

Female labour force participation: evidence from Ghana

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participation

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Received 16 June 2015
Revised 10 June 2016
Accepted 16 June 2016

Abstract

Purpose – The purpose of this paper is to examine female labour force participation (FLFP) and their employment choice between the formal and informal sectors after several institutional and social reforms such as Millennium Development Goal 3 aimed at promoting gender equality and empowerment of women by 2015, using data from Ghana's 2010 Population and Housing Census.

Design/methodology/approach – In this paper, logit regression and multinomial logit techniques were employed.

Findings – The results show that FLFP has declined marginally from the 2005 figures; education remains the important factor in determining women's participation in the formal sector. Strikingly 91 per cent of the FLFP is engaged in the informal sector of the Ghanaian economy, a sector with a very low contribution per head.

Practical implications – Interventions such as encouraging female education and retraining of self-employed females to improve upon their efficiency ought to be pursued vigorously; whiles developing rural areas for females to get equal labour opportunities and many others aimed at enhancing the efficiency and by inference earning per head of the informal sector is highly recommended.

Originality/value – The literature on the FLFP is thin in Ghana. The current study uses a census data unlike the previous studies and as such employed a huge sample size that reflects the reality in Ghana. The study contributed immensely to policy having established that 91 per cent of the female labour force is engaged in the informal sectors of the economy, and therefore any intervention targeting at reducing poverty and meeting the MDG 3 should be targeted at the informal sector of the Ghanaian economy.

Keywords Education, Multinomial logit, Female labour force participation, Logit regression

Paper type Research paper

1. Introduction

Labour market outcomes is one of the most studied issues in the economic and social literature (see Mammen and Paxson, 2000; Lam and Duryea, 1999; Van der Klauw, 1996, etc.). The growing evidence on the role of human capital in the development process has made social sector investment an important component of national strategies for sustained growth and development. The specific issue of women's participation in the labour market supply was considered very significant due to its impact on the quality of life of women and their families. Thus, female labour force participation (FLFP) is a primary indication of the extent to which females participate in the economic activities of any country. As a measure of gender equality, FLFP rates have gained significant interest among researchers and development specialists worldwide due to it being used as a proxy to measure progress being made towards gender equality (Amoateng *et al.*, 2004). Female labour participation rate is also used to proxy for the state of the economic development, thus, whether it is an agrarian subsistence economy or a developed economy (Psacharopoulos and Tzannatos, 1989). It is well known that economic and social development depend, among many other factors, upon a rational exploitation of



International Journal of Social
Economics
Vol. 44 No. 11, 2017
pp. 1489-1505
© Emerald Publishing Limited
0306-8293
DOI 10.1108/IJSE-06-2015-0159

JEL Classification — J21, I25, C35

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human resources endowment (Austen, 2005). However, the level of participation of women in the labour market remains largely below men's level.

In Ghana, Sackey (2005) reports that the formal sector of the labour market is said to be male-dominated because employment in the sector is contingent upon participants' education and skill acquisition, among others, requirements that tend to be met more by males than females for various reasons (notably among them are financial, institutional and cultural problems). Traditional roles, occupational segregation by gender, among others restrict women's access to formal employment (Atieno, 2006). Female labour participation is not only prevalent in the informal sector in Ghana, but also tends to exhibit increasing trends in the recent past. According to Nyamekye (2012), the size of the informal sector employment in the 1980s was twice that of the formal sector. However, this figure increased by five-and-a-half (5.5) folds in the 1990s, a phenomenon which has been attributed partly to the low educational attainment of the female participants. A striking statistics by the Ghana Statistical Service (2012) revealed that about 31 per cent of Ghanaians aged 15 years and above have never attended school; a total of 35.7 per cent have attained only basic education and 33.3 per cent have attained secondary education or higher. The inability of the formal private sector to generate jobs in their required quantities has also pushed many into the informal sector. Public sector workers have continuously declined from 13 per cent in 1991/1992 to 9 per cent in 2005/2006 and further declined to 6 per cent only in 2010 according to the Ghana Living Standard Survey (GLSS) (1991/1992 and 2005/2006) and the 2010 Ghana's Population and Housing Census (GPHC). The relative decline in public employment has been compensated by an increase in the private sector, both formal and informal sectors with the share of female participation being at 1.4 and 96.3 per cent, respectively, compared with that of the male counterpart which stood at 3.6 and 91.7 per cent, respectively (Ghana Statistical Services (GSS), GPHC, 2010). In the absence of appropriate social protection mechanisms (e.g. unemployment benefits) informal activities have become survival strategies for many Ghanaians.

Over the past years, Ghanaian women have benefited from several institutional and social reforms guaranteeing wider rights and favouring women's emancipation and their contribution to national development. Notable is the Millennium Development Goal 3, a milestone driven by the United Nations (UN) to promote gender equality and empowerment of women by 2015. According to the UN, in many countries including Ghana, productive work participation by women under conditions of freedom, equity and human dignity is in short supply. Therefore, an increasing participation of women in paid employment could secure for them better income, economic security and well-being. However, females' participation in the labour market has not witnessed any significant improvement. For instance, the 2010 GPHC data report that there are large inequalities between women and men in non-agricultural employment in Ghana. The data indicate that the share of women in paid employment stood at 32.7 per cent, increasing marginally from the 2000 GPHC figure of 30.1 per cent. The report is even worse looking at it from the labour force participation rate of females in Ghana (thus, 66.8 per cent in 2010 compare to 72.6 per cent in 2000). The current study touches on interesting areas of factors accounting for female labour market participation and quantifies the effects of these factors in Ghana; and women's employment choice between the formal and informal sectors with far reaching policy implications. Unlike the previous studies by Ackah *et al.* (2009) and Sackey (2005) which used the GLSS 1998/1999 and 2005/2006 data, this study uses the 2010 GPHC which serve as bases for comparison with previous works with the GLSS data, but focusses on what has changed after the various interventions aimed at meeting the MDGs targets.

