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Determinants of Non-Farm Work Participation in Rural Ghana: Gender Differences for Self-Managed Business and Wage Labor

Ayako Miyazaki[1]*, Atsushi Chitose[1] and Motoi Kusadokoro[1]

This study investigates the determinants of participation in the different types of non-farm activities (self-managed business and wage labor) in rural Ghana, with a focus on gender differences and the availability of various kinds of individually managed agricultural assets. The main results are as follows. The productive assets a woman individually manages had a significantly positive effect on the probability of participation in a self-managed business. However, this relationship was not found in the case of men's participation or in engagement in wage labor of both sexes. Women's own asset management could promote their participation in self-managed businesses.

Key words: intrahousehold resource allocation, non-farm work, Ghana

1. Introduction

Sub-Saharan Africa accounts for over 50% of the world's poor (World Bank, 2016). Participation in non-farm activity is regarded as one of the livelihood strategies to enable rural people to boost their incomes and improve household wellbeing (Reardon, 1997).

In the context of African rural society, intrahousehold resource allocation tends to be decided not only in terms of the household unit, but also on an individual household member basis. This suggests that women's participation in economic activity would rely on their own characteristics such as educational attainment or availability of assets they can manage. Such individual characteristics may be reflected in their internal household bargaining power, as examined by Kurosaki and Ueyama (2002) for the case of agricultural work. This mechanism is functionally equivalent to previous findings in a more general context, namely that women's bargaining position in household decision-making influences their labor market participation (Doss, 2013).

Women's participation in economic activity may also be influenced by social traits. Discrimination resulting from culture or social customs may limit women's chances to enter the labor market (Minniti and Naude, 2010). In many developing countries, women face more constraints than men when they engage in economic activity, despite the fact that their income-earning activity contributes to farm household wellbeing (Doss, 2013).

[1] Tokyo University of Agriculture and Technology
Corresponding author*: s151801y@st.go.tuat.ac.jp

In Africa, productive assets in a household, such as farmland and livestock, tend to be managed individually by multiple family members. Some women in rural Ghana have the right to manage farmland, though the size of such holdings is generally smaller than that of men (Doss, 2002).

The existing literature tells us that various factors influence women's non-farm work participation in rural Africa. In particular, a woman's asset availability seems to matter. It is postulated that the availability of assets managed by women may affect their decision-making regarding participation in non-farm work through two channels. One channel is a positive relationship between asset availability and bargaining power in the household (Doss, 2013). The other channel is a negative relationship between asset availability and resource constraint to participate in non-farm work. Particularly, the latter channel may be the cases where women use income and/or products from their individually managed assets to start self-managed business.

These conjectures motivate us to investigate empirically the role of individually managed assets in women's decision-making regarding non-farm work participation and its effect on labor participation in the different types of non-farm activities. Accordingly, we analyze the case of rural Ghana wherein productive assets tend to be managed individually by multiple family members.

2. Data and Empirical Method

The data were derived from a Living Standard Measurement Survey (LSMS) published by the World Bank associating with Yale University, which implemented the

Ghana Socio Economic Survey 2009/2010. The LSMS has provided a regionally representative sample covering 10 regions: 5,009 households and 18,889 individuals from 334 enumeration areas (EAs). In each EA, 15 households were selected and interviewed. Based on the data composition, household members are defined as persons living together in the same household unit. Hence, children living apart from their parents are not counted on as household members. We selected adult individuals who belong to male-headed households that manage farmland by individual household members (either self or other members) from the total of 18,889 individuals. Our definition of adult is 15 years old or older in age. Since one of our main objectives is to examine an effect of the intrahousehold bargaining on non-farm work participation, we restricted the data to male-headed households, where the bargaining is most likely to be carried out between a male household head and a female spouse. The number of sample individuals amounts to 5,860, consisting of 2,995 men and 2,685 women. Also, note that because the sampled individuals are likely to cultivate farmland managed by themselves individually, we call them "farm individuals" in this paper.

Non-farm activities are categorized into a) employment in the rural non-farm labor market, b) self-employment in the local non-farm sector, c) employment in the migration labor market, and d) employment in the farm labor market (Reardon, 1997). Given the distribution across 4 activity types in our data, we set two types of non-farm work: self-managed business equivalent to b), and wage labor including a), c), and d).

