A Sectorial look at Female Firm Ownership in Ghana

Prince Adjei[1], Sonal Agarwal[2] and Isaac Doku[3]

Abstract
This paper uses firm-level data for 708 firms in Ghana drawn from the World Bank enterprise Survey conducted between the period 2007-2009 to analyze how the likelihood of a firm having female vs. male top manager varies across sectors. The service sector which is often considered to be more favorable toward women is compared with men vis-à-vis the manufacturing sector. Applying a logistic regression model in exploring the data, the study focused on the wholesale and retail sub-sectors of the service sector to examine the likelihood of having a female top manager relative to a male. The study finds a significantly higher presence of female managers in wholesale firms compared to retail firms and the manufacturing at large. The analysis also finds that the higher presence of female managers in the wholesale sector relative to manufacturing is much higher among the relatively small firms and firms that exported part of their produce. These findings could serve as useful inputs for the design of optimal policy measures aimed at promoting gender equality in a country.
Keywords*: Female labour force Participation, Labour demand, Labour supply

1.   Introduction
The millennium development goal (goal 3) asserts that all countries under the UN conventions should by the end of 2015 promote gender equality and empower women. This has sparked a growing body of work that highlights gender disparities along various dimensions and the resulting consequences on economic outcomes. Gender disparity in various economic and social dimensions is now being recognized as a pervasive phenomenon across the world (Hausmann et al. 2006). Female labour force participation (FLFP) rates have gained interest and currency among researchers and development practitioners worldwide due to their usefulness in measuring the progress toward gender equality (Amoateng *et al*, 2003).

---

[1] Prince Adjei, Data Link Institute, P. O. Box CO 2481, Tema. E-mail: prinje86@yahoo.com
[2] Sonal Agawarl, Data Link Institute, P. O. Box CO 2481, Tema. Email: sonal.mitali@gmail.com
[3] Isaac Doku, Data Link Institute P. O Box CO 2481, Tema. E-mail: isaacoberkoh27@gmail.com

However, research work in the area is severely hampered by lack of relevant data especially for developing countries.

A number of studies have documented gender-based disparities favoring men over women in labor market participation rates and wages (Duflo, 2005; Tzannatos, Zafiris, 1999). Studies have also found that men and women workers and owners tend to be concentrated in different sectors and occupations. In other words, relative to men, certain sectors or jobs seem to be more favorable towards females than other sectors or jobs.

It is estimated from the Ghana Population and Housing census conducted in 2010 that females constitute 51.2% of the total population and 52.5% of the working age population. By virtue of this fact, it might be suggestive that women should participate more in the labour force than their male counterparts. This is however not the case due to labour market rigidities imminent in the Ghanaian Labour Market. As indicated by Sackey (2005), even though some relative improvement has been recorded in the participation of women in the labour market due to female activism and the important role played by most women especially single parents in the family, men still dominate. One concern with focusing on participation rates is that increased women's employment is often concentrated in low paying and vulnerable jobs. Hence, it is crucial to examine the presence of women in not only high paying jobs but in jobs with significant decision making responsibilities which are thus less vulnerable (Elson 1999).

Given the relative side-stepping of Ghanaian women in the labour market, it stands to reason what the situation might be in terms of firm ownership and the managerial impetus of women in the various industrial sectors. Do women have the chance to own firms? Do they get the opportunity to become managers? If they do, then in which sectors do they usually find themselves? This and other questions set the tone for a critical inquiry into the dynamics of female firm ownership and female employment in Ghana.

The presence of female top managers signals the existence of high paying jobs for women and also encourages other women to seek better employment. For example, women in top managerial positions may serve as role models for other women to seek better employment and higher paying jobs. Also, in contrast to male managers, female managers are less likely to discriminate against other women and therefore more likely to promote female workers to higher paying jobs (Altonji and Blank 1999).

