



Role of Bank Loans for Increasing the Productivity of Small- and Medium-Sized Enterprises in Bangladesh

Mohammad Masuduzzaman¹, Farida Parveen¹, Md. Syedul Islam¹, Saifa Islam Dipty²

¹Deputy General Managers, Department of Research, Bangladesh Bank, Head Office, Dhaka, Bangladesh, ²Student, Islamic University Technology, Dhaka

Abstract

In many countries, it is widely viewed that small- and medium-sized enterprises (SMEs) are very promising sector. They not only contribute to productivity but also create employment opportunities for the mass people. In spite of their significant role in output growth and generation of employment, they often face difficulties in bank finance for expanding their economic activities. For the sake of developing SMEs, Bangladesh Bank, the central bank, Bangladesh Bank initiated some special schemes to provide better formal financial services for them. However, on the ground of widespread belief that SMEs had been diverting loan into unproductive sectors, Bangladesh Bank (2016) adopted a comprehensive investigation to find causes of high growth of such loans and its economic impact through a field survey of 451 enterprises financed under banks and non-banking financial institutions (NBFIs) in 2012. For further analysis with a view to finding out the relationship between production and SME financing, we use a sub sample of 310 enterprises of that survey data for the period 2009–2011 and introducing a finance variable into the neoclassical production function, we estimate three production functions — for all SMEs, Manufacturing, and Business SMEs with panel data regression model. From the estimated equations, we find that financing in SMEs contributes positively to output basically sales of SMEs. The results suggest that output is very sensitive to bank financing to the SMEs in industrial sector than those in the business sector. For this reason, banks and NBFIs should prioritize to provide loans to the SMEs in the industrial sector which can contribute more productivity and thus economic growth.

Keywords: Small- and Medium-Sized Enterprises; Bank Loan; Productivity; Panel Data Analysis; Bangladesh

1. Introduction

Small- and medium-sized enterprises (SME's) contribution to GDP — gross domestic product has been increasing in developing countries like Bangladesh and the sector is considered as driver of economic development in the sphere of enhancing productivity, offering significant employment opportunities, empowering the poor, and providing assets to enhance poverty reduction. The fight against unemployment or lack of employment opportunities has been one of the key challenges facing Bangladesh economy since independence. Near about two-third of Bangladesh's labor force are employed in agriculture due to not getting opportunities in other sectors mainly services and manufacturing sectors in job market. Despite high reliance of job on agricultural sector, industrial and services sectors have been growing significantly in Bangladesh. Resultantly, over the years, share of agriculture in GDP has been declining while industry and service sectors have been driving forces of growth. However, manufacturing sector in Bangladesh has also been contributing to economic growth significantly over the last decade. The contribution of manufacturing sector in GDP is over 25% and growth rate of this sector is over 10% during the same period.

A nationwide survey by Bangladesh Bank (2016) shows that value addition of SMEs' accounts over 25% of Bangladesh's GDP. Hence, SMEs contribute significantly in transforming economy from agricultural to industrial led growth creating avenues of productive activities that may lead development process in Bangladesh. However, SMEs in Bangladesh are dominated by trading activities. However, in Bangladesh, SMEs are mainly concentrated in the activities in the trading sector.

Due the contribution of SMEs has drawn the attention to financial services providers in the light of their contribution in generating and fostering economic growth though their access to the formal financial sector is very limited. Banks and MFIs – microfinance institutions have now come to apprehend the potentialities of SMEs and invent financial schemes for them. SMEs in Bangladesh mostly require financing for three purposes – for start-up capital, for working capital, and for fixed capital. SMEs mostly they rely on personal savings or retained earnings in the case of those who are already in operations. Hence, SMEs' contribution to job creation and output growth is very crucial while making policies. In such backdrop SMEs, the central bank, Bangladesh Bank initiated some schemes for providing financial services for them.

