Working Paper No. 57

Impact of Access to Credit on Microenterprise Development

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August 2018

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Abstract

The paper addresses three key issues: rate of financial and economic returns to investment in microenterprises; impact of access to finance on production efficiency; and impact of microenterprises on employment. The results show positive average rate of financial and economic returns. Further, access to credit contributes to increases in labour productivity and total factor productivity. The regression results imply that financial profit initially increases with debt-equity ratio but it does so at a decreasing rate; and beyond a certain point, financial profit may actually decline. The intensity of employment creation using the hurdle model shows that having access to credit not only increases the volume of employment, but also increases the number of days of employment. In general, the study supports the hypothesis that access to finance contributes to flourishing of enterprises, employment and financing agencies' profitability. The critical issue is to develop targeted financial support mechanism for the microenterprises in view of their wide diversity and complex operational mechanisms. The paper advocates for a comprehensive approach that will combine plausible instruments involving all financial institutions so that the policies can be implemented in an effective manner.

Impact of Access to Credit on Microenterprise Development

Farah Muneer[1]

1. Introduction

Over the past decades, the dominant transformation of shifting from farm to nonfarm activities in the Bangladesh economy has drawn much attention of policymakers because of its prospects of creating low cost employment for the expanding labour force through forward and backward linkages. In most cases, these nonfarm activities adopt labour intensive technologies, absorb additional labour from the agriculture sector and contribute to poverty reduction through higher productivity and higher profits.

According to BBS Economic Census 2013, there are about 8.0 million economic units compared with 3.7 million in 2003 and, out of these 8.0 million, more than 35 percent are economic households. The majority of these economic households are microenterprises (including cottage enterprises). However, despite having a small share in economic units, small and medium enterprises (SMEs) occupy a major position in industrial development policy of Bangladesh. Although small enterprises have little share in total SME loans, microenterprises (MEs) are mostly left out of formal banking system because of high transaction cost and absence of proper monitoring system. In Bangladesh, large and medium enterprises have more access to formal credit market and micro and small enterprises have more access to MFIs and informal credit market (Khalily et al. 2013).

It is argued that access to credit can affect ME growth in two ways e.g. starting up and scaling up of operation. With access to credit, a household can start an enterprise and also if it is already involved in enterprise activity it can expand its operation by using more credit. Research shows that only around 23 percent of the enterprises in Bangladesh have access to credit for starting up and only around one-third of the enterprises have access to credit for scaling up of enterprises (Khalily et al. 2013). Other studies (e.g. Mukherjee and Zhang 2007) show that access to credit induces enterprise entry into the nonfarm market and thus contributes to growth. A number of researches acknowledge the role of credit in boosting up the productivity and growth of enterprises (Johnson et al. 2002, Levine et al. 2000, McMillan and Woodruff 2002, Cull and Xu 2005). Khalily and Khaleque (2013) show that access to credit accounts for 2.8 percent increase in labour productivity relative to enterprises having no access to credit.

In the present study, our broader objective is to assess the impact of access to credit on microenterprise development. In this paper, we measure the development of enterprise by three indicators; i) enterprise's profitability, ii) productivity, and iii) its ability to create employment opportunity. Availability of credit as a policy for starting up and scaling up of enterprises can be taken into consideration if it contributes to increase in non-farm employmentalong with higher profitability and productivity. It is important because it can provide an insight on whether banks or MFIs contribute to the well-being of borrowers by increasing their income and accumulation of asset.Thus, this study contributes towards investigating if the debt-equity structure of enterprises influences the profitability of enterprises. As employment

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generation is known to be the major contribution of enterprises, we would also like to see if credit facilitates more employment creation in the enterprises. The study thus adopts three approaches:

1) Measure the returns of microenterprises and find the determinants of microenterprise profitability;

2) Analyse microenterprise productivity using the Cobb-Douglas production function; and

3) Assess the participation in enterprise activity (employment creation) and its intensity.

2. Literature Review

As mentioned earlier, the study examines the impact of credit on enterprise profitability, productivity and its ability to generate employment opportunity. Impact of access to credit on enterprise's financial performance is examined in a number of studies using both theory and empirics. Clark (1917) argues that as demand or income increases in an economy so does investments made by firms. The theory suggests that most firms choose to increase production in order to increase their profits. The theory also argues that such increase in production attracts more investors which enhance profitability and in order to increase production access to finance is very crucial. This is known as accelerator. According to Edgmand (1979), the accelerator theory of investment is based on the fact that a particular amount of capital stock is necessary to produce a given output. This therefore means that in order for enterprises to increase output and profitability, additional amounts of financing are required. The theory supports the notion that credit financing leads to accelerated business profitability. Many studies argue that access to finance may have both positive and negative impact on the financial performance of enterprises.Obert and Olawele (2010) argue that the use of high levels of debt in the capital structure leads to an increase or decrease in the return on equity. Debt is always desirable if an enterprise achieves relatively high profits as it results in higher returns to shareholders. If enterprises incur major loss in business, employing more debt in the capital structure will be detrimental as the firm won't be able to cover the cost of debt.Atieno (2006) explains that limited access to credit can negatively affect profitability and financial survival if enterprise operates under poor economic conditions and high interest rates. On the other hand,Laferrara (2003) argues that if credit is accessible and reasonably priced, enterprises can solve the liquidity problem which in turn boosts profitability.Kogut (1985); Grant, et al. (1988) also suggest that the presence of favourable credit terms leads to greater access to finance. Thereforean enterprise can invest in more ventures and increase its sales volume. Higher sales volume and production will lead to increased revenues and profitability which means improved financial performance.

