with value 1 indicating if the share of the firm's ownership held by foreign individuals or enterprises is larger than 49% and 0 otherwise. Given that export-oriented firms are viewed as displaying higher levels of firm performance, export-orientation is also included as a control using a dummy variable with value 1 indicating firms exporting directly at least 1% of sales and 0 for those who sell only domestically.

Firm performance is also viewed as varying across economic sectors. Given that unregistered start-ups may be heavily concentrated in labour-intensive sectors with fewer returns to scale, controlling for sector is important (Siqueira et al., 2016). Sector is here a categorical variable indicating the sector of the firm (i.e., textiles, leather, garments, food, metals and machinery, electronics, chemicals and pharmaceuticals, wood and furniture, non-metallic and plastic materials, auto and auto components, other manufacturing, retail and wholesale trade, hotels and restaurants, and others).

Access to finance (i.e. bank loans) is strongly correlated with firm performance and given a burgeoning literature on how unregistered start-ups lack access to finance from formal lenders, this may well impact on firm performance not only because they scale-down operations but also due to the high cost of informal loans and the limited financing available lead them to substitute (low skilled) labour for physical capital (Cull et al., 2007). Access to bank loans or credit is here a dummy variable with value 1 indicating whether the firm has access to bank loans or to a line of credit to finance its activities and 0 otherwise.

Firm performance is also often associated with the level of technological innovation. Given that most literature finds less innovation and adoption of new technologies in informal enterprises and that which does exist is more adaptation and imitation; this needs controlling for when examining the impact of registration on firm performance, especially given that some view this as the key reason for the productivity gap between developed and developing economies (Mansury and Love, 2008). Here, three rather limited control variables available in the WBES are used: quality certification, a dummy variable with value 1 indicating that the firm has an internationally-recognised certification and 0 otherwise; presence of a website, a dummy variable with value 1 when the firm uses a website for business related activities and 0 otherwise, and the use of e-mail, a dummy variable with value 1 when a firm uses e-mail with clients and suppliers and 0 otherwise.

Human capital factors, such as the educational level, skills and experience of the owners, managers and the workforce, the level of professionalism, and whether there is numerical flexibility in the workforce, are asserted to have a significant impact on firm performance (La Porta and Shleifer, 2014). Controlling for human capital factors is thus important, especially given that informality is associated with less productive workers due to more productive workers self-selecting formal over informal enterprises. Here, six control variables available in the WBES are used: top manager's experience, a continuous variable of the years of experience the top manager has working in the sector; temporary workers, a variable measuring the average number of temporary workers in the firm; permanent full-time workers, a continuous variable of the average number of permanent full-time workers in the firm; female full-time workers; and as a

signal of professionalism, whether they use an external auditor, a dummy variable with value 1 indicating that the firm has its annual financial statement reviewed by an external auditor and 0 otherwise.

So too does the wider business environment determine firm performance. Two control variables are thus used measuring whether various facets of the business environment are a major constraint on the firm's activity, namely: transport, a dummy variable with value 1 indicating that transportation is a major constraint for the firm's activity and 0 otherwise, and electricity, a dummy variable with value 1 indicating that electricity supply is a major constraint for the firm's activity and 0 otherwise.

Analytical Methods

In South Africa, women owned and actively managed 45 per cent of all enterprises in 2007, although the share of all enterprises that they own and manage is higher in the informal than the formal sector (52 per cent compared with 31 per cent (FinScope South Africa, 2010). Given that our sample comprises formal firms that have started their business with registration and others without registration, there is no statistical, theoretical and/or empirical reason to disregard the potential endogeneity issue that might arise due to the differential approach to registration by firms. Whether enterprises register or not at the outset can be conceived as an endogenous choice by firms and this will have an effect on the estimated coefficients. Therefore, our sample of formal enterprises that either registered or not at the start of operations is a sample that is not random but rather, a sample with a systematic pattern of registration. Hence, if we model the determinants of firm performance conditional on their registration status and other relevant correlates without addressing the potential problem of sample selection bias, our estimates will not be reliable. In this paper, therefore, a Heckman two-step estimator (i.e., the Heckit estimator) is adopted to generate our econometric estimates. Simply put, the indicators of firm performance in South Africa (e.g., percentage of female ownership) will be regressed on a number of determinants controlling for the problem of sample selection bias.

The primary equation or the equation of interest is a model of determinants of firm performance can be written as;

$$p_i^* = x_{1i}'\beta_1 + \varepsilon_{1i} \quad (1)$$

Where x_{1i} denotes a vector exogenous/control variables (incorporating, among others, firm registration status, age, size, human capital, sector, constraints, legal status of firms...etc) and p_i^* represents firm I 's performance (i.e., as captured by the annual rate of sales and productivity growth). The performance indicators are observed for these formal firms that were both registered and unregistered at start-up and spent different lengths of time unregistered. To describe whether a firm is registered or not, a second equation (i.e. the selection equation) can be specified as:

$$R_i^* = x_{2i}'\beta_2 + \varepsilon_{2i} \quad (2)$$

with the following observation rule;

$$\begin{aligned} p_i^* &= p_i, R_i = 1, \text{ if } R_i^* > 0 \\ &\& R_i = 0 \text{ if } R_i^* \leq 0 \end{aligned} \quad (3)$$