However, high growth in SME loans in the recent past in Bangladesh apparently indicated the issues of monitoring and supervision with regard to diverting loans into unproductive sectors. On that background, Bangladesh Bank (2016) adopted a comprehensive analysis of finding causes of high growth of such loans and its economic impact through a field survey of 451 enterprises financed under bank and non-banking financial institutions (NBFIs) in 2012. In the light of that survey data, this study attempts to investigate the role of loans given to SMEs on output with specifying product functions, applies panel data analysis using a sub sample of 310 enterprises for the period 2009–2011 and provides some policy suggestions.

The remainder of paper is outlined in the following ways. After introduction, review of literature is described in the second section. A snapshot of SME sector of Bangladesh is reviewed in the third section. Methodology is presented in the fourth section. The fifth section shows empirical results of the study. The last section depicts conclusion.

2. Review of Literature

The key advantage of SMEs is their potentialities of job creation at low level of capital. However, challenges for SMEs are lack of start-up capital, high financing cost and banks' reluctance to provide loans for fixed and working capital. Here are some empirical studies which highlight the role of SME financing for productivity and employment opportunities.

Kediri in 2012 investigated the role of SMEs to creation of jobs in Nigeria. Using Binomial Logistic Regression the study observed that SMEs did not achieved this goal because of their incapability to attain sufficient formal financial support and they relied on loans from the informal sector for starting business.

Alam and Ullah (2006) showed that in Bangladesh SMEs are contributing to GDP 25%, industrial job creation, 80%, and labor force 25% even though they receive inadequate loans from the formal financial institutions. They identified some factors hindering SME's development includes absence of term lending, less access to the market, technology, and expertise and business information. They recommended that government can do a lot of work for developing the SMEs. This is because if SMEs are flourished, they can contribute to more employment and output in the economy.

Gichuki et al. (2014) showed that the challenges restricting MSEs – micro and small enterprises in Kenya include high cost of loans, requirement of collateral, peoples' unwillingness to be grantors, high loans processing fee, and shortened loan repayment time. Hence, they suggested to provide loans to MSEs in more easy, reasonable ways.

Abdul-Kemi and Zubair (2014) showed that loans provided by commercial banks have a positive effect on output growth and economic development in of Nigeria. The paper found that loans given by microfinance banks to transportation, trade, and industrial sectors have played a significantly positive impact on output growth and Nigeria's development during 1992–2013. The paper recommended that a significant improvement in entrepreneurship and economic development can be gained through financing SMEs in Nigeria.

Wang (2013) showed that SMEs can play an important role in attaining growth in revenue and also in profit. He revealed that there is higher financial risk associated with SMEs those have low level of production.

Akingunola and Oreoluwa (2011) showed that financing SMEs had a significant positive impact on output growth in Nigeria. Dube (2013) also showed that financing SMEs and productivity are positively related in Zimbabwe. The study suggested that low level of rate of interest can encourage SMEs to receive loans.

We conclude from the existing literature that SMEs contributes to improvement of productivity of SMEs and employment generation in many economies. Moreover, such contributions vary among different countries and regions. A number of studies in the past identified factors affecting SMEs' growth and expansion such as competition, finance, and technology. Studies also show that SMEs still confront huge challenges specially lack of start-up capital which deter their productivity and development of the economy. However, financing SMEs affects positively on output. In light of that, this study puts more importance to identify the contributions of bank loans to SMEs on productivity in Bangladesh which makes it a difference from the existing literature.

3. Snapshot of SME Sector in Bangladesh

In Bangladesh, SMEs are considered a growth-led sector. The SME entrepreneurs in Bangladesh are now making a significant contribution in national economy. Here, we will discuss some snapshot of surveyed 310 SMEs regarding their output (sales), capital, manpower, and loans taken from banks and NBFIs during 2009–2011. Trends of output, bank loans and capital, and employment of the sampled 310 SMEs are shown in Chart 1.