A number of studies are also available which show thataccess to credit has a mixed impact on productivity of enterprises.Early theoretical models of entrepreneurship assume directly that credit contracts for business start-ups and on-going financing are very limited. For example, in the model of Bernhardt and Lloyd-Ellis (2000), there are no credit possibilities at all. In their models, the operation and formation of firms has to be funded by entrepreneurs' accumulated savings and firms' past profitability. However, there are positive evidences too–credit has a positive impact on enterprise productivity (for example, Levine 1991; Smith and Starr 1995; Schiantarelli and Sembenelli 1999). But few studies report negative impact of credit on productivity, and it is largely due to inefficient use or allocation of resources. In Malaysia, Ghani

and Suri (1999) attribute the negative impact of credit to inefficient allocation of resources. Some other studies also report negative impact of access to credit on productivity (Budina et al. 2000; Konings et al. 2003; and Lizal and Svejar 2002). They attribute it as the utilisation of funds for survival rather than investment. The behaviour of lenders oftenleads to inefficient allocation and use of resources for market imperfections, and therebyundermines growth (Stiglitz and Weiss 1981; Gonzalez-Vega 1976). These findings and arguments are quite consistent with the thesis of McKinnon (1973) and Shaw (1973).

We have also reviewed some literature on the ability of microenterprise to generate employment opportunity.Agyapong et al. (2012) discuss the role of micro, small and medium enterprises (MSMEs) in poverty alleviation in Ghana.They find that town and rural based MSMEs help to create jobs and increase income of the people.Tadesse (2010), in a study on Ethopia in Mekelle city, shows that microenterprises create jobs for many individuals. The average employees of SMEs are 7.05 per SME in Mekelle city. Moreover, there is an increase in average employees of MSEs from year to year. Cohen (1996) reviews 20 studies on the impact of credit on enterprise's ability to create employment. Most find positive, but small, impacts on the number of paid employees (excluding owners) in enterprises. Increases are generally concentrated among a small proportion of borrowers, in most cases less than 25 percent of enterprises. Most enterprises experience no change in paid employment. One study from rural Malawi finds that the impact on employment is primarily due to the start-up of new enterprises, but this is atypical, since most programmes tend to support on-going rather than new enterprises (Buckley 1996). A study from Bolivia shows that credit is used to take on paid labour only after the business has grown to a certain critical size in terms of sales or output. Before that increases in employment tend to be confined to family labour (Mosley 1996). Several studies suggest that men are more likely than women to benefit from these new paid employment opportunities.

3. Methodology and Analytical Framework

In this paper, we are investigating the impact of access to credit on profitability, productivity and employment. The critical issues are: How do we measure these? What does it mean to have access to credit? In this paper, enterprises having access to credit refer to those enterprises that have taken credit from banks or MFIsfor at least once during the period 2011-2014.Now, we discuss the methodology of measuring profitability, productivity and employment and how we have measured impact of credit on these variables.

Measuring Profitability

In this study we have calculated return on assetand profit margin.We include fixed asset, inventory of finished goods and liquid asset in total asset calculation. While calculating fixed asset we consider the book value of land, building, equipment and other durable goods. Lastly, we divide the net business profit by total asset to get return on asset.While calculating net profit we need to consider three types of costs. These are operating cost other than labour costs, cost of hired labour and cost of family labour.One of the salient characteristics of rural enterprises is that it employs mostly family labour rather than hired labour. As enterprises do not actually pay the family labour we calculate the cost of family labour by the wages that is forgone by those family labours if they would have chosen the best alternative work. This is called opportunity cost of labour. We have considered the prevailing median nonfarm daily wage to be the

opportunity cost of family labour depending on the whether it is located in rural or urban areas. Lastly, we multiply it with total man days of labour provided by family members.

It is necessary to mention that we have considered three different opportunity costs for three different groups of self-employed family labour. The above calculation is for those who involve only in enterprises; they do not work as wage earner in any sector or have any other self-employed farm activity. The second group consists of those who work as part time wage earners or involve in self-employed farm activity along with working at enterprises. In this case we adjust the man days while calculating the opportunity cost of family labour. The third group consists of those who works in wage sector full time along with enterprises. If the family member is involved in wage sector full time meaning if he/she is involved in wage sector more than 5 hours, we consider his/her opportunity cost to be zero as he/she is forgoing his/her leisure time and we take their opportunity cost of leisure time as zero.So opportunity cost of labour can be different depending on whether the family member is fully involved in enterprise only or involved in other activities along with enterprise, whether s/he works full time or part time in wage sector or whether the enterprise is located in rural or urban area. Finally we calculate financial profit by deducting the operating cost and cost of hired labour from the total revenue and economic profit by deducting the operating cost, cost of hired labour and opportunity cost of hiring family labour from total revenue. Moreover, to measure the impact of access to credit on profitability we conduct OLS regression analysis considering financial profit as dependent variable and access to credit as a dummy independent variable.

