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# Does Microfinance Move the Households Toward Self Employment?

Md. Abdul Khaleque<sup>1</sup>

## Abstract

*The present study is based on 5208 observations, which is comprised of participant households of microcredit programs, non-participant households of program villages as well as non-participant households from control villages. We found that among the participant households 37% depend on wage as well as self employment activity and 20% is solely dependent on self-employment activity and the remaining depends on dual activity (self-employment as well as wage employment), but among the non-participant households 60% is solely dependent on day labor activity. To find the link between occupation selection and microfinance participation, we use simple as well as multiple regression models like logit, multinomial logit, seemingly unrelated regression, etc. The regression results based on earnings from the elective occupations or number of days worked in that occupation suggests that the surveyed participant households have higher likelihood of being self-employed or to maintain self-employment as well as wage employment at a time to increase their welfare. The shifters due to relaxation of credit constraint or proliferation of access to credit moves toward sole self-employment activity with higher likelihood than the dual activity - to be employed in self-employment as well as wage employment within a given time span. In compendium, we can lucidly claim from this paper that beyond the asset structure of the households such as landholdings, savings, education, etc., the microfinance directly induces self-employment activity or transfer available working days from the day labor activity to self-employment activity and maximize their economic gain such as higher income, savings etc.*

**JEL Classification** E24, J22, J23 J24

**Keywords** Credit, Self-employment, Logit, Multinomial logit, Seemingly Unrelated Model

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# Does Microfinance Move the Households Toward Self Employment?

## 1 Introduction

Self-employment has been receiving a great deal of attention recently. Measures to promote self-employment (and small businesses generally), such as employment legislation, large firm and local authority assistance to the self-employed, guaranteed loans etc., are being actively considered by policy makers. The selection of occupation or dependence of the household on the sources of income plays critical role in household livelihood strategy. Households typically depend on either wage income, non-wage income or in some case on both wage and non-wage income due to the demographic composition of the households or the opportunity of economic activity. It is empirically found that the wage dependent households are vulnerable to poverty or any economic shock than the non-wage dependent households. So self-employment activity gains due to high return. Now, the question is that the households having the potency of establishing self employment activity can establish smoothly or easily. From many literatures, it is found that capital constraint locks the innate business capacity. The constraint is severe for the poor or the poorest households. But access to capital of such households opens up a world of self-employment opportunity and moving out of severe poverty or simply poverty.

Finance is essential for establishment or promotion of self employment activity. From the earlier stage of development, credit or loan is playing a crucial role in financing the undertaken project. There was always a latent demand for credit for finance. Some households have access to such credit using pledges. The pledges exclude many of potential poor entrepreneurs from the credit services. The emergence of microfinance has overcome this problem to a great extent and is playing an important role in the promotion of self-employment in traditional activities. The expansion of microfinance in Bangladesh has been rooted in the expectation that it can help generate self-employment, which can ultimately solve both the problems of unem-

ployment and of poverty (Shantana R. Halder). In Bangladesh, BRAC's major programmatic foci are the promotion of self-employment (microfinance, and technical support) and human development (non-formal education and health services) [David Hulme, Karen Moore, 2007]. Prof. Yunus said, "At Grameen Bank, I have tried to demonstrate that credit for the poor can create self-employment and generate income for them". The objective of Grameen Bank was to reduce poverty, to empower women through encouraging the development of new business or the diversification of existing business. Like Grameen Bank, the goal of MFIs as development organizations is to serve the financial needs of un-served or underserved markets as a means of meeting development objectives.

In a World Bank study of lending for small and microenterprise projects, three objectives were most frequently cited (Webster, Riopelle, and Chidzero 1996): (i) to create employment and income opportunities through the creation and expansion of microenterprises; (ii) to increase the productivity and incomes of vulnerable groups, especially women and the poor; (iii) to reduce rural families' dependence on drought-prone crops through diversification of their income-generating activities. The matured microfinance has become successful to a great extent to provide the credit services to the poor or moderate poor, but the major portion of the ultra poor or hard core poor remained underserved. In any country there are un-served or underserved enterprises and households, ranging from the ultra-poor, who may not be economically active, to small growing enterprises that provide employment in their communities. This range or continuum constitutes the demand side for microfinance services. Often the supply side does not offer a corresponding continuum of services. MFIs need to supply services that fill the gaps and integrate the un-served groups into the market (Microfinance Handbook). PKSF develops a loan product apt for those underserved or ultra poor. It is functionally difficult to promote sole self employment activity among the ultra poor households of which majority is dependent on daily wage based activity and hence adopt dual sector - wage and non-wage employment.

This paper seeks to understand the plausible determinants of entrepreneurship from literature first. Then a set of variables and their link with selection of occupation is being analyzed for understanding the plausible pushing factors of self employment and integration of wage employment and self employment. Then it aims at setting the hypotheses and testing the hypotheses using the household level data from Bangladesh. Checking the robustness of findings through using several econometric approaches such

as simple logit, linear regression model, multinomial logit model, seemingly unrelated bi-variate probit model etc., we have determined the link between self-employment and microfinance participation.

## **2 What Determines Promoting Entrepreneurship? Evidence from Literature**

Predominantly, two types of factors influence the occupation selection - to be self employed or wage employed or to be involved in both activities. These two factors are named as "attractive factors" and "influential factors". The attractive factors include high returns to labor, talent or skill; and the influential factors includes human capital, innate entrepreneurial capability, assets, etc. The better access to efficient and effective labor and commodity market, better access to infrastructure such as better communication, access to electricity, etc., play important role in selecting occupation, because large markets for goods; good communications and transportation that facilitate trade. The possibility of entry and expansion, access to capita markets; clear property rights, patent, protection, no expropriation of rents by rent seekers, ability to start firms to collect quasi rents on talent also determines the occupation selection (Murphy, Shleifer, Vishny, 1991).

The individual characteristics of the labor especially entrepreneurial ability, labor skills, attitudes toward risks are the lead determinants of self employment (Richard E. Kihlstrom., Jean-Jacques Laffont, ). Education - the ability enhancer factor - is likely to affect the self-employment/paid-employment choice primarily by reducing the coefficient of variation in self-employment earnings. He mentioned that this can occur in two ways: education serves as a filter such that the more educated are more likely to be uniform in their abilities. They also tend to be better informed, implying that they are more efficient at assessing self-employment opportunities.

There may be age-related and health related shifts in preferences in connection with employment status. The old are less likely to take risks than the young. In addition, the old may also be more averse to the more demanding work entailed by self-employment. Health is expected to affect self-employment primarily through work characteristics. The longer hours and the greater responsibility associated with self-employment mean that the less healthy are likely to find it a more demanding status.