Given the data set of LSMS, gender differences are found to prevail in the labor market in Ghana. Men's main fields of wage labor are service, education, agriculture and transport, while educational work alone accounts for about 50% of women's employment. Women also have a lower participation rate in wage labor: only 2% of total farm females participate in it. On the contrary, gender differences are smaller in self-employment. Regardless of gender, main activities of self-managed business are retail sale of food products, management of restaurants, and processing of vegetables and animals. It should be noted, however, that the different questions were used in the survey to identify each individual's experience of non-farm activity. In the case of self-managed business, he/she was asked if he/she had ever been engaged in self-managed business during the past one-year period. In the case of wage labor, he/she was asked if he/she had ever been engaged in wage labor during the past 7-day period. Therefore, it is highly possible that the data fail to capture casual wage labor particular in agriculture and employment in seasonal migration. Thus, we assume that the data is biased to formal wage labor to some (unknown) extent.

We specify three types of productive asset: land, large animals, and middle/small animals. As mentioned in the section of Introduction, we hypothesize that the availability of such assets will influence women's participation in non-farm work through two channels, namely enhancing bargaining power and mitigating resource constraint.

Other variables are composed of general characteristics of household and individual. The household characteristics are household member size, number of children in the household, and polygamous household defined as the household of which the head has more than one spouse. The individual characteristics are age, education (basic and higher certification), marital status (formally married, consensual union, widowed, divorced, never married, others, and unknown), and relationship to household head (head, spouse, child, and others). "Others" categorized for marital status are those being betrothed or separated, while "others" for relationship of household head include grandchild, parent/parent in law, son/daughter in law, other relative, and adopted/foster/stepchild.

Our empirical analysis strategies consist of the two steps. In the first step, using the male and female observations described above, participations in each non-farm activity are separately regressed by gender on the possible determinants, to compare the gender differences. To deal with the unobservable factors which may arise due to the diversity of ethnic groups, agro-ecological environments, and market conditions in Ghana, the model includes EA dummies and also adopts cluster robust standard errors on EAs.

In the second step, special attention is paid to the effects of household unobservable factors coupled with the above-mentioned two channels (i.e. bargaining power and resource availability) on women's non-farm work participation. To deal with this issue, we apply the household fixed effect model to the female sample, assuming that the bargaining over the participation in non-farm activities is carried out between women and the household head. This is because even though women's participation in non-farm activities were affected by their asset availability, it is not yet clear whether the bargaining

power of women works unless the bargaining against whom is defined. The household fixed effect controls for unobservable factors of household and more aggregated levels. Because the characteristics of household head are also absorbed by the fixed effect, the results can be interpreted based on the assumption of bargaining between household head and women.

Since the household fixed effect model utilizes the variability of variables within household, the female sample is restricted to those who live together at least with one another women aged 15 years old or over. Recall that the sample is restricted to the individuals in male-headed households to focus on the common bargaining between a male household head and a woman. This selected data set contains 1,529 observations.

In addition, woman's land share (woman's land size/household's land size) is introduced as an explanatory variable in an attempt to capture an effect of women's intrahousehold bargaining power on their non-farm work participation. Land share might serve as a proxy variable for women's bargaining power so that its effect on non-farm work participation can be examined separately from an effect of land size on it. An effect of land size is viewed as a resource availability effect, and it is a mirror of a resource constraint effect in a more general setting. Because the structure of the original data does not allow us to specify the assets managed by a household unit, household's farmland size is a total of multiple household member's farmland sizes.

Despite the discrete nature of dependent variables, linear probability models are applied to all regressions instead of discrete choice models such as probit and logit. The main reason is that the linear probability model can be easily combined with the household fixed effect model without causing bias on the estimated coefficients when the model is linear (Bandiera, 2007).

