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ABSTRACT

This paper studies the contributions of bank-based financing to agriculture, SMEs and non-SMEs in the overall poverty reduction in Bangladesh. Annual data are used from 1980 to 2015. ARDL bounds testing approach is applied for evidence of cointegration among the variables and VECM is subsequently estimated. The empirical results show that financing of non-SMEs significantly reduces overall poverty in the long run. To this effect, SMEs play a marginal role in the current state of affairs. In contrast, agricultural financing reveals, otherwise.

Key Words: Bank Credit, Agriculture, SMEs, Non-SMEs, Cointegration, VECM
JEL Classifications: O10,O11,O12

I. Introduction

Agriculture and SMEs are the two pillars of utmost importance in Bangladesh economy. Both contribute to creation of jobs and income that help alleviate poverty and improvement in the quality of life. Agricultural activities primarily take place in the rural Bangladesh. SME activities are dispersed through both rural and urban areas. Agriculture is all labor-intensive. SMEs are labor-intensive and agro-based. So, both sectors complement each other. Due to size disadvantages and unique systemic risks, both sectors may not have needed access to capital that is the lifeblood of productive economic activities. The key role of agriculture in Bangladesh need not be overemphasized because it currently contributes around 16.77 per cent of country's gross domestic (GDP), and 4.5 percent of total exports, employs 47.5 per cent of the total labor force, and feeds the entire population (around 160 million). It is increasingly being recognized in the empirical economic literature that the development of a growing economy depends critically on the development of the agricultural sector (Andriesse et al., 2007; World Bank, 2008). In Bangladesh, about 70 per cent of the rural poor are concentrated in the agricultural sector. Hence, poverty alleviation is required for the rural farmers. Growth in the agricultural sector has important links with the overall economy through various channels. First, agriculture provides crucial supplies of raw materials to many other non-agricultural sectors. Second, consumption of agricultural commodities has important implications for poverty reduction of households in both rural and urban areas. Rice constitutes a major share in the consumption expenditures of the poor households. Therefore, the demand for and supply of agricultural commodities, especially food items, and their prices greatly influence the welfare of poor households. Third, the rural sector is the dominant source of supply of unskilled labor to the economy. However, changes in

global production networks and increased urbanization continue to change the character of the rural Bangladesh.

Still the agricultural sector in Bangladesh is characterized by the adoption of outmoded technology, dependence on unpredictable weather, poor infrastructure, small and fragile markets, inadequate income flows, etc. So, concerted efforts should be made to expand the rural financial system to ensure its smooth operations and thereby contribute to agricultural productivity. In turn, this would mitigate the severity of the overall poverty. Formal rural financial markets in Bangladesh comprise specialized banks, nationalized commercial banks, a sizeable number of private banks, Bangladesh Rural Development Board (BRDB), as well as NGOs. Informal sources of credit like local moneylenders, friends and relatives also significantly contribute to the rural economy of Bangladesh. For farmers, transaction costs are still comparatively high with inadequate access to formal credit. For informal lending, such costs are even much higher.

A large number of Bangladesh's farmers live in extreme poverty (below $1.25 income a day). They are unable to increase production easily, since they lack needed capital for investment in modern technology. They are also highly vulnerable to natural disasters. While they tend to have large families, they are often unable to send their children to schools and often lack sufficient foods for the family unit (Rahman, 2007). Achieving the Millennium Development Goal (MDG) of halving poverty to 26.5 percent in the non-farm sector (World Bank 2009) is remarkable. However, economic and institutional constraints, the country's geographical and demographic characteristics, and its vulnerability to natural disasters, make poverty mitigation a very challenging task. Moreover, they would further complicate achievement of the newly focused Sustainable

Development Goal (SDG), while 13 percent of total population still live in extreme poverty earning less than $1.25 a day.

The SMEs are quite dominant in the industrial structure of Bangladesh. They comprise over 90% of all industrial units. Together, the various categories of SMEs are reported to contribute between 80 to 85 per cent of industrial employment and 23 per cent of total civilian employment. The value added contributions of the SMEs vary from 45 to 50 per cent of the total manufacturing value added (Bangladesh Bureau of Statistics).