One possible impediment to entrepreneurship is lack of capital (David G. Blanchflower., Adrew J. Oswald, .). This is an appropriate stage at which to consider the role of capital in self-employment. Initial capital, resulting from accumulation, gifts, inheritances or loans, is often required for setting up a self-employed enterprise. It follows that a close-knit family structured towards enterprise is likely to influence the self-employment/employment decision.

After all, the individual's expected probability of profitability of investment often considered as the bottom line of occupation selection. Beyond, profitability of investment, longer period of involvement in labor market, longer period of unemployment, and internal control in the locality, prompts to be self-employed (Evans and Leighton).

### **3 What Are the Plausible Alternative Pushing Factors?**

The households have to be dependent on various economic activities as livelihood strategies. There are some factors that bring the household from low productive economic activity to high productive activity, such as, the level of education of the household members which affects the transition of occupational movement. Generally, with an upgrading education, the household member moves from the low productive farm-wage activity to high productive off-farm-wage activity (Latif, 2001). In the long run, the return on high productive off-farm-wage income prompts to be self employed.

Due to credit constraints hundred plans of the poorest of the poor remain in their thought region, they cannot be brought as true and effective plan in their life. The innate capability goes under utilization. Some of the poor households have a demand for microfinance for making small investments for their self-employment opportunities, but lack of collateral or information exclude them from the access to credit market. As a consequence, due to the lack of financial resources, they were either unable to be self-employed, or, if they had started their own business, suffered from under-financing and were not able to expand their business to a size sufficient to generate in-

Table 1: The pushing factors of self employment

Factors	Wage employ- ment	Self employment or integration of self employment and wage employment
Access to Credit	–	+
Education	–	+
Electricity	–	+
Household size	+	+
Landholding	–	+
Savings	–	+
Migration	–	–/+
Agricultural equipment	+	+
Vulnerable to Monga	+	–
Presence of char	+	–
Participant of MFI	+	+

Note: Assumptions made by the author

comes above the poverty line. On a macro-level, the lack of financial capital for small and micro businesses has been a major obstacle to the small-scale private sector not only in developing, but also in transition and, to a smaller extent, in industrialized economies (Alexander S. Kritikos and Denitsa Vigenina).

## 4 Integration of Wage Employment and Self Employment

The current study is using data on households who belong to the ultra poor group and majority of them were dependent on wage income, mainly on labor wage income. The objective of most the ultra poor program is to reach this group of people and to push them from ultra poor to moderate poor. The ultra poor can be brought to the moderate poor by raising the welfare of the ultra poor households and this can be done by the amelioration of consumption and income of the household. To raise consumption sustainably, the income has to be raised sustainably. But how can the income of

the ultra poor, who are predominantly employed in wage farm activity, be diversified? This question prompts us to draw the attention of the role of MFI in pushing the households towards the integration of wage employment and self employment or self employment only as their livelihood. The income of ultra poor households can be increased by two ways: first raising the local wage rate and secondly, shifting the households from wage activity to non-wage activity or in some cases the integration of wage and non-wage activity. The wage rate can be raised by affecting the local labor market through labor transformation - labor wage based households can be transformed to non-wage based households or the integration of such activity. We can explain why ultra poor have the higher likelihood to be engaged in wage based activity as well as self employed activity. As the ultra poor program target the household which is labor income based, the infiltration of microfinance program prompts the labor income based household to rear cow, goat or poultry. Initially, such program helps the ultra poor household to raise the stock income from non-wage income. This motivation increases the number of earning member in the family, that is, the women who were primarily unemployed, now become self-employed<sup>2</sup>. PRIME<sup>3</sup> increases employment hours, especially among females (Khandker, Khalily, and Samad).

Microfinance is a very different business, though. It is aimed at "micro" businesses which most often involve self-employment in the informal sector, and women make up a large and growing segment of informal-sector businesses (The Economics of Microfinance, Second Edition, Page 216, and Chapter 7). As Emran, Morshed, and Stieglitz (2007) argue in an important rethinking of missing markets, the logic about the lack of credit alternatives can be extended to other missing markets: where women lack adequate access to labor markets, women will value self-employment opportunities all the more-and will have stronger incentives for diligence in repaying loans. Anne Marie Goetz And Rina Sen Gupta argued that credit delivers a range of particular benefits when targeted to low-income women. It is seen as a critical input for increasing women's employment in small-scale enterprises and

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<sup>2</sup>By 2000, fertility in Bangladesh had fallen to nearly three children per woman, a dramatic decline with clear economic and social implications. The change means that women have more time and resources for self employment, and it shows that important transformations were already under way within households well before microfinance burst onto the scene (The Economics of Microfinance).

<sup>3</sup>PRIME is ultra poor oriented program of PKSF, which is implementing this program through its POs in five districts of Greater Rangpur - Gaibandha, Kurigram, Lalmonirhat, Nilphamari, and Rangpur.

is expected to encourage the adoption of improved technology to enhance the productivity of women's homestead-based income-generating activity. Instead of generating the employment opportunity of unemployed housewife or adults, if the main earners of the household engaged solely in their invested paddy husking, petty trade, and livestock rearing, activities, there is a negative return to that labor when it is imputed to the male agricultural wage rate (Hossain, 1984). Livestock fattening and mulch cow rearing are exceptions, because they involve relatively low-intensity labor inputs which can be distributed to other household members, children especially. Nevertheless, livestock rearing offers limited scope for significantly shifting women's rate of market engagement through technological changes or increased employment, and such employment increases household non-wage income. (Anne Marie Goetz And Rina Sen Gupta, 1996)

Sometimes the access to credit encourages the small traders to trade in goods or promote vendor activity. Therefore, access to microfinance transforms the household occupation. The household moves from wage employment to self employment. But such transformation does not take place at night, it takes time. So, in the short run most of the ultra poor households move from wage employment to the integration of wage employment and self employment. In the long run, microfinance program can help some of the households to be solely self-employed. Khandker (2001) tells that microfinance programs support production and consumption by the poor. He opines that easy loan repayment terms level out consumption and help the unemployed to become self employed.

Hossain (2002) shows that the participation in Grameen Bank generate new employment for about one-third of its members. The new employment was generated mostly for the female members nearly a half of whom reported having no productive occupation before joining the Grameen Bank. Thus, one-third of the female members has been changed from domestic workers to income earners. He showed that for male members 7 percent were unemployed before participation in Grameen Bank and they become engaged in new employment of livestock farming. The labor force participation rate has increased and the increased labor force mainly involved with self employment.

