

AN EMPIRICAL TESTING OF RELATIONSHIP BETWEEN MICROFINANCE AND ECONOMIC GROWTH IN INDIA

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ABSTRACT

Microfinance is the provision of a broad range of financial services such as deposits, loans, payment services, money transfers and insurance to poor & low-income households and micro enterprises. Microfinance sector in India has grown manifold from its inception. This has given a great opportunity to the rural poor to attain reasonable economic, social and cultural empowerment, leading to better living standard and quality of life for participating households. Microfinance has been a panacea for poverty reduction in India and thus it is profoundly promoted by our financial system throughout the economy. Moreover the phenomenon has a two way linkage with economic growth. The present study intends to look into various aspect and try to derive the inter relationship between these two factors. Two variables, i.e. GDP and Micro loans to Self Help Groups (SHG), have been taken for the study. Their annual data from the financial year 2006-07 to 2011-12 have been taken for analysis. The tools like coefficient of correlation and regression have been used to get an insight into the relationship of the selected variables. The result shows a very high level of correlation, i.e. 0.96, between the variables and a significant impact of Microloans on GDP.

Keywords: Correlation, Economic Growth, GDP, Microfinance, Micro Loans, Regression, Self Help Groups (SHG)

Introduction

The microfinance concept introduced by Bangladeshi Professor in Economics, Muhammad Yunus, in 1970 has grown into worldwide movement & is gathering momentum to become a major force in India. Before this, the world's poorest people were almost underserved by financial institutions as they were unable to offer the necessary collateral to secure loans. Along with it, most banks did not consider small loans to be appropriate as high transaction costs were prohibitive. Here in India, many poor people lacks formal banking services. In the absence of formal access to financial services, the poor have no choice but to go to local money lenders at the time of need, which exploits and charges interest rates ranging from 30% to 120%.

Microfinance, as a boom, came to rescue such poor. Microfinance, through granting very small loans, enables poor people to run small businesses and earn livelihood. Microfinance is an economic development approach that involves providing financial services through institutions to low income clients. Microfinance is the practice of providing small scale financial services to the world's poor, mainly loans and savings and increasingly other products like insurance and money transfer. Also referred to as "banking for the poor",

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microfinance has emerged as a simple and viable way to provide financial assistance to the under privileged. It also helps in pulling them out of rut of poverty and thus acclaimed recognition across the globe as a silver bullet to reduce poverty & bring in social empowerment. The study will look into the basic concept of microfinance. Thereafter the study will focus on depicting the relation between the economic growth and the innovative financial tool called microfinance. The two representative variables have been taken where GDP will be representing the economic growth and Micro loans to SHG will symbolize the state of microfinance. The tools like coefficient of correlation and regression analysis have been used for empirically testing the relationship. The study would also be helpful to all academicians, researchers and practitioners in this field.

Objective of the study

The main objectives of the study are as follows:

- To understand the concept of Microfinance
- To understand the relationship between the microfinance activities and economic growth.
- To know whether micro loans has an impact on GDP of India

Hypothesis

- a) There is no correlation between the microloans to SHG and GDP of India
- b) There is no significant impact of microloans on GDP of India

Literature Review

Barr (2005) evaluated the relationship between the microfinance and financial development. He argued that millennium developmental goals would only be achieved if the new financial reforms will focus more on microfinance to curb the poverty and thus achieving financial development. He emphasized on making the microfinance an integral part of the overall financial development strategy of any developing economy.

Khandker (2005) in his article scrutinized the effects of microfinance on poverty reduction at both the participant and the aggregate levels using panel data from Bangladesh. The results suggested that the access to microfinance contributes to poverty reduction, especially for female participants, and to overall poverty reduction at the village level. Microfinance thus helps not only poor participants but also the local economy.

Tulchin (2006) in his policy working paper examined microfinance as a sustainable tool for urban poverty alleviation in Latin America and the impact that government actors have on the sector. The paper begins by defining the value of microfinance and its role in development within the urban Latin American context. As per the author, Government actors in developing nations impact the sector through economic policy, financial institution regulation, and supervision. Governments and their implementing agencies shape the overall environment in which microfinance institutions operate. They can also be influential in linking microfinance to other productive financial flows, particularly remittances. 'Sustainable microfinance' was also defined and then considered in light of two goals: on a micro level, financially self-sufficient institutions able to provide services without external funding; and on a macro level, industry 'massification' to rapidly extend outreach to reach more people and make microfinance a meaningful vehicle for poverty alleviation. Test factors of sustainability included: 1) market-driven cost of services to clients; 2) institutional financial soundness; 3) repeat clients; and 4) an ongoing industry. Actor behavior was evaluated based on the success of these indicators. Lastly, the paper provided a research agenda to develop deeper support for policy recommendations.