For example, one view is that relative to men, women have a comparative advantage in occupations that require less use of brawn and greater use of brains (Rendall, 2010). Another view is that in a majority of countries, females are the primary caregivers in the family affecting their labor market participation, wages and also the types of jobs they can undertake (Becker, 1985; Bielby and Bielby, 1988; Hundley, 2000 and Lombard, 2001).

This paper contributes to the above literature by focusing on the gender of the top managers of private firms in Ghana and how the gender composition of the managers varies across sectors. For the sectors, the paper first compare the wholesale sub- sector as a whole with the manufacturing sector and then single out the wholesale sub- sector as unique and different from other services sectors such as retail. A greater presence of female workers and female entrepreneurs in the services sector compared to manufacturing has been noted in the literature (World Bank, 2012; Dolado et al., 2004; ILO, 2012). The wholesale and retail sectors have been singled out as especially important for female entrepreneurs as for

example, in the Sub-Saharan Africa and Eastern Europe and Central Asia regions (Bardasi et al., 2011).

Stemming from the above evidence, the general objective of the study is to examine the relationship between a firm's sector and the likelihood of having a female top manager. Specifically the study seeks to
  (i)   investigate the relationship between a firm's sector and the likelihood of having a female top manager
  (ii)   examine the relationship between firms' size and location and the likelihood of having a female top manager.
The remaining sections of the paper focus on model specification, estimation strategy and empirical analysis. The concluding section summarizes the main findings of the paper.

3.0   Model Specification and Estimation Strategy
Following Amin and Islam(2014), this study adopts a logistic regression model with a binary dependent variable. A standard but simple model of the likelihood of a woman being a top firm manager asa function of the sector of the firm and other firm level characteristics is specified as:

$$FEMMGR_i = \beta_o + SECTOR_i'\lambda + Z_i'\gamma + \varepsilon$$

Where, FEMMGRi is the status of the top manager of the firm in the labour market, which is equal to 1 if the *ith* top manager is a female and zero if otherwise.

The primary variables of interest on the right-hand side of the equation are SECTORS *which* captures the individual sectors of the firm to which the top manager is a female categorised into (services, retail, wholesale, construction. Other services) relative to manufacturing sector; The vector *Zi* comprises additional information presumably influencing female firm ownership, such as age dummies of the firm (young: 1-10years; middle aged: 11-20; older 21-30 with the matured 30+ as referencedummy), crime status (firm losses due to presence of crime =1: no crime = 0), time tax, number of fulltime employment and location of the firm, measuredby dummies of LARGE CITY(if firm is in large city=1; otherwise=0).

Given the binary nature of the dependent variable, a logistic regression estimation technique is applied to the ownership model to capture the sectoral and firm specific characteristics of female participation in the labour market. The choice of the logistic estimation is informed by the fact that the dependent variable is dichotomous (either a female top manager or otherwise) and the model is useful in understanding the relationship between the predictors or explanatory variables and the binary response variable or dependent variable.
Equation (1) is therefore specified as

$$\Pr[FEMMGR = 1 \mid SECTOR_i, Z_i] = \Delta(\beta_o + SECTOR_i'\lambda + Z_i'\gamma)$$

$$= \frac{e^{b_0 + SECTOR_i'\lambda + Z_i'\gamma}}{1 + e^{b_0 + SECTOR_i'\lambda + Z_i'\gamma}} \qquad i=1, 2, \ldots, n$$

From the probability density function for the logit model, the form of the logisticregression model is as follows:

$$Logit(p_i) - \ln\left[\frac{p_i}{1 - p_i}\right] - b_i x_i$$

With *pi* being the probability that a woman assumes the role of a top manager of the firm, b*i* standsfor the regression coefficient, *xi* being the independent covariates, and the ratio $\left[\dfrac{p_i}{1-p_i}\right]$ being the odds that a woman assumes the role of a top manager. By taking theexponent of each *bi,* that is, exp (b*i*), the result is interpreted as the relative odds of being a female top manager in the firmwith characteristics Z*i* relative to firms in the reference group. The marginal effect of the logistic regression isused in analyzing the empirical results in this work. The model helps to investigatethe effect of the independent variables on the likelihood of having a female top manager.