## 5 Strategy to Identify Household Occupation and Setting Hypotheses

The sources of household income were used to identify the household occupation. A household is said to be solely employed in wage activity if its entire income comes from wage activity, a household is said to be self employed if its income arrives solely from self-employment activity and a household is considered as mixed employed household if its income comprises from both sectors - wage employment and self employment. We are hypothesizing that a household has the likelihood to shift from wage employment to self-employment or their integration if the participation of microcredit program causes a reduction in the income from wage employment and raises the income from self employment. So, in succinct, our hypothesis is that the participation of microfinance program lowers the household wage income and increases the household self employment income. We have drawn the inference using the logit model, linear regression model, multinomial logit model, seemingly unrelated bi-variate probit model, etc., where the different occupations were used as the outcome variable and a set of variables that are likely to affect the occupation were used explanatory variables. The coefficients of the explanatory variables of the estimated models will give the direction of occupational livelihood.

## 6 Data and Variables

The study used the PKSf-InM (Palli Karma Shahayak Foundation-Institute of Microfinance) census data of 480,918 poor households in the greater Rangpur as its population. The census covered five districts, namely; Kurigram, Lalmonirhat, Rangpur, Gaibandha and Nilphamari. The benchmark survey covered all the Upazilas <sup>4</sup> of Kurigram (except the Kurigram Sadar) and Lalmonirhat districts, ten Upazilas in other three districts - Rangpur, Gaibandha and Nilphamari. Thus finally, the census covered a total of 23

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<sup>4</sup>At present the entire 35 Upazilas of the Greater Rangpur were covered by the PRIME program. Under this program around 8.3 million ultra poor households were brought under coverage.

Upazilas, 209 unions, 2531 villages and 480,918 households.

Multi-stage cluster sampling technique was adopted to draw the sample from the census data. In the first stage, district was considered as the primary sampling unit, Upazila as the second stage sampling unit, union as the third, village as the fourth and households as the ultimate or final stage sampling unit.

In the first stage, we considered the entire five districts of greater Rangpur in our sample implying that sample households will represent all the five districts. In the second stage, at least two Upazilas were selected randomly. This constituted 16 randomly selected Upazilas (about 70 percent) out of 23 Upazilas. The selected Upazilas consisted of 133 unions. In the third stage, 40 percent of the unions or at least three unions, whichever is lower, from each chosen Upazila were selected. The selected numbers of unions were 61 (about 46 percent). The selected unions constituted of 701 villages which became the population for the fourth stage. Around 30 percent or at least two villages from each union were selected randomly. The numbers of villages selected were 271 (about 39 percent). Finally, at least 10 households were selected randomly from the villages having a maximum of 150 households and 7.5 percent of the households from the villages having more than 150 households. Therefore, ultimately 5,240 households among the population of 62,520 households were selected from the chosen villages. Through interview method, we could cover 4,606 households. Rest of the households was not completed due to several reasons such as unavailability due to migration, problem with FGD numbers, etc.

Twelve Upazilas in Rangpur, Gaibandha and Nilphamari in 2008 were not under PRIME. Therefore, these became the population for selecting control Upazilas. We used the multi-stage sampling technique to select control households. In the first stage of sampling we randomly selected four Upazilas (around 33 percent). In the second stage 10 unions (about 20 percent) were randomly selected from the population of 49 unions of the four Upazilas. From these selected unions, 40 villages were found as control villages. Out of 40 villages, in the third stage, 27 villages were selected. Total 5726 households were selected from the villages. The ultimate sampling unit covers about 13 percent of the selected villages. Hence, we selected 702 households from the control villages.

Table 2 gives the summary statistics of controls used for analysis in this

paper. We find that about 56 percent of the ultra poor household is associated with the microfinance program. Among the MFI members, near about 80 percent households are partially or fully dependent on wage income while among the non-members this is almost 86 percent. The mutually exclusive statistics suggests that among the microfinance member the number of wage income dependent households is lower than among the non-member. We find that about 43 percent of the MFI borrowers are solely dependent on wage income while about 60 percent of non-borrowers are solely dependent on wage income. On the other hand, about 20 percent of microfinance borrower is solely dependent on income from self employment and this is only 14 percent among the non-borrowers. As among ultra poor, majority is dependent on wage income (about 83 percent at different degree or about 50 percent solely), the access to credit facility probably exposed the households to keep income from wage employment and to establish a self employment activity and this leads the households to be dependent on the wage income as well as income from self employment. The data suggests that near about 37 percent of the borrowers have diversified income while 26 percent of non-members have diversification in their income. In terms of average age of household head, average education level (years of schooling), household size, access to electricity and government support, the intention of migration and advanced labor sale, there are a little bit differences among the member and non-member of microfinance program. However, the access to microfinance services helps the members to save and earn income more than the non-members and this produces a difference between members and non-members of MFIs.

Table 3 represents the summary statistics based on occupation categories. We found that the average income of sole self entrepreneurs is higher than that of wage income based households or than that of income from wage and enterprise. Almost 65 percent of the self employment based households are associated with microfinance program, while about 48 percent of the wage income based household keeps link with microfinance program and on average 64 percent of the households who are dependent on wage and self enterprise income has link with microfinance program. The households of each occupation category of the study have head of same aged person, but the education level of the head belonging to the self enterprise group have better education level than the other two groups of households. The self employment group has higher access to electricity, landholdings, agricultural equipment and higher amount of household savings. About 19 percent of the self enterprise based households lives in char, on the other hand, 29 per-

cent of the wage income based households live in char area. Among the self entrepreneurs the migration rate (9 percent) is lower than wage labor (28 percent).

## 7 Econometric Model and Estimation Strategy

The model presented in the following section is based on a binary representation of the employment status decision. It allows the employment status decision and the earnings in each option to be determined simultaneously while at the same time allowing for the influence of unmeasured attributes. The econometric specification is necessarily tailored to the data used.

Assume that there are three employment options available to each individual head of household: self-employment, paid employment or paid and self employment within a given period of time. There are, of course, several important features of self-employment that distinguish it from paid employment, and it is worth considering them in some detail. Self-employment is, generally, regarded as being more risky than paid employment and, in fact, our data show that the coefficient of variation of self-employment earnings is over two times that for paid employment. Thus, we will assume that the individual will take into account both the mean and the variance of earnings associated with each alternative. Given that self-employment is more risky, attitudes to risk will matter. Thus, *ceteris paribus*, a less risk-averse individual is more likely to choose self-employment.

We are primarily trying to establish a linear relationship of a set of explanatory variables with the annual total wage income and self employment income separately using the ordinary least square method.

$$y_j = \alpha + x' \beta + \epsilon_j \quad (1)$$

Here,  $j$  indicates the sector. The term  $y_1$  is the wage income and  $y_2$  is the self employment income. The vector  $X$  includes a set of individual characteristics, household characteristics, and regional dummies and  $\epsilon$  is the stochastic disturbance term. We will first regress the wage income on the set of explanatory variables and then regress the income from self employment

on the same set of explanatory variables, assuming that the disturbance term  $\epsilon_1$  and  $\epsilon_2$  does not affect each other.