From Chart 1, we have observed that output (sales) is positively related with capital, loans (outstanding), and employment and all the variables increased over the time. The amount of outstanding loans increased by 33.67% to Taka 3.65 billion in 2010 and 14.04% to Taka 4.17 billion in 2011 against 2010 (Chart 1). Accordingly, output increased by 12.40% to Taka 36.51 billion in 2010 and 14.84% to Taka 41.93 billion in 2011 against 2010. Capital also increased by 16.30% to Taka 5.95 billion in 2010 and 18.44% to Taka 7.05 billion in 2011 against 2010. The number of employment also increased by 8.28% to 10927 in 2010 and 10.56% to 12082 in 2011 against 2010.

The trends of output, bank loans and capital, and employment of the sample manufacturing enterprises are shown in Chart 2.

From the trends in loans, output, capital, and employment for 113 manufacturing SMEs in Bangladesh during 2009–2011, we have found that output (sales) increases as capital, loans (outstanding), and employment increase over the time. The outstanding amount of loan increased by 25.08% to Taka 2.28 billion in 2010 and 16.27% to Taka 2.65 billion in 2011 against 2010 (Chart 2). Consequently, output went by 14.22% to Taka 14.05 billion in 2010 and 15.28% to Taka 16.19 billion

Chart 1: Trends in Sales, Capital, Loans, and Manpower in all SMEs

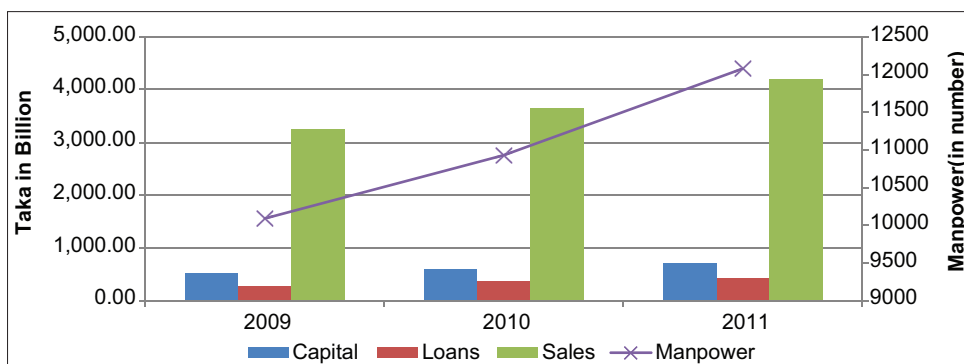
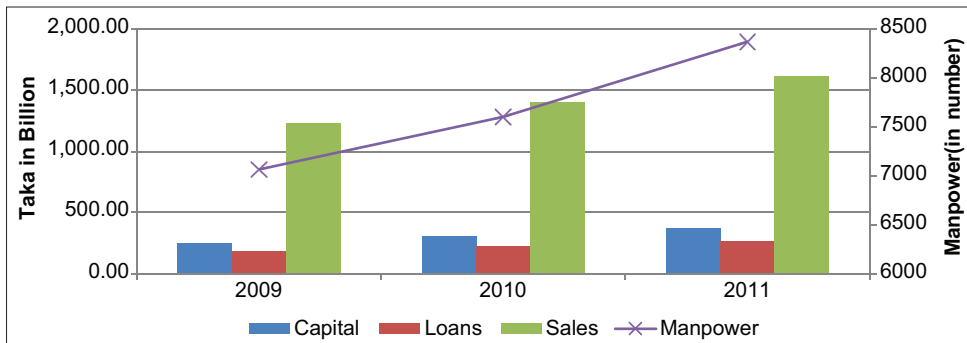


Chart 2: Trends in Sales, Capital, Loans, and Manpower in Manufacturing SMEs

in 2011 against 2010. Capital also grew by 21.07% to Taka 3.06 billion in 2010 and 22.71% to Taka 3.76 billion in 2011 against 2010. The number of employment is also accelerated by 7.66% to 7605 in 2010 and 10.07% to 8371 in 2011 against 2010.

The trends of output, bank loans and capital, and employment of the business enterprises are shown in Chart 3.