Table 1. Descriptive statistics of variables by gender

Variable	Variable Description	Male (n = 2,995) Mean	Male (n = 2,995) SD	Female (n = 2,685) Mean	Female (n = 2,685) SD
	Dependent Variables				
Self-Employment	1 if the individual manages self-owned business, 0 otherwise	0.09	0.28	0.16	0.36
Wage Labor	1 if the individual works for wage labor, 0 otherwise	0.09	0.29	0.02	0.12
	Independent Variables				
Asset					
Land Size	Self managed land size (ha)	2.29	5.07	0.07	0.51
Land Share	Land share in the household	0.67	0.46	0.03	0.14
Large Animal	1 if own possessed large animal, 0 otherwise	0.28	0.45	0.06	0.24
Middle/Small Animal	1 if own possessed the middle or small animal, 0 otherwise	0.31	0.46	0.10	0.30
Other Variables					
Household characteristics					
Household Size	Number of household member	5.50	2.96	6.26	2.92
Household Land Size	Total land size in the household (ha)	3.61	5.89	3.65	6.14
Polygamy	1 if the household practices polygamy, 0 otherwise	0.13	0.33	0.22	0.41
Number of Children	Number of child member in the household	2.21	1.95	2.67	2.05
Individual characteristics					
Age	Age for individual	39.60	18.63	36.89	16.37
Education					
No Education	1 if the individual has no educational certification, 0 otherwise	0.66	0.47	0.83	0.37
Basic	1 if the individual acquires basic certification, 0 otherwise	0.26	0.44	0.14	0.35
Higher	1 if the individual acquires higher certification, 0 otherwise	0.08	0.27	0.02	0.15
Marital Status					
Formal Married	1 if the individual has been married formally, 0 otherwise	0.57	0.49	0.68	0.47
Consensual Union	1 if the individual has consensual union, 0 otherwise	0.07	0.25	0.07	0.25
Divorced	1 if the individual has divorced, 0 otherwise	0.03	0.17	0.00	0.05
Widowed	1 if the individual has widowed, 0 otherwise	0.02	0.12	0.05	0.22
Never Married	1 if the individual has been never married, 0 otherwise	0.30	0.46	0.18	0.39
Others	1 if the individual has been separated or betrothed, 0 otherwise	0.01	0.08	0.00	0.04
Unknown	1 if the individual has no specific marital status, 0 otherwise	0.01	0.09	0.01	0.11
Relation to Head					
Household Head	1 if the individual is a head of household, 0 otherwise	0.70	0.46		
Spouse	1 if the individual is a spouse of the head, 0 otherwise			0.73	0.44
Child	1 if the individual is a child of the head, 0 otherwise	0.25	0.43	0.18	0.38
Others	1 if the individual has other relation to the head, 0 otherwise	0.05	0.21	0.09	0.29

Note: 1) The minimum legislated age for entering primary school in Ghana is 6 years. Moreover, a new entrant will have to spend about 9 years to qualify to sit the Basic Education Certificate of Examination (BECE) or 10 years in the case of the Middle School Leaving Certificate (MSLC) before the 1987 Educational Reforms. In our analysis, "Basic" indicates possession of the Basic Education Certificate of Examination (BECE) and the Middle School Leaving Certificate (MSLC), while "Higher" indicates the acquisition of the certificates higher than the above.

3. Results

Table 1 summarizes the definition of variables of interest in our analysis and their descriptive statistics. It is found that a self-employment rate for females is higher than that for males. Contrarily, the participation rate for wage labor is much lower than males. Comparing means of other variables reveals the distinct features regarding gender differences. First, large gender differences exist in individually managed asset availability: men have the greater availability of farmland and livestock than women. Second, gender differences are also pronounced for education. The percentage of men with an educational certificate is much higher than for women. It is hypothesized that these gender differences are reflected in behavioral differences by gender in participation in non-farm work.

1) Gender differences and determinants of asset management on non-farm activities

Table 2 presents the estimation results for determinants of engagement in self-managed business and wage labor for men and women. The coefficients for religion and EA dummies are not reported in the table. The standard errors reported in the table are the cluster robust standard errors on EAs. Note that household head is used as a base category for the relationship to the household head in the models for males and spouse as a base category in the models for females. The estimation results reveal that the availability of individually-managed assets has no significant effect on participation in self-managed business and wage labor for both sexes. Even though we assumed that productive assets would positively affect non-farm work participation, these results did not support our expectations. One plausible reason for this is that because managing larger farmland or more animals might need more time on a farm, it is likely that the availability of productive assets might have a negative impact on non-farm work participation. Thus, the expected positive effect of asset availability was offset by such a negative impact.