Although the two regressions seem unrelated, the two error terms of the two regressions may be correlated and hence the correlated contemporaneous error terms correlate the two regressions. Therefore, to get consistent and efficient estimates we have to consider the contemporaneous error correlations. Seemingly unrelated regression models captures the (contemporaneous) errors associated with the dependent variables.

## 8 Results

The simple two variables model (income of the households or total working days as dependent variable and membership of MFI as explanatory variable) shows the lucid link between self employment activity and microfinance. It is seen from table - 4 that the annual average wage income of the household declines among the MFI members, but the income from self employment tends to increase. Such finding suggests that there is a clear substitution between wage employment and self employment. However, rather than complete substitution of the occupation, there may have juxtapose of wage employment and self-employment in the households and the result reveals that the income of this group also increase with the participation of the microfinance program. Analogous findings are found in the analysis when we keep total annual working days as regressand and MFI membership as regressor, which is, the total working days as wage employers decline and increases the number of self employment workings days. The increase in total working days is pronounced for the households which have both types of occupation - wage and self employment activity.

The multiple regression analysis shows the same findings of the two variables regression analysis. The result suggest that among the young head the tendency to be self employed is higher than the aged-head and this is consistent whenever we incorporate the district level fixed effect in the regression model. The higher level of education prompts the head of the household to be solely employed in self-employment activity which is clear by the negative signs of the models where wage employment or wage employment and self

employment were used as regressand.

### **8.1 Likelihood of choosing different occupation: Earning Approach**

Working right is an important human right. There are two ways of employment based on opportunity, which are wage-employment and self-employment. Table 4 shows the role of MFI in choosing occupation of household. In other way, we may say that table shows us the diversification or the comparability between the mentioned categories (e.g. wage-employment and self-employment). Our prime objective of this type of view is to find out that "Does any drastic change may lie due to the any household member association with MFI?" Our conviction is that the MFI association veers the household from wage-employment to self-employment. In this view, the logit model is constructed where "any association with the MFI (i.e. any household member is a member of MFI)" considered as the explanatory variable and the counterpart variables are 'wage-employment only', 'self-employment only', and 'wage and self employment'. In this table, the logit coefficient for wage-employment is -0.0681 which means, with other variables held constant, that if 'Any household member is a member of MFI' increase by a unit, on an average the estimated logit i.e. the likelihood of being wage employment decrease by 0.068 point. Moreover, suggesting that the result is statistically significant at the level of 1% significance as well as the negative sign of the co-efficient divulges the negative relationship between two variables.

Nonetheless, the Logit provides the converse result for the remained dependent variables e.g. 'self employment only' and 'wage and self employment', both of them assert the positive relationship between explanatory variable and suggesting the highly statistically significance with 1 % level of significance. In case of 'self-employment only', the logit coefficient is 0.426 which means per unit increase in MFI association by household member increase the estimated logit by 0.43 point, advocating the result with 1% level of significance. Sometimes the MFI covered member involving both with the wage employment and with self-employment. The logit coefficient for this variable is 0.506, which implies, with other variables held constant, if any household member is a member of MFI increase by a unit, on an average

the logit coefficient is increased by 0.506 point.

## 8.2 Likelihood of choosing different occupation: Labor Supply Approach

Using the working days approach, the role of MFIs on choosing the occupation of household is intensified in the lower portion of the table 4, the explanatory variables and explained variables are as per the income based approach. In addition, the objectives of such regression analysis are same as the former one and covet to see "Is there any deviation lies in this approach?" or the result carries out merely the previous result. Clearly, there is no distinct difference between the income based approach result and working based approach result, the only difference comes in terms of magnitude of the logit coefficient.

Working days approach shows that the effect of explanatory variable (MFI associated household member) on explained variable (wage-employment only, self-employment only and wage and self-employment) is statistically significant at 1% level of significance. The MFI membership creates the negative result on wage employment which means due to per unit increase of working day the average income is decreased by 0.8 (approx.), the self-employment would be increased as well as "wage and self employment" also been increased by 0.639 point.

The results of maximum-likelihood estimation for the logistic regression model are presented in the Table 5. To identify the determinants of occupational selection of the household several logit regressions for the probability of a work-transition is postulated here. Specifically, separate estimation is made up for each type of selection. The logit coefficients are used to determine whether there any differences in household socio-economic characteristic veers them to the work transition. Table 5 shows many of the common explanatory variables such as- socio-economic, financial and natural features used to describe the occupation selection. The basic interest of our discussion is to explore the role of MFI's membership on the previously mentioned employment categories.

As a determinant of the occupation MFI membership plays an important role in this present study. The coefficient of ' any household member

is a member of MFI' is negative and highly significant. The probability of wage-employment falls by 0.497 points for non-association with MFI and suggesting result is significant at 1 percent level of significance. Nevertheless, the same explanatory variable represents the opposite result if we regress against the self-employment on the same set of explanatory variables and in this case, the logit coefficient is 0.350, which means for an additional member association with MFI resulting 0.350-point increase in probability of being self-employed as well as the result is significant at 1 percent level of significance. The coefficient of 'any household member is a member of MFI' is also positive and significant at 1 percent level with 0.366 point.

The coefficient of the variable household head age is positive and significant at different level among three explained variables "wage employment only", "self-employment only" and "wage and self-employment". The wage-employment increases by 0.01 point as the age of household head increase but "self-employment" and engaging in both "self and wage employment" decreases in response to age increase and in both case result pursue the 1 percent level of significance. This result confirms the finding of (Rees and Shah, 1989)

Education plays an important role in improving human capital. The coefficient of the variable for 'wage-employment only' is negative and significant with 5 percent level of significance, which implies that the probability of being wage employed falls as the individual attain schooling, they would rather like to engage them on self-employment as a result the co-efficient of variable for "self-employment only' bears the positive (0.041) result with 1 percent significant level. As the coefficient value of the variable present the insignificant result.

The logit coefficient of household size and electricity exerts the negative relationship on wage-employment and the result is significant. But the positive relationship has observed for the self employment only and wage and self-employment which suggest that access of electricity and larger household posses the higher probability to engage them on self-employment only, in other sense- the household with greater member and having electricity engage them self in both kind of employment.

The coefficient of "household's agricultural equipment number"; "asset sale" generates the negative effect on wage-employment where the result of former one is insignificant but the later one is significant at 5 percent sig-

nificance level. The underlying reason of the negative relationship between wage-employment only and the asset sale is that for enthusiasm towards self-employment people sell their asset and invest their money in self-employment sector. For the self-employment the result is positive for "asset sale" without any kind of statistical significance but negative for the "household's agricultural equipment number" with 5 percent significance level.