SMEs play a significant role in the transition of agriculture-led economies to industrial one furnishing ample opportunities for processing activities which can generate sustainable source of revenue and enhance the development process. SMEs thus shore up the expansion of systematic productive capability. They help absorb productive resources at all levels of the economy and add to the formation of flexible economic systems in which small and large firms are interlinked. SMEs are the growing force in the fastest growing economy of China, in terms of contribution to the national GDP (accounting for 40%), scale of assets, diversification of products, and the creation of employment. Similarly, the role of SMEs is well acknowledged in other countries such as Japan, Korea and all other industrialized economies for employment, reducing poverty and increasing the welfare of the society. Nearly, 11.3 million jobs are generated by non-farm establishments in Bangladesh, of which 73 per cent are created by micro enterprises. Focusing on the 10+ units, small units constitute 35.2 per cent of the total employment, followed by medium and large units comprising 8.8 and 56.0 per cent, respectively. In other words, SMEs employ 1.3 million people, constituting 44 percent of the total 10+ units employment. Small manufacturing enterprises are almost evenly distributed between rural and urban areas both in terms of number of establishments (52% and 48%,

respectively), and employment (51% and 49%, respectively). In the case of medium manufacturing enterprises, there is a higher incidence of both urban establishments and urban employment (57% for both counts). Rural location for medium units constitutes 43 percent in terms of both establishments and employment (Bangladesh Bureau of Statistics).

Over the past two and a half decades, Bangladesh has made significant progress in overall poverty reduction cutting into less than half from its high intensity level in the 1970s and the 1980s. Still rural poverty is more severe than urban poverty. Any further success on this front requires more pro-poor and inclusive growth strategies through greater financial inclusion.

In light of the above, the objective of this study is to assess the contributory roles of agriculture, SMEs and non-SMEs toward the overall poverty reduction in Bangladesh. The balance of the paper is as follows. Section II provides a brief review of the related literature. Section III outlines the empirical design. Section IV reports empirical results. Section V offers conclusions and policy implications.

II. Brief Review of Related Literature

Agriculture is the main source of income among the rural poor. Relative to other sectors, agricultural growth can reduce poverty rates faster and more effectively (Christiaensen et al., 2011). Farmers' decisions to invest and to produce are closely influenced by needed access to financial instruments. If appropriate risk mitigation products are lacking, or if available financial instruments do not match farmers' needs, farmers may be discouraged to adopt better technologies, to purchase improved varieties of agricultural inputs, or to make other decisions that can improve the efficiency of their businesses. Enhancing

access to finance can increase farmers' investment choices and provide them with more effective tools to manage risks (Karlan et al., 2012a; Cai, et al., 2009).

Datt and Ravallion (2008) have demonstrated in their study that India's agricultural growth reduced both rural and urban poverty. Agricultural growth at the macro level may be beneficial for the poor than growth in other sectors. Most importantly, agricultural growth is relatively more pro-poor. Usually, there are no barriers to entry in the labor-intensive agricultural sector. So, agricultural growth will increase employment in the rural sector. Increasing agricultural productivity provides relief for both rural and urban poor by reducing food prices. Increase in agricultural production, especially by small and marginal farmers, is more effective in reducing poverty (Bezemer and Headey, 2008). In addition, the increase in agricultural production can help an increase in non-agricultural activities in rural areas.

Datt and Ravallion (2002) identified in their study on India that the flexibility of the non-agricultural sectors is higher in the states where the level of education is high, agricultural productivity is large, number of landless peasants is less and child mortality rates are low. Sabur (2004) analyzed the impact of agricultural growth on rural poverty by 0.25% in Pakistan and found that an increase in agricultural income by 1 % decreases 0.25% of rural poverty. Katircioglu (2006) examined the relationship between agricultural sector and the economic growth between 1975-2002 in North Cyprus by invoking co-integration analysis and found long-term bi-directional causality.

Chabbi and Lachaal (2007) analyzed the contribution of agriculture to economic growth and the ties between other sectors in Tunisia. The findings show that economic sectors

tend to move together in the long term. However, in the short term, the role of agriculture in leading other sectors of the economy is quite limited.

