The Effect of Inflation on Mobilizations of Fund and Issue of Loans by Microfinance Institutions: A Case Study of Some Microfinance in the Upper East and Brong Ahafo Region of Ghana

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Abstract High inflation is collapsing businesses in many developing countries. And yet inflation is still high in Ghana. It has led to high interest rate charge by financial institutions and therefore individuals' inability to go for loan and save as well. The study focused on determining the relationship between inflation, mobilization of funds and the issue of loans by Micro-finance Institutions (MFIs). Samples of three (3) MFI's were conveniently and purposively chosen from Upper East and Brong Ahafo regions for the study. The data was analysed using descriptive, correlation and regression analysis. The key findings were that inflation has inverse relationship between issues of loan and mobilizations of fund, but mobilizations of fund and issues of loan had a direct relationship. Models were therefore developed based on these findings to predict the volume of loan issues and mobilizations of fund, giving inflation.

Keywords Inflation, Issues of loan, Mobilizations of fund and microfinance institutions

1. Introduction

Inflation is a major problem of most economies in the world and it influences countries, both negatively and positively. Zou, et. al. (2011) stated that inflation is an important factor contributing to social and economic instability and disorder and is one of the main observed and tested economic variables both theoretically and empirically. Inflation is one of the main problems of developing countries in the world and Ghana is no exception. Ghana, being a developing country, struggles to overcome the causes of inflation. The average year on year inflation tread in Ghana as far as the study period is concern for the year 2009 to 2013 are 19.2933, 10.7766, 8.7341, 8.4000 and 11.4583 for 2009 to 2013 respectively.

Inflation is the general increase in the level of prices of goods and services in an economy over a period of time. When the general price level changes; each unit of our currency value comes down and therefore buys less goods and services. The day to day increase in prices of commodities especially of non-food items like oil and gas snatch money from savings of consumers and the uncertainty of prices for both food and non-food items, generate

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enthusiasm among people to earn more and more. People therefore prefer working over recreation undermining their health, and seeking for loans of which they are sometimes unable to save (Cardoso, 1992). Nevertheless, Fischer (1993) and Barro (1996) found a very small negative impact of inflation on growth. Fischer (1993) however concluded that, "however weak the evidence, one strong conclusion can be drawn: inflation is not good for longer-term growth". Barro (1996) also preferred price stability because he believed it is good for economic growth.

Inflation influences the standard of living of people, for that matter mobilization of funds and issue of loans by financial institutions. As the rate of inflation increases, there is a reduction in the real value of money, (i.e. the purchasing power of people) and an increase in the price of goods and services introduces some difficulty in achieving basic necessities therefore leading individuals to depend on loan facilities to sustain their standard of living. The question then is, how can there be loans without mobilization of funds? These loans are paid back with a higher interest which is a burden on the family economy, because all things being equal, it is the same money that circulates in the economy. Hence most fixed income earners, especially those belonging to middle and lower class, crush in such circumstances. Financial institutions on the other hand are faced with the problem of mobilizing funds leading to the difficulty in issuing loans. A growing theoretical literature describes mechanisms where predictable increase in the rate of

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inflation interferes with the ability of the financial sector to allocate resources effectively. There is a significant, and economically important negative relationship between inflation, banking sector development and equity market activity. As inflation rises, the marginal impact of inflation on banking lending activity and stock market development diminishes rapidly, (Boyd et al, 2000).

Jabbar, A. Khan et. al. (2011) found that inflation impacts people like lender and borrower, fixed payment receiver, salaried group, stakeholders, entrepreneurs and harvesters, stating that their economic conditions are not stable due to their static income, with continuous change in prices of goods and services. Bach (1974) stated that Inflation transfers real purchasing power from creditors to debtors, unless the inflation is anticipated and taken into account in setting the terms of the loan, due to time value of money. The high levels of inflation cause an unstable economy in which money does not hold its value for long, oil and gas prices getting higher in recent years, electricity, transportation and rent not also left out. Workers therefore have the need of higher remuneration to cover up the higher costs of living, and are not able to save, manufacturers too are forced to increase their selling prices, scale back production to check their costs (resulting in lay-offs), or will be unable to invest in future production.