Importantly, the logit co-efficient of "migration" and "Government support" bears insignificant result for wage-employment but significant result for the "self-employment only" and "wage and self employment". It is mentionable that the explanatory variable migration exerts positive relationship but the government support exerts negative relationship with wage-employment where the latter one indicates the "Government support" ply wage employer on the way of self-employment. For the "self-employment only" both of "migration" and of "government support" generates the negative result but the result of same variables on "wage and self-employment" produce the positive result.

Explanatory variables "Presence of char" and "vulnerable to monga" shows the statistically significant result among three occupation selection categories- "wage employment only", "Self-employment only" and "wage and self employment". The coefficient of presence of char is positively correlated with the wage employment with 0.0446 point, which means that for the inhabitants of char area, the likelihood of being wage employment is increased by 0.446 point. However, in the counterpart the "self-employment only" take the negative result for the same variables. Notably, the coefficient of "presence of char" express negative result for "wage and self-employment" with 10 percent level of significance.

The aforesaid explanation for logit coefficient is found under the condition of non-fixing of the district level. If we fix the district level then we find that the result of all estimation is more or less same as the result found in the previous case, what is the difference is the significant level among different occupational selection categories.

Table 6 is constructed by using estimation result that reported for the district dummy and the explanatory variables. In this case, the explanatory variables are same as the table 5. Table 6 shows the working days based estimation to proximate determinants of occupation selection. In working days approach the regression does not result so much drastically different from

the previous table 5 but in some case of explanatory variables the change take place such as- "Household Head's year of education"; " Household head's agricultural equipment"; " savings" and Government support". For "wage-employment only" the logit co-efficient of "Household head's educational year" is 0.13, which is negative and insignificant but under the same consideration the estimation based on income says the different what is significant.

Again, according to the income based approach, with or without fixing the district dummy, the logit coefficient of "Savings" posses no value among the different occupational selection categories but accordance with the working days based approach, invariable with using district dummy the same explanatory variable "savings" posses significant value against overall occupational selection categories. In addition, "government support" and "presence of char" also produce the insignificant result for the wage employment only in relation to the working days approach estimation where as in the income approach point of view the regression result is more significant.

### **8.3 Likelihood of choosing different occupation: Multinomial Approach**

There is a difference in likelihoods of choosing a occupation - day labor (wage income), self-employment (non-wage income) or both within a given span of time say a year. For getting the results, we have considered the day labor activity as the base occupation and the remaining two as the alternative occupations within a given time. Since the coefficients of base category are set to zero, we can simply interpret the coefficients of the alternate outcome as the difference in likelihood of choosing the occupation.

Table 7 represents the logit based multinomial choice of occupation selection. We found that the participation in microfinance program positively prompt the households to be self employed or to maintain the dual activity - wage as well as non-wage activity. The results show that compared to wage employment, the participation in microfinance program prompts the households to be solely self-employed and in some cases prompts them to be engaged in both activities. The relationships of occupation choice and participation of microfinance program are statistically significant at 1 percent level of significance.

Number of available labor (to be wage employed or self employed or both) in the household typically induces to be engaged in self employment activity than wage employment activity. The ecological vulnerability as well as economical vulnerability reduces the likelihood of choosing self-employment activity.

The marginal effects suggests that the participation of microfinance program reduces the likelihood of being employed in wage based activity (-0.117) and among them who shifts from wage employment to non-wage employment (0.044) less than half of them become solely dependent on self-employment activity and the remaining part choose both self-employment and wage employment activity. Having access to electricity also reduces the likelihood of being wage employment (-0.09) and among those shifters, majorly concentrate on self-employment activity than the dual employment (wage and non-wage).

#### **8.4 Is there any link between wage and self employment? Findings from Seemingly Unrelated Bi-variate Probit Regression**

In rural economy, the households led by single or multiple earners are involved with several types of occupation as their livelihood. It is a common picture that the marginally landless farmers had to cultivate land and earn crop income as well as in other time s/he had to work as day labor. This statement tells that there is tendency among households to be employed in self employment activity and wage employment activity within a given period of time. Therefore, it is rationale that there is link between wage employment and self-employment. The models defined by equation (1) tells that the equation for wage employment and the equation for self-employment are unrelated, that is, income from self-employment or labor supply for self-employment has no link with wage employment. The seemingly unrelated bi-variate probit results suggest that participation of microfinance promotes self-employment activity and reduce the wage employment aspiration. We found a relation between the wage employment equation and the self-employment equation.

The predicted probability shows that on an average the participant households have 0.374 probabilities to be engaged in wage and self employment in a year, while this is 0.264 for the non-participant households. The probability of sole self employment is higher among the participant households than the non-participant households, where as the probability of wage employment is lower among the non-participant households. The difference in Univariate (marginal) predicted probability of self employment between self employment and wage employment is almost 0.17. The results also show that conditional (on self employment) predicted probability of wage employment is almost identical between wage employment and self employment, that is, the self employed households has less incentive to engage in wage employment. But the conditional (on wage employment) predicted probability of self employment is higher for the microfinance participant households than the non-microfinance members. This difference may be due to occupation transformation or increasing household level self employment activity through the utilization of productive credit (Table 11).

## 8.5 Implication based on policy variables

The finding suggests that the shifters from wage employment to other alternatives due to access to credit undoubtedly reveals that expansion of microfinance program has positive impact on generation of self-employment activity or development of such activity through expansion or renovation and improves the welfare of the self-employed households. Such transformation also improves the welfare of the wage dependent households through increase in wage in the labor market. Therefore, to receive the maximum benefits from expansion of microfinance program the following issues should be controlled.

1. The credit market should efficiently operate and ensure the supply of credit.
2. The institutional impediments toward access to credit should be removed.
3. Credit constraint/rationing should be relaxed by means of (1) and (2)

4. The credit market imperfect should be removed, such as, information asymmetry or adverse selection problems should be tackled effectively.

The above suggestions tell about the future research like the credit constraint and self-employment activity or the differentials in gain due to credit constraint or rationing and hence restricting self-employment activity.

## **8.6 Conclusion**

The researchers, policy makers, the practioners as well as well-wishers of economic development have a lot of interest to learn about the role of MFIs in promoting entrepreneurship. The household liquidity constraints impede to accumulate assets in order to start viable businesses. Our results suggest that the relaxation of such constraints by means of expanding access to finance prompts households to move toward self-employment. Such movement does not take place at a time. Rather, access to credit of the poor households initially brings the non-productive household members into productive sector, mainly in self-employment activity. Such opportunity creates new income opportunity in relative to wage income. The returns to self employment than attract the households to be solely self employed in the long run to receive the windfall gain from self-employment activity.

