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Gender and firm-size: Evidence from Africa

Mohammad Amin
World Bank

Abstract

A number of studies show that relative to male owned businesses, female owned businesses are smaller in size. However, these studies are restricted to the developed countries. We find similar results for firms in the unregistered sector of developing countries of Burkina Faso, Cameroons, Cape Verde, Ivory Coast, Madagascar and Mauritius.

Enterprise Analysis Unit, World Bank, Washington DC, 20433. Email: mamin@worldbank.org. I would like to thank Rita Ramalho for useful comments. All remaining errors are my own. All views expressed in the paper are those of the author and do not necessarily reflect the views of the institution he is associated with.
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1. Introduction

Existing studies show that relative to male owned businesses, female owned businesses are smaller as measured by employment and turnover. However, most of these studies are restricted to the formal or the registered sector. Also, a majority of these studies focus on the developed countries, especially the U.S. For example, Brush et al. (2006) find that in the U.S., average revenue of female owned firms equaled USD 151,130, about 0.26 times the same for male owned businesses. Coleman (2007) and Chagnati and Parasuraman (1996) also report similar results for the U.S. The present paper reports similar findings for firms in the informal or unregistered sector in six developing countries in Africa.

Understanding the firm-size and gender relationship is important for a variety of reasons. First, firm-size is an important determinant of the profitability of a firm and therefore the income levels of the owners. Gender parity in income levels or the lack of it for the owners of informal businesses could be explained by differences in firm-size. For example, in one of the few studies on developing countries, Sabarwal and Terrell (2008) find that women owned businesses in the formal sector in 26 transition countries are significantly less profitable than male owned businesses. However, they attribute the bulk of this difference to the relatively smaller size of female owned firms. In short, understanding how firm-size varies across male and female owned businesses could therefore be an important first step towards achieving better gender parity through, for example, policies that encourage larger sized firms among females. Second, better access to finance to women is considered as an important tool for achieving gender parity in income levels. Understanding how firm-size varies with the gender of the owner is therefore crucial, given that firm-size and various aspects of access to finance are known to be strongly correlated (see, for example, Carter and Shaw, 2006). Third, apart from access to finance, other problems or obstacles to doing business peculiar to women may be correlated with firm-size. Possible examples include, corruption, crime, limited access to markets and raw materials and poor bargaining power vis-à-vis the clients. Fourth, the benefit and cost of becoming formal, an important policy issue, are likely to vary with the scale of operation. One reason for this could be the fixed cost involved in registering (registration fees, obtaining information on procedures required for registration, etc). Fifth, understanding the difference in firm-size by the gender of the owner can help in the design of appropriate policies aimed at gender parity. For example, based on the findings in this paper, policies that are more favorably disposed towards smaller scale of production are likely to have a larger effect on gender parity than policies that are scale-neutral or those that favor large scale production.

2. Data and main variables

The data we use is a random sample of 630 unregistered firms in Burkina Faso, Cameroons, Cape Verde, Ivory Coast, Madagascar and Mauritius, collected by the World Bank in 2008-09 (Enterprise Surveys).[1]

In separate regressions, the dependent variables include the (log of) total number of people working at the firm (*Employment*) and the (log of) total sales of a firm in USD (*Sales*).[2] Both the variables are for a regular month. The mean value of *Employment* equals 0.742 (2.6 without logs) and the standard deviation is 0.64. The corresponding figures for *Sales* are 6.01 (USD 3370 without logs) and 1.56, respectively.

[1] Data and methodology are available at www.enterprisesurveys.org.

[2] *Employment* includes owner(s) and family members of the owner(s) who may be working at the firm. A total of five observations (out of 673) that have unduly large effect on our main results in some of the specifications are excluded.

Our main explanatory variable is a dummy equal to 1 if the largest owner of the firm is a female and 0 otherwise (*Female*). The mean value of *Female* is 0.385 and the standard deviation equals 0.487. Throughout the paper, female owned business will mean *Female* equal to 1.

We control for a number of variables to rule out some of the possible mechanisms through which gender may affect firm-size. The controls also serve to guard against omitted variable bias problem with our main estimation results.

In the main specification, we control for country fixed effects, a dummy equal to 1 if a firm manufactures its main product itself (Manufacturing activity dummy), age of the firm (log values) and fixed effects for the level of education of the main decision maker. The education levels are no education, primary school (complete or not), secondary school (complete or not), vocational training and some university training. Next section discusses the remaining controls.

3. Estimation

Regression results for *Employment* are provided in Table I. Without any other controls, employment in female compared with male owned businesses is lower by 0.171 log points or 23% of the mean value of the dependent variable, significant at less than the 1% level (column 1). Alternatively, employment (without logs) in female owned businesses is about 0.84 times that in male owned businesses.