Sengupta and Aubuchon (2008) have focused on achievement made by *Prof. Muhammad Yunus* and

the Grameen Bank for their efforts to create economic and social development from below. Their article was intended as a non-technical overview on the growth and development of microcredit and microfinance. The Grameen bank and its achievement were reviewed. They emphasized on the group lending mode of granting microfinance and how it is beneficial. The paper also reviewed the microfinance in different economies and its future.

Vanroose & D'Espallier (2009), in their paper analyzed the relationship between performance of microfinance institutions (MFIs) and the development of the formal financial sector of the country in which the MFI is active. They found indications of interdependencies between MFI-performance and formal financial sector development and also found that the MFIs reach more clients and are more profitable where access to the formal financial system is low.

Kumar, Bohra and Johari (2010) in their descriptive paper analyzed the present microfinance sector of India focusing on economic problems like population, under employment, low rate of education, low per capita income etc. that has actually resulted in poverty. Another major factor, as per the authors, resulting in poverty is the low asset base. The paper also centers its attention on microfinance in rural sector of our economy and how marketing of microfinance takes place in such areas. The paper concluded that the rural people have very low access to institutionalized credit especially from commercial banks which needs to be improved.

Pillai and Nadarajan (2010) in their paper provided evidences about Microfinance being a powerful tool to alleviate poverty and empowering rural women and also in bringing social and economic changes in the rural India. Microfinance and self help groups were found to be successful in promoting empowerment of women leading to development. Their paper analyzed the impact of microfinance on the empowerment of SHG leaders in psychological, economic, social aspects, managerial skills and their attitudes in Kanyakumari District.

Awojobi and Bein (2011) in their paper have established a causal relationship between the variables selected and evaluated it with the "t-test" statistic. The relevance of the independent variables in explaining the subject has been justified based on the F-statistic test and R² coefficient of multi-determination. They also used a lin-log regression model, where economic growth has been regressed on poverty level in Nigeria. Results showed that about 93 percent variation in GDP is explained by changes in micro loans and savings. And 79 percent change in poverty was due to growth and unemployment. It was also observed that poverty is multifaceted and it is because of the lack of productive resources in the country. It was revealed that the standard of living of the Nigerian people can be improved by providing them finance (Capital). Because of which there can be extensive participation in economic activities which could improve their lives.

Devaraja (2011) has described the evolution of the Microfinance revolution in India. The study stated that the outreach of such activities has been low along with the question mark on the profitability and sustainability of MFIs. This paper defined the three distinct aspects where government needs to play a significant role. The first was to protect the rights of the micro-borrower. The second was that of prudential oversight of risk-taking by firms operating in microfinance. The third was a developmental role, emphasizing scale-up of the microfinance industry where the key issues are diversification of access to funds, innovations in distribution and product structure, and the use of new technologies such as credit bureaus and the UID. He also suggested having proper regulation mechanism for the microfinance industry.

Krishnan (2011) emphasized on the well functioning of financial system for the long-run economic growth of a country. The paper looked at how the financial development of an economy can be measured. It then traced the financial development of India through the 1990s to the present, assessing the development of

each segment of financial markets. In doing so, it highlighted the dualistic development of the financial sector. Finally, the paper made an attempt to offer an explanation of this dualistic development and proposed a road map for the future development of financial markets in India.

Research Methodology

The study begins with the collection of the data pertaining to Microloans to SHG and GDP of India.

Data and its source

The present study uses 6 years annual data for the financial year 2006-07 to 2011-12 for the following variables, namely, GDP at factor cost and Micro loans disbursed to SHG. The major source of data for the above variables is Handbook of Statistics on Indian Economy maintained by Reserve Bank of India (RBI) and specifically for Microloans to SHG, it is the Status of Microfinance Report published by NABARD.