Table 2: Summary Statistics by MFI membership

Variables	Non-member of MFI 43.91	Member of MFI 56.09	Aggregate
Wage employment	0.86	0.8	0.83
	0.35	0.4	0.38
Self employment	0.4	0.57	0.5
	0.49	0.49	0.5
Wage employment only	0.6	0.43	0.5
	0.49	0.49	0.5
Self employment only	0.14	0.2	0.17
	0.35	0.4	0.38
Wage and self employment	0.26	0.37	0.32
	0.44	0.48	0.47
Income	39027.12	45553.65	42687.74
	44,442.28	69,176.48	59,675.88
Age of head	42.24	41.37	41.75
	13.74	12.3	12.96
Education of head	1.27	1.49	1.39
	2.55	2.74	2.66
Household size	3.98	4.29	4.15
	1.61	1.51	1.57
Access to electricity	0.06	0.1	0.08
	0.24	0.3	0.27
Log of land	1.33	1.58	1.47
	1.41	1.37	1.4
Agricultural equipment	2.18	2.4	2.31
	1.89	2.19	2.06
Savings	91.54	368.19	246.71
	857.36	1,470.62	1,246.76
Advanced labor sale	0.06	0.08	0.07
	0.24	0.26	0.25
Asset sale	0.03	0.06	0.05
	0.17	0.24	0.21
Migration	0.16	0.19	0.18
	0.37	0.39	0.38
Support received	0.24	0.31	0.28
	0.43	0.46	0.45
Presence of char	0.33	0.2	0.25
	0.47	0.4	0.43
Vulnerable to monga	0.85	0.84	0.84
	0.36	0.37	0.37

Source:PRIME-II

Table 3: Summary Statistics by Occupation Type

Variables	Wage employment only	Self employment only	Wage and self employment
Income	30896.15 (21251.05)	55683.00 (106516.80)	53971.32 (61472.19)
Member of MFI	0.48 (0.50)	0.65 (0.48)	0.64 (0.48)
Age of head	42.18 (13.15)	40.94 (13.13)	41.52 (12.55)
Education of head	1.17 (2.45)	1.91 (3.21)	1.45 (2.61)
Household size	3.92 (1.53)	4.21 (1.50)	4.49 (1.60)
Access to electricity	0.06 (0.24)	0.14 (0.34)	0.09 (0.28)
Log of land	1.08 (1.16)	1.91 (1.60)	1.84 (1.44)
Agricultural equipment Savings	2.09 (1.74)	1.84 (2.41)	2.88 (2.19)
Advanced labor sale	141.45 (717.02)	449.19 (2325.14)	301.15 (1031.00)
Asset sale	0.08 (0.28)	0.03 (0.16)	0.07 (0.26)
Migration	0.03 (0.18)	0.05 (0.22)	0.06 (0.24)
Support received	0.18 (0.38)	0.09 (0.29)	0.22 (0.41)
Presence of char	0.28 (0.45)	0.20 (0.40)	0.32 (0.47)
Vulnerable to monga	0.29 (0.45)	0.19 (0.39)	0.23 (0.42)
	0.87 (0.33)	0.78 (0.41)	0.83 (0.38)

Source:PRIME-II

Table 4: Role of MFI in Choosing Occupation

Explanatory variables	Wage employment only	Self employment only	Wage and self employment
Earning Equation			
Member of MFI	-0.681***	0.426***	0.506***
Constant	0.057	0.077	0.062
	0.391***	-1.813***	-1.029***
	0.043	0.061	0.048
Log-Likelihood	-3,440.88	-2,323.54	-3,158.99
Labor Supply Equation			
Any household member is a member of MFI	-0.769***	0.386***	0.639***
	0.058	0.076	0.063
Constant	0.458***	-1.746***	-1.159***
	0.044	0.06	0.05
Observations	5023	5023	5023

Source:PRIME-II

Table 5: Proximate Determinants of Occupation Selection (Earning Equation Approach)

Explanatory variables	Wage employment only	Self employment only	Wage and self employment	Wage employment only	Self employment only	Wage and self employment
Any household member is a member of MFI	-0.497***	0.350***	0.366***	-0.510***	0.354***	0.369***
	0.063	0.083	0.066	0.063	0.083	0.066
HH head's age: years	0.010***	-0.009***	-0.006**	0.009***	-0.008**	-0.006**
	0.002	0.003	0.003	0.002	0.003	0.003
HH head's education: years	-0.028**	0.041***	-0.007	-0.030**	0.042***	-0.006
	0.012	0.014	0.012	0.012	0.014	0.012
HH size	-0.151***	0.056**	0.122***	-0.159***	0.063**	0.125***
	0.021	0.027	0.022	0.022	0.027	0.022
HH has electricity	-0.411***	0.541***	-0.003	-0.400***	0.513***	-0.001
	0.113	0.124	0.114	0.114	0.125	0.115
Log of landholding	-0.376***	0.319***	0.186***	-0.374***	0.319***	0.182***
	0.025	0.03	0.024	0.025	0.031	0.025
HH's agricultural equipment: Number	-0.003	-0.252***	0.141***	-0.006	-0.241***	0.139***
	0.016	0.023	0.017	0.017	0.024	0.017
Savings	-0.000***	0.000***	0	-0.000***	0.000***	0
	0	0	0	0	0	0
Advance crop sale	0.499***	-1.099***	-0.031	0.485***	-1.067***	-0.03
	0.12	0.224	0.123	0.121	0.224	0.123
Asset sale	-0.351**	0.152	0.265*	-0.397***	0.208	0.263*
	0.149	0.177	0.144	0.151	0.179	0.145
Migration	0.09	-0.821***	0.335***	0.092	-0.826***	0.343***
	0.08	0.127	0.08	0.081	0.128	0.081
Government support	-0.034	-0.407***	0.265***	-0.046	-0.400***	0.277***
	0.068	0.095	0.069	0.069	0.096	0.07
Presence of char	0.298***	-0.363***	-0.134*	0.249***	-0.328***	-0.091
	0.071	0.098	0.075	0.075	0.104	0.078
Vulnerable to monga	0.446***	-0.359***	-0.184**	0.430***	-0.345***	-0.174*
	0.088	0.104	0.089	0.088	0.104	0.089
Constant	0.673***	-1.139***	-1.782***	0.855***	-1.273***	-1.893***
	0.155	0.194	0.162	0.172	0.217	0.18
District fixed level	No	No	No	Yes	Yes	Yes
Number of observations	5,061	5,061	5,061	5,061	5,061	5,061
Log-Likelihood	-3,162.32	-2,110.25	-2,987.42	-3,126.96	-2,101.07	-2,970.69

Source:PRIME-II

Table 6: Proximate Determinants of Occupation Selection (Labor Supply Approach)