R_i is a binary variable indicating registration status which assumes a value of 1 when a firm starts operation with registration and takes a value of 0 otherwise. Therefore, equation (2) can be estimated using a standard probit/non-linear model which is appropriate to predict the probability

of registration based on a maximum likelihood (ML) estimation technique. This constitutes the first stage of estimation. The second stage of estimation is undertaken conditional on equation (1) and by including the selectivity correction term generated at the first/probit stage of estimation. The specification is completed by making a distributional assumption on the error terms of the primary and selection equations. We assume that ε_{1i} and ε_{2i} follow a bivariate normal distribution with expectations zero and constant variances given as σ_1^2 and σ_2^2 respectively. The covariance of the errors is given as σ_{12} and we assume it is non-zero justifying the dependence of the two equations and their joint estimation in the Heckman two-step estimator framework. The non-zero assumption is appropriate because factors that are not under the control of the researcher that affect firms' decision to register at start-up are likely to be associated with factors that affect equation of firm performance (i.e. either sales or productivity growth equations). After controlling for self-selection, the second stage regressions enable us to test the two hypotheses posed in this study about the postulated link between female ownership and performance.

4. Results and discussion

Table 1 displays the correlation coefficients between the two performance indicators (i.e. annual sales growth and annual productivity growth) and the key explanatory variables such as female share of ownership and firms' registration status at start-up. The correlations clearly show a positive association between female share in firm ownership and the two performance indicators.

INSERT TABLE 1 ABOUT HERE

Table 2 reports the multivariate regression results. The finding, displayed in the second row of the results, is that after controlling for other key determinants of firm performance and the endogeneity of firm registration status, female-owned enterprises witness higher levels of firm performance than those in which there is no involvement of women in the ownership of the enterprise. The impact of female ownership is positive and significant for both annual sales growth rates and annual productivity growth rates. This study, therefore, confirms hypothesis 2.

INSERT TABLE 2 ABOUT HERE

This finding that women's involvement in firm ownership is statistically significant and has a positive relationship with firm performance means that enterprises benefit from women's involvement in ownership in the South African context. Although this analysis reveals the positive association, it does not explain why this relationship exists. To do so, the wider literature must be examined. Van Oostveen et al. (2014) argue that this is because women owners tend to focus on stability and adopt a longer-term perspective. It might also be because firms with female owners are more adept than firms owned by males in using sales networks and sustaining network relationships.

It is also undoubtedly because some of the conventional reasons for the under-performance of women entrepreneurs are not present in South Africa, namely financial exclusion from formal loans, poorer education, and the barrier to successful of entrepreneurship of domestic responsibility (FinScope South Africa, 2010; Kenge, 2016; Marlow and MacAdam, 2013; SBP, 2013). Here, each issue is considered in turn. Firstly, and on the issue of gender

discrimination in relation to bank loans, this is not significantly large; 43.7 per cent of women small business owners do not have formal loans compared with 39.2 per cent of male owners (FinScope South Africa, 2010). Indeed, the Women's Empowerment and Gender Equity Act proposed by the Department of Trade and Industry (DTI) sets out a range of policies (including a gendered quota system) and programme interventions in targeted areas (such as finance, entrepreneurial education and training, provision of business information, international trade development support) embodied under a "Strategic Framework on Gender and Women's Economic Empowerment". This follows a previous initiative by the Department of Trade and Industry (DTI) in the form of an enterprise development strategy covering the period from 2005-2014. This identified a number of strategic actions to promote entrepreneurship and female owners of enterprises have been targeted and encouraged, providing regulatory flexibilities and access to the credit market. Even if this study is not an evaluation study of this strategic initiative, the results tentatively intimate that such a policy approach is beneficial since women's involvement in the ownership of firms is associated with higher overall levels of firm performance.

Secondly, and on the issue of poorer levels of educational attainment, despite significant differences across genders (nearly half of men have graduate or postgraduate degrees compared with one-third of women), the level of tertiary education among South African women is rising progressively, and increasingly share of women are obtaining qualifications in traditionally "male" fields such as engineering. More importantly, the Women's Entrepreneurship Programme (WEP) was introduced in South Africa to promote and encourage women entrepreneurs by addressing their lack of entrepreneurial training and education. Botha (2006) confirms the effectiveness of this programme and concludes that this entrepreneurship programme helped create new businesses, grow the existing ones and generate new jobs.

Third and finally, the argument is that women entrepreneurs have domestic responsibility pressures more than their male counterparts, resulting in the lower growth characteristics of women-owned firms. Even if there is a strong gender division of domestic labour in South Africa, according to the SME Growth Index, South African women entrepreneurs in the formal sector do not consider cultural and family responsibilities as an obstruction to their business activities (Kenge, 2016; SBP, 2013). It is also sometimes stated that women's lower appetite for risk is partially responsible for the smaller size and slower growth of women-owned firms. There is little evidence, however, that this is the case in South Africa. South African women owners are 6 per cent more likely than men to indicate an aspiration for firm growth and examining their self-reported attitude towards risk, both genders tend to be moderately open to risk and although characterizing themselves as "cautious", they are not more risk-averse than men (SBP, 2013).