Variables in the study

The major variables used in this study are briefly explained below:

GDP: Gross domestic product (GDP) is the market value of all officially recognized final goods and services produced within a country in a given period of time. GDP per capita is often considered an indicator of a country's standard of living. GDP per capita is not a measure of personal income. Under economic theory, GDP per capita exactly equals the gross domestic income (GDI) per capita. GDP is related to national accounts, a subject in macroeconomics.

Micro Loans to SHG: Microcredit is the extension of very small loans (microloans) to impoverished borrowers who typically lack collateral, steady employment and a verifiable credit history. It is designed not only to support entrepreneurship and alleviate poverty, but also in many cases to empower women and uplift entire communities by extension. Modern microcredit is generally considered to have originated with the Grameen Bank founded in Bangladesh in 1983. Many traditional banks subsequently introduced microcredit despite initial misgivings. As of 2012, microcredit is widely used in developing countries and is presented as having enormous potential as a tool for poverty alleviation.

Statistical tools and techniques

Correlation: In statistics, the Pearson correlation coefficient or Pearson's r is a measure of the correlation (linear dependence) between two variables X and Y , giving a value between $+1$ and -1 inclusive. It is widely used in the sciences as a measure of the strength of linear dependence between two variables. It was developed by Karl Pearson from a related idea introduced by Francis Galton in the 1880s. It is also defined as the covariance of the two variables divided by the product of their standard deviations. Pearson's correlation coefficient when applied to a population is commonly represented by the Greek letter ρ (*rho*) and may be referred to as the population correlation coefficient or the population Pearson correlation coefficient. The formula for ρ is:

$$\rho_{X,Y} = \frac{\text{cov}(X, Y)}{\sigma_X \sigma_Y} = \frac{E[(X - \mu_X)(Y - \mu_Y)]}{\sigma_X \sigma_Y}$$

Pearson's correlation coefficient when applied to a sample is commonly represented by the letter r and may be referred to as the sample correlation coefficient or the sample Pearson correlation coefficient. We can obtain a formula for r by substituting estimates of the covariances and variances based on a sample into the formula above. That formula for r is:

$$r = \frac{\sum_{i=1}^n (X_i - \bar{X})(Y_i - \bar{Y})}{\sqrt{\sum_{i=1}^n (X_i - \bar{X})^2} \sqrt{\sum_{i=1}^n (Y_i - \bar{Y})^2}}$$

An equivalent expression gives the correlation coefficient as the mean of the products of the standard scores. Based on a sample of paired data (X_i, Y_i) , the sample Pearson correlation coefficient is

$$r = \frac{1}{n-1} \sum_{i=1}^n \left(\frac{X_i - \bar{X}}{s_X} \right) \left(\frac{Y_i - \bar{Y}}{s_Y} \right)$$

Where.

$$\frac{X_i - \bar{X}}{s_X}, \bar{X}, \text{ and } s_X$$

are the standard score, sample mean, and sample standard deviation, respectively.

Regression: Regression analysis is a statistical technique for estimating the relationships among variables. It includes many techniques for modeling and analyzing several variables, when the focus is on the relationship between a dependent variable and one or more independent variables. More specifically, regression analysis helps one understand how the typical value of the dependent variable changes when any one of the independent variables is varied, while the other independent variables are held fixed. Most commonly, regression analysis estimates the conditional expectation of the dependent variable given the independent variables — that is, the average value of the dependent variable when the independent variables are fixed. Less commonly, the focus is on a quantile, or other location parameter of the conditional distribution of the dependent variable given the independent variables. In all cases, the estimation target is a function of the independent variables called the regression function. In regression analysis, it is also of interest to characterize the variation of the dependent variable around the regression function, which can be described by a probability distribution. Regression analysis is widely used for prediction and forecasting, where its use has substantial overlap with the field of machine learning. Regression analysis is also used to understand which among the independent variables are related to the dependent variable, and to explore the forms of these relationships. In restricted circumstances, regression analysis can be used to infer causal relationships between the independent and dependent variables.

In linear regression, the model specification is that the dependent variable, y_i is a linear combination of the parameters (but need not be linear in the independent variables). For example, in simple linear regression for modeling n data points there is one independent variable: x_i , and two parameters, β_0 and β_1 :

$$\text{Straight line: } y_i = \beta_0 + \beta_1 x_i + \varepsilon_i, \quad i = 1, \dots, n.$$

(In multiple linear regressions, there are several independent variables or functions of independent variables.)