2.1 Variable sand their Measurement

Dependent Variable: The dependent variable is measured as a dummy. It is captured as 1 if the top manager of the firm is a female and 0 if otherwise. Thus the dependent variable is **FEMALE.**

Main Explanatory Variable

The main explanatory variables include dummy variables indicating the sector to which the firm belongs. First the presence of female managers in wholesale as a whole vs. manufacturing sector is analyzed. In this regard, a dummy variable equal to 1 if the firm belongs to the wholesale sectors and 0 otherwise (Wholesale) is defined. Next, the paper analyzes how the individual service sectors compare with manufacturing and variable equal to 1 if the firm belongs to the retail sector and 0 otherwise (Retail), a dummy variable equal to 1 if the firm is engaged in wholesale activity and 0 otherwise (Wholesale).

Control Variables: A number of control variables have been included to account for variations in firm size, quality of business environment, location of firm, severity of crime among others. Consequently the following independent variables are captured:

Firm Size (Log of Employment): This is measured as the number of permanent full time employees at the end of the fiscal year prior to the survey period(2013).

Age of the firm: This is captured as the difference between the year of firm establishment and the end of the survey period. It is conceivable that younger firms may be less tied to tradition and therefore more women to women employment. The log of age is captured in the model. It is however categorized decadally. Thus firms that are ten years or less, between 11and 20 years, and those above 20 years.

Location: The location variable was captured in the form of a dummy variable. 1 if the location is a large city and 0 otherwise. The definition of a large city was considered to be one with a population greater than one million residents. The variable **LARGE CITY** thus takes care of the location.

Exports: This represents the percentage of firm's sales coming from both direct and indirect exports.

Crime: This is captured as a dummy to ascertain whether the firm incurred some losses as a result of theft, robbery, vandalism or arson that occurred on the establishment's premises. Itis thus shown as 1 if there was crime and 0 if there was no crime.

Time tax: This is captured as a measure of regulatory burden at the firm level captured by the percentage of senior management time spent in dealing with government regulation.it also reflect a measure of the business climate.

2.2   Data and Descriptive Statistics

The main data source consists of firm-level surveys for Ghana conducted by the World Bank's Enterprise Surveys between 2007 and 2009. These surveys were conducted in some cases across the whole region (such as Latin America and Eastern Europe and Central Asia) and sometimes in individual countries. However, a common sampling methodology – stratified random sampling – was followed in all the surveys along with a common questionnaire. The sample for each country was stratified by firm-size, sector of activity and location within the country. Weights are provided in the survey to ensure that the sample is representative of the non-agricultural private sector of the economy. The Enterprise Surveys cover manufacturing as well as services sectors but certain services such as education and health are not covered. Also, the primary sector, which encompasses agriculture, mining, forestry, etc., is also excluded from the survey.

The Enterprise Surveys currently cover over 130,000 firms in 135 countries, of which 121 have been surveyed following the standard methodology. This allows for better comparisons across countries and across time. The sample for Ghana was selected using stratified random sampling, following the methodology explained in the Sampling Manual.   For the purpose of this study, a sample of 708 firms are considered.For the Ghana ES, several sample frames were used. The first was supplied by the World Bank and consists of enterprises interviewed in Ghana 2007.In Ghana, the urban centers identified were Accra, Tema, Takoradi, and North (i.e. Kumasi and Tamale).   Each urban center was divided into an appropriate number of zones. The summary statistics are shown in table 2.1 below.