The quantity theory of money states that, there is a direct relationship between the quantity of money in an economy and the level of prices of goods and services (Friedman, 1956). This indicates that an activity of the monetary system in Ghana has a direct relationship with inflation, as the quantum of Money supplied in the system will be the *_cause'* and the *"effect"* will be inflation rate but are all macroeconomic indicators employed by the central bank in its quest to contract or expand the economy (Friedman, 1992).

Many researches have been conducted on this issue but the researcher selected this unique topic because, it draws a relationship between inflation, mobilization of funds and issue of loan.

2. Methodology

The study sought to investigate critically, the effect of inflation on mobilizations of funds and issue of loans by microfinance institutions in the upper East and Brong Ahafo Regions of Ghana for a period of five years (2009-2013). A case study approach was used to describe the relationship between inflation, mobilization of funds and issues of loan of financial institution, using information from their financial statement.

Convenient and purposive sampling of non- probability sampling was used to select microfinance institutions and interview selected managers to collect their qualitative opinion on the topic.

2.1. Sampling Techniques

This study was mainly based on data from both primary and secondary sources, using Convenience and purposive sampling method with a sample size of 3 microfinance institutions and 9 practitioners.

2.2. Data Analysis

Researchers analysed the data using descriptive statistics, correlation analysis, simple and multiple linear regression models conducted using Statistical product and service solution (SPSS) and Microsoft excel.

2.3. Research Model

The models of the study are as follows

$$\mathbf{Y} = \mathbf{b}_0 + \mathbf{b}_1 \mathbf{X} + \mathbf{\varepsilon}_i$$

Where Y is the dependent variable, this represents total mobilization of funds (savings) and issues of loan; X is the independent variable and represents average inflation in the data collected, it also assumed that some level of error and omissions may exist in the data and need to be catered and represented by ε_i , the variables b_0 is the intercepts of the equations and b_1 is the constant which also represents the slope of the regression and describes the change in the dependent variables (savings and loan) when there is any unit change (increase or decrease) in the independent variables (inflation).

This generates two equations that are shown below:

Note S = mobilization of funds (savings), L = Issues of loan and I = inflation

$$S = b_0 + b_1 I + \varepsilon_i \tag{1}$$

$$\mathbf{L} = \mathbf{b}_0 + \mathbf{b}_1 \mathbf{I} + \mathbf{\varepsilon}_i \tag{2}$$

Solving the modules mathematically produces another situation where savings is seen to have effect on loans thus $b_1(S-L) = 0$. This means that subtracting loans from savings and multiplying the result with the coefficients of the two produces zero, in other words where there is no savings, loans will be zero. Where the two independent variables (savings and inflation) are put together it produces another equation thus;

$$\mathbf{L} = \mathbf{b}_0 + \mathbf{b}_1 \mathbf{S} + \mathbf{b}_2 \mathbf{I} + \mathbf{\varepsilon}_i \tag{3}$$

3. Results and Discussions

3.1. Descriptive Analysis

Descriptive statistics is a set of brief descriptive coefficients that summarizes a given data set, which can either be a representation of the entire population or a sample.

Field data of the three microfinance institutions A, B and C who want to remain anonymous are represented in tables 2, 3, 4 and figures 1, 2, 3 respectively, which includes funds

mobilized and loans issued for the period while average inflation for each year is represented in table 1. For a giving inflation, the researcher examined its effect on the variables; savings and loans in the various institutions over the years.

The figures 1, 2 and 3 below represents the raw data of three MFI's named institution A, B and C respectively.

Figure 1 of institution A shows that in 2009 when inflation was 19.2933, the total savings thus funds mobilized was GH(135,176.90 against loans of GH(1,987.29 as compared to that of institution B and C that had savings of GH(278,114.59), GH(1,562,879.68) and loans of GH(76,478.56), GH(1,112,132.32) respectively at the same inflationary rate.