Measuring Productivity

In the study, we have observed the impact of access to credit on labour productivity, capital productivity and total factor productivity (TFP). We calculate labour productivity by simply dividing the total sales of enterprise by total number of full-time employees. Similarly, we calculate capital productivity by dividing the total sales of the enterprise by value of total asset. On the other hand,TFP is a variable which accounts for effects in total output not caused by labour or capital. Two firms having equal amount of capital and having equal number of labour can have different outputs due to some unobserved factors which we call TFP. While capital and labour are tangibles, TFP is intangible such as technological advancement or improvement in human capital.

We consider an enterprise that use only two inputs capital (K) and labour (L). With these two inputs, the enterprise can produceoutput(Y) which is specified as follows:

$Y = f(K. L)$

If this production function takes the Cobb-Douglas form, then we can specify it as:

$Y = AK^{\alpha}L^{\beta}$

Here α and β are the coefficients of capital and labour respectively and A is referred to as efficiency parameter. If we take the double log functional form we can present it as:

$Ln(Y) = a + \alpha Ln(K) + \beta Ln(L) + \varepsilon$

where $\varepsilon$is the error (or disturbance term) which is included to capture the effects of exogenous and endogenous variables not included in the model.

As mentioned before, TFP consists of those factors which remain unmeasured or unobserved

in the production function. Therefore, if we can somehow measure the error term of the double log form of Cobb-Douglas functionmentioned above, we can calculate TFP. To calculate it, we take the difference between actual output and predicted output derived from the equation above (double log equation). Basically this is the residual estimation based on the observed and estimated output. We can represent it as:

TFP = ε = log (Y) – predicted log (Y), this residual ε will capture the effects of all other factors such as technology, training, entrepreneurial capacity etc.

Now we can observe the impact of credit on coefficient of capital and labour (which represent capital productivity and labour productivity respectively) along with efficiency coefficient which is TFP that captures effect of all factors on output other than labour and capital. The estimated models are:

1) For assessing the impact on labour productivity :
   $Ln(Y/L) = \alpha_0 + \alpha_1 ATC + \alpha_2 training + \alpha_3 age + \alpha_4 education + \alpha_5 firm's operating years + \mu$

2) For assessing the impact on capital productivity :
   $Ln(Y/K) = \beta_0 + \beta_1 ATC + \beta_2 electricity + \beta_3 home\text{-}based firm + \beta_4 firm's operating years + \Omega$

3) For assessing the impact on TFP:
   $TFP = \gamma_0 + \gamma_1 ATC + \gamma_2 training + \gamma_3 education + \gamma_4 firm's operating years + \gamma_5 home\text{-}based firm + \eta$

These models are in semi-log form. Y/ L and Y/ K represent productivity of labour and capital respectively. It shows by increasing 1 unit of labour how much output can be increased. TFP represents total factor productivity. ATC represents access to credit; a dummy variable taking the value either 1 or 0. Variable training represents if the entrepreneur receives training related to the enterprise s/he is involved in, variable electricity represents if the enterprise uses electricity for its operation and home based firm represents if the enterprise operating in entrepreneur's house. All these are dummy variables. Rest of the variables such as entrepreneur's age, entrepreneur's years of education and enterprise's operating years are continuous variables.μ, Ω, η are the unobserved factors affecting productivity in the respective equations.

As mentioned earlier, access to credit cannot impact output directly as it is not an input itself. Participating in the credit market is also not an independent decision. It depends on transaction cost, need of loan and on characteristics of participants, characteristics of the community where credit is disbursed and others. It can also be a supply side issue because not everyone applying for credit is going to get it. Lenders will screen the loan application and normally the financially better off clients receive the loan. On the other hand, sometimes credit is disbursed in targeted areas like poverty prone areas. In this case, poor households are going to get the credit. Also the capability of using the credit will not be the same for all households. Some households put more efforts and dedication to their enterprises; some may have more enterprising ability. These unobserved characteristics can influence the effective use of credit and hence can influence productivity.

From the above discussion it is clear that including access to credit directly in the model may lead to two problems:endogeneity and selection bias. To test for endogeneity in the model, we have used Durbin-Wu-Hausman test for endogeneity. This test confirms that the access to credit variable is endogenous. If we estimate this model with OLS the results will not be valid

because in order for OLS to be valid, assumption of strict exogeneity should be fulfilled which means the errors in the regression should have conditional mean equal to zero. If 'U' is the error term and 'X's are the independent variables, then strict exogeneity applies $E(U, X) = 0$. So OLS estimation will not hold in this case. The most common way to estimate the model with endogenous variables is to use two stage least squares (2SLS). For that we need instrumental variable. We can resolve the problem of endogeneity and selection bias by incorporating instrumental variable. By instrumental variable we mean such a variable which is correlated with access to credit but not with outcome variables such as labour or capital productivity or TFP. As we are observing the impact of credit from formal and quasi formal institutions in enterprise productivity, we consider the distance of the nearest bank from the location of enterprise as the instrumental variable.The longer distance of the bank from the enterprise location will make the transaction cost of credit high. As a result it will make the probability of getting access to credit from formal sector low. This variable will not directly impact any outcome variables but it will impact access to credit negatively. The greater the distance of enterprise from the nearest bank, the lower is the access to credit. In our model we also observe heterogeneity when we performed white test. Therefore, IV2SLS will not be appropriate for this model, instead we use IVGMM as it gives us estimates that are weighted by the inverse of variance-covariance matrix of moment conditions. Also it gives us consistent and efficient estimates.