Table 2.1 Summary Statistics				
Variable	Mean	Std. Dev.	Min	Max
Female	0.146893	0.354249	0	1
Wholesale	0.043785	0.204762	0	1
Retail	0.175141	0.380357	0	1
Firm Age	2.438216	0.763771	0	4.330733
Large City	0.713277	0.452551	0	1
Export	7.84322	21.45946	0	100
Employment(log)	2.6503	1.074622	1.609438	6.429719
Crime	0.00565	0.075005	0	1
Time Tax	4.162429	14.25492	0	100
Number of Observations(Firms) 708				

2.3   Analysis of Empirical Results

The regression result is provided in Table 2.2. The estimates shown in the table are the log odds ratio obtained using a logit specification with *Female* as the dependent variable. Corresponding marginal effects are presented in appendix 1. Three equations are estimated. First the likelihood of having a female manager varying between the wholesale and manufacturing sector without any control is examined in the equation (1). As indicated in the first equation, moving from the manufacturing to the wholesale sector increases the likelihood of a firm having a female manager statistically. The log odds ratio is 3.077, significant at less than 1 percent level. The associated marginal effect is an increase of 2.7 percentage points against the sample mean value of 2.97 percent of the dependent variable. In checking whether the presence of female top managers is present in the service sector (wholesale and retail combined), and not just limited to wholesale, equation 2 provide results

for the two sub sectors within the service category (wholesale and retail). The omitted category is the manufacturing sector. This means that the results shown for both sectors are relative to the omitted manufacturing sector. It is evident that the estimated log odds ratio of wholesale remains positive and statistically significant at less than 1 percent level. The magnitude of the log odds ratio almost remains the same as in the first equation. In the case of the retail sector, the probability of a firm having a female manager is lower relative to the manufacturing sector. This result is however not robust.

In equation 3, various firm –level controls are injected into the model. The presence of these controls increases the estimated log odds ratio of wholesale to increase from 3.0810 in equation 2to 3.7428 in equation 3 whilst decreasing that of retail from 1.0076 in equation 2 to 0.9884 in equation 3. These changes might be due to the control for firm size. Despite these changes, wholesale is still positive, economically large and statistically robust at the 1 percent level. The associated marginal effect here implies an increase of 3.12 percentage points in the likelihood of a firm having a female manager when one moves from manufacturing to the wholesale sector. Three firm-level controls were found to be statistically significant. First, the likelihood of a firm having a female manager is significantly higher among the relatively large firms (log odds ratio of 0.7435) and among relatively younger firms. Also evident is the result that exporting firms tend to favour women as top managers.

Table 2.2: Regression Results(Logit Specification, log odds ratio)

Dependent Variable: Female	Equation(1)	Equation (2)	Equation (3)
Wholesale	3.0768***	3.0810***	3.7428***
	(1.1916)	(1.2019)	(1.4516)
Retail		1.0076	0.9884
		(0.2422)	(0.2432)
Firm age			1.01674**
			(0.0083)
Large City			1.0535
			(0.2053)
Export			1.007*
			(0.0042)
Employment			0.7435
			(0.6557)
Crime			0.6244
			(0.6479)
Time Tax			0.9979
			(0.00624)
Observations	708	708	708

Figures in bracket contain linearized standard errors. Significance is denoted by ***(1%), ** (5%) and *(1%). Estimates shown are log odd ratios obtained from Logit estimation. All regressions use a constant term which are not shown.

5.0   Conclusion

Using firm-level data for 708 firms in Ghana and focusing on the proportion of female top managers of firms, the study finds that the percentage of female managers is much higher in the wholesalesectorthan the retail and manufacturing sector. It is also evident find that the higher percentage of female managers in the wholesale sector vis-à-vis manufacturing is not uniform - it is much larger for the relatively smaller firms and for younger firms as well as those engaged in exports.The study thus complements the plethora of literature explaining female labour force participation in Ghana and offers and understanding into the determinants and consequences of the gender composition of the top managers of private firms in Ghana.

References

Amin, M. & Islam, A. (2014). Presence of women in top managerial positions. *Enterprise Note Series* No. 29, World Bank Group

Amin, M. & Islam, A. (2014). Are there more female managers in the retail sector; evidence from survey data in developing countries. *Policy Research Working Paper* 6843, World Bank Group

Amoateng, Y., Lucas, D., & Kalule-Sabiti, I. (2003). South Africa's human capital in the 1990s, *African Studies Association and the Pacific 2003 Conference proceedings African on Global Stage*

Bardasi, E., Shwetlana S., & Katherine T. (2011). How do female entrepreneurs perform? Evidence from three developing regions, *Small Business Economics* 37:417-441.