Explanatory variables	Wage employment only	Self employment only	Wage and self employment	Wage employment only	Self employment only	Wage and self employment
Any household member is a member of MFI	-0.591***	0.306***	0.494***	-0.584***	0.300***	0.481***
	0.064	0.085	0.069	0.066	0.086	0.07
HH head's age: years	0.008***	-0.007**	-0.005*	0.007***	-0.007**	-0.004*
	0.002	0.003	0.003	0.002	0.003	0.003
HH head's education: years	-0.013	0.040***	-0.021*	-0.017	0.041***	-0.019
	0.012	0.014	0.012	0.012	0.014	0.012
HH size	-0.152***	0.083***	0.106***	-0.159***	0.089***	0.109***
	0.021	0.027	0.022	0.022	0.027	0.022
HH has electricity	-0.266**	0.484***	-0.112	-0.291**	0.464***	-0.074
	0.111	0.125	0.117	0.113	0.126	0.119
Log of landholding	-0.328***	0.309***	0.148***	-0.313***	0.306***	0.131***
	0.024	0.03	0.024	0.025	0.03	0.025
HH's agricultural equipment: Number	0.036**	-0.274***	0.118***	0.031*	-0.263***	0.120***
	0.016	0.024	0.017	0.016	0.024	0.017
Savings	-0.043***	0.017	0.031***	-0.045***	0.02	0.032**
	0.012	0.015	0.012	0.012	0.015	0.012
Advance crop sale	0.669***	-1.097***	-0.202	0.658***	-1.066***	-0.199
	0.122	0.22	0.127	0.123	0.22	0.128
Asset sale	-0.244*	0.178	0.141	-0.253*	0.224	0.109
	0.147	0.175	0.146	0.149	0.177	0.147
Migration	0.026	-0.826***	0.416***	0.039	-0.834***	0.415***
	0.079	0.125	0.08	0.081	0.126	0.081
Government support	-0.147**	-0.430***	0.408***	-0.130*	-0.431***	0.396***
	0.068	0.094	0.069	0.069	0.095	0.07
Presence of char	0.136*	-0.327***	0.027	0.041	-0.283***	0.112
	0.07	0.096	0.075	0.074	0.102	0.078
Vulnerable to monga	0.498***	-0.424***	-0.208**	0.488***	-0.412***	-0.201**
	0.087	0.102	0.089	0.088	0.103	0.09
Constant	0.686***	-1.107***	-1.861***	0.939***	-1.256***	-2.040***
	0.154	0.192	0.164	0.172	0.215	0.183
District fixed level	No	No	No	Yes	Yes	Yes
Number of observations	5,017	5,017	5,017	5,017	5,017	5,017
Log-Likelihood	-3,176.33	-2,137.53	-2,928.53	-3,134.32	-2,128.53	-2,904.74

Source:PRIME-II

Table 7: Multinomial Choice of Occupation Selection: Logit Estimates  
(Earning Equation Approach)

	Self employ- ment only	Wage and self employment	Self employ- ment only	Wage and self employment
	Model-I	Model-II	Model-III	Model-IV
Any household member is a member of MFI	0.521***	0.446***	0.537***	0.460***
	0.091	0.072	0.092	0.074
HH head's age: years	-0.012***	-0.009***	-0.011***	-0.008***
	0.003	0.003	0.003	0.003
HH head's education: years	0.048***	0.014	0.051***	0.016
	0.015	0.013	0.015	0.013
HH size	0.128***	0.160***	0.138***	0.167***
	0.029	0.024	0.03	0.024
HH has electricity	0.644***	0.235*	0.621***	0.239*
	0.139	0.128	0.14	0.13
Log of landholding	0.474***	0.331***	0.473***	0.327***
	0.033	0.027	0.034	0.028
HH's agricultural equipment: Number	-0.203***	0.082***	-0.192***	0.084***
	0.025	0.018	0.026	0.018
Savings	0.036**	0.044***	0.034**	0.040***
	0.016	0.013	0.017	0.014
Advance crop sale	-1.228***	-0.262**	-1.200***	-0.254**
	0.23	0.127	0.231	0.128
Asset sale	0.331*	0.349**	0.402**	0.377**
	0.198	0.161	0.2	0.163
Migration	-0.761***	0.155*	-0.765***	0.156*
	0.133	0.085	0.134	0.086
Government support	-0.340***	0.181**	-0.328***	0.191**
	0.101	0.074	0.102	0.075
Presence of char	-0.446***	-0.225***	-0.392***	-0.177**
	0.103	0.079	0.109	0.082
Vulnerable to monga	-0.568***	-0.385***	-0.552***	-0.372***
	0.113	0.098	0.114	0.098
Constant	-1.045***	-1.436***	-1.246***	-1.599***
	0.21	0.174	0.234	0.193
District fixed level	No	No	Yes	Yes