2. Literature review

Employment is one of the most studied issues in the economic and social literature. The specific issue of women's participation in the labour market supply has been considered

by several studies in different contexts. This study hinges on two theories, that is, modernisation and income-leisure theories.

Economists have tried many theories to explain labour force participation. The income-leisure theory which emanates from the neoclassical theory posits that individuals or household members enter the labour market because they want more income, and they work as long as they think that the benefits from work exceed those from household activities (Psacharopoulos and Tzannatos, 1989). Therefore, the supply of labour is dependent on the remuneration accrued to labour, other non-labour income and the utility of the economic unit between work and leisure. The implication of the model is that the incumbent worker is induced by higher wages to supply more labour hours but it also makes additional work less attractive since the same level of income can be realised with less work. However, those outside the labour force are induced by higher wage to join the labour force and therefore increase labour participation. Therefore, the effect of higher wages on labour participation is ambiguous and varies from country to country. Again, the higher the household's non-labour income, the less premium particularly women placed on participating in the labour force all things being equal. The income-leisure model is a static model and suffers from time dynamics. That is, with respect to time trends, it is necessary to look at the movement of aggregate labour supply and demand (Long, 1958) as both determine equilibrium wages and of course the amount of labour hour supply are also subject to changes during development.

According to modernisation theorists, economic development is positively associated with FLFP through change in the country's occupational structure (i.e. the increasing availability of service and white-collar jobs) and increased educational opportunities, often accompanied by reduced female fertility rates and household responsibilities. The modernisation process is associated with increased demand for labour, a general social acceptance of women's education and employment, as well as lowers fertility (Heckman, 1980; Standing, 1981; Bauer and Shin, 1987). From this viewpoint, increasing FLFP means that females benefit from modernisation. The modernisation condition leads to a U-shaped pattern of female participation in the development dynamics. That is, at the initial stage of development when the economy is at subsistence level and for that matter agriculturally dependent, heavy use of female labour becomes optimal. But as the economy moves into industrialisation, agriculture loses its significance as the main employer of women. The expansion of industry is usually associated with a reduction in female employment. Development is also associated with higher educational enrolments that delay women's entry to the labour market. When the service and government sectors expand, women are pulled back into the labour force. Later, the economy may be confronted with labour shortages that lead to higher availability of part-time jobs and higher wages for women (Psacharopoulos and Tzannatos, 1989). The outcome of female participation is largely affected, in addition to individual characteristics, by the economic and social environment. Family policy (such as childcare benefits and parental leave) and labour market policies (such as labour market flexibility and employment incentives) in particular, have a direct impact on women's decision. For example, the level of unemployment, which is dependent on the dynamics of the economy and labour market policies, directly affects the level of women's participation. "On one hand, a high rate of female unemployment tends to discourage female participation; on the other hand, a high male unemployment rate is likely to stimulate women's participation as they may enter the labour market to compensate for the loss of family income due to husband's unemployment" (Jaumotte, 2003). The discouraging effect of a high unemployment rate on female participation was also highlighted by Tansel (2001) in the case of Turkey.

The various dimensions of labour force participation have been enumerated from the aforementioned theories and literature. Among them are the standard economic variables,

such as education, experience, wages and incomes, empirical studies have indicated that many non-economic variables influence female labour supply functions. These include marital status and fertility, urbanisation, landownership and farm size, head of household's status, and employment structure. Several empirical studies have concluded an inverse relationship between women's participation during the age of bearing and rearing children and labour force participation. This is due to the simultaneity of women's participation during the age of bearing and rearing children and work. Psacharopoulos and Tzannatos (1989) point out an ambiguous relation between the two in the developing countries. For instance, more children mean more farm work by women in the developing country in order to feed the children or more paid work to support the family. More children are also seen as social capital and a form of investment and therefore the older child can look after the younger one and may even perform some household task freeing the women to participate in the labour market.

Mammen and Paxson (2000) supported the U-shaped hypothesis between the FLFP rates and the type of residence – urban vs rural. In rural subsistence economies, where most households live in these areas, female participation is high. In rural areas, family responsibilities and agricultural work can be combined; the household consume a substantial proportion of what they produce. However, female participation is lowest in urbanized, middle-income countries. The separation of home and work environments in urban areas make it difficult for a working mother to combine raising a family with work, accounting for the lower participation rates. Female participation rates are again high in high-income countries. In these countries women are highly educated, so the opportunity cost of exiting the workforce for childcare is high. Therefore, FLFP rates are high and fertility rates are low in this environment (Bloom *et al.*, 2009).

Labour supply studies show that labour force participation for women has risen over time. For instance, Ehrenberg and Smith (2000) examine the trends in women's labour force participation among women aged 25-54 in some selected developed economies (i.e. Canada, France, Germany, Japan, Sweden and the USA) between the period 1965 and 1997. They find that the fraction of women in the labour market in all of these countries, on average, increased from half or less in 1965 to approximately two-thirds or more in 30 years. Although they find some differences in trends across countries, the study concludes that common factors such as changes in fertility, educational attainment, labour market opportunities and social attitudes are influencing labour supply trends in the industrialised world. Similar increase in participation in trends in female labour supply in developing countries has been observed by some researchers (see Atieno, 2006; Kaur and Kaur, 2012), however, the bulk of women's work is considered to take place in the "non-market" economy, either at home or in the informal economy.