Becker, G. S. (1985). Human Capital, Effort, and the Sexual Division of Labor, *Journal of Labor Economics,* 3 (Supplement): S33-S58.

Bielby, D. D., & William T. B. (1988). She Works Hard for the Money: Household Responsibilities and the Allocation of Work Effort, *American Journal of Sociology,* 93(5): 1031-1059.

Dolado, J. J., Florentino F., & Juan F. J. (2004). Where Do Women Work? Analysing Patterns in Occupational Segregation by Gender. *Annals of Economics and Statistics* 71/72: 293–315.

Dollar, D., & Roberta, G. (1999). Gender Inequality, Income, and Growth: Are Good Times Good for Women?. Working Paper Series No. 1, *Policy Research Report on Gender and Development*, World Bank, Washington DC, USA.

Duflo, E. (2005). Gender Equality in Development. *BREAD Policy Paper* No. 11, 2005.

Hundley, G. (2000). Male/Female Earnings Differences in Self-Employment: The Effects of Marriage, Children and the Household Division of Labor. *Industrial and Labor Relations Review,* 54(1): 95-114.

ILO (2012). Key Indicators of the Labour Market (KILM), *5th Edition, International Labour Office, www.ilo.org*

International Labor Organization (ILO). Global Trends for Women 2012.Geneva, Switzerland, 2012 ISBN: 978-92-2-126657-0.

Joyce P. J. (1999). Labour Force Participation. *The Quarterly Review of Economics and Finance*, 39, 597 - 610

Oppenheimer, V. K. (1976). Female Labour Force in the United States: Demographic and Economic Factors Governing its Growth and Changing Composition. Westport, CT. Greenwood Press.

Rendall, M. (2010). Brain versus Brawn: The Realization of Women's Comparative Advantage. Working Paper No. 491, Working Paper Series, *Institute for Empirical Research in Economics*, University of Zurich.

Reskin, B. F., & Roos, P. A., (1990). Job Queues, Gender Queues; Explaining women's inroads into male occupation. Philadelphia, P. A, Temple University Press.

Sackey, H. A. (2005). Female labour force participation in Ghana: The effects of education, *AERC Research Paper 150*.

Smith, J.P. & Ward, M. P. (1985). Time Series Growth in the Female Labour Force. *Journal of Labour Economics*, 3 59-90

Tzannatos, Z. (1999). Women and Labor Market Changes in the Global Economy. *World Development,* 27(3):551-70.

World Bank (2010). World Development Indicators (WDI); *Washington, DC, World Bank.*

World Development Report (2012). Gender equality and development. Washington, DC: The World Bank 2011, 426 pp., ISBN: 978-0821388259.

World Enterprise Survey, 2013 Edition.

Appendix 1

Table 3: Marginal Effects(Logit Specification)

Dependent Variable: Female	Equation(1)	Equation (2)	Equation (3)
Wholesale$^{\Psi}$	0.2663***	0.2667***	0.3129***
	(1.1916)	(1.2019)	(1.4516)
Retail$^{\Psi}$		0.0016	-0.0024
		(0.2422)	(0.2432)
Firm age			0.0034**
			(0.0083)
Large City$^{\Psi}$			0.1075
			(0.2053)
Export			0.0015*
			(0.0042)
Employment			-0.0614
			(0.6557)
Crime$^{\Psi}$			-0.0876
			(0.6479)
Time Tax			-0.0004
			(0.00624)
Observations	708	708	708

Figures in bracket contain linearized standard errors. Significance is denoted by ***(1%), **(5%) and *(1%). Estimates shown are marginal effects obtained from Logit estimation. (Ψ) refers to discrete change of dummy variable from 0 to 1.