Regarding other variables, education has a significantly positive effect on wage labor regardless of gender. Educated people tend to participate in the non-farm labor market in rural Ghana, which is consistent with the previous studies (Barrett *et al.*, 2001). Being household head has a positive effect on wage work participation for men. In the case of women, older women are more likely to participate in self-employment. Polygamy is found to have a significantly negative effect on women's self-managed business; however, it has a significantly positive effect on men's participation in wage work. This can be characterized as a striking gender difference in labor participation in rural

Table 2. Estimation results for determinants of engagement in self-managed business and wage labor by gender

	Self-Managed Business				Wage Labor			
	Male (n=2,995)		Female (n=2,685)		Male (n=2,995)		Female (n=2,685)	
	Coef.	Robust (S.E.)	Coef.	Robust (S.E.)	Coef.	Robust (S.E.)	Coef.	Robust (S.E.)
Asset								
Land Size	0.003	(0.002)	0.017	(0.021)	0.000	(0.001)	-0.004	(0.002)
Large Animal	-0.003	(0.018)	0.066	(0.043)	-0.016	(0.017)	0.017	(0.013)
Middle/Small Animal	0.007	(0.016)	-0.004	(0.030)	-0.021	(0.014)	-0.017	(0.011)
Other Variables								
Household Size	-0.006	(0.005)	0.010	(0.006)	0.002	(0.004)	0.002	(0.002)
Polygamy	-0.001	(0.018)	-0.065**	(0.027)	0.025*	(0.013)	-0.006	(0.007)
Number of Children	0.009	(0.007)	-0.006	(0.008)	-0.005	(0.005)	-0.001	(0.002)
Age	0.002	(0.002)	0.008***	(0.003)	0.001	(0.002)	0.001	(0.001)
Age^2	-2.52E-5	(2.18E-5)	-9.95E-5***	(2.81E-5)	-3.85E-5*	(2.13E-5)	-6.11E-5**	(5.64E-6)
Education								
Basic	0.027*	(0.015)	0.029	(0.025)	0.037**	(0.017)	0.006	(0.009)
Higher	0.027	(0.024)	-0.037	(0.058)	0.239***	(0.030)	0.241***	(0.063)
Marital Status								
Consensual Union	0.030	(0.030)	-0.006	(0.041)	0.031	(0.033)	0.011	(0.015)
Divorced	-0.011	(0.040)	-0.004	(0.107)	0.043	(0.045)	-0.010	(0.031)
Widowed	-0.075**	(0.033)	-0.016	(0.060)	0.041	(0.051)	-0.002	(0.010)
Others	0.051	(0.101)	0.107	(0.190)	0.059	(0.110)	0.009	(0.008)
Never Married	-0.036	(0.022)	-0.062	(0.042)	-0.037	(0.028)	-0.003	(0.007)
Unknown	-0.080**	(0.036)	-0.037	(0.052)	-0.058*	(0.034)	-4.54E-4	(0.005)
Relationship to head								
Child	-0.031	(0.028)	-0.074	(0.045)	-0.106***	(0.033)	-0.013*	(0.007)
Others	-0.059**	(0.027)	-0.019	(0.049)	-0.086***	(0.030)	-0.009	(0.010)
EA dummies	included		included		included		included	
Religion dummies	included		included		included		included	

Note: 1) *, ** and *** indicates statistical significance at the 10%, 5%, and 1% levels, respectively.

2) Adult individual observations only from male-headed households are used for the estimation; OLS model is used; standard errors are clustered by enumeration area.

Ghana. Women in the polygamous household might be discouraged to work in the rural non-farm economy.

Asset ownership, especially middle/small animals, may have the endogeneity or reverse causality problem. These problems are considered more carefully for female sample in the next section by introducing the household fixed effect models. Before discussing the results, we estimated the models which excluded a variable of middle/small animal ownership from the above models as a robustness check. The estimation results other than middle/small animal ownership remain unchanged though their results were not presented in this paper.

2) Estimation with household fixed effect model for women's non-farm work participation

Tables 3 indicates the results from the estimation of household fixed effect models for women's participation in self-managed business and waged work. The table reports the cluster robust standard errors on EAs. Recall that land share (woman's land size/household's land size) is specified in the models to capture an effect of women's intrahousehold bargaining power on their non-farm work participation.

Main findings are summarized as follows. First, both farmland size and large animal ownership positively affect self-managed business participation. These estimates are different from those in Table 2, implying that unobservable household fixed effects were negatively correlated with these asset variables and the models without controlling for the fixed effects underestimated the coefficients. However, land share does not influence either self-managed business or wage labor. These results imply that asset availability or resource constraint may be a more important determinant of women's non-farm work participation than their bargaining power against male household heads. For robustness check, we estimated the same model as for Table 2 using the sample used in Table 3. It is confirmed that the estimation results are similar to those of Table 2.