Table 1. Average Inflation for Five Years

Year	Average Inflation
2009	19.2933
2010	10.7766
2011	8.7341
2012	8.4000
2013	11.4583

Source: GBC inflationary rate in Ghana

Table 2. Institution A

YEAR	SAVINGS	LOANS
2009	135176.90	1987.29
2010	273036.87	49469.53
2011	537292.68	284454.74
2012	163228.62	649320.49
2013	909218.85	415310.74

Source: Field survey, 2015

Table 3. Institution B

YEAR	SAVINGS	LOANS
2009	278114.59	76478.56
2010	331170.49	81176.34
2011	384226.05	82194.78
2012	169451.25	157634.60
2013	986451.25	81156.82

Source: Field survey, 2015

Table 4	Institution	C
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YEAR	SAVINGS	LOANS
2009	1562879.68	1112132.32
2010	2344098.78	1541105.15
2011	3590523.46	2520603.40
2012	2142053.00	4505952.80
2013	5600460.90	3705859.50

Source: Field survey, 2015



Figure 1



Source: Field survey, 2015 Figure 2





Figure 3

In order to examine the actual effects of inflation on these variables, it was necessary to examine not less than three (3) to four (4) years.

In the year 2010, institution A, B and C accumulated savings of GH**¢**273,036.87, GH¢331,170.49 and GH\$\$2,344,098.78 respectively whiles loans for these institutions were GH\$49,469.53, GH\$81,176.34 and GH¢1,541,105.15 as against the inflationary rate of 10.7767. Considering the first two (2) years 2009 and 2010, inflationary values reduced from 19.2935 to 10.7767 inversely, the savings and loans values of the various institutions increased. This inverse relationship between inflation against savings and loans, confirms what Peter H. Sturm (1982) found out in his paper (the interaction of taxation and inflation and their effect on saving) that if interest rates do not adjust instantaneously to changes in the inflation rate, the relative rate of return on financial and real

assets will change, and people will re-arrange their portfolios, increasing their holdings of real assets at the expense of financial assets, because their real assets include consumer durables which they feel comfortable with. However, one cannot base on only this to make a valid conclusion. It is appropriate to consider some more years.

As at 2011, inflation value was 8.7342 which is a reduction from 10.7767 again yielded an increase in the savings of institution A from GH(273,036.87) to GH(537,292.68), institution B from GH(2331,170.49) to GH(2384,226.05) and institution C from GH(2,344,098.78) to GH(2,590,523.46) and it also affected the issues of loans by increasing its figures. Again this result confirms Den Haan (1990) after considering a shopping-time model where inflation distorts the allocation of time on shopping, leisure, and labour. For higher inflation the opportunity costs of money increase and agents reallocate more time to shopping

activities. As a consequence, savings decrease. As concluded by Aminu. U and Anono A. Z. (2012), they revealed that a decreasing inflation possessed a positive impact on economic growth through encouraging productivity and output level and on evolution of total factor productivity arguing that a good performance of an economy in terms of per capita growth may therefore be attributed to the rate of inflation in the country.

In 2012, an unexpected result was found which pushed the researchers to find out the deviations from normal. In this year, inflation was 8.4000 which show a reduction from 8.7767 with reference to previous year and one would have expected a corresponding increase in savings and issue of loans. However, the result indicated that savings in all the three institutions reduced, thus A from GH¢537,292.68 to GH¢163,228.62, B from GH¢384,226.05 to GH¢169,451.25 and C from GH¢3,590,523.46 to GH¢2,142,053.00. On the contrary, loans has increased tremendously in all the three institutions, thus A from GH¢284,454.74 to GH¢649,320.49, B from GH¢82,194.78 to GH¢157,634.60 and C from GH¢2,520,603.40 to GH¢4,505,952.80. This outcome was quite unusual but research reveals that 2012 was an election year.

In election year, people spend by not saving their disposable income, sometimes they borrow to spend and this could have accounted for the reduction in savings and increase in issues of loans. From the economics point of view, when there is a lot of money in circulation, inflation increases but this was not so. What could have accounted for this is that may be the items on which the funds were spent did not form a significant part of the basket of goods for determining inflation and massaging of the inflationary value by the government could also account for the reduction in inflation during the election year. This result confirms Nitish Kumar (2014) which states that political manipulation drives banks' lending in order to win elections.

Now, one may ask, what happens after the election year? Thus the year 2013 inflation increased from 8.4000 to 11.4583, a normal inverse relationship in loans against inflation was revealed. However, for savings the results showed that, institutions A increased from GH\$163,228.62 GH¢909,218.85, В from GH¢169,451.25 to to GH**C**986.451.25 and С from GH\$\,\$2,142,053.00 to GH¢5,600,460.96. There was a tremendous reduction in issues of loans in all the three (3) institutions. The question is what could have accounted for these changes.

