Research Paper

An Econometric analysis of Inequality and availability of micro credit in Karnataka

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Abstract:
"The study intends to assess the impact of availability of micro credit on the inequality of households. The study has chosen around 3000 households and the inequality has been estimated at the household level through calculating the log mean deviation of per capita consumption expenditures of households. The log mean deviation of per capita consumption expenditures of a household reflects how far that household deviates from the mean. and have found that access to credit has a significant and negative impact on the inequality in the society as it negatively determines the log mean deviation of per capita consumption expenditures of households. Similarly, the results also indicate that the total amount of household credit significantly and negatively determines the log mean deviation of per capita consumption expenditures of households and thus, it reduces the level of inequality. There is a non-linearity in the relationship between total amount credit and inequality. At the beginning when the amount of credit is relatively lower, the level of inequality reduces up to a certain amount of credit. After that level, the level of inequality goes up with the increase in the total amount of credit. In contrary to the inverted U-shaped hypothesis in the relationship between financial development and inequality, the article finds a U-shaped relationship between the total amount of credit and inequality."

Key Words: *Micro Credit, expenditure, inequality, poverty, U shape analysis, An econometric analysis of Inequality and availability of micro credit in Karnataka*

I.   Theoretical background

Income inequality measurement is an attempt to give meaning to poverty and comparisons of distributions, which may be derived from appealing various techniques. Existence of inequalities in income and wealth is a common feature of all economies, irrespective of their stage of economic development in general, political, social and cultural system in particular. However, the rate of increase in inequality has been alarming in recent times. This has generated much concern among academics and policy makers. Inequalities within countries have been growing at a rapid pace, particularly since the 1980s, when more and more economies started embracing neo-liberal policies (Abraham, 2004). The transformational and distributional effects of these policies in reducing poverty and inequality have been disappointing. Similar studies have expressed concern. In developing countries, the formal sector financial institutions exclude poor households through the collateral requirement, credit rationing, preference for high-income clients, bureaucratic and lengthy procedures of loan sanctions. On the other hand, informal sector financial sources are exploitative in nature (Bhaduri 1983, Rao 1980, Bardhan 1980, Ghosh 1986, Ghate 1992, Flotz 2004, Pertick 2005). The credit constraint has a gender characteristic (Arenius and Minniti 2005). Women are more likely to be constrained than men in terms of accessing capital for starting new businesses (Fletschner 2008). The better access to credit reduces the liquidity constraint that individuals face. Singh, Square, and Strauss (1986) argue that the relaxation of the liquidity constraint of a household contributes to the better allocation of resources, increases production, increases income and welfare. Foltz (2004) argues that easing of credit constraint significantly increases the profitability of agricultural firms. Imperfections in the financial capital markets significantly contribute to the allocative inefficiency in the production of firm households (Chavas et. al. 2005). Access to microcredit increases income and consumption of households and thus, reduces poverty of participating households (Chowdhury et. al. 2005, Chowdhury and Khandker, 1996). The welfare effect of easing women's credit constraints on the entire family is more than easing men's credit constraints (Kabeer 2001).

According to the widening gap hypothesis, financial development through financial deepening benefits

rich and powerful people in the society when governance is very weak due to lower quality of institutions which are important for ensuring the governance in the society (Banerjee and Newman, 1993; Galor and Zeira, 1993). As per this hypothesis, it is argued that financial development induced financial deepening does not ensure access to credit for everybody in the society. The people who are wealthy have enough to provide with collateral to commercial banks can only have access to credit. Those who lack the required collateral for getting a loan are left behind. As a result, the extent of the inequality widens despite an increase in the availability of loanable funds in the economy. The inequality narrowing hypothesis indicates that the individuals who were not given loans before receiving loans due to financial development induced financial deepening. As a result, the income level of these people goes up and thus, the level of inequality reduces and that also contributes to poverty reduction in the society (Banerjee and Newman, 1993; Galor and Zeira, 1993; World Bank, 2001). Jalilian and Kirkpatrick

(2002) argue that financial development can help policymakers in achieving the objective of reducing poverty in developing countries.

The available literature on the relationship between financial development and inequality has looked into the issue from the macroeconomic perspective. The majority of the studies have been done using cross-country panel data sets. Some studies have been done at the country level using time series macro data. A few studies have examined the issue at the regional level within the country. None of the available studies has looked into the issue at the micro level. Therefore, there is a gap in the literature in terms of the assessment of the relationship between financial development and inequality at the microeconomic level.