Measuring Employment

While referring to employment, we consider full time employment only. While analysing this question we need to keep in mind that if we can assess the impact of credit on increase in enterprise employment in two ways. We can observe the households who are already engaged in some enterprise activities and by taking credit now they can spend more days involving themselves in enterprises. This means if credit has a positive impact on enterprise employment we would observe that days spent in enterprise employment will increase for the household already engaged in enterprise employment due to taking credit. However, increase in enterprise employment may also occur when a household who was not engaged in enterprise employment prior taking credit, with credit now it has participated in enterprise employment. To find out the impact of credit on enterprise employment first we need to address these two different outcomes. The first one involves those who are already involved in enterprise employment prior to taking credit; what we want to know is how credit impacts the amount of days they are involved in enterprise employment once they get credit. The second one, involves those households that were not engaged in non-farm activities prior to credit, what we want to know is how having access to credit influences the households to participate in enterprise employment. These two types of outcome will together constitute the total impact of credit on enterprise employment.

Now we need an econometric model that can separate the decision making process into two parts: the participation decision and the quantity decision. It means a household first decides whether to participate in non-farm employment and those who decide to participate how much labour time they are going to spent on this non-farm employment. So, our econometric model must be able to address these two events together.

One common approach to model phenomena that give rise to this type of problem is to use the tobit model. If the decision to participate in the market is decoupled from the amount decision, then the tobit model is inappropriate. In these cases, the double-hurdle model presented in

Cragg (1971) is an appropriate alternative to the tobit model. To describe this model we follow Osmani (2015) and Wooldridge (2010).

It is important to note that; here we define nonfarm employment by the number of days a household is engaged in non-farm employment which is a continuous variable. Let us denote it by θ. Suppose λ is a binary variable that determines whether θ will be zero or positive: *$\lambda = 0$ θ = 0 and $\lambda = 1$ $\theta > 0$*. In this case, the binary variable λ is the participation dummy which can take the value 0 or 1 which means that the households who have decided to participate in non-farm employment will take the value *$\lambda = 1$* and $\theta > 0$, and the households those decide not to participate will take the value *$\lambda = 0$* and which eventually means $\theta = 0$. However, if it decides to participate we need to introduce a non-negative continuous variable which can be denoted as θ^*, It is to mention that θ^* can only be observed when $\lambda = 1$ in which case $\theta^* = \theta$. Now θ will generate the following equation:

$$\theta = \lambda . \theta^* \qquad (1)$$

Thus, the variable θ is an outcome of two separate processes - λ and θ^*. The participation decision λ depends upon a set of explanatory variables denoted by the vector n, and θ^* depends on a set of explanatory variables denoted by the vector x. The vectors n and ***x*** can be indicator partially identical or can also be completely different. The two variables λ and θ^* also have two very different probability distributions. There are two estimating equations for the two parts of the model. In the first part, the participation decision can be estimated either with a logit or a probit model. In this study, we use the probit model in which the probability of participation is given by , where Ω is the vector of parameters associated with the explanatory variables , and is normal probability distribution. The estimating equation is:

$$\lambda = n\Omega + \square \qquad ...(2)$$

The second equation will only be valid if we have *$\theta > 0$*; the estimating equation can be written as

$$\theta = x\beta + u \qquad ...(3)$$

Here, is the vector of parameters associated with the explanatory variables x and, crucially, *u* follows a distribution that allows for only positive values of θ. It is important to note that, while running double hurdle model we do not get the marginal impact of explanatory variables on explained variable. We can only derive the direction and signs from the regression. To get the marginal effect we have to use the 'margins" command. In choosing the explanatory variables we follow Osmani (2015) to a large extent. In this study, our explained variable is number of days a household spends in non-farm activities. So it will take the value 0 if the household is not involved in non-farm activity and it will take positive values if the household is involved in non-arm activity.

4. Data, Sampling Distribution and Status of Access to Finance

This paper uses primary data of 1,843 enterprises in 2014 surveyed by the Institute for Inclusive Finance and Development (InM). The survey collected data throughout the country (except Rangamati district) to investigate the impact of access to credit on microenterprise development focusing on microenterprises' returns, productivity and capability to create employment with access to credit.

Generally the word enterprise refers an action which involves some initiatives by taking a risk by setting up, investing in and running a business. However, there is no universal definition regarding which specific investment can be called microenterprise or small enterprise or

medium and large enterprise as different factors are used by different institutions to define the size of enterprises. The Bangladesh Bureau of Statistics (BBS) in the 2003 Economic Census classified enterprises by the number of full time employees engaged. The classifications are :(i) Microenterprises: enterprises having less than 9 employees; (ii) Small enterprises: enterprises having employees between 10-49; (iii) Medium enterprises: enterprises having employees between 50 and 99; (iv) Large enterprises: enterprises having employees above 100. However, in the 2013 Economic Census, BBS has followed the classification as given in the Industrial Policy 2010.