Demography is also linked to labour force participation, since what happens to fertility affects FLFP. The hypotheses usually have been that, an expansion of female labour force employment would tend to lower fertility rates. Among development planners in developing countries the possibility that female employment would slow the rate of population growth has encouraged widespread enthusiasm for policies designed to accelerate the growth of the female labour force. Sackey (2005) concluded that higher FLFP is often accompanied by lower fertility rates. Other studies show that females, especially with older children, and being heads of households will utilise available opportunities for employment. Children are the main reason for them to participate; this is because the survival of their children depends on their access to the labour market. Women who fall within this category are less likely to discriminate in their choice of activities owing to the need to cater for their families (Atieno, 2006). This partly explains why women are found in all types of employment, ranging from permanent employment, temporary employment and self-employment. The constraining influence of fertility and the associated demand for childcare time have

often been considered as the principal determinants of FLFP and as such have featured prominently in the recent empirical and theoretical research on female labour supply. Sackey (2005) found out that the willingness of married women to participate in the labour force stems from a desire to provide their family with a higher standard of living, underscoring the welfare improvement rationale for female labour market participation. Zareen and Lubna (2002) observed that women's economic participation was significantly influenced by factors such as their age, education, marital status. Employment status of the head of the household (generally a male), presence of male member and children of ages 0-5 are also important variables that significantly affect women's participation in economic activities. From their study, the authors expected a negative relationship between number of children and women labour force participation, but found a positive relation, again concurring the welfare improvement rationale.

A study by Hill (1983) (as cited in Rincon de Munoz, 2007) produced a suggestive paper that takes into account the "informal sector" of Japan. The presence of an informal sector of the labour market allows women to engage in economic activities – by producing goods at home for sale in the market, working on a family farm or working in a small family-run business – while simultaneously caring for children and performing other home-related duties. Thus, choices of women may be viewed as trichotomous rather than dichotomous: women may choose to work in the formal sector of the labour market (as an employee), in the informal sector, or they may choose not to work. Accordingly, Hill (1983) (as cited in Rincon de Munoz, 2007) estimates a trichotomous labour force participation model for a sample of employees, family workers and non-participants from the Tokyo Metropolitan Area. The author found out that education and market experience were significantly associated with a greater probability of working in the formal sector. In contrast, the author found out that husband's income and the number of young children was significantly associated with a greater probability of being out of the labour force. Variables such as experience and the presence of young children increased the probability of being employed in the informal sector.

Naqvi and Shahnaz (2004) examined the factors which influence women's decision regarding work participation. They used a cross-sectional data from integrated household survey (PIHS) from 1998 to 1999 for the age group of 15-49 years. Probit and multinomial logit model was used to estimate the parameters. The results indicate that marital status, primary education, number of children and female heads of households are inversely related with women's participation in economic activities, and concluded that age and education other than primary, were positively related to decision making and participation in economic activities, however, married women were less likely to participate. The study concludes that women in an informal sector can both work and care for children more easily than women in the formal sector.

Olusoji (2004) analysed the factors that determines the participation of women in labour force in each geopolitical zone, and investigates the factors that account for difference in the number of hours supplied by women in formal and informal sectors of employment in Nigeria. The results indicate that the FLFP rate based on the sample of 3,000 is quite low with the unemployment rate hovering around 47 per cent and women aged 35-44 years have the highest participation rate. Strikingly, most of the women are in the formal employment and almost all of them had tertiary education, while majority of those with no formal education are in the informal sector. The result of econometric analysis shows clearly that the variables that determine labour force participation rates for women are age, education, children under six, religion, ethnic group and unemployment.

Magidu (2010) analysed the socio-economic determinants of labour force participation for active individuals between 15 and 65 years in Uganda. The data used are from the Uganda National Service Delivery Survey. The researcher found a significant and strong negative effect on participation in the formal sector for older individuals (aged 55-65). Furthermore,

he also found a significant and strong positive effect on participation in work and higher participation rates for relatively medium aged workers (45-54 years). The results further suggest that female individuals face a lower relative probability to participate in formal sector more than their male counterparts. It is also observed that unmarried female individuals tend to be engaged in formal than informal sector activities. Lower education and age are found to be associated with individuals who are in informal sector and vice versa. The results also suggest that an individual faces a high relative probability to participate in the formal sector if he/she resides in urban and it reduces as an individual moves to rural.

Yakubu (2010) investigated the dynamics in the South African labour force based on the human capital theory (HCT), which postulates that the education of women is positively related to the likelihood of their labour force participation. Data for the study were extracted from the 2008 Quarterly Labour Force Survey of Statistics South Africa. Logistic regression modelling was used to estimate the influence of education on labour force participation, while controlling for other demographic and economic factors. The results show that there is an association between the level of education and FLFP. He therefore postulated that the education of women is positively related to the likelihood of their labour force participation in South Africa.

Shaheen *et al.* (2011) investigated the patterns of FLFP in Pakistan. The study utilised Multiple Indicator Cluster Survey 2007-2008 data of Punjab. The variables used in the analysis are FLFP, age, age square, marital status, area, female monthly income, family size, household head education, different classes of female education and employment status. Results of logit model depicts that household head education, primary, middle, matric and madrasa education level is negatively related with the decision of FLFP while, decision towards participation is strong if female belonged to urban area, if she is married, if she has higher education and if she has large family size. They again used the ordinary least square method to estimate the earning function and found out that age shows a substantial increase in the wages with each additional year spent and sign of age square was negative which was in accordance to their expectation which indicates the concavity of the earning function. Moreover, as the level of education increase the returns to each year of education also increases. In different occupational status females earn more if they are employee, employer or self-employed than labourer (a reference category); while females earn less if they belonged to agricultural sector or other sectors than labourer. However, household heads education and family size are positively and significantly related with female earnings.

Bbaale and Mpuga (2011) used maximum likelihood probit and multinomial logit models to analyse the impact of female education on labour force participation and the choice of the employment type, respectively, for the case of Uganda. They used data from the Uganda Demographic and Health Survey 2006 data set. The results showed that female education (at post-secondary level) increases the probability of FLFP. Additionally, female education, especially at the secondary and post-secondary levels increases the likelihood of being engaged in wage employment. Again women in female headed households and those in the highest wealth quintile are more likely to participate in wage employment. Women in the rural areas are less likely to be engaged in wage employment compared to their counterparts in the urban areas. Thus, women's education can play an important role in poverty reduction not only because the income earned benefits their spouses, but most especially because it benefits the children. The results also suggest that in order to expand the numbers of women in the labour force in general, and wage employment in particular; measures are needed to educate women beyond secondary level.