It was revealed that after election year, peoples expenses comes down, excess income increases, government begins to spend on projects to impress the citizens thus increasing people disposable income to save the more. A lot of money in circulation among other things in an economy leads to an increase in inflation.

The researcher's base on the above analysis concluded that, there is an effect of inflation on issues of loans and mobilization of funds (savings) but the extent to which the effect is measured is shown in the analysis below.

3.2. Inferential Analysis

To understand the statistical beauty of our findings, interpretations, and conclusions of the research, let us consider a regression analysis on the data collected.

From the regression results, it was found that, a moderate correlation exists between the two variables as a correlation coefficient of -0.286 and -0.347 is obtained in institutions A and C, whiles institutions B weakly correlate with -0.035 coefficients. The negative correlation in all the three institutions implies that, as the average inflation increases, the average mobilization of funds (savings) decreases. As Cardoso (1992) concluded when he studied the effect of inflation on poverty between 1970 and 1990 in the Latin American countries that if nominal wages increase less than the price of goods consumed by wage earners, workers' real income will decline and this affects standard of living of people since households have to cut down consumption expenditure or sort over-time jobs in neglect of leisure which finally leads to ill-health and in most cases they are unable to save. This is confirmed by the correlation coefficients.

Also the table gives an R square value of 0.082, 0.001 and 0.120 which implies that about 8.20, 0.10, and 12.0 percent of the variation in the average savings made yearly by clients of the three institutions has been explained by inflation. This variation is established significantly from the table since a significant 'F-value' is obtained and that; inflation reliably predicts average mobilization of funds (savings).

Now considering the coefficients output, the independent variable (inflation) is insignificant with ($p \ge .05$), hence we cannot confidently say that it has an effect in predicting the average mobilization of funds (savings) in all the three institutions and this uncertainty can be the variation that occurred in the election year. Also the coefficient associated with the inflation figures implies that, for a unit increase in inflation, there would be a GH¢20998.840 decrease in mobilization of funds in institution A, B reducing by GH¢2568.315 and C by GH¢126049.831.

The modules below can be developed for the institutions in terms of inflation and savings.

Savings = $649,959.680 - 20,998.840(inflation) + \varepsilon_i$	Institution A
Savings = $460015.486-2,568.325(inflation) + \varepsilon_i$	Institution B
Savings = $4526882.817 - 126,049.831(inflation) + \varepsilon_i$	Institution C

Where savings is the dependent variable representing total annual mobilization of funds (savings), inflation is the independent variable and thus the yearly average inflation in the data collected. It is also assumed that some level of error and omission may exist in the data and need to be catered for and represented by ε_i whose values are (A=40544.584, B=41890.379 and C=196756.827) given by the model. Based on the above, these institutions could predict their yearly mobilizations of funds giving average inflation and the margin of error.

From the analysis in table 5, the researchers based on the former premises of the study can state that averagely, about 6.77 percent of the variation in savings is explained by inflation. Therefore rejecting H_0 and accepting H_1 concluding that, inflation has effect on mobilization of funds.

The output in Table 6 shows that there is a strong correlation between the variables considering institution A and C while B is moderately correlated. Again the negative correlation between the variables show that as inflation increases, average loans decreases and a vice versa. The output shown by the R-square values implies that the variations in average issue of loans, being explained by inflation is about 44.9percent, 22.9 percent and 43.9percent in institution A, B and C respectively. This variation established is insignificantly by the F-statistic in the table. Notwithstanding this, the negative coefficient associated with the inflation figures implies that, for a unit increase in inflation, there would be a GHC40435.584 decrease in the issue of loans by institution A, B decreases by GH¢3749.073 and C by GH¢212832.990. This result is consistent with Martin Evans and Karen Lewis (1995) who characterizes the shifts in inflation by a Markov switching model. They examine the long-run relationship between nominal interest rates and inflation and concluded that in the long-run nominal interest rates reflect expected inflation one-for-one. Thus higher interest rate affects people willingness and ability to borrow.

The modules below can be developed for the institutions in terms of inflation and loans.