This paper is divided into 4 sections. The second section presents the objectives and methodology The third section describes the findings of this study. Finally, the conclusion of the paper is presented in section 4.

II.   Objectives And Methodology

The analysis is based on a household-level survey of randomly selected three thousand four hundred and eighty-one (*N=3481*) households. The inequality has been estimated at the household level through calculating the log mean deviation of per capita consumption expenditures of households.
Using multivariate models, Our objective in this paper is to assess the impact of accessibility of credit on the inequality at the household level In Karnataka state of India .
The following models have been formulated for achieving the objectives of the paper.

$$Y_{ij} = \beta ACCESS_j + \Sigma \varphi X_{ij} + \Sigma \delta Z_j + u_i \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

$$Y_{ij} = \eta LOAN_j + \Sigma \varphi X_{ij} + \Sigma \delta Z_j + u_i \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots(2)$$

The analysis is based on a household-level survey of randomly selected three thousand four hundred and eighty-one (*N=3481*) households from 140 villages in different parts of the Karnataka. Besides information on consumption and access to credit, the survey collected detailed information from all households on a variety of other factors such as demographic information (age, sex, marital status, etc.) and socio-economic information (education, employment, assets, microcredit etc.). The survey also collected detailed village-level information such as the distance of a household from the nearest primary school, secondary school, market and district headquarters, along with variables describing village infrastructure such as the presence of schools, markets, roads, electricity, etc.

III.   Findings of the Study

Table 1 shows the estimated results of the equation 1. The results indicate that the access to credit (ACCESS) negatively determines the log mean deviation of per capita consumption expenditures of households and it is statistically significant. It means that access to credit has a significant and negative impact on the inequality in a society as it helps households to increase their income through investing in income-generating activities. The similar results are also reflected in the results in table 2. The results show that the total amount credit (LOAN) of a household has a significant and negative impact on the log mean deviation of per capita consumption expenditures of households. This result illustrates that the amount of credit reduces inequality at the household level. These results confirm the inequality narrowing hypothesis of Benerjee and Newman (1993) and Galor and Zeira (1993). The quadratic term of the amount of credit (LOANS) has a positive coefficient and it is statistically significant. It means that the relationship between the amount of credit and the log mean deviation is non-linear and it is U-shaped. The increase in the total amount of credit reduces inequality up to a certain level and it increases inequality after that level. The reason might be that the amount of credit reduces inequality of those households, which have income below the mean level, through enhancing their abilities to invest in income generating activities and the same credit increases the inequality of those households which belong above the mean income level through increasing their income further away from the mean level. This result contradicts the Greenwood-Jovanovic inverted U-shaped hypothesis in the relationship between financial development and inequality (Greenwood and Jovanovic, 1990).

The results in Table 2 also illustrates that loans from community-based organizations (LOANCBO) have negative impacts on the level of inequality in the society. It means that loans from community-based organizations enable households living below the mean income to increase their income through investing them in income generating activities and thus, these loans reduce the of inequality in the society. However, the coefficient of LOANCBO is not statistically significant. Like loans from microfinance institutions, loans from NGOs (LOANNGO) have also positive impacts on the inequality. Loans from NGOs are similar to loans from MFIs. Like the positive relationship between loans from microfinance institutions and inequality, probably the same reasons are also working on the positive relationship between loans from NGOs and the inequality. The loans from money lenders (LOANML) reduce the inequality. But, the result is not statistically significant. Usually, money lenders are exploitative, but households can easily acquire these loans from money lenders. The easy accessibility of these loans by households might be the main reason behind the negative relationship between these loans and the inequality as the easy accessibility enables poor entrepreneurial households to get the required amount of fund for starting income generating activities easily and quickly and thus, it reduces inequality. On the other hand, loans from family members and friends (LOANFF) have significant and negative impacts on the inequality. This result is logical in the sense that the terms and conditions of loans from family members and friends are easier and the interest rates are zero in most of the cases. These easy terms and conditions are likely to be the reasons behind the negative relationship between these loans and the inequality. Finally, loans from suppliers (LOANS) have negative impacts on the inequality. But, it is not statistically significant. Usually, households which have businesses take loans from suppliers in kind and these loans are paid back after selling the supplied finished product or finished products made from supplied raw materials. As these loans help some households to earn some extra income without any additional capital or incurring any costs, the relationship between loans from suppliers and the inequality is negative.