Controlling for the variables in the main specification causes the estimated coefficient of *Female* to decrease in magnitude from -0.171 above to -0.129 (p-value of .009, column 2) due to country fixed effects, and further to -0.108 (p-value of 0.025; column 4) due to the remaining controls. We note that even the latter estimate is large, equaling 14.6 percent of the mean value of the dependent variable.

For additional robustness, we first control for a dummy variable indicating if a firm uses family labor, total number of owners of the firm and a dummy indicating if a firm operates from inside (vs. outside) household premises (column 5). Next, we control for a dummy variable indicating if the largest owner started the businesses on his/her own or with partners (vs. taking over an existing business), a dummy variable indicating if the firm produces or sells under contract for another business or person, and dummy variables that capture city-size[3] fixed effects (column 6). None of these controls make any significant difference to our main results.

Next, we include three dummy variables, which indicate if a firm uses electricity, water and machines for its business (column 7), followed by access to finance related variables (column 8). The latter include dummies indicating if a firm has a bank account to run the business, firm normally buys some (or all) of its inputs on credit, firm normally sells some (or all) of its output on credit, financial accounts of the business are run separately from the household accounts, and if a firm wanted to borrow last year but could not do so (firm is financially constrained). Last, we include a dummy variable indicating if, in the past 2 years, the firms' workforce was affected by high absenteeism due to sickness of the employee or the employee's family members and friends (*Sick*), and a similar dummy variable for HIV/AIDS (*Aids*). These controls do not affect our main results qualitatively, although the estimated coefficient of *Female* does increase in magnitude from -0.120 (column 6) to -0.153 (column 9).

3.1 Sales

[3] Cities in our sample are grouped into capital city, cities (other than capital city) with a population of 1 million or more, 250,000 to 1 million, 50,000 to 250,000 and the rest.

Regression results for total sales are provided in Table II and they reveal a strong negative relationship between *Female* and total sales, significant at less than the 5% level. Without any other controls, the estimated coefficient of *Female* equals -0.291 (column 1). The estimate implies that on average, sales (without logs) of a male owned business are about 1.33 times that of a female owned business. This large difference between male and female owned businesses easily survives the various controls discussed above (columns 2-9, Table II).

4. Conclusion

In sample of over 600 unregistered firms in six developing countries in Africa, we find strong evidence that female owned businesses are much smaller in total employment and total sales than male owned businesses. The finding is similar to what existing studies have reported for developed countries. More work is needed to check if our results hold in other developing countries or not.

References

Brush, C., N. Carter, E.J. Gatewood, P. Greene and M. Hart, (2006), *Growth Oriented Women Entrepreneurs and Their Businesses* (New Horizons in Entrepreneurship). Cheltenham, UK and Northampton, MA: Edward Elgar.

Carter, Sara and Eleanor Shaw (2006), "Women's Business Ownership: Recent Research and Policy Development" Report to the Small Business Service, U.K.

Chagnati, R. and S. Parasuraman (1996), "A Study of the Impacts of Gender on Business Performance and Management Patterns in Small Businesses" *Entrepreneurship, Theory & Practice* Winter, 73-75.

Coleman, S. (2007), "The Role of Human and Financial Capital in the Profitability and Growth of Women-Owned Small Firms" *Journal of Small Business Management* 45(3):303-319.

Sabarwal, Shwetlana and Katherine Terrell (2008), "Does Gender Matter for Firm Performance? Evidence from Eastern Europe and Central Asia" IZA Discussion Paper Series No. 3758.