Bezemer and Headey (2008) revealed the impact of agricultural growth on economic development and proverty reduction. Their study shows that the agricultural sector has been highly neglected for a decade or so despite its vital importance. Suryahadi, et al., (2009) investigated the relationship between economic growth and poverty by means of separation of industrial and residential areas. They found that sectoral growths affect poverty in different ways. Rural agricultural development in Indonesia reduces poverty more effectively in rural areas.

OECD's 2006 report draws attention to the role of economic growth in reducing poverty and the contribution of agriculture to the economic growth. In many developing countries, agriculture is the main source of employment, national income and foreign exchange earnings. Agricultural growth reduces rural poverty by reducing and stabilizing food prices, providing employment to the rural population, increasing demand for consumption of goods and services, and transferring economic growth to the non-agricultural sectors.

Tomasz (2008) studied the role of agricultural credit in the development of the agricultural sector in Poland. This study found that the agricultural credit that are primarily funded by co-operative banks have statistically significant positive impact on agricultural growth in only two regions among country's 16 regions. This study further concluded that most important factors affecting agricultural development in Poland are average farm size and agricultural employment.

Akram, et al, (2008) used time series analysis to evaluate the impact of institutional credit on farm productivity, agricultural growth and alleviation of poverty. They found that the agricultural credit unleashed positive impact on GDP. At the same time, the impact of agricultural credit in reducing poverty was significant both in the short run and in the long run. Anthony (2010) empirically investigated the impact of agricultural credit on economic growth in Nigeria. The results revealed that agricultural variables have favorable impact on economic growth. Agricultural credits are viewed as an effective instrument for counter-cyclical agricultural output, non-oil export and GDP stabilization in Nigeria. Khan, et al., (2011) reviewed the past literature on agricultural credit in rural areas of Pakistan and concluded that agricultural credit not only improved the farming but also effected every other sector of the economy in a positive way.

The growth of labor-intensive industries ensures greater involvement of the poor and better utilization of cheaper inputs. The utilization of low-wage workers in the production process (low wages are high enough for reducing poverty and low enough for market competitiveness) works to the advantage of the labor-intensive industries. Simultaneously, it is helpful in poverty reduction. Sen (1960) and Myrdal (1968) emphasized the role of labor-intensive industrialization in poverty reduction. The utilization of labor and human capital accumulation of the poor for poverty reduction is important (World Bank, 1990).

In recent years, the importance of SMEs for their contributions in economic growth and development gained worldwide recognition. SMEs employ much more labor force than the huge multinational corporations, (Mullineux, 1997). Due to dynamic and evolutionary nature, small firms serve as agents of change (Audretsch, 2000). SME sector has been a source of concern for the policy makers for the accelerated growth in developing nations.

SMEs are a major source of potential employment in low-income countries. That is why these enterprises are considered to be the "engine of growth" (Advani, 1997). The initiatives for the promotion of SMEs by the governments of the recent times, especially in developing countries, are underway (Feeny and Riding, 1997). Wider economic and socio-economic objectives such as poverty alleviation can be achieved by developing the SMEs (Cook and Nixon, 2000). There is a low cost associated with the job creation in SMEs and these enterprises are more labor-intensive than the larger firms [Leidholm and Mead, (1987); Schmitz, 1995)].

Since the SMEs are more labor-intensive, they are more likely to be located in rural areas and smaller urban areas. So development of the SMEs may be helpful for the economic satiability, growth and employment. The dispersion of these enterprises in these areas and their labor intensity may be very important in fair distribution of income than the large firms. The development of SMEs helps the economies grow in the long run. Moreover, these enterprises improve domestic market efficiency and use the scarce resources productively (kayanula and Quartey,2000).