For the purpose of this study, we categorised the enterprises based on size of employment as we find that financial elements such as return on asset or profit margin vary significantly with employment size. We have considered an enterprise as microenterprise if that enterprise has less than 5 full time employees including family labour. We have further disaggregated the microenterprises into two groups; microenterprises that have less than or equal to 2 employees and another one is microenterprises with 3-4 employees. Both the category includes family labour. We have named these two categories of enterprises as "small" and "large" microenterprise respectively. By following this definition of microenterprise we find almost 98 percent enterprises of our sample fall under microenterprise which is consistent with Khalily and Khaleque (2013), Nixon (2005) and Green el al. (2006). We have surveyed

As we are observing the impact of access to credit on enterprise development first we need to know the existing debt-equity mix (capital structure) of the enterprises. Table 1 shows the distribution of sources of start-up capital and present capital of micro and small enterprises. By start-up capital we mean the amount of capital during the commencement year of the enterprise. In our sample, the average operating years of the enterprises is around 10. On the other hand, present capital structure means that the capital structure of enterprise in the year 2014. So it can be said that we are comparing the capital structure of the enterprises for the years 2004 and 2014. The data show that own resources (savings or inheritance) account for close to 90 percent of the start-up capital of the "small" microenterprises with 1-2 full time employees.

Table 1
Initial and Present Capital of Enterprises (As % of total capital)

Initial Capital Structure of Enterprises				
	Enterprises having 1-2 full-time employees	Enterprises having full-time employees 3-4	Enterprises having full-time employees>=5	Total
Own resource	88.01	80.80	76.49	85.14
Partner's resource	1.01	6.19	1.52	2.02
Loans from commercial banks	3.82	10.22	18.73	7.00
Loans from MFIs	3.61	1.76	2.36	3.10
Informal loans	3.55	1.03	0.91	2.74
Present Capital Structure of Enterprises				
Own resource	88.31	89.10	81.09	87.71
Partner's resource	0.69	4.68	1.16	1.56
Loans from commercial banks	2.77	3.45	14.28	4.13
Loans from MFIs	5.62	2.23	2.36	4.58
Informal loans	2.61	0.54	1.11	2.03

Enterprise Field Survey, InM (2014)

For "large" microenterprises with 3-4 full time employees, this figure is around 81 percent. It is important to note that around 25 percent of start-up capital of small enterprises is comprised of loan; of which about 19 percent is from commercial banks. On the other hand, the share of commercial banks in the start-up capital is very low for "small" microenterprises. Another important point to note is that the percentage of bank's share in capital has significantly declined for "large" microenterprises. For "small" microenterprises and small enterprises, the figure has also decreased. So for scaling up the enterprises, the entrepreneurs lackcredit support from formal banking. If we examine the data for MFIs' share in capital structure, we find the opposite trend. The share of MFIs in the start-up capital structure of "small" and "large" microenterprises is around 3 percent and 1.7 percent respectively whereas in the present capital structure we find that the share of capital has increased to around 5 percent for "small" microenterprises. Another important point to observe is that, despite the presence of so many banks and MFIs, the share of informal loan in capital declined very little. If we observe the aggregate picture we find that the share of commercial banks' loan decreased over time; on the other hand, share of MFIs' loan has increased.

5. Results and Discussion

Access to Finance and Enterprise's Financial Performance

We have analysed the relationship between size of enterprises and profit margin and returns on asset.In the analysis, we find that profit margin has an inverse relationship with the size of enterprises (Figure 1). Small enterprises have the least financial and economic profit margin which is around 6 percent and 5 percent respectively. Though microenterprises (enterprises with 1-2 employees) have low profit but, in terms of return, they have the highest return. The financial profit margin of "small" and "large" microenterprises is around 13 percent and 9 percent respectively. It is important to mention that the difference between financial profit margin and economic profit margin decreases with the type of enterprises. Also we do not see much difference in profit margin among enterprises when we look at economic profit. On the other hand, when we compare the financial profit margin we observe big differences between micro and small enterprise. Figure 2 shows the return on asset of the enterprises in our sample. It shows that "small" microenterprises have the highest return. The average financial and economic return on asset is around 107 percent and 56 percent respectively. The result shows that "large" microenterprises have least return on asset. However, on an average, microenterprises have higher return on asset compared with small enterprises in our sample. In the case of returns to asset also, we find lower differences between financial and economic ROA for small enterprises compared with microenterprises. It is because the opportunity cost-asset ratio is higher for microenterprises than that of small enterprises.
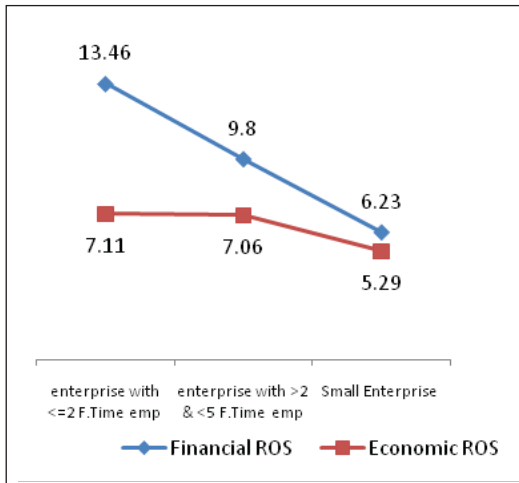
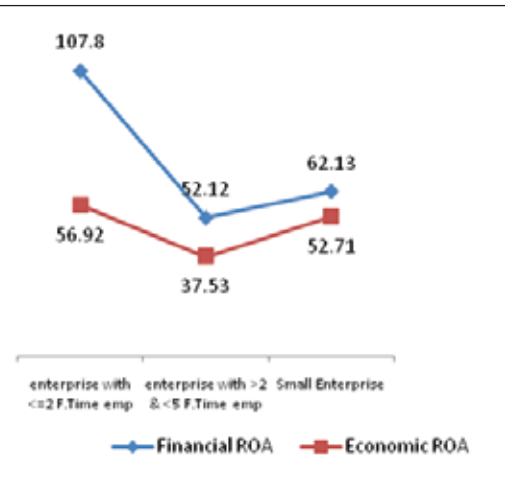**Figure 1: Returns to Sales (Profit Margin) of Enterprises**