Faridi *et al.* (2011) used the data of Bahawalpur (district of Punjab, Pakistan) and found that women's self-employment is positively related with age and experience. Analysis of various education levels shows that women with low-level education tend to engage in

self-employment than women who have high levels of education. Kaur and Kaur (2012) examined the trends and patterns of female workforce participation during 1991 and 2001 and the determinants of women's work in Punjab. The study was based on a secondary data from the various issues of Statistical Abstract of Punjab, Human Development Report of Punjab and Ministry of Women and Child Development. OLS regression technique was employed to estimate the various factors, which affect woman's work participation. The results showed that, at the district level, there was a high inter-district variation for labour force participation for both males and females. However, the inter-district variations in female work participation rates have declined in Punjab due to sharp rise in female work participation rates in 2001. The highest female work participation rate was found in Nawanshahr district and the lowest in Gurdaspur district. They also found out that, the basic level of education is not sufficient to enter the labour market and that, the matric level of education can be considered as the minimum criterion for female labour market participation.

In Ghana, Sackey (2005) used data from the 1998/1999 GLSS 4 to estimate FLFP and fertility model. He concluded that irrespective of the type of residence, whether rural or urban, both primary and post-primary school attainments impact positively on female labour participation and negatively on fertility. Ackah *et al.* (2009) also used data from the GLSS in investigating the determinants of FLFP at two points in time, 1991 and 2006, with the view that labour market participation of women improves female relative economic positions and overall economic efficiency of Ghana. Their study concluded that females with primary school education or above are more economically active than those with no education. However, this pattern is prevalent among females participating in wage employment. The study also concluded that high fertility acts as a constraint on female participation in wage employment. The findings collaborate that of Sackey (2005) that the presence of children in the home significantly reduces participation in wage work.

The foregoing literature shows that access to factors of production as well as human capital, children, spouse's earnings and age are important in labour supply. The factors important in determining the participation in different categories of the labour market (labour allocation between different categories of the labour market) are identified as education, household headship, experience, assets, other incomes, age, and number of children and the nature of the labour market. This study adds to the body of literature by analysing women's labour force participation using 2010 GPHC data set.

3. Methodology and data description

The basic theoretical framework that guides this study is derived from the household participation theory based upon Becker's (1965) theory of the allocation of time. The same approach was adopted by Iwayemi and Olusoji (2013), and Magidu (2010). The theory is a utility maximisation which indicates that the utility an individual economic unit derives from participating in a particular occupation is dependent upon the individual characteristics (x), the wage received on the job (w) and the job-specific characteristics (z). This is modelled as:

$$u_{ij} = u(x_i, w_j, z_j) \quad (1)$$

where i indexes individuals and j indexes occupations. The individual wage outcome (w_{ij}) in occupation j is a function of the individual's own characteristics (x_i) and job characteristics (z_j) as in the following equation:

$$w_{ij} = f(x_i, z_j) \quad (2)$$

Equation (2) is an implicit function of Equation (1). The individual is assumed to maximise a well behaved twice differentiable utility function subject to a time and income constraints.

The decision to participate reflects the rational choice of the individual female after comparing the gains from the market earnings with the opportunity cost of exiting the workforce for childcare and in other activities for a given level of household income from all other sources. The wage function in Equation (2) is embedded in the utility function of Equation (1). The odd of increased income from other sources has a tendency to induce the relative gains from market participation (Wolfe *et al.*, 1982; Heckman, 1980). The individual maximises a utility function subject to the constraint imposed by the fixed time and how to allocate her time to home production, market work and leisure. Thus, the optimal allocation of time to market work is determined by the individual and household attributes (x) as well as on the labour market characteristics (w and z). The theory of allocation of time (i.e. income-leisure theory) and related theories suggest that FLFP is predicated on x , indicates individual and household characteristics such as age, marital status, ethnicity, number of children, region, area of residence, education, etc., and other identifies vector of explanatory variables in the occupational choice (w and z) such as wealth, a proxy for wage, employment choice whether formal or informal employment, etc.

The model for FLFP could be written as follows:

$$FLFP_{ij} = f(x_i, w_j, z_j) \quad (3)$$

Assuming a linear generic function based upon the literature, the female participation utility is modelled as:

$$FLFP_{ij} = \beta x_i + \alpha z_j + \varepsilon_{ij} \quad (4)$$

where x_i is now a row vector of explanatory variables which are determined by an individual's characteristics like age, education, husband's education, marital status, household size, number of children, area of residence, that is, rural or urban; z_j is explanatory variables representing the job characteristics such as wealth, a proxy for wage, employment choice whether formal or informal employment; and ε_{ij} is the error term. An individual will choose among j occupations, the one that yields the highest utility.

To participate in the labour market or not to participate is estimated by logit regression technique which captures the influence of the socio-economic variables that affect the household decision. The dependent variable $FLFP$ denoting female labour force participation is fitted binary variable that take the value of 1 if the i th female is in the labour force and 0 otherwise. Key variable of interest is education attainment of the female labour. The literature reviewed identifies the individual and job explanatory variables in the participatory choice generic equation which is specified as:

$$FLFP = B_0 + B_1 Educ + B_2 Wealth + B_3 Mstatus + B_4 Age + B_5 HEduc + B_6 Lcn + B_7 Hsize + B_8 R + B_9 Nchld + \varepsilon_i \quad (5)$$

where $Educ$, $Wealth$, $Mstatus$, Age , $HEduc$, Lcn , $Hsize$, R and $Nchld$ represent female education attainment, the wealth index of the household (which is used to proxy for wage in the theoretical framework to avoid selection bias given that the non-participating individual is allocated 0), marital status, age, husband's education level, women's residence (location), household size, religion and presence of children under six years in the home, respectively.