From the trends in loans, output, capital, and employment for 197 business SMEs in Bangladesh during 2009–2011, there is a positive relationship among output (sales), loans (outstanding), and employment. The loan amount (outstanding) increased sharply by 50.79% to Taka 1.37 billion in 2010 and slightly by 16.27% to Taka 2.65 billion in 2011 against 2010. Resultantly, output rose by 14.22% to Taka 22.46 billion in 2010 and 15.28% to Taka 25.73 billion in 2011 against 2010. Capital also increased gradually by 11.63% to Taka 2.89 billion in 2010 and 13.92% to Taka 3.29 billion in 2011 against 2010. The number of employments also went up by 9.75% to 3322 in 2010 and 10.56% to 3710 in 2011 against 2010.

4. Research Methodology

In this paper, we apply a sample of 310 enterprises with variables – capital, labor, sales (output), and bank loans for the period 2009–2011 and estimate production function with panel data regression model to find the relationship specifically between output and loans.

4.1. Model specification

To find the role of bank loans to SMEs, this study rests on the neoclassical production function. The production function basically neoclassical exhibits return to scale (constant) in labor and capital which can be shown as in general form:

$$Y = f(A, K, L) \quad (1)$$

where Y is output, K is the stock of capital, and L is the labor force, and “ A ” represents total factor productivity of economic factors. With constant return to scale, output per worker (i.e., labor productivity) $y \equiv Y/L$ will depend on capital per worker (i.e., capital intensity) $k \equiv K/L$. A form of neoclassical production function called the Cobb Douglas production function usually expressing the relationship in equation (1) with logarithmic form as:

$$Y = c + \alpha \ln L + \beta \ln K \quad (2)$$

where $c = \ln A$ is a constant. α and β are coefficients related to labor and capital.

Nwosa and Oseni (2013) considered a variable named banks’ loan to SME sector, “ F ,” a policy variable into Equation (2) viewing that with the current level of capital and labor, it is possible to increase growth rate of real output with increasing bank loans to SMEs. Real output (Y) is,

therefore, a function of three factors – capital stock, labor and bank's loans to SME and shown as follows:

$$Y = c + \alpha \ln L + \beta \ln K + \delta \ln F \quad (3)$$

Where δ is the coefficient of bank loans to the SMEs.

Since SMEs' contribution to production varies to the sectors in which they are producing, we will specify two more production functions. The first equation is specified as follows:

$$Y_1 = c_1 + \alpha_1 \ln L_1 + \beta_1 \ln K_1 + \delta_1 \ln F_1 \quad (4)$$

Equation (4) expresses a production function with specifying the relationship between output and banks' loan to SMEs in manufacturing sector with the coefficient δ_1 . The second equation is specified as follows:

$$Y_2 = c_2 + \alpha \ln L_2 + \beta \ln K_2 + \delta_2 \ln F_2 \quad (5)$$

Equation (5) expresses a production function with specifying the relationship of output with banks' loan to SMEs in business sector with the coefficient δ_2 .

4.2. Test hypothesis

The objective of this paper is tested through the null hypothesis which is stated that is no significant relationship of output (sales) with labor, capital, and loans to SMEs in all equations (3), (4), and (5), that is,

$$\alpha = \beta = \delta = 0, \alpha_1 = \beta_1 = \delta_1 = 0, \text{ and } \alpha_2 = \beta_2 = \delta_2 = 0$$

5. Methods

We apply panel data regression to test null hypothesis and use a sample of 310 enterprises of SMEs and divide into industry and business categories – 113 for the industrial sector and 197 for the business sector and test the null hypothesis for these two groups. The data are used for the period 2009–2011.

5.1. Fixed effects

The fixed effects (FE) model is used to investigate the relationship of output (sales) with labor, capital, and loans to SMEs within an enterprise over time. The FE model is based on assumption that each enterprise is different. Hence, an enterprise's error term and constant are not be correlated with the other one.

The equation for the FE model becomes:

$$Y_{it} = \alpha \ln L_{it} + \beta \ln K_{it} + \delta \ln F_{it} + \theta_i + u_{it}$$

where

θ_i ($i=1 \dots n$) is the unknown intercept for each enterprise (n^{th} enterprise-specific intercepts).