Second, the determinants of women's wage work participation markedly differ from those for self-managed business. Although education is found to be the most important factor for non-farm work participation, its effect differs by non-farm work activity type. Basic education has a negative effect on self-managed business, while higher education positively affects women's wage labor. The results for self-managed business are inconsistent with the results in Table 2. The results for wage labor suggest that getting a job in Ghana's formal labor market relies on individual qualifications such as education levels rather on household position (including asset availability) or social traits. Note, however, that the impact of education might be overestimated because the majority of female wage labors in the original data set are classified as formal wage labors.

Table 3. Estimation results for determinants of women's engagement in self managed business and wage labor (n=1,529)

	Self-Managed Business				Wage Labor			
	Coef.	Robust (S.E.)	Coef.	Robust (S.E.)	Coef.	Robust (S.E.)	Coef.	Robust (S.E.)
Asset								
Land Size	0.030**	(0.014)			-0.001	(0.003)		
Land share			0.023	(0.112)			0.051	(0.057)
Large Animal	0.111*	(0.067)	0.118*	(0.067)	0.027	(0.036)	0.026	(0.036)
Middle/Small Animal	-0.037	(0.049)	-0.045	(0.050)	-0.018	(0.024)	-0.019	(0.023)
Other Variables								
Age	0.010**	(0.004)	0.010**	(0.004)	4.58E-4	(0.001)	3.24E-4	(0.001)
Age^2	-1.11e-4***	(3.96e-5)	-1.13e-4***	(3.96e-5)	-6.21E-6	(1.09e-5)	-5.06E-6	(1.11e-5)
Education								
Basic	-0.109***	(0.034)	-0.112***	(0.034)	0.019	(0.012)	0.019	(0.012)
Higher	-0.040	(0.051)	-0.040	(0.051)	0.192***	(0.064)	0.192***	(0.064)
Marital Status								
Consensual Union	0.027	(0.088)	0.038	(0.088)	-0.053	(0.035)	-0.059	(0.036)
Divorced	0.021	(0.077)	0.033	(0.076)	-0.003	(0.010)	-0.005	(0.010)
Widowed	0.009	(0.096)	0.011	(0.097)	-0.011	(0.013)	-0.013	(0.013)
Others	0.094	(0.076)	0.094	(0.090)	-0.007	(0.010)	-0.024	(0.027)
Never Married	-0.030	(0.049)	-0.029	(0.049)	-0.027**	(0.011)	-0.028**	(0.011)
Unknown	-0.084	(0.068)	-0.082	(0.068)	-0.007	(0.006)	-0.008	(0.006)
Relationship to head								
Child	-0.064	(0.067)	-0.067	(0.068)	0.003	(0.011)	0.004	(0.011)
Others	-0.027	(0.076)	-0.030	(0.078)	0.011	(0.011)	0.014	(0.012)

Note: 1) *, ** and *** indicates statistical significance at the 10%, 5%, and 1% levels, respectively.

2) The sample in Table3 is restricted to females living together at least with another woman aged 15 years old or over in the male-headed household; household fixed effect models are used, and standard errors are clustered by enumeration area.

4. Summary and Conclusion

Women in rural Ghana tend to engage in self-managed business rather than wage work. It also suggests that low education is a main constraint for women from entering the wage labor market. Self-managed businesses are an alternative route for women to improve their economic status and wellbeing.

Applying household fixed effect models, we tested the hypotheses of resource constraint and intrahousehold bargaining power for women's non-farm work participation. We found that a resource constraint is a more important determinant of women's non-farm work participation in Ghana. Women who have the right to manage productive assets are more likely to engage in self-managed business. It implies that development projects aiming to reduce poverty in Ghana by promoting self-employment may need to pay attention to their agricultural asset availability within the household.

In our estimation, the effects of women's intrahousehold bargaining power against a male household head, on their non-farm work participation were not confirmed. The household fixed effect model may not control for individual unobservable factors such as social status of women's blood relationships in local community, which may affect the distribution of agricultural assets within a household. Further research is required to identify their intrahousehold bargaining power with attention to how their assets function in decision-making regarding women's non-farm work participation. Considering institutions associated with the intrahousehold asset allocation may help understand such a decision-making process and their bargaining position.

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