Figure 2: Returns to Asset of Enterprise

Enterprise Field Survey, InM (2014)

As mentioned earlier, we have estimated an OLS model on financial profit to investigate the determinants of profits. As there is heteroscadasticity, we have used robust standard errors to explain the results. Table 2 shows that age of entrepreneurs has a non-linear impact, suggestive of the existence of a life cycle effect. The positive sign of the coefficient of the age variable and the negative sigh of the coefficient of its square together imply that financial profit initially increases with age, but it does so at a decreasing rate and beyond a certain age financial profit may actually decline. Our result shows both coefficients are significant. From the descriptive analysis, we have seen that very small percentage of women participates in enterprise activities. From the OLS analysis, we also find that gender matters. If the entrepreneur is male, then financial profit is expected to increase by 0.42 percent of the amount of the case when the entrepreneur is female. This reflects the social norms of Bangladesh especially in rural areas. Generally females have more restriction on mobility; parents are also less interested to educate their daughters than sons. As women have less opportunity to join the labour force, they do not have much experience even if they join the work force. All these factors may induce them to earn lower financial profits than the male counterparts. Our result shows that the higher the experience of entrepreneursin terms of more operating years of enterprises, the more financial profit it can make. The result is significant as well. We also find asset size, debt-equity ratio,and operating cost of enterprises have significantly positive impact on profit.

Table 2
OLS Regression on Determinants of Financial Profit (Log form)

Variables	Coefficient	Robust Std. Error
Entrepreneur's Age	0.0277***	0.00638
Entrepreneur's Age2	-0.00029***	0.00006
If the entrepreneur is Male	0.42138***	0.07511
Entrepreneur's period of study	-0.00065	0.00340
Enterprise's years of operation	0.0088***	0.00199
Enterprise's total asset (log)	0.20846***	0.01200
Enterprise's operating expense (log)	0.09020***	0.01080
Enterprise's Debt Equity Ratio	0.05106***	0.02327
Enterprise's Debt-Equity Ratio2	-0.00195**	0.00135
If the enterprise is in manufacturing sector	0.07048	0.07107
If the enterprise is in transportation sector	0.29565***	0.05995
If the enterprise is in business sector	0.06358	0.05534
If the enterprise is in service sector	0.18401***	0.07905
Constant	7.1816***	0.19407
Observation	1829	

Enterprise Field Survey, InM (2014)

Impact of Access to Credit on Enterprise Production and Productivity

As mentioned before, we have conducted IVGMM to observe whether access to credit has any impact on productivity. Table 3 shows the IVGMM estimation for capital productivity, labour productivity and TFP. From the analysis, we find that access to credit has a significant positive impact on the productivity of labour. However, it has no significant impact on capital productivity and TFP. It is observed that firms with access to credit have 6.5 percent higher labour productivity than the firms with no access to credit. It is also important to note that training and education help to increaselabour productivity significantly, by 0.51 percent and 0.07 percent respectively. The analysis shows that enterprises having electricity can increase capital productivity significantly by 0.29 percent. On the other hand, enterprises having home-based operations have 0.47 percent lower capital productivity than enterprises having market-based operation or commercial based-operation. In the TFP model we observe that if entrepreneurs receive training related to enterprises, then TFP significantly increases by 0.95 percent. We do not find any significant impact of credit on TFP. TFP is essentially determined by technology, innovation, and human capital. It takes time to observe the impact on these factors. As our data is cross sectional, probably it is too early to say that there is no significant impact of credit on TFP. However, if we observe the sign of the coefficient, it tells us that credit has apositive impact on TFP.

Table 3
Effect of Access to Credit on Productivity of Labour, Capital and TFP

Labour Productivity (n=1535)		
Variables	Coefficient	Std. Error
If the enterprise have access to credit	6.5641**	3.1858
If any training received by entrepreneur	0.5079***	0.1945
Entrepreneur's age	0.0085	0.0060
Entrepreneur's education	0.0709***	0.0180
Operating years of the enterprise	-0.0187	0.0162
Capital Productivity (n=1374)		
If the enterprise have access to credit	0.7118	1.5493
If the enterprise operation in home-based	-0.5651 ***	0.1093
Operating years of the enterprise	0.0131*	0.0073
Total Factor Productivity (n=1535)		
If the enterprise have access to credit	3.5305*	2.0447
Operating years of the enterprise	-0.0019	0.0202
If the enterprise operation in home-based	-0.4852***	.13518

Enterprise Field Survey, InM (2014)

Access to Credit and Enterprise's Ability to Generate Employment

As mentioned earlier, microenterprises have an important contribution in creating new employment opportunity. A study of the Institute for Inclusive Finance and Development (InM) in 2013 shows that, on an average, 1.64 full time employment is created by each microenterprise. Taking this into account, microenterprise sector is estimated to have created around 3.7 million full time jobs in 2013. It definitely has a huge impact on economic growth. Contribution of microenterprises can also be measured in terms of its share in GDP. According to World Development Report 2011, in 2000, SMEs contributed 15.23 percent to the total GDP of Bangladesh and have tended to increase its share over time. In 2009, it contributed 17.92 per cent to the total GDP of the country.