Mukras (2003) suggests a set of policy recommendations for poverty alleviation through strengthening of SMEs. Strengthened SMEs generate employment and economic growth. The proponents of SMEs argue that entrepreneurial and innovative ventures in SMEs help improve economic growth and poverty mitigation in developing economies (Beck et al., 2004). Small enterprises enhance competition and entrepreneurship resulting in economy-wide benefits in terms of gains in efficiency, innovation and productivity. Gebremarian et al.,(2004) analyzed the relationship between development of small businesses and the incidence of poverty. Likewise, Beck et al. (2005) explored the relationship between SMEs' growth and poverty level. They found a strong negative

relationship between them. This underscores the importance of SMEs in the overall poverty reduction. The Small and medium enterprises are more labor-intensive. So growths in these enterprises generate more employment than the growth in large industries (Snodgrass and Biggs, 1996). To be more specific, SMEs generate income and employment in the economy (Lukas, 2005). Aina and Amnes (2007) suggest effective and fully funded policy programs for the development of SMEs in Nigeria, for generating employment opportunities and improving economic growth prospects thereby to empower the poor and the deprived.

The adoption of growth strategies for labor-intensive SMEs boosted economic growth with low income-inequality in the Republic of Korea and Taipei, China during 1950s - 1990s (Li and Lou, 2008). Larger absorption of rural surplus-labor and reduction in urban unemployment due to promotion of small and medium enterprises helped these economies grow further with low income-inequality. However, China experienced robust economic growth since 1980 with rising income-inequality. To add further, the SME sector plays a vital role in development, employment generation and poverty alleviation in African economies. About 85% of the total manufacturing employment in Ghana is provided by the SME sector. This sector consists of 92% of businesses and contributes 70% of the GDP in Ghana. In South Africa, this sector contributes 52-57% of GDP and provides 61% of total employment. SMEs constitute 91% of the formal businesses in South Africa (Abor and Quartey, 2010).

Agyapong (2010) discusses the role of micro, small and medium enterprises (MSMEs) in poverty alleviation in Ghana. The author is of the view that town and rural based MSMEs help create jobs and increase income of the people. This increased income helps the people to obtain better schooling, health facilities, and empowers them to get rid of

vicious circle of poverty. Furthermore, growth in small and medium enterprises (SMEs) also contributes to human capital through on-job training. The author is also of the view that MSMEs also contribute in the increase of tax revenue of the government.

III. Empirical Design

Several methods are available to test for the existence of long-run equilibrium relationship among time-series variables. The most widely used methods include Engle and Granger (1987) test, maximum likelihood test following Johansen (1988, 1991) and Johansen- Jusellius (1990) tests. These methods require that the variables in the system are integrated of order one i.e. I(1). In addition, these methods suffer from low power and do not have good small sample properties. Due to these drawbacks, autoregressive distributed lag (ARDL) bounds testing approach to cointegration has become popular in recent years.

This study thus employs ARDL bounds testing approach to cointegration following Pesaran, et al. (2001). This methodology is preferred to classical cointegration procedures, as it has certain advantages over them. For example, it can be applied regardless of the stationarity properties of the variables in the sample. It allows for inferences on long-run estimates which are not possible under classical cointegration procedures. Furthermore, ARDL model can accommodate greater number of variables in comparison to Vector Autoregressive (VAR) models.

The time series data for each variable have to be tested for unit root. This testing is necessary to avoid the possibility of spurious regression. If data are found I(0) or I(1), the ARDL approach to cointegration is preferably applied consisting of three steps. First, the existence of long-run relationship between or among the variables is established by

testing for the significance of lagged variables in an error-correction mechanism regression. Then, the first lags of all variables in level are added to the equation to create the error-correction mechanism equation for performing additional test by computing the joint F-test on the significance of all the lagged variables. Second, the ARDL form of equation is estimated where the optimal lag-length is selected by the Akaike (1969) Information criterion (AIC). Subsequently, the restricted version of the equation is solved for the long-run solution.