Loans = 754,599.050 - 40,435.584 (inflation) +
ε_i
Loans = 139,714.216 - 3,749.073(inflation) +
ε_i Institution B
Loans = 5174193.683 - 212832.990(inflation) +
ε_i Institution C

Where loans is the dependent variable, representing total annual issue of loans, average yearly inflation is the independent variable and it is also assumed that some level of error and omission may exist in the data and represented by ε_i whose values are (A=25879.587, B=3975.616 and C=140326.869) given by the model. Based on the above, these institutions could predict their yearly loans to be issued giving average inflation and the margin of error.

The analysis in table 6 indicates that about 37.07 percent of the variations in issues of loans are explained by inflation; therefore the researchers based on this to reject H_0 and accept H_1 concluding on the latter premises of the research that inflation has effects on issues of loans.

Considering the three institutions, it is realized that inflation has effects on savings and loans. Solving the modules mathematically also depicts some effects of savings on loans. Table 7 below shows that the variables are highly correlated with a coefficient of 0.699 and significant at 95% confidence level, with a P-value of ≤ 0.05 . This means that as savings increases, issues of loans also increases and we can reliably predict the behaviour of loans based on savings. Again an R-square value of 0.671 means that about 67.1 percent of the variations in loans is explained by the savings and this is established by the F-statistics value of 26.470, this result agrees with the findings in Nigeria, where the level of funds mobilization by banks is guite low due to a number of reasons, ranging from low savings deposit rates to the poor banking habits or culture of the people (Nnanna, Englama and Odoko, 2004).

Table 5. Effects of Inflation on Savings

Name of Institution	Constant	Correlation Coefficient	R-Square	F-Value	Coefficients
А	649959.680	-0.286	0.082	0.268	-20998.840
В	460015.486	-0.035	0.001	0.004	-2568.315
С	4526882.817	-0.347	0.120	0.410	-126049.831

Table 6. Effects of Inflation on Issues of Loans

Name of Institution	Constants	Correlation Coefficient	R-Square	F-Statistic	Coefficients
А	754599.050	-0.670	0.449	2.441	-40435.584
В	139714.216	-0.478	0.229	0.889	-3749.073
С	5174193.683	-0.659	0.434	2.300	-212832.990

 Table 7. Effects of Savings on Issues of Loans

Correlation Coefficient	F-Statistic	P-Value	R-Square	Coefficients	Constant
0.699	26.470	0.00	0.671	0.756	39357.742

Variables	Correlation	Coefficients	F-Statistic	R-Square	Constant
Inflation	0.679	-48793.596	12 221	0 (80	(22411 72)
Savings	-0.131	0.739	13.321	0.689	033411./20

Table 8. Effect of Inflation and Savings on Issues Loans

Also the constant and coefficient values of GH¢39357.742 and GH¢0.756 respectively means that, a unit change in savings will affect loans by GH¢0.756.

The module driven below can be used to predict the behaviour of issue of loans given a certain level of savings.

Loans =
$$39,357.742 + 0.756(savings) + \varepsilon_i$$

It is therefore concluded that there is a high correlation between mobilization of funds and issues of loans and with a P-value ≤ 0.05 meant that it is significant at 95% confidence level.

Effect of Inflation and Savings on Issues Loans

Let us consider situations where MFI's has no other source of funds for loans (reserved fund) except savings. As indicated above, inflation and savings has effect on loans. Considering the effect of both variables on loans issued, produces the following tables;

The regression analysis between the two independent variables (inflation and savings) and the dependent variable (loans) shows that, the correlation coefficient between inflation and loan is highly correlated with 0.679 whiles savings and loan is weakly correlated with -0.131.

An R-square value of 0.689 means that the changes in the loans is about 68.9 percent explained by savings and inflation and this is reliably established by a significant F-Statistic of 13.321 thus savings and inflation can reliably predict loans. The evidence stands in conformity with Mndell-Tobin (1965) which showed that nominal interest rate would rise less than one-for-one with inflation because in response to inflation the public would hold less in money balances and more in other assets, which would drive interest rate down.

From the table above, the intercept is 633411.726 whilst slopes are -48793.596 for inflation and 0.739 for savings, the standard error for the dependent variable is (756,734.567) and that of the independent variables are (57,221.832) for inflation and (0.150) for mobilization of funds (savings), which depicts how well the variables are spread out. A general regression equation is driven using the variables above to give the module below;

Loans = 633411.726 - 48793.596(inflation) + 0.739(savings) + ε_i

Based on the above findings, the researchers can conclude that both variables (inflation and mobilization of funds) affect issues of loans.