Table I: Employment and gender

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable: Employment (Total number of people working at the firm in a regular month, log values)									
Female	-0.171***	-0.129***	-0.134***	-0.108**	-0.120**	-0.120**	-0.139***	-0.140***	-0.153***
	[0.001]	[0.009]	[0.007]	[0.025]	[0.014]	[0.015]	[0.004]	[0.005]	[0.002]
Country fixed effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Manufacturing activity dummy			0.286***	0.262***	0.290***	0.297***	0.226***	0.242***	0.227***
			[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Education fixed effects				Yes	Yes	Yes	Yes	Yes	Yes
Age				0.156***	0.133***	0.120***	0.135***	0.132***	0.127***
				[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Firm uses family labor					0.231***	0.248***	0.269***	0.261***	0.267***
					[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Number of owners					0.151***	0.151***	0.159***	0.163***	0.150***
					[0.002]	[0.002]	[0.001]	[0.002]	[0.002]
Firm operates from within household premises					0.053	0.05	-0.007	0.004	0.028
					[0.320]	[0.352]	[0.895]	[0.948]	[0.607]
Largest owner started the business on his/her own or with partners						0.081	0.093	0.039	0.045
						[0.263]	[0.184]	[0.593]	[0.537]
Firm produces or sells under contract for another business or person						0.001	-0.009	-0.012	-0.015
						[0.994]	[0.912]	[0.883]	[0.858]
City-size fixed effect						Yes	Yes	Yes	Yes
Electricity							0.228***	0.223***	0.209***
							[0.000]	[0.000]	[0.001]
Water							0.133**	0.115**	0.110**
							[0.011]	[0.030]	[0.036]
Firm uses machines							-0.004	0.007	-0.001
							[0.948]	[0.902]	[0.984]
Firm is financially constrained								-0.039	-0.058
								[0.409]	[0.224]
Firm has a bank account to run the business								0.087	0.079
								[0.132]	[0.165]
Firm normally buys some (or all) of its inputs or supplies on credit								0.012	0.003
								[0.826]	[0.956]
Firm normally sells some (or all) of its output on credit								0.054	0.072
								[0.292]	[0.157]
Financial accounts of the business run separately from the accounts of the household								0.071	0.067
								[0.141]	[0.162]
Sick									0.194***
									[0.007]
Aids									0.118
									[0.176]
Observations	673	673	629	598	580	573	567	551	550
R-squared	0.017	0.118	0.161	0.205	0.264	0.274	0.307	0.318	0.339

Robust p values in brackets. All regressions use a constant term (not shown). Significance level is denoted by *** (1% or less), ** (5% or less) and * (10% or less). Sample size varies due to missing observations.

Table II: Total sales in a regular month and gender

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable: Total sales in a regular month (USD, log values)									
Female	-0.291**	-0.286**	-0.354***	-0.332***	-0.313***	-0.303***	-0.354***	-0.352***	-0.355***
	[0.022]	[0.014]	[0.003]	[0.005]	[0.009]	[0.009]	[0.003]	[0.004]	[0.004]
Country fixed effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Manufacturing activity dummy			-0.19	-0.211*	-0.258*	-0.242*	-0.241*	-0.158	-0.161
			[0.106]	[0.075]	[0.052]	[0.064]	[0.085]	[0.254]	[0.251]
Education fixed effects				Yes	Yes	Yes	Yes	Yes	Yes
Age				-0.001	0.066	0.029	0.035	0.041	0.04
				[0.993]	[0.416]	[0.714]	[0.665]	[0.600]	[0.605]
Firm uses family labor					-0.138	-0.112	-0.079	-0.09	-0.089
					[0.283]	[0.398]	[0.548]	[0.502]	[0.505]
Number of owners					0.137*	0.171**	0.161**	0.189**	0.186**
					[0.085]	[0.031]	[0.040]	[0.016]	[0.017]
Firm operates from within household premises					-0.12	-0.155	-0.171	-0.123	-0.12
					[0.460]	[0.336]	[0.304]	[0.462]	[0.474]
Largest owner started the business on his/her own or with partners						-0.077	-0.024	0.033	0.032
						[0.675]	[0.899]	[0.855]	[0.857]
Firm produces or sells under contract for another business or person						0.469**	0.495**	0.584***	0.586***
						[0.029]	[0.019]	[0.006]	[0.006]
City-size fixed effect						Yes	Yes	Yes	Yes
Electricity							0.054	0.024	0.022
							[0.749]	[0.888]	[0.899]
Water							0.240*	0.230*	0.230*
							[0.059]	[0.078]	[0.079]
Firm uses machines							-0.156	-0.113	-0.114
							[0.282]	[0.440]	[0.439]
Firm is financially constrained								-0.061	-0.063
								[0.616]	[0.607]
Firm has a bank account to run the business								0.265*	0.264*
								[0.060]	[0.061]
Firm normally buys some (or all) of its inputs or supplies on credit								0.311**	0.308**
								[0.025]	[0.027]
Firm normally sells some (or all) of its output on credit								-0.037	-0.033
								[0.772]	[0.801]
Financial accounts of the business run separately from the accounts of the household								0.312**	0.313**
								[0.026]	[0.027]
Sick									0.037
									[0.813]
Aids									-0.004
									[0.983]
Observations	651	651	606	581	520	514	508	493	493
R-squared	0.008	0.195	0.219	0.23	0.252	0.289	0.301	0.339	0.339

Robust p values in brackets. All regressions use a constant term (not shown). Significance level is denoted by *** (1% or less), ** (5% or less) and * (10% or less). Sample size varies due to missing observations.