To examine the female occupational choice, we estimate a multinomial logit model. A multinomial logit regression model was formulated with sex, education attainment, residential, marital status, region of residence, household size, husband's education, wealth and the age of the individual as the explanatory variables. The dependent variable is FLFP takes on three values for the multinomial logistic model coded as follows:

0 = unemployed; 1 = participating in the informal sector and 2 = participating in the formal sector.

Data source and description

The study is based on a nationwide data from the 2010 GPHC collected by the GSS. The 2010 GPHC provides information on population and housing characteristics for the entire country, the 10 administrative regions and the 170 districts that existed in Ghana at the time of the 2010 census. The 2010 Census was a de facto count and each individual present in Ghana, irrespective of nationality, was enumerated at the place where he/she spent the midnight of 26 September 2010. The data compiled from the census exercise yielded a population of 24,658,823, with 5,467,136 households in Ghana and with an average household size of 4.4. The distribution of the population by sex indicates that the male population is 12,024,845 and the female population is 12,633,978. Of the population aged 12 years[1] and older, 42.9 per cent were married while 42.0 per cent had never been married. In addition, 10.2 per cent had been married before but at the time of the census were separated, widowed or divorced. The census figures indicate that 28.5 per cent of the population of 15,208,425 aged 15 years and older has never been to school. The proportion currently attending school and those who have attended school before are 16.6 and 54.9 per cent, respectively. The proportion of the population which has never attended school in the rural areas (33.1 per cent) is more than two times that of the urban areas (14.2 per cent). There is also a marked difference between males (21.6 per cent) and females (34.7 per cent) who have never attended school.

The GPHC data show that of the total population of 15,208,425 aged 15 years and older, 71.1 per cent is economically active (employed and unemployed) while the economically not active population (not employed, not seeking nor available for work) constitutes 28.9 per cent. Of the economically active population, 94.7 per cent are employed while the unemployed (i.e. those without work but are seeking and available for work) make up 5.3 per cent. The proportion of males who are economically active (72.8 per cent) is slightly higher than females (69.6 per cent). Females, on the other hand, are more likely to be unemployed (5.8 per cent) than males (4.8 per cent).

In this study, we used a sample of 10 per cent of the female economically active population aged 15 years and older as our working sample. This constitutes 555,879 samples (see Table I). The sample was selected conditional on being a female belonging to the economically active population so that the effects of education on FLFP are investigated.

Studies of women in developing countries from the literature endorse common individual and household characteristics that tended to constrain the female labour force from fully participating in the labour supply. To account for these limitations, data on households' composition such as the number of children, the size of the household, husband's level of education attained, the marital status, the location of the female participant, whether she is located in urban or rural Ghana, and the age were collated. Following the work of Sackey (2005) and Ackah *et al.* (2009); and to account for the parabolic relation between age and life-cycle, the squared age is used as an explanatory variable.

4. Results from the study

A description of the data is first carried out to give a vivid explanation of the nature of the data set used in the study and the percentage distribution of the variables employed. The results are presented in Tables I and II, respectively, for the descriptive statistics and the logit regression analysis.

Participation rates presented in Table I are high, which we define to include both employed and unemployed female who are actively looking for work. The rate 71.1 per cent is however lower than the rates reported by Sackey (86.9 per cent) and Ackah *et al.* (82.2 per cent) in 2005 and 1992, respectively. The sample figure of employed, which constitutes those who worked for pay, those who did not work but had job to go back to, and those who did voluntary work without pay represented 93.6 per cent compared to the census figure of 94.2 per cent. The high

IJSE	Participation	Numbers	Percentage
44,11	<i>Census</i>	7,982,524	100.0
	Economically active	5,558,794	69.6
	Employed	5,237,942	94.2
	Unemployed	320,852	5.8
	Not economically active	2,423,730	30.4
1498	<i>Sample – educational qualification</i>	555,879	100.0
	No education	199,838	35.95
	Primary	72,876	13.11
	JHS	195,614	35.19
	SHS	67,873	12.21
	Diploma	11,173	2.01
	Degree	8,505	1.53
	<i>Sample – economically active</i>		
	Employed (93.6%)	520,303	93.6
	Unemployed (6.4%)	35,576	6.4
	<i>Unemployed – level of education (6.4%)</i>	35,576	100.0
	No education	6,639	18.66
	Primary	5,333	14.99
	JHS	13,647	38.36
	SHS	7,752	21.79
	Diploma	1,316	3.70
	Degree	889	2.50
	<i>Employed – formal-level of education (8.99%)</i>	46,775	100.0
	No education	2,690	5.75
	Primary	1,913	4.09
	JHS	8,700	18.60
	SHS	18,888	40.38
	Diploma	7,872	16.83
	Degree	6,712	14.35
	<i>Employed – informal-level of education (91.01%)</i>	473,528	100.0
	No education	190,500	40.23
	Primary	65,631	13.86
	JHS	173,264	36.59
	SHS	41,197	8.70
	Diploma	1,989	0.42
	Degree	947	0.20

Table I.
Distribution of labour force participation, education attainment, sector participation

Source: Computed by the authors from GPHC data set (2010)

level of participation rates is driven largely by the informal sector which accounts for 91.01 per cent is highly influenced by the rural economy which is predominantly female owned peasant farming. The formal sector accounts for less than 10 per cent of the female participation rate basically made up of public employment and private formal. This indicates that the majority of women participants are in the informal sector and signifies that the sector significantly plays a vital role in the welfare of women in Ghana.