Y_{it} is the sales (output) of i^{th} enterprise at time t ,

L_{it} represents labor of i^{th} enterprise at time t ,

K_{it} represents capital of i^{th} enterprise at time t ,

F_{it} represents loans to the SMEs of i^{th} enterprise at time t ,

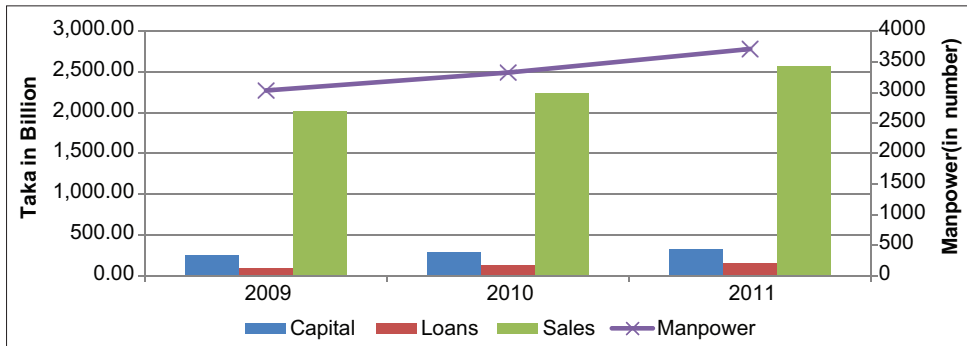
α , β and δ are the coefficients for labor, capital, and loans to SMEs,

u_{it} is the error term which is the cross section or individual specific error component

Similar FE models will be used for SMEs to the industrial and business sectors also.

5.2. Random effects

The rationale behind random effects (RE) model is that the variation across enterprises is assumed to be random and uncorrelated with loans included in the model. RE consider those individual characteristics

Chart 3: Trends in Sales, Capital, loans, and Manpower in Business SMEs

that may or may not influence output. An advantage of RE is that time invariant variables are included and these variables are absorbed by the intercept in the FE model.

The RE model is:

$$Y_{it} = \alpha_i \ln L_{it} + \beta_i \ln K_{it} + \delta_i \ln F_{it} + \theta_i + v_{it} + \varepsilon_{itc} = \alpha_i \ln L_{it} + \beta_i \ln K_{it} + \delta_i \ln F_{it} + \theta_i + w_{it}$$

where

$\theta_i (i=1, \dots, n)$ is the unknown intercept for each enterprise (n^{th} enterprise-specific intercepts).

Y_{it} is the sales (output) of i^{th} enterprise at time t ,

L_{it} represents labor of i^{th} enterprise at time t ,

K_{it} represents capital of i^{th} enterprise at time t ,

F_{it} represents loans to the SMEs of i^{th} enterprise at time t ,

α_i, β_i and δ_i are the coefficients for labor, capital, and loans to SMEs,

w_{it} is the composite error

The composite error term (w_{it}) is consist of two components – v_i , the cross section or individual specific error component and ε_{it} the combined times and cross section error component.

5.3. Fixed or random: Hausman test

To decide between fixed or RE, a Hausman test is needed to run for all three models where the null hypothesis is that the preferred model is RE versus the alternative the FE (Greene, 2008, Chapter 9). It basically tests whether the unique errors (u_i) are correlated with the regressors against the null hypothesis is they are not.

6. Findings of the Study

The aim of this paper is to investigate the relationship between production and SME Financing. By applying panel data regression models for Equations (3), (4), and (5), the results show that financing SMEs contributes positively to output in Bangladesh, though the impact varies to different sectors.

The results of the relationship between production and SME financing based on both FE and RE methods are shown in Table 1. It shows that both FE and RE methods establish statistically significant positive relationships of output with SME loans with Equations (3) and (4). However, a statistically significant positive relationship between output and SME loans is found with equation (5) through RE method, but not through FE method.