An ARDL representation is specified as follows:

$$\Delta LPOV_t = \beta_0 + \sum_{i=1}^{p} \beta_i \, \Delta LPOV_{t-i} + \sum_{i=1}^{p} \lambda_i \, \Delta LSMEFIN_{t-i} + \sum_{i=1}^{p} \alpha_i \, \Delta LAGRIFIN_{t-i} + \sum_{i=1}^{p} \pi_i \, \Delta LNONSME_{t-i} + \psi LPOV_{t-1} + \gamma LSMEFIN_{t-1} + \theta LAGRIFIN_{t-1} + \cap LNONSME_{t-i} + \mu_t \quad \ldots\ldots.(1)$$

Where, LPOV= log of poverty level by headcount, LSMEFIN = log of total institutional credit to SMEs, LAGRIFIN=log of total institutional credit to agricultural sector, LNONSME= log of total institutional credit to non-SME sector, t=time subscript and i= 1,…,.p

For null hypothesis (H_o) of no cointegration, $\psi = \gamma = \theta = \cap = 0$

For alternative hypothesis (H_A) of cointegration, $\psi \neq \gamma \neq \theta \neq \cap \neq 0$

Third, vector error-correction model using the first-differences of the variables is estimated for the long-run solution, and to determine the speed of adjustment toward long-run equilibrium. A general vector error-correction model following Engle and Granger (1987) is specified below:

$$\Delta LPOV_t = \beta_0 + \sum_{i=1}^{p} \beta_i \Delta LPOV_{t-i} + \sum_{i=1}^{p} \lambda_i \Delta LSMEFIN_{t-i} + \sum_{i=1}^{p} \alpha_i \Delta LAGRIFIN_{t-i}$$

$$+\sum_{i=1}^{p} \pi_i \Delta LNONSME_{t-i} + EEC_{t-1} + \acute{\mu}_t \ \ldots\ldots\ldots(2)$$

The estimated coefficient (E) of the error-correction tern (EC_{t-1}) is expected to be negative for long-run convergence and causal flows. If λ_i's, α_i's and $\pi_i's$ are non-zeros, lagged changes in agricultural credit, SME credit and non-SME credit lead the current change in the overall poverty in the short-run. Their relative numerical magnitudes indicate relative influence of the relevant explanatory variable on the dependent variable. The sum of the coefficients of each lagged independent variable shows its net interactive feedback effect with other variables. Annual data from 1980 to 2015 are used. The data sources include the Bangladesh Bank (the Central Bank of Bangladesh) for sectoral bank credit disbursements, and the Bangladesh Bureau of Statistics (BBS) for the overall poverty.

IV. Empirical Results

The standard data descriptors are reported as follows:

Table 1: Descriptive Statistics

Particulars	LPOV	LSMEFIN	LAGRIFIN	LNON_SME
Mean	3.868693	8.170962	16.83558	10.63125
Median	3.904394	8.161075	17.16587	10.60342
Maximum	4.322542	10.78717	18.53099	13.04382
Minimum	3.258097	5.289529	15.13385	7.955671
Std. Dev.	0.300439	1.548283	0.961123	1.421132
Skewness	-0.441469	-0.055676	-0.033521	-0.048079
Kurtosis	2.226647	2.078421	1.777749	2.092162
Jarque-Bera	2.009076	1.256657	2.185157	1.215398
Probability	0.366214	0.533483	0.335351	0.544602

The distribution of a variable tends to be normal when its mean –to- median ratio approaches unity, skewness is low and kurtosis is below its benchmark of 3. The numerics in Table 1 suggest that distribution of each variable is approximately normal. The Jarque- Bera statistics also tend to affirm normal distribution of each variable with varying probabilities.

The pairwise correlation matrix is provided as follows:

Table 2: Correlation Matrix

	LPOV	LSMEFIN	LAGRIFIN	LNON_SME
LPOV	1			
LSMEFIN	-0.984404002429064	1		
LAGRIFIN	-0.833411941585218	0.852148545128005	1	
LNON_SME	-0.985107990050278	0.999801361332417	0.851496798294152	1

As observed in Table 2, credits to SME, Non-SME and agriculture have high negative correlation with poverty. However, all independent variables with positive correlation with each other indicate their interactive complementarities.