Using the information on the highest education qualification obtained, we define six categorical education indicators as per the census data: none, primary, junior high secondary (JHS), senior high secondary (SHS), diploma and degree. Table I also shows that a strikingly almost 36 per cent of the sample had received no schooling or had not completed primary education. The percentage of those who completed primary school was 13 per cent, JHS was 35 per cent, SHS was 12 per cent, only 2 and 1.5 per cent had attained diploma and degree qualifications, respectively. The findings further show that overall a large proportion of females in the labour market (95 per cent) had only attained SHS as the highest education qualification or had received no schooling at all.

Variable	Coefficient	Marginal effect	Female labour force participation
Education			
Primary	0.411*** (0.0657)	0.201*** (0.00367)	
JHS	0.247*** (0.0563)	0.109*** (0.00256)	
SHS	0.570*** (0.0666)	0.297*** (0.00417)	
Diploma	0.723*** (0.116)	0.426*** (0.0902)	
Degree	0.552*** (0.138)	0.301*** (0.00942)	
Wealth	-0.0220*** (0.00608)	-0.001*** (0.00026)	
Age	0.159*** (0.1141)	0.0065*** (0.0004)	
Agesq	-0.0015*** (0.0002)	-0.0001*** (0.0000)	
Location	-0.553*** (0.0472)	-0.0235*** (0.00199)	
Number of children	0.206*** (0.0339)	0.0087*** (0.00143)	
Household size	-0.0154*** (0.00457)	-0.00066 (0.00019)	
Marital status			
Married	0.156*** (0.0510)	0.00681*** (0.00228)	
Separated/divorced	0.224*** (0.0840)	0.01039** (0.00422)	
Widowed	0.298** (0.121)	0.01436** (0.00656)	
Region			
Central	0.110 (0.0928)	0.00448 (0.00363)	
Greater Accra	-0.0431 (0.0752)	-0.00186 (0.00328)	
Volta	0.164* (0.0976)	0.00656* (0.00367)	
Eastern	-0.0642 (0.0849)	-0.00279 (0.00378)	
Ashanti	-0.200*** (0.0737)	-0.0090*** (0.00351)	
Brong Ahafo	0.195** (0.0924)	0.00774** (0.0034)	
Northern	0.413*** (0.107)	0.01512*** (0.00336)	
Upper East	0.204 (0.131)	0.007981 (0.0047)*	
Upper West	0.268 (0.160)*	0.0101 (0.00538)*	
Husband education			
Primary	-0.132 (0.0875)	-0.0059 (0.00414)	
JHS	-0.0642 (0.0488)	-0.00277 (0.00214)	
SHS	0.0110 (0.0669)	0.000467 (0.00282)	
Diploma	0.227* (0.124)	0.00873*** (0.00434)	
Degree	0.253*** (0.119)	0.00873*** (0.00407)	
Constant	3.291*** (0.154)		
Observation		555,879	
R ²		0.1012	
GOF test		p-value (0.1920)	
Link test		p-value (0.508)	

Table II. Logit regression for female labour force participation

Results from logit model on female labour participation

The study seeks to find out the determinants of FLFP in labour markets hence a choice model is inevitable. Since for choice models the coefficients cannot be interpreted directly, there is the need for the estimation of the marginal effects. For the continuous independent variables, the marginal effects were computed at their means. For the categorical variables, however, the marginal effects were calculated as the discrete change in the independent variable from 0 to 1. In the first instance, we obtained results related to the marginal impact of a female educational level, marital status and residence on the female participation in the labour force and the result is shown in Table II.

The results show that overall; having some schooling increases the chances of females participating in the labour force. The positive marginal effects for all categories of education attest to that (see Table II). There is no trend however, to suggest that attaining a higher education increases the chances of female participating in the labour force as

suggested by Yakubu (2010). This is in line with Sackey (2005) who concluded that there is no significant difference between females with primary and post-primary attainment of education as far as participation in the labour force is concerned. The probable explanation to this outcome is related to the measurement of participation, which consists of not only a large agrarian sector but also a large informal sector which nearly every female member tends to participate in the labour force by engaging herself in one kind of economic activity or the other.

As indicated in Table II, female marital status exerts positive and significant influence of female participating in the labour market. All things being equal, widowed and divorced women are more likely to be active in the labour market participation than married ones though the later also reports of positive marginal effects. Similar observations were reported in South Africa as divorced women are more likely to participate in the labour force than married females (Yakubu, 2010). On the contrary, Yakubu (2010) reports that being a widow/widower or never married rather reduce the odds of FLFP in South Africa. In Ghana, our data show that self-employment accounts for about 70 per cent of the total female employment. This means that since there is no support system for single mothers in Ghana, the environment placed an obligation on widows to participate in the labour market to provide decent living for their children, which self-employment provide the kind of flexibility for mothers to combine work with household activities.

Another important observation is that, the husband's educational attainment tends to have positive and significant effects on the odds of female participation in the labour market only at the diploma and degree levels. The outcome tends to concur with the hypothesis that marriages tend to involve people with similar backgrounds and that the female working class in Ghana tends to marry their peers. This could be explained by both social and economic considerations.

Age has a non-linear effect on FLFP, increasing first and then decreasing later in life (Sackey, 2005). This assertion remains the same from the current study, that is, age has predictable patterns on the odds of being in the labour force. The only difference in the demographic structure *vis-à-vis* the participation rate is that, the 2010 GPHC data show that about 15 per cent of the prime age categories of 20-24 years participated in the labour market, only second to 25-29 years group (17 per cent). In all, being in the prime age categories 20-54 years tend to be related with higher odds of participating in the market. This is marked different from Ackah *et al.* (2009) who report that being in the prime age categories 35-54 years tend to be related with higher participation odds. The results show that more and more females tend to participate in the labour market in Ghana quiet earlier than the past decade.

Table III reports result on the marginal impacts estimates from the multinomial logit model on FLFP and occupational choice. We estimated the multinomial logit model by defining the labour force status of a female as a dummy equal to 1 if a female is reported participating in the informal sector, two if a female is reported participating in the formal sector and 0 if the female is reported not engaging in any economic activity. Following Sloane and Theodossiou (1996), a female reported as unemployed was omitted (set to 0) for the model to be identified.