FE results with Equations (3) and (4) show that all coefficients are positive. They are statistically significant at 1% level. Therefore, we conclude that output varies positively with capital, labor, and SME loans. The values of coefficients of SME loans with Equations (3) and (4) are 0.06 and 0.18,

Table 1: Regression results of production Equations (3), (4), and (5)

Equation (3) dependent variable, $\ln Y$	FE			RE		
	Coefficient	Std. Error	P-value	Coefficient	Std. Error	P-value
$\ln L$	0.580365**	0.056033	0.0000	0.349376**	0.036386	0.0000
$\ln K$	0.273047**	0.033718	0.0000	0.416347**	0.027733	0.0000
$\ln F$	0.059296**	0.015328	0.0001	0.088311**	0.014548	0.0000
C	2.970273**	0.154877	0.0000	0.349376**	0.036386	0.0000
Adj. R-sq.	0.985121			0.454024		
F-stat.	130.9289**			258.5130**		
P-value (F-stat.)	0.000000			0.000000		
Hausman (Chi-sq. Stat.)	79.741474***					
Equation (4) dependent variable, $\ln Y_1$						
$\ln L_1$	0.230957**	0.069958	0.0011	0.164221**	0.051940	0.0017
$\ln K_1$	0.512611**	0.054309	0.0000	0.460290**	0.046486	0.0000
$\ln F_1$	0.180971**	0.042202	0.0000	0.262185**	0.035390	0.0000
C_1	2.217534**	0.255040	0.0000	2.400481**	0.220573	0.0000
Adj. R-sq.	0.881684			0.590623		
F-stat.	22.90213**			163.5486**		
P-value (F-stat.)	0.000000			0.000000		
Hausman (Chi-sq. Stat.)	13.563162**					
Equation (5) dependent variable, $\ln Y_2$						
$\ln L_2$	0.454806**	0.053271	0.0000	0.380570**	0.043447	0.0000
$\ln K_2$	0.541696**	0.047645	0.0000	0.617150**	0.038028	0.0000
$\ln F_2$	0.024993	0.028416	0.3796	0.054397*	0.025838	0.0357
C_2	2.452377**	0.157327	0.0000	2.214028**	0.139043	0.0000
Adj. R-sq.	0.935575			0.603078		
F-stat.	44.05475**			299.8127**		
P-value (F-stat.)	0.000000			0.000000		
Hausman (Chi-sq. Stat.)	12.381927**					

**and *indicates significant at 1% and 5% level

respectively, and standard errors are 0.015 and 0.042. The p-value of both coefficients is 0.000 indicating the relationship of output with SME loans is significant at 1% level. Therefore, a positive statistically significant relationship exists between output and SME loans with both equations. However, the values of F Statistic of estimated Equations (3) and (4) are 130.93 and 22.90 which are significant statistically at 1% level and show that the models are acceptable. The adj. R^2 are 0.98 and 0.88 which reveal that a statistically a good fit of the relationship.

On the other hand, the RE results with Equations (3) and (4) show that all coefficients are positive. They are statistically significant at 1% level. Therefore, we also conclude that output varies positively with capital, labor, and SME loans. However, the values of F Statistic are also statistically significant at 1% level indicating the models are acceptable. However, the adj. R^2 are 0.45 and 0.59 which again reveal that a statistically a poor fit of the relationship.

In case of FE result with Equation (5), the coefficient of SME loans is positive and its value is 0.024 and standard error is 0.15. The p-value of the coefficients is 0.3796 indicating a positive relationship between output and SME loans, but statistically is not significant at 5% level. However,

other two coefficients of the production Equation (5) – capital and labor are statistically significant at 1% level. The value of F statistic of estimated Equations (5) is 44.05, which is statistically significant at 1% level and shows that the model is acceptable. The adj. R^2 is 0.94 which reveals that a statistically a good fit of the relationship. However, the RE result with Equation (5) shows that all coefficients are positive. However, coefficients of capital and labor are statistically significant at 1% level. The value and standard error of the coefficient of SME loans are 0.05 and 0.14, respectively, which indicates that the relationship between output and SME loans is significant at 5% level.