Data Analysis

Descriptive Statistics

From the Table 1, it can be seen certain descriptive statistics of the variables selected, i.e. GDP and Microloans. The mean average GDP for the duration selected is Rs. 4369269.8 cr. where as for microloans it is 12201.5 crore rupees. The median point is Rs.4333156.5 and Rs 13353.4. For GDP and Microloans respectively. The kurtosis is -1.25 for GDP data and -1.09 for Microloans. The standard deviation, range, and sum for GDP are 615793.75, 1638150 and 26215781, respectively. Similarly, the standard deviation, range, and sum for Microloans are 3802.68, 9964.38 and 73208.96, respectively.

Table 1:
Descriptive Statistics

GDP		Micro Loans to SHG	
<i>Mean</i>	4369296.833	<i>Mean</i>	12201.49333
<i>Standard Error</i>	251396.7476	<i>Standard Error</i>	1552.441574
<i>Median</i>	4333156.5	<i>Median</i>	13353.405
<i>Standard Deviation</i>	615793.7547	<i>Standard Deviation</i>	3802.689712
<i>Sample Variance</i>	3.79202E+11	<i>Sample Variance</i>	14460449.05
<i>Kurtosis</i>	-1.258863857	<i>Kurtosis</i>	-1.093470182
<i>Skewness</i>	0.106060072	<i>Skewness</i>	-0.603005358
<i>Range</i>	1638150	<i>Range</i>	9964.38
<i>Minimum</i>	3564364	<i>Minimum</i>	6570.39
<i>Maximum</i>	5202514	<i>Maximum</i>	16534.77
<i>Sum</i>	26215781	<i>Sum</i>	73208.96
<i>Count</i>	6	<i>Count</i>	6

Correlation Analysis

Table 2 clearly specifies that there is high level of positive correlation between the variables. The GDP and Microloans to SHG is having 0.96 of coefficient of correlation. Both the variables move in the same direction together. Hence we reject the null hypothesis that there is no correlation between the microloans and economic growth represented by GDP.

Table 2:
Correlation Matrix

	GDP	Micro Loans to SHG
<i>GDP</i>	1	
<i>Micro Loans to SHG</i>	0.960035958	1

Regression Analysis

Regression analysis also proves the point that the microfinance has a strong impact on the economic growth of our country. The model's R square is 0.9216 which specifies that the 92.16% of variation in GDP is explained by Microloans to SHG. Both the intercept and the coefficient of variable are significant as it can be seen by the P value as well as T statistic. The p value for both the intercept and coefficient of micro loans is less than 0.05. It can be interpreted that the microloans have a significant impact on GDP of India, thus rejecting our null hypothesis.

Conclusion

The microfinance sector is able to reach the large population below poverty line which aims to bring every assisted family above the poverty line, by creating a self employment opportunity through micro credit taken. The Industry as a whole is on an upswing. The study rightly pinpoints the relationship between the microfinance and economic growth. The study shows a high level of positive coefficient of correlation between the variables and also significant impact of microloans on GDP of India.

Table 3:
Regression

Regression Statistics	
<i>Multiple R</i>	0.960035958
<i>R Square</i>	0.921669041
<i>Adjusted R Square</i>	0.902086301
<i>Standard Error</i>	192689.0383
<i>Observations</i>	6

	Coefficients	Standard Error	t Stat	P-value
<i>Intercept</i>	2472394.909	287471.8498	8.600476572	0.001
<i>Micro Loans to SHG</i>	155.4647347	22.66110678	6.860421081	0.00236

RESIDUAL OUTPUT		
Observation	Predicted GDP	Residuals
1	3493858.848	70505.15238
2	3848142.768	48493.23244
3	4377383.591	-218707.5906
4	4719373.359	-211736.3593
5	4734053.894	151900.1058
6	5042968.541	159545.4594

No doubt, micro finance has come a long way but it has to climb the ladder further. Microfinance institutions have not been completely successful in its pursuits because of some inherent weaknesses and restraints. The industry have made impressive gains in coverage of rural population with financial services but mainstreaming of impact assessment and incorporation of local factors in service delivery to maximize its impact on achievement of goals of poverty alleviation has to be considered. In spite of weakness and various constraints, microfinance remains a powerful tool for the development of economy, poverty alleviation and social empowerment. It may be a drop in the ocean, but it has made people self sufficient and fuelled economic growth.

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