IV.   Summary and Conclusion

This paper intends to assess the role of access to credit, along with other household and village level characteristics, on the inequality. The inequality has been estimated at the household level through calculating the log mean deviation of per capita consumption expenditures of households. The log mean deviation of per capita consumption expenditures of a household reflects how far that household deviates from the mean in terms of per capita consumption expenditures. The inequality in a society as a whole is estimated through calculating the average log mean deviation of per capita consumption expenditures of all households in that society. The analysis is based on a sample survey of three thousand four hundred eighty-one *(N=3,)* households.

The results indicate that access to credit has a significant and negative impact on the inequality in the society as it negatively determines the log mean deviation of per capita consumption expenditures of households. Similarly, the results indicate that the total amount of household credit also significantly and negatively determines the log mean deviation of per capita consumption expenditures of households and thus, it reduces the level of inequality in the society. The results also indicate that there is a U-shaped relationship between total amount credit and inequality. Out of seven credit sources, five sources have negative impacts on the inequality at the household level and the remaining two sources have positive impacts on the same inequality. Loans from commercial banks, community-based organizations (CBOs), money lenders, family members and friends and suppliers negatively determine the log mean deviation of per capita consumption expenditures of households and thus, inequality in the society. Out of these sources, only loans from commercials banks and loans from family members and friends significantly and negatively determines the log mean deviation of per capita consumption expenditures of households. On the contrary, loans from microfinance institutions (MFIs) and non- government organizations (NGOs) positively determine the log mean deviation of per capita consumption expenditures of households and consequently, the inequality in the society. Out of these two sources, only the variable on loans from MFIs is statistically significant.

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Table 1: Determinants of Inequality and Access to Credit by Households

VARIABLES	Equation 1 (Access to Finance)
ACCESS	-0.0394***
RELIGION	0.0205
MEMBERS	0.116***
AGE	-0.00420*
AGE Square	2.74e-05
SEX	-0.148***
HEADEDU	-0.00670**
EDUMALE	-0.00918***
EDUFEMALE	-0.00711***
EMPAG	-0.102***
EMPDL	0.0194
LANDIRR	-9.23e-07
LANDNIRR	-0.000283***
ASSETSP	-0.0349***
LSTOCK	-0.0162***
RIVERERO	-0.000232*
NHHS	1.46e-05
HOMELESS	0.000113
MIGRATION	0.000107***
ROAD	0.00339
SCHOOL	0.00355
ELECTRICITY	-0.00439
FLOOD	-0.0421*
SIDR	-0.0662***
Constant	0.386***
Observations	3113
R-squared	0.252

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 2: Determinants of Inequality and Total Loan Amount of Households

VARIABLES	Equation 2 (Total Household Loan Amount)	
	Linear	Quadratic
LOAN	-6.93e-07***	-1.87e-06***
LOANS		2.07e-12***
RELIGION	0.0231	0.0220
MEMBERS	0.116***	0.117***
AGE	-0.00431*	-0.00413
AGE Square	2.92e-05	2.80e-05
SEX	-0.147***	-0.147***
HEADEDU	-0.00630**	-0.00596**
EDUMALE	-0.00917***	-0.00899***
EDUFEMALE	-0.00671***	-0.00668***
EMPAG	-0.100***	-0.0998***
EMPDL	0.0184	0.0183
LANDIRR	-8.01e-07	-7.98e-07
LANDNIRR	-0.000276***	-0.000279***
ASSETSP	-0.0357***	-0.0351***
LSTOCK	-0.0162***	-0.0162***
RIVERERO	-0.000223	-0.000222
NHHS	1.61e-05	1.77e-05
HOMELESS	0.000102	9.01e-05
MIGRATION	0.000102***	0.000101***
ROAD	0.00324	0.00328
SCHOOL	0.00368	0.00389
ELECTRICITY	-0.00307	-0.00599
FLOOD	-0.0415*	-0.0378*
SIDR	-0.0629**	-0.0575**
Constant	0.375***	0.365***
Observations	3113	3113
R-squared	0.254	0.256

*** $p<0.01$, ** $p<0.05$, * $p<0.1$