Our analysis in Table 4 shows that an enterprise creates 1.33 full time employment which becomes 2,458 full time employees from 1,843 enterprises in our sample. Furthermore, we observe from the data that microenterprises create more employment for family labour whereas small enterprises create employment outside family. The data show that a "large" microenterprise employs, on an average, 2 paid employment whereas small enterprise hires more than double paid workers than that of "large" microenterprise which is around 5 labour per enterprise. "Large" microenterprise also hires considerable family labour. The data showthat the family employment creation per "large" enterprise is around 1.26. Overall, full time employment creation per firm is 1.1 and 3.28 for "small" and "large" microenterprise respectively whereas for small enterprises the average full time employment creation is almost double than that of "large" microenterprises.

Table 4
Employment Creation by Enterprises

	Microenterprise (N=1806)		Small Enterprise (N=37)	Aggregate (N=1843)
	Enterprises having 1-2 full-time employees	Enterprises having 3-4full-time employees	Enterprises having >=5 full-time employees	
Number of Firms	1700	106	37	1843
Full time Family Labour	1784	133	41	1958
Full time Hired Labour	95	215	190	500
Total Full time Employment creation	1879	348	231	2458
Avg. Full time Employment creation per firm	1.1	3.28	6.24	1.33
Avg. Full time Family labour creation per firm	1.05	1.26	1.11	1.06
Avg. Full time Hired labour creation per firm	0.06	2.03	5.14	0.27

Enterprise Field Survey, InM (2014)

From the above analysis, we observe that enterprises have multiplier effect on employment. Also we find from the above analysis that enterprises with access to credit produce more output and they have higher labour productivity. However, does that mean it has a positive impact on creating non-farm employment? It can so happen that with credit the same number of labour is producing more output now if they were underutilised before. On the other hand, if the enterprise is operating in its full capacity and by taking credit it can expand its operation then it will hire more labour. In this section we intend to find out how access to credit works for employment creation.

Table 5shows that access to credit has a positive impact on both the participation decision and the amount decision meaning that having access to credit influences the household positively to enter into the non-farm labour market. It also influences the number of days spent in non-farm activities positively meaning those who are already in the labour force are encouraged to work more, because of the higher returns to labour made possible by access to credit. In the earlier analysis, we have also observed that access to credit induces higher labour productivity. The households are now observed to spend highernumber of days in enterprise activity. Both these impacts are highly significant instatistical terms.

Table 5
Hurdle Model Estimates for Total Nonfarm Employment

	Participation Decision		Amount Decision	
	Coefficient	Std. Error	Coefficient	Std. Error
Access to formal & Quasi formal credit	.4217608***	.0357424	4.209438***	.5748102
Working Age Male members of household	.1634609***	.0207046	2.292723***	.3113846
Working Age Female members of household	. 1150154***	.0244869	2.234355***	.3708504
If Remittance received by household (dummy)	-.5549051***	.04914	-7.117103***	.8291241
Age of Household head	-.0047996***	.001479	.0103339	.0230415
If household head is male	.5306156***	.0802536	5.788178***	1.39592
Schooling Year of household head	-.0003309	.005998	.1494046**	.0656827
Land ownership of household (decimal)	.0000759	.0001326	-.0030067*	.0017156
Average Schooling years of Household	.0204007***	.0084893		
Village Average Wage Rate	-.0006072	.0003805	-.0025784	.0056197
Percentage of Extreme poor in village	-.1866581**	.1020894		

Enterprise Field Survey, InM (2014)

Although our focus is on assessing the impact of credit on non-farm employment or enterprise employment, we can also identify several factors that influence non-farm employment significantly. As expected, availability of more working age members in the household has a significantly positive impact on both participation and amount decisions. But the gender of the members matters in this regard – availability of male members has a bigger impact than that of female members. Although from the coefficient itself we cannot derive any meaningful conclusion, however from the magnitude of the coefficient we can say that higher the number of working age males in the households, the higher is the possibility to join the non-farm labour force as well asspending of more days in non-farm activityby the households. The result is also similar for the female working age group. However, the magnitude is lower than the male working age group. This reflects the socioeconomic culture prevalent in the society which shows that females face higher restrictions in joining the labour force. Access to remittance income has a negative impact on nonfarm employment in terms of both participation and amount equation. This is the traditional case of labour-leisure substitution. As the households receive non-labour income from their family members or relatives working abroad, they would like to enjoy more leisure. Hence we find the negative sign in the coefficient of remittances in both equations. It is expected that aged people are not likely to join the labour force. From the

analysis, we also find the same and the coefficient is significant as well. However, in the amount equation is has no significant impact. We also find that gender of the household head also matters–female headedhouseholds (either widowed, or divorced or separated) participate less in the labour force and have lower levels of employment once they participate, as compared with households whose heads are males. Schooling years of the household head does not matter for participation decision, however, it does matter when it comes to amount decision. The result shows that it has a positive and significant impact on the amount decision. We find similar results for land ownership. In order to participate in non-farm employment, land ownership does not have any influence. Nevertheless, once the household participates in non-farm labour force if it possesses more land, it may tend to concentrate more on farm-employment. We find the coefficient significant as well.