While choosing the preference between FE and RE results, we tested Hausman Test. We found that the values of Chi-square in all Equations (3), (4), and (5) are 79.74, 13.56, and 44.05 which are all significant at 1% level. These indicate that FE is appropriate.

From the above FE results, it is found that in general SME loans providing by the banks and financial intuitions affect positively on the output to the SME sector as a whole. However, if we segregate impact of SMEs loans into impact on manufacturing or business sectors, we find that output is very sensitive to bank financing to the SMEs in the manufacturing sector than the business sector.

7. Conclusion and Recommendations

The aim of the paper is to investigate the relationship between banks' loans and productivity to SME sector. By applying a panel data analysis with production function as stated in Equation (3), (4), and (5), we found that output is positively related with capital, labor, and bank's loans in all equations. In general, SME loans providing by the banks and financial intuitions have positive impact on the output to the SME sector. Since a significant number of the sampled SMEs is operating in the business sector, we have divided the all SMEs into two groups – manufacturing and business categories to see their impacts on output for policy purposes. Accordingly, we find that output is very sensitive to bank financing to the SMEs in the manufacturing sector than those in the business sector.

The findings of this research work will go a long way in the further development of the SME sector in Bangladesh. Banks and NBFIs may play greater role in search of potential SME entrepreneurs. We have seen that trading SMEs need bank loans for purchasing goods for more sales and profit, but they employ few workers. Therefore, they cannot add value more. In some cases, too much loans to business SMEs result in problems in recovery. Manufacturing SMEs really need huge investment in addition to capital either to start production operation or to expand production. In both cases they employ a lot of workers and add value more. For this reason, banks and NBFIs should prioritize in providing SME loans to the entrepreneurs of the industrial sector which can generate more employment and output as well.

References

- Abdul-Kemi, Zubair, I. (2014), Entrepreneurship and economic development in Nigeria: Evidence from small and medium scale enterprises (SMEs) financing. *International Journal of Business and Social Science*, 5(11), 225-230.
- Akingunola, Oreoluwa, R. (2011), Small and medium scale enterprises and economic growth in Nigeria: An assessment of financing options. *Pakistan Journal of Business and Economic Review*, 2(1).
- Alam, M.S., Ullah, A.M. (2006), SMEs in Bangladesh and their financing: An analysis and some recommendations. *The Cost and Management*, 34(3), 57-72.
- Bangladesh Bank. (2016), A Survey Report on an Enquiry into the Causes of High Increase in Loans to the Small and Medium Enterprises (SME) and Its Economic Impact", Special Research Report, SRW1601.
- Dube, H. (2013), The impact of debt financing on productivity of small and medium scale enterprises (SMEs): A case study of SMEs in Masvingo urban. *International Journal of Economics, Business and Finance*, 1(10), 371-381.
- Gichuki, J.A.W., Njeru, A., Tirimba, O.I. (2014), Challenges facing micro and small enterprises in accessing credit facilities in Kangemi Harambee market in Nairobi City county, Kenya. *International Journal of Scientific and Research Publications*, 4(12), 2-25.
- Greene, W.H. (2008), *Econometric Analysis*. 6th ed. Upper Saddle Rive, NJ: Prentice-Hall.

- Kediri, I.B. (2012), Small and medium scale enterprises and employment generation in Nigeria: The role of finance. Kuwait Chapter of Arabian Journal of Business and Management Review, 1(9), 79-93.
- Nwosa, P.I., Isiaq, O.O. (2013), The impact of banks loan to SMEs on manufacturing output in Nigeria. Journal of Social and Development Sciences, 4(5), 212-217.
- Wang, X. (2013), The Impact of Microfinance on the Development of Small and Medium Enterprises: The Case of Taizhou, China. Available from: https://www.econ.jhu.edu/wp-content/uploads/sites/27/2013/07/seniorthesis_xitian_wang.pdf.