Multinomial logistic regression is a choice model. Though the coefficients in choice models can tell us the direction and significance of the relationship between the dependent and the independent variables, they do not say much about the effects of the latter on the former. As a result of this, the marginal effects were computed to form the basis of the discussion of the findings in this study.

The results show that all the estimates are significantly different from 0 with a χ^2 of 13,215.67. The results also show pseudo R^2 of 0.2425, an indication of a measure of good fit of the model. This is supported by the statistically significant LR χ^2 at 1 per cent suggesting the joint significance of the independent variables in explaining the probability of female

Variable	Formal		Informal	
	Coefficient	Marginal effect	Coefficient	Marginal effect
Woman education ^a				
Primary	0.174* (0.119)	0.0243*** (2.56e-06)	-0.415*** (0.0664)	-0.0449*** (0)
JHS	0.658*** (0.0958)	0.0364*** (0)	-0.246*** (0.0570)	-0.0462*** (0)
SHS	2.001*** (0.100)	0.283*** (0)	-0.869*** (0.0670)	-0.309*** (0)
Diploma	2.641*** (0.136)	0.726*** (0)	-2.207*** (0.128)	-0.755*** (0)
Degree	2.669*** (0.159)	0.785*** (0)	-2.519*** (0.170)	-0.807*** (0)
Wealth	0.0575*** (0.00825)	0.00296*** (0)	-0.0277*** (0.00606)	-0.00410*** (0)
Age	0.189*** (0.0150)	0.00171*** (1.51e-05)	0.148*** (0.0115)	0.00525*** (0)
Agesq	-0.00165*** (0.000201)	-9.94e-06** (0.0466)	-0.00144*** (0.000160)	-5.75e-05*** (3.29e-10)
Location	-0.302*** (0.0675)	0.00807*** (7.26e-06)	-0.560*** (0.0492)	-0.0337*** (0)
Number of children	0.121*** (0.0155)	-0.00285*** (2.06e-09)	0.0341* (0.0196)	0.0834*** (0)
Household size	-0.0850*** (0.00805)	-0.00269*** (0)	-0.00939** (0.00455)	0.00211*** (7.66e-11)
Marital status ^b				
Married	-0.220*** (0.0680)	-0.0147*** (0)	0.180*** (0.0522)	0.0225*** (5.86e-11)
Separated/divorced	-0.431*** (0.113)	-0.00858*** (0.000435)	-0.171** (0.0855)	-0.000417 (0.936)
Widowed	-0.617*** (0.158)	-0.0111*** (0.000186)	-0.269** (0.124)	-0.00357 (0.650)
Region ^c				
Central	0.156 (0.123)	0.00188 (0.579)	0.109 (0.0929)	0.00308 (0.562)
Greater	-0.178* (0.101)	-0.00572** (0.0211)	-0.00793 (0.0770)	0.00506 (0.261)
Accra				
Volta	0.207 (0.130)	0.00134 (0.703)	0.178* (0.0979)	0.00647 (0.228)
Eastern	-0.0891 (0.114)	-0.00108 (0.721)	-0.0613 (0.0849)	-0.00189 (0.717)
Ashanti	-0.331*** (0.101)	-0.00552** (0.0295)	-0.176** (0.0745)	-0.00341 (0.468)
Brong	0.321** (0.126)	0.00504 (0.178)	0.195** (0.0923)	0.00365 (0.492)
Ahafo				
Northern	0.730*** (0.156)	0.0125** (0.0217)	0.436*** (0.109)	0.00536 (0.410)
Upper	0.364** (0.185)	0.00502 (0.375)	0.241* (0.130)	0.00535 (0.476)
East				
Upper	0.504** (0.222)	0.00867 (0.220)	0.295* (0.158)	0.00379 (0.672)
West				
Husband's education ^d				
Primary	-0.372** (0.150)	-0.00814** (0.00355)	-0.114 (0.0879)	0.00212 (0.00574)
JHS	-0.252*** (0.0708)	-0.00710*** (0.00176)	-0.0359 (0.0492)	0.00505* (0.00297)
SHS	-0.0636 (0.0845)	-0.00330 (0.00199)*	0.0382 (0.0679)	0.00489 (0.00379)
Diploma	0.276** (0.140)	0.00289 (0.00340)	0.204 (0.128)	0.00592 (0.00639)
Degree	0.279** (0.132)	0.00219 (0.00323)	0.227 (0.125)*	0.00747 (0.00625)
Constant	-5.730*** (0.301)		0.577*** (0.214)	
No. of obs	555,879			
Pseudo R ²	0.2425			
Log likelihood	-20,445.678			
Prob > χ^2	0.0000			
LR χ^2	13,215.67***			

Notes: ^aOmitted category is women with no education; ^bOmitted category is single women; ^cOmitted category is the Western region; ^dOmitted category is husband with no education. Unemployed is the base outcome. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Source: Computed by the authors from GPHC data set (2010)

Table III.
Results from the multinomial logistic regression model for female labour force participation (occupational choice)

participation choice of the market. The results reflect the robustness of the model in explaining determinants of FLFP and employment choice in Ghana.

With respect to education, as expected, all the dummy variables exhibit positive marginal probabilities of labour force participation in the formal sector, but generally negative, much smaller effects in the informal sector. The exception is women with only primary education who are slightly more likely to participate in the informal sector than are women with no education. As the level of education increases, women become more and more likely to participate in the formal sector with marginal effects ranging from 2.4 to 79 per cent.