Hence, in contrast to the dominant negative view of the relationship between female entrepreneurship and firm performance, this paper reveals that policy initiatives designed to promote increased female ownership of firms enhance firm performance. No empirical support is found for the female underperformance hypothesis using various econometric specifications such as Heckman two-step estimator (with sample selection bias correction) and ordinary least squares estimator- OLS (without sample selection bias). Our findings instead show that women's involvement in the ownership of firms improves firm performance. Overall, our results therefore make a compelling case for increasing the involvement of women in the ownership of firms as it is beneficial to long-term growth of sales and productivity which in turn boost aggregate economic growth in the South African economy.

5. Conclusions

This paper has evaluated critically the thesis that women entrepreneurs under-perform relative to their male counterparts by examining whether women's involvement in firm ownership has a significant impact on firm performance. The finding is that there is a positive and significant relationship between female ownership and firm performance in South Africa. Firms in which there is the involvement of women in the firms' ownership outperform firms owned solely by men.

This finding has important policy implications. It challenges the conventional depiction of women entrepreneurs as necessity- and survival-driven entrepreneurs unworthy of state support and investment compared with opportunity- and growth-oriented male entrepreneurs (Nichter and Goldmark, 2009). Instead, the results show that women can play an important role in promoting aggregate economic activity by leading firms to have higher sales and productivity growth. As such, it reveals the importance of promoting women's entrepreneurship as well as women's involvement in firm ownership, such as by removing persistent bottlenecks including credit access and also ensuring equal rights of ownership between men and women. These initiatives are worthwhile not only on the basis of women's empowerment but also on the basis that they boost firm performance and thus economic development and growth at the macro level.

Whether this finding is more widely relevant beyond the South African context now needs to be evaluated. This paper, therefore, provides clear suggestions for future research. Until now, few studies have evaluated the effects of women's involvement in firm ownership on firm performance either in other African countries or more widely. If this paper therefore leads to further studies of the relationship between women's involvement in firm ownership and firm-level performance, then this paper will have achieved one of its intentions. If this then leads governments to recognize the positive role of women's entrepreneurship and women's involvement in firm ownership in promoting economic development and growth, then it will have fulfilled its wider intention. What is certain, however, is that little if no evidence-base exists for any longer simply assuming that women's entrepreneurship is necessity- and survival-driven, and by definition, lower performing than men's entrepreneurship.

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Table 1. Correlation matrix of the two performance indicators and key explanatory variables

Variables	1	2	3	4
1 Sales growth	1			
2 Productivity growth	0.78	1		
3 Female ownership share	0.02	0.03	1	
4 Unregistered	0.06	-0.02	0.04	1

Source: WBES 2007 dataset; own calculations.

**Table 2: Effect of Female Ownership on firm performance in South Africa:
Heckman selection model (2nd stage)**

Variable	Annual Sales Growth	Annual Productivity Growth
	Coefficient (s.e.)	Coefficient (s.e.)
Constant	30.02***(3.63)	23.55***(4.03)
Female ownership	0.49**(0.23)	0.43*(0.24)
Unregistered	3.02***(0.78)	-0.65(0.91)
Firm age	-0.09***(0.01)	0.04**(0.02)
Exporter	-0.51(0.75)	-0.28(0.86)
Foreign ownership	-0.35(0.66)	0.60(0.77)
Workforce		
Top manager years of experience	0.03(0.02)	-0.05**(0.02)
Temporary workers	-0.02*** (0.00)	-0.05*** (0.01)
Permanent fulltime workers	0.00(0.00)	0.00(0.00)
Credit access	0.22(0.45)	2.15*** (0.52)
Major constraints		
Transport constraint	3.06*** (0.96)	1.19(1.12)
Electricity constraint	2.52*** (0.49)	3.66*** (0.57)
Innovation		
Quality certification	-1.09** (0.51)	0.56(0.59)
External auditor	0.57(0.50)	0.95*(0.59)
Website	-0.04(0.50)	-1.51*** (0.58)
E-mail	-0.62(0.54)	0.36(0.62)
Firm size (RC: small)		
Medium	-2.86*** (0.49)	-3.48*** (0.57)
Large	-0.07(0.82)	-1.57** (0.95)
Legal status (RC: Other shareholding)		
Open shareholding	-6.54*** (2.39)	-4.87* (2.79)
Closed shareholding	-7.22*** (1.32)	-9.21*** (1.53)
Sole partnership	-9.41*** (1.37)	-12.05*** (1.59)
Partnership	-8.66*** (4.96)	-8.65*** (5.47)
Limited partnership	-6.91*** (1.44)	-9.68*** (1.68)
Rho	0.03(0.04)	0.03(0.04)
Lambda	0.47(0.61)	0.55(0.78)
Wald Chi-square statistic	294.2***	248.1***
(p-value)	(0.00)	(0.00)
No of observations	937	937

***, **, * = statistically significant at 1%, 5% and 10% respectively.