Source:PRIME-II

Table 8: Marginal Effect of Logit based Multinomial Choice of Occupation

Explanatory variables	Wage employment		Self employment		Both self and wage employment	
	Marginal Effect	Z Score	Marginal Effect	Z Score	Marginal Effect	Z Score
Discrete Change Approach						
Any household member is a member of MFI	-0.117	-7.35	0.044	4.09	0.074	4.93
HH head's age: years	0.003	4.37	-0.001	-2.99	-0.001	-2.51
HH head's education: years	-0.006	-2.01	0.005	3.1	0.001	0.21
HH size	-0.039	-7.13	0.01	2.78	0.029	5.86
HH has electricity	-0.094	-3.38	0.082	3.83	0.013	0.49
Log of landholding	-0.093	-15.01	0.043	11.06	0.051	9.19
HH's agricultural equipment: Number	0.002	0.45	-0.032	-10.71	0.03	7.88
Savings	-0.01	-3.29	0.002	1.17	0.008	2.86
Advance crop sale	0.118	4.16	-0.101	-7.48	-0.017	-0.64
Asset sale	-0.091	-2.46	0.03	1.14	0.061	1.77
Migration	0.022	1.13	-0.09	-8.25	0.067	3.53
Government support	-0.01	-0.59	-0.047	-4.39	0.057	3.57
Presence of char	0.069	3.94	-0.042	-3.74	-0.028	-1.68
Vulnerable to monga	0.11	5.12	-0.058	-3.62	-0.053	-2.54
Delta Approach						
Any household member is a member of MFI	-0.103	-7.45	0.042	3.8	0.061	4.48
HH head's age: years	0.002	4.45	-0.001	-2.87	-0.001	-2.25
HH head's education: years	-0.005	-2.09	0.005	3.08	0	0
HH size	-0.033	-7.24	0.009	2.57	0.024	5.62
HH has electricity	-0.081	-3.28	0.07	4.38	0.011	0.48
Log of landholding	-0.082	-16.6	0.041	10.92	0.041	8.67
HH's agricultural equipment: Number	0.003	0.89	-0.032	-10.79	0.029	8.88
Savings	-0.009	-3.29	0.002	1.06	0.007	2.74
Advance crop sale	0.126	4.6	-0.141	-4.88	0.015	0.56
Asset sale	-0.079	-2.44	0.028	1.21	0.052	1.77
Migration	0.036	2.05	-0.11	-6.69	0.074	4.53
Government support	-0.004	-0.25	-0.051	-4.19	0.055	3.94
Presence of char	0.062	4.04	-0.043	-3.4	-0.019	-1.27
Vulnerable to monga	0.097	5.11	-0.053	-3.94	-0.045	-2.49
Elasticity Approach						
Any household member is a member of MFI	-0.152	-6.81	0.141	3.65	0.1	4.27
HH head's age: years	0.223	4.5	-0.335	-2.97	-0.176	-2.38
HH head's education: years	-0.022	-2.2	0.045	3.2	-0.003	-0.31
HH size	-0.337	-6.88	0.245	2.6	0.332	5.69
HH has electricity	-0.022	-3.28	0.031	4.83	-0.002	-0.37
Log of landholding	-0.349	-13.28	0.333	9.92	0.139	6.71
HH's agricultural equipment: Number	-0.014	-0.63	-0.51	-10.15	0.183	8.35
Savings	-0.034	-3.08	0.014	0.83	0.025	2.7
Advance crop sale	0.012	4.17	-0.073	-4.65	-0.007	-1.11
Asset sale	-0.011	-2.19	0.006	1.02	0.006	1.69
Migration	0.002	0.3	-0.138	-6.25	0.028	3.47
Government support	-0.008	-0.83	-0.097	-4.01	0.044	3.77
Presence of char	0.03	4.36	-0.078	-3.48	-0.024	-1.75
Vulnerable to monga	0.18	5.19	-0.303	-4.05	-0.141	-2.71

Source:PRIME-II

Table 9: Multinomial Choice of Occupation Selection: Logit Estimates (Labor Supply Approach)

	Self employ- ment only	Wage and self employment	Self employ- ment only	Wage and self employment
	Model-I	Model-II	Model-III	Model-IV
Any household member is a member of MFI	0.534***	0.627***	0.533***	0.619***
	0.089	0.073	0.091	0.074
HH head's age: years	-0.010***	-0.008***	-0.009***	-0.007**
	0.003	0.003	0.003	0.003
HH head's education: years	0.038***	-0.005	0.041***	-0.002
	0.015	0.013	0.015	0.014
HH size	0.147***	0.151***	0.156***	0.157***
	0.029	0.024	0.029	0.024
HH has electricity	0.509***	0.073	0.508***	0.118
	0.137	0.129	0.139	0.131
Log of landholding	0.430***	0.277***	0.421***	0.259***
	0.033	0.027	0.033	0.028
HH's agricultural equipment: Number	-0.246***	0.052***	-0.234***	0.055***
	0.025	0.018	0.025	0.018
Savings	0.039**	0.045***	0.041**	0.046***
	0.016	0.013	0.017	0.014
Advance crop sale	-1.278***	-0.446***	-1.253***	-0.442***
	0.225	0.131	0.226	0.132
Asset sale	0.291	0.231	0.332*	0.218
	0.194	0.161	0.196	0.163
Migration	-0.719***	0.243***	-0.730***	0.234***
	0.131	0.085	0.132	0.086
Government support	-0.287***	0.337***	-0.294***	0.319***
	0.1	0.074	0.101	0.075
Presence of char	-0.338***	-0.039	-0.254**	0.061
	0.101	0.079	0.107	0.083
Vulnerable to monga	-0.616***	-0.421***	-0.602***	-0.412***
	0.112	0.098	0.113	0.099
Constant	-1.014***	-1.494***	-1.255***	-1.745***
	0.206	0.175	0.231	0.196
District fixed level	No	No	Yes	Yes

Source:PRIME-II

Table 10: Seemingly Unrelated Regression and Bi-probit Results (Labor Supply Approach)

Explanatory variables	Earning Equation		Labor Supply Equation	
	Wage employment	Self employment	Wage employment	Self employment
Member of MFI	-13.826***	53.943***	-0.380***	0.163***
HH head's age: years	4.582	5.738	0.038	0.044
HH head's education: years	1.498***	0.18	0.005***	-0.004**
HH size	0.175	0.22	0.001	0.002
HH has electricity	0.207	1.12	-0.009	0.023***
Log of landholding	0.85	1.064	0.007	0.008
HH's agricultural equipment: Number	18.329***	24.356***	-0.090***	0.043***
Savings	1.525	1.91	0.013	0.015
Advance crop sale	-24.963***	36.193***	-0.192***	0.265***
Asset sale	8.107	10.152	0.067	0.071
Migration	-15.823***	23.328***	-0.206***	0.173***
Government support	1.738	2.176	0.015	0.016
Presence of char	10.045***	-6.615***	0.009	-0.141***
Vulnerable to monga	1.166	1.46	0.01	0.012
Constant	-0.005***	0.016***	-0.000***	0.000***
Number of observations	0.002	0.002	0	0
	43.722***	-62.765***	0.414***	-0.554***
	8.658	10.843	0.073	0.109
	-4.584	-2.776	-0.135	0.132
	10.608	13.284	0.089	0.1
	15.985***	-23.042***	0.022	-0.447***
	5.852	7.328	0.048	0.065
	8.281*	-9.322	-0.093**	-0.238***
	4.967	6.22	0.041	0.051
	-6.485	-21.950***	0.077*	-0.186***
	5.141	6.438	0.042	0.051
	-5.122	-49.456***	0.284***	-0.235***
	6.294	7.882	0.053	0.058
	61.689***	47.689***	0.455***	-0.688***
	11.194	14.019	0.093	0.106
	5023	5023	5023	5023

Source:PRIME-II

Table 11: Probability Estimates from Bi-variate Probit Regression

Occupation Types	Non-participants		Participants	
	Mean Proba- bility	SD	Mean Proba- bility	SD
Wage and self employment	0.264	0.134	0.374	0.134
Wage employment only	0.598	0.166	0.429	0.162
Self employment only	0.138	0.093	0.197	0.119
Univariate (marginal) predicted probability of wage employment	0.862	0.093	0.803	0.119
Univariate (marginal) predicted probability of self-employment	0.402	0.166	0.571	0.162
Conditional (on self-employment) predicted probability of wage employment	0.653	0.179	0.662	0.162
Conditional (on wage employment) predicted probability of self employment	0.312	0.165	0.473	0.171
Obs.	2201		2816	

Source:PRIME-II

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