Residual-based ADF and PP tests for nonstationary and their counterpart KPSS test for stationarity are implemented to examine the time series property of the variables. All computed test statistics are reported as follows:

Table 3: Results of Three Alternative Unit Root Tests

A. Augmented Dickey- Fuller Test: Null of Unit Root

Variables	Level	First Differencing	Second Differencing	Result (Level)
LPOV	1.549741	-2.105167	-7.784701***	Non Stationary
lsmefin	-2.844373	-5.166489***		Non Stationary
lagrifin	-1.844254	-4.112862***		
Lnon-sme	-3.440965**			Stationary

B. Phillips-Perron Test: Null of Unit Root

Variables	Level	First Differencing	Second Differencing	Result (Level)
LPOV	2.221421	-1.975706	-7.944800***	Non Stationary
lsmefin	-2.311666	-5.249975***		Non Stationary
lagrifin	-1.844254	-9.274981***		Non Stationary
Lnon-sme	-2.511689	-4.811713***		Non Stationary

C. KPSS (Kwiatkowski-Phillips- Schmidt-Shin) Test: Null of No Unit Root

Variables	Level	First Differencing	Second Differencing	Result (Level)
LPOV	0.769459	0.364368***	--	Non Stationary
lsmefinfin	0.140248***		-	Stationary
Lagrifin	0.771940	0.123062***	-	Non Stationary
Lnon-smeFin	0.615730***		-	Stationary

Notes: (1) The MacKinnon (1996) ADF critical values are –3.752946 and –2.998064 at 1% and 5% levels of significance, respectively. The KPSS (Kwiatkowski et al., 1992) critical values are 0.73900 and 0.46300 at the aforementioned levels of significance, respectively. (2) *** Significant at 1% level, ** Significant at 5% level, and * significant at 10% level.

Table 3 indicates both ADF and PP tests confirm non-stationarity for LPOV, LSMEFIN and LAGRIFIN in log-levels at 5% level of significance. KPSS test results also reveal the same for LPOV and LAGRIFIN. However, it indicates otherwise for LSMEFIN and LNON-SME at the same level of significance. For LNON-SME in log- level, the null hypothesis of non-stationarity is rejected by ADF test but accepted by PP test. KPSS test rejects the alternative hypothesis of non-stationarity. Thus, evidence is mixed. To state further, ADF test is inefficient and less reliable due to its super-sensitivity to the selection of lag-structure than KPSS test. However, KPSS test also suffers from sample size distortions. The mixture of I (0) and I (1) behaviors of variables justify

implementation of the ARDL procedure for conintegration. The ARDL procedure could skip unit root testing and determination of the order of integration, though.

Consequently, the ARDL procedure is implemented as outlined in equation (1) to detect the cointegration relationship among the variables. The null hypothesis (H_o) of no cointegration is $\psi = \gamma = \theta = \cap = 0$ and its alternative hypothesis (H_a) $\psi \neq \gamma \neq \theta \neq \cap \neq 0$. The estimates are reported as follows:

$$\Delta LPOV_t = \underset{(1.011715)}{0.384961} + \underset{(2.770335)}{0.540253}\Delta LPOV_{t-1} + \underset{(0.579969)}{0.123672}\Delta LPOV_{t-2} \underset{(-0.113523)}{- 0.007183}\ \Delta LSMEFIN_{t-1}$$

$$+ \underset{(0.622035)}{0.002606}\ \Delta AGRIFIN_{t-1} + \underset{(0.080122)}{0.006341}\Delta LNON\_SME_{t-1} \underset{(-0.742837)}{- 0.024847}\Delta LNON\_SME_{t-2}$$

$$\underset{(-0.032062)}{- 0.032062}\ \Delta LNON\_SME_{t-1} \underset{(-0.822551)}{- 0.039019}\ LPOV_{t-1} + \underset{(0.405060)}{0.034386}\ LSMEFIN_{t-1} -$$

$$\underset{(-0.822239)}{- 0.004369}LAGRIFIN_{t-1} \underset{(-0.530452)}{- 0.048625}\ NON\_SME_{t-1} \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)'$$

Respective t-value of each coefficient is reported in parentheses. Adjusted -R^2 = 0.511852, F= 4.236422 and AIC = - 6.091310.

Following Pesaran et. al (2001), the lower bound and the upper bound critical values of F-statistic at 5% level of significance are 2.365 and 3.553, respectively. So, the calculated F-statistic at 4.236422 clearly rejects the null hypothesis of $\psi = \gamma = \theta = \cap = 0$, in favor of the alternative hypothesis $\psi \neq \gamma \neq \theta \neq \cap \neq 0$. This confirms evidence of co-integration among the variables of interest in this paper.