Women with diploma and degree exhibit the highest marginal probabilities of participation, 73 and 79 per cent, respectively. These two groups are also the least likely to participate in the informal sector. This is probably due to the fact that employment in the formal sector is considered more desirable because of higher wages and fringe benefits. The results are consistent with the findings of Atieno (2006), Rincon de Munoz (2007), Magidu (2010) and Yakubu (2010). They all emphasise that higher level of education increases the opportunities for women to work in the labour market (wage employment) and income producing activities outside the home because of the higher opportunity cost of staying at home indulging in non-market activities. This probably reflects the structural changes and employment shares of the Ghanaian economy in recent times. Data from World Bank (2010) suggests that in 2010 the agriculture sector employed about 40 per cent of the labour force in Ghana in spite of the fact that agriculture contributed less than 30 per cent of GDP, while the services sector which contributed about 50 per cent of GDP also employed almost 40 per cent of the labour force. According to the modernisation theorists, when a country is developing, the contribution of agriculture to national income should decline while that of other sectors, especially manufacturing rises. In the case of Ghana, one can report of a declining agriculture sector that is associated with increasing share of the services sector whilst the manufacturing sector has at best been stagnant. This suggests that Ghana may have leaped the manufacturing boom stage, a stage which is also associated with increased supply of jobs for the many (especially males) who are leaving the agricultural sector. Therefore, investment in the female human capital (through education) has resulted in increased opportunities to work in the expanding services sector and raises the female productivity compared with home production. The effects of education on sectorial choice, reveals that both diploma and degree exert a statistically significant effect on the probability of female labour force participating in the formal wage employment (at 1 per cent level of significance) while the effect is minimal in the formal sector for SHS, JHS and primary category.

The ownership of assets implies a relative degree of security to households and determines household needs. Theoretically the ownership of assets may impact the labour force participation of female in two ways. In one way, the assets make the household richer and financially stable and women are less likely to work. In another way, if the household owns assets, it may be easier for women, specifically in the informal sector to work at household-enterprises and therefore increasing participation. Rincon de Munoz (2007) have used asset value as a proxy for the non-wage income of the household and found that a change in non-wage income has a negative effect on a woman's time allocation in the market as well as at home, since it increases the consumption of leisure. In our sample, more than half the women come from households with assets. The study found that, presence of wealth however, increases the probability of women participating in the formal sector by 3 percentage points, and 4 per cent less likely to work in the informal sector. The possible explanation may be that women from comparatively financially endowed households are less likely to work in the informal sectors where the opportunity cost of participating in the sector is high and therefore unattractive to reveal their preferences for the sector.

The number of children also presents a very significant (at 1 per cent significant level) though relatively small negative impact on women participating in the formal sector but positive impact in the informal sector. This implies that, the number of children in the household significantly reduces the probability of women working in the formal sector by 3 per cent and significantly increases the probability of women working in the informal sector by 8 per cent. The results are consistent with the findings of Rincon de Munoz (2007), Magidu (2010) and Yakubu (2010). The woman's decision for labour force participation is determined to some degree by comparing her productivity at home and in the labour market. Children require constant care, and a woman's productivity at home in this case is evaluated higher than the potential returns from outside work (Olusoji, 2004).

This emphasises an earlier assertion that informal sector's activities may not necessarily conflict with maternal roles. It is interesting to note that only 3 per cent of women with children participate in the formal sector compared to 8 per cent of women in the informal sector. This is as expected because most wage jobs squarely conflict with maternal roles.

Husband's educations (at all levels) do not seem to significantly determine women's labour force participation choice. Apart from women whose husbands with primary and JHS education attainment having between 8 and 7 per cent less likely to participate in the formal sector, all other women whose husbands with varying level of education has no influence over their choice. This goes to confirm the earlier assertion that probably females with higher education tend to be married to men with equally higher education and by inferring the opposite may also be true. If this assertion is true, then the implication is that females with husbands in lower education attainments do not also possess the requisite skills to be engaged in the formal sector of the Ghanaian economy.

7. Conclusion

This study began with the notion that the formal sector of the Ghanaian labour market is said to be male-dominated because employment in the sector is contingent upon participants' education and skill acquisition, requirements that tend to be met more by males than females for various reasons. Therefore overtime, female labour participation is not only prevalent in the informal sector in Ghana, but also tends to exhibit increasing trends in the recent past. However, Ghanaian women have benefited from several institutional and social reforms guaranteeing wider rights and favouring women's emancipation and their contribution to national development. Notable is the Millennium Development Goal 3, a milestone driven by the UN to promote gender equality and empowerment of women by 2015. This paper sought to investigate the new driving factors accounting for female labour market participation and female employment choice of the Ghanaian women, focussing on what has changed after the various interventions aims at meeting the MDGs targets.

Generally, female labour market participation rate is quiet high, a rate of 71.1 per cent is however lower than the rates reported by Sackey (86.9 per cent) and Ackah *et al.* (82.2 per cent) in 2005 and 1992, respectively. The results indicate that education and marital status were found to be significant determinant in influencing female participation in the labour force in Ghana. The choice sector participants who are attracted tend to be influenced by the level of educational attainment. Females with higher levels of education (degree and diploma) exhibit the highest odds of being employed in the formal wage employment sector in Ghana. These constitute only 3.5 per cent and this has huge policy implication. By and large, the informal sector absorbs the large chunk (91 per cent) of the female labour force in Ghana. Agriculture is the predominant employer of female labour; its employment share is 44.7 per cent of the total labour force but its share to the GDP is only 22.7 per cent (GLSS 6). The implication is that the GDP per head of the informal sector of Ghana is quiet low and therefore needs urgent attention. Interventions such as encouraging female education and retraining of self-employed females to improve upon their efficiency ought to be pursued vigorously, addressing the demand side of labour market, developing rural area infrastructures for females to get equal labour opportunities and many others aimed at enhancing the efficiency and by inference earning per head of the informal sector is highly recommended.

Note

1. Data on marital status was only of persons 12 years and older. According to the GSS, the selection of the age limit was based on the average age at menarche and also on the practice in some parts of Ghana where girls as young as 12 years old could be given in marriage.

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