Our analysis shows that if the household members are more educated, they are not likely to participate in farm employment. This also has a cultural dimension. Usually more educated households do not want to be involved in wage employment. We do not include this variable in amount equation since average years of schooling may have an impact on the choice of activity that is whether members want to join farm or non-farm labour force. However, once the household has decided to join, it has nothing to do with overall education level of the household member. Among the village level characteristics, we include average wage rate and percentage of extreme poor households. It is found that higher the wage rate, the lower the possibility of the household to enter in the non-farm labour force. It also impacts the amount decision significantly. If the wage rate is high obviously the household would want to work more in farm employment because it gives higher return with less risk. Our analysis also shows if the villages have more households living under lower poverty line, then the households located in the village will have lower probability of joining the non-farm labour force.

Finding Marginal Impact

As our focus is on finding the impact of access to credit on non-farm employment we discuss the average marginal effect of access to credit. In this case we have calculated the average marginal effect of access to credit on three different aspects: (i) probability of the household to join the non-farm labour force; (ii) expected number of non-farm employment days given that the household participates in non-farm labour force; and (iii) expected number of non-farm employment days for overall sample (irrespective of employment status).

Table 6
Average Marginal Impact of Credit on Non-Farm Employment

	dy/dx (marginal effect)	Delta-Method Std. Error
Impact of access to credit on participation	0.1152***	.0095
Impact of access to credit on amount	0.2196	.4247
Impact of access to credit on non-farm employment		
days regardless of household's employment status	2.9651***	.2697

Table 6 shows the average marginal impact of credit on non-farm employment. The result shows that households with access to credit have 11.5 percent higher probability to participate in non-farm self- employment activities. This is expected because from the previous results we

have observed that the highest share of capital comes from the entrepreneurs' own source which means his/her equity. Also the major constraint they face is the lack of availability of credit. Hence, it is obvious that if credit is made available then more households can participate in non-farm activities. However, given that a household member is already employed in the non-farm sector, access to credit does not have any significant impact on the number of days that a household spends in the non-farm sector. This phenomenon may arise when labour productivity increases and the same amount of output can be produced while spending less time. Nevertheless, if we observe the overall impact of credit on non-farm employment we find it is positive and statistically significant. We also find that on an average having access to credit increases the expected number of non-farm working days by almost 3 person days per month which means 36 person days per year. As we did not find the "amount effect" significant we can say that the major increase in non-farm employment days comes from participation decision of the households to involve themselves in non-farm activities.

6. Conclusions and Policy Recommendation

Access to credit is one of the essential supports for any enterprise to grow. Our analysis shows that microenterprises in Bangladesh face severe credit constraint compared with small enterprises. Around 89 percent of the capital of microenterprises is generated by the entrepreneurs' own fund. Hence, we can say that they suffer from inadequate funds. If microenterprises have higher returns, probably financing agencies other than MFIs might be interested to finance them. Our analysis shows that microenterprises have higher returns compared with small enterprises. It should also be highlighted that we do not find any enterprise in our sample having negative profits both in financial and economic terms. Our results strongly indicate that financing enterprises especially microenterprises are profitable for financing agencies. The regression results show positive sign of the coefficient of debt-equity ratio and negative sign of the coefficient of its square which together implies that financial profit initially increases with debt-equity ratio, but it does so at a decreasing rate and beyond a certain point financial profit may actually decline. Hence it may be necessary for the financial agencies to observe the debt-equity ratio while providing loan. In terms of intensity of employment creation by the enterprises, the hurdle model used in this study shows that having access to credit not only increases the number of employment, it also increases the days of employment (36 days per year) compared with those who do not have access to credit. Hence it can be said that access to credit contributes to achieving broader development agendas like employment creation.

As discussed above, access to finance can play an important role in flourishing enterprises, employment and financing agencies' profitability. However, the critical question is how to deliver financial support to the enterprises while credit constraints remain a crucial problem for the entrepreneur for years. Our analysis shows only 3 percent of microenterprises' capital is sourced from banks. However, given the advantages of banks that they have higher ability to mobilise financial resources and act as intermediaries to invest in the portfolio of firms and individuals, Bangladesh Bank may re-orient its credit and refinancing policies that will be friendlier for microenterprise financing. As our result suggests, NGO-MFIs are the prime provider of financial services to microenterprise, the MRA may support them to mobilise more financial resources. Currently, MFIs are allowed only to mobilise member savings and term deposits. The MRA should amend this rule to fasten the process of savings mobilisation and ME

financing. The present restriction of limiting voluntary deposits or term deposits to 25 percent of equity capital can be amended as "voluntary deposits or terms deposits will not be more than 25 percent of loans outstanding". MRA may amend rules to relax the limit on ME financing as a ratio of loans outstanding. The existing limit of 50 percent may be relaxed to 60 percent without affecting financing of income generating activities for poverty alleviation (Khalily et al. 2016). It will perhaps be more appropriate to pursue a comprehensive approach that combines plausible instruments engaging all financial institutions so that policies can be implemented in an effective manner.

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