The estimated long-run coefficient is reported as follows:

Table 4: Estimated Long-Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.409426	0.387183	16.55399	0.0000
LSMEFIN	-0.060140	0.086801	-0.692844	0.4939
LAGRIFIN	0.002399	0.005679	0.422489	0.6758
LNON_SMEFIN	-0.191784	0.093351	-2.054436	0.0490
AR(1)	0.865078	0.048930	17.67983	0.0000

Adjusted R-square = 0.996593; Akaike info criterion = -5.155749
Durbin-Watson stat = 1.646675 ; F-statistic =2414.223

The above empirical evidence reveals that both SMEFIN and NON_SMEFIN have long-term negative impacts on the overall poverty level. However, the effect of SMEFIN is statistically insignificant in terms of the associated t-value. This is due mainly to the inadequate access of SMEs to institutional credit. In contrast, the long-run coefficient of NON_SMEFIN is statistically significant at 5% level. This shows that NON_SMEFIN has strong negative effect on poverty level in Bangladesh. Financing to large industries creates job opportunities to a notable extent as most of these industries are still highly labor-intensive (for example, RMG sector). Additionally, employees of large industries receive greater financial and non-financial benefits to dent on the overall poverty level. These benefits may not yet be available in small and medium industries. The effect of agricultural financing seems counter-intuitive with no statistical significance. This is possible due to output losses on account of natural disasters deeply hurting the rural farmers or depressed prices of farm produces after good harvests in the face of rising input costs and farmers' post-harvest inadequate holding capacity due to immediate debt repayment obligations and poor storage facilities for perishable produces.

Next, the estimates of the VECM are reported as follows:

Table 4: Vector Error –Correction Model (VECM) Estimation

Variable	Coefficient	t-Statistic	Prob.
C	0.021512	1.547970	0.1381
$\hat{e}_{t-1}$(ECT$_{t-1}$)	**-0.235431**	**-2.334555**	**0.0307**
D(LPOV(-1))	0.624538	3.066790	0.0063
D(LPOV(-2))	0.522459	2.105159	0.0488
D(LSMEFIN)	-0.022209	-0.342575	0.7357
D(LSMEFIN(-1))	-0.108777	-1.234663	0.2320
D(LNON_SMEFIN)	-0.039396	-0.557200	0.5839
D(LNON_SMEFIN(-1))	0.149464	1.445674	0.1646
D(LNON_SMEFIN(-2))	-0.020536	-0.463928	0.6480
D(LNON_SMEFIN(-3))	-0.043500	-0.960388	0.3489
D(LAGRIFIN)	-0.002440	-0.509485	0.6163
D(LAGRIFIN(-1))	-0.002584	-0.567078	0.5773

$\overline{R}^{2=}$ 0.493857, F=3.661073, DW=2.063994, AIC=-5.896521

The coefficient of the error-correction term $(\hat{e}_{t-1})$ at -0.235431 is statistically highly significant in terms of the associated t-value. The low numerical value implies very tepid adjustment toward long-run equilibrium after a shock. Approximately, 23% of deviation resulting from the previous year's shock converges back toward the long-run equilibrium in the current year. It ensures that long run equilibrium can be attained. Banerjee et al., (1998) holds that a highly significant error correction term is further proof of the existence of stable long-run relationship.

In the short run, the sum of the coefficients of changes in financing to small and medium enterprises of current year and one year-lag period is negative indicating net negative effect on the current change in poverty level (LPOV) in the country. But the short-run coefficients of the SMEFIN are statistically insignificant in terms of the associated t-values. The sums of coefficients of other two regressors namely NON-SMEFIN and AGRIFIN are also negative

indicating that short-term net effects of both variables are negative with no statistical significance. Their statistical insignificance is the result of inadequate access to institutional credit. $\overline{R}^2$ at 0. 493857 shows that 49% of the current negative change in LPOV is due to current and lagged increases in SMEFIN, NON_SMEFIN and AGRIFIN in the long run as well as in the short run. The F-statistic at 3.661073 reveals overall modest statistical significance of the estimated VECM. The DW-statistic at 2.063994 confirms near-absence of serial correlation. The AIC criterion is taken into cognizance to determine optimum lag-structure to overcome the problem of over-parameterization of the model and resulting bias as well as inefficiency in the estimated parameters.