4. Findings

This research looked at the relationship between inflation, issues of loan and mobilizations of funds by MFI and developed a model to predict the behaviour of the variable inflation, issue of loans and mobilizations of fund given the changes in any of them. The researchers considered several alternative models in examining the effects of inflation, mobilizations of fund and issues of loan.

Analyzing the model of inflation against mobilizations of funds it was found that, a negative correlation of 0.22 exists between the two variables, which meant that an increase in inflation leads to a decrease in mobilizations of fund, this agree with Grier R. and Kevin B. (2006) who says Inflation uncertainty has a negative and significant effect on growth but once the effect of inflation uncertainty is accounted for, failure to maintain a desired pace of inflation does not have a direct negative effect on output growth. However, Dotsey and Sarte (2000) used a cash-in-advance model to show that inflation variability has a positive effect on economic growth through increased savings. This is true if and only if risk averse agents will tend to save more during periods of uncertainty. This extra pool of savings will then translate via higher investment into higher GDP growth forgetting that, this period attracts a higher interest by financial institutions in giving out loans

On examining relationship between inflation and issue of loans, again it was found that a negatively strong correlation existed between the variables with a coefficient of 0.60 and it also revealed that about 37.07 percent of the variations in issues of loans are explained by inflation.

The models also examined the variables mobilizations of funds and issues of loan and found that, there was a highly positive correlation between the variables with a coefficient of 0.69 and that about 67.1 percent of the variations in loans is explained by the savings, and is significantly established with P-value of 0.00.

Notwithstanding this, solving the models mathematically depicted a situation where inflation and savings has effect on issues of loan. The results again showed that about 68.9 percent of the variations in issues of loan are explained by inflation with a coefficient of -48793.596 and savings with a coefficient of 0.739.

Finally, the models below were developed to predict the state of the dependent variable given the independent variables;

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	$\begin{aligned} Savings &= 649,959.680 - 20,998.840(inflation) + \epsilon_i & \dots \\ Savings &= 460015.486 - 2,568.325(inflation) + \epsilon_i & \dots \\ Savings &= 4526882.817 - 126,049.831(inflation) + \epsilon_i & \dots \end{aligned}$	Institution A Institution B Institution C
≻	Inflation against issues of loan	
	$\begin{array}{l} Loans = 754,599.050 - 40,435.584 \mbox{ (inflation)} + \mbox{ ϵ_i} \\ Loans = 139,714.216 - 3,749.073 \mbox{ (inflation)} + \mbox{ ϵ_i} \\ Loans = 5174193.683 - 212832.990 \mbox{ (inflation)} + \mbox{ ϵ_i} \end{array}$	Institution A Institution B Institution C
	Mobilization of funds against issues of loan	
	Loans = $39,357.742 + 0.756(savings) + \varepsilon_i$	General model
\triangleright	Inflation and mobilization of funds against issues of loan	

Loans = 633411.726 - 48793.596(inflation) + 0.739(savings) + ε_i General model

4.1. Conclusions

The inflation rate of Ghana still remains high in absolute terms and by comparison with many other countries and the world in general.

Considering the findings from the models above, there is a correlated inverse relationship between the three variables under study, which means an increase in inflation will lead to decrease in mobilization of funds and issues of loans, but statistically insignificant relationship in terms of inflation against savings and loans. This deviation is taught to be the variations in the election year.

Again, positively correlated relationships exist between mobilizations of fund and issues of loan, therefore as mobilizations of funds increases, issues of loan also increases and this is statistically significant at 95% confident interval.

Inflation contributes to individual's inability to save since it influences the standard of living. Although this study does not concentrate on inflation against standard of living, but Anafo et al, (2014) found that Inflation and income negatively influences the standard of living of people. Microfinance institutions on the other hand, cannot give out loans if there are no mobilizations of fund or they manage to give at a higher interest rate and this can collapse small scale businesses resulting to adverse effect on the individual, business owners, economy and the country at large.

Finally, the models can predict the dependent variables with a 5% error margin giving the independent variables.

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