Finally, the stability of the long run parameters together with the short-run movements has been examined. To this end, reliance is on cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests proposed by Borensztein et al. (1995). The same procedure has been utilized by Pesaran and Pesaran (1997), and Mohsen et al. (2002) to test the stability of the long-run coefficients. The tests applied to the residuals of the VECM model are shown in Figures 1 and 2, respectively (Appendix). As can be seen in the figures, the plot of CUSUM and CUSUMsq statistics stay within the critical 5% bounds. Thus, parameters of the VECM do not depict any instability. In other words, the parameters are stable over the sample period.

V. Conclusions and Policy Implications

To sum up, each time variable tends to be normally distributed with nonstationarity depicting either I(o) or I(1) behavior. ARDL testing confirms cointegrating relationship among the variables. The estimated long-run coefficients reveal that bank loans extended to non-SMEs significantly reduce the overall poverty. Bank loans to SMES have marginal effect on mitigation of overall poverty in Bangladesh. Perhaps, this is due to their inadequate access to bank credit. However, significance for rural poverty reduction cannot be ruled out. Counterintuitively, bank loans to agricultural sector

seem to raise the overall poverty, although statistically highly insignificant. This is a likely occurrence resulting from output losses due to natural disasters or reduced prices of farm produces after good harvests despite escalation of input costs and farmers' inadequate post-harvest holding capacity due to immediate debt repayment pressure and poor storage facilities for perishable produces.

For policy implications, greater emphasis needs to be placed on SME financing by encouraging discouraged and indifferent SMEs to apply for bank credit on softer terms, as feasible. Farmers need larger access to bank credit, insurance against crop failures, reasonable price support, input subsidies, rural storage facilities, and credit for longer duration to improve holding capacity after harvests. In closing, SMEs and farmers are vulnerably exposed to diverse risks. So, risk management should also be an integral part of poverty-reducing strategies (Holzmann and Jorgensen, 2001; Christiaensen and Subbarao, 2004).

In closing, urban-centric economic growth strategy alone is not enough to reduce poverty in a significant way. There is a growing need for inclusive growth strategy to this effect.

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Appendix

Figure 1: CUSUM Test of Residual Stability

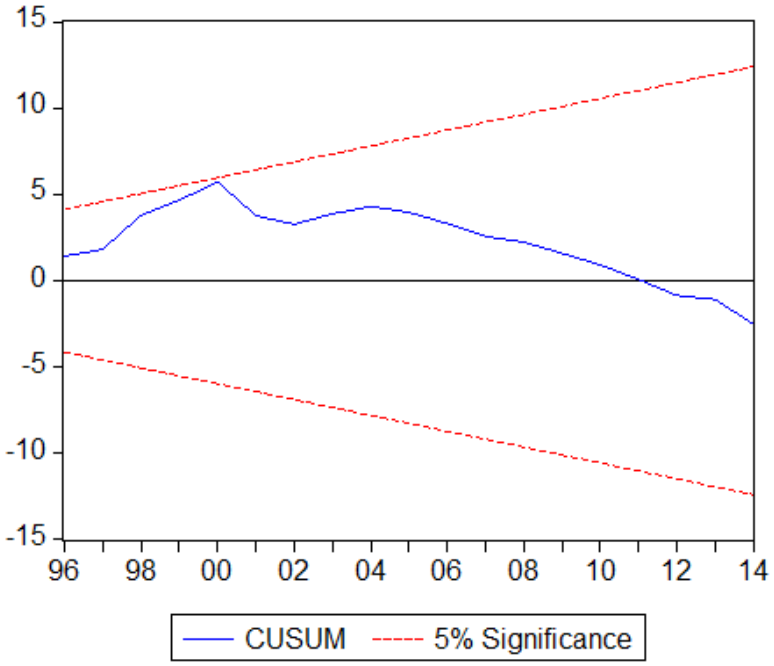

Figure 2: CUSUM Squared Test of Residual Stability