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Microfinance and Inequality*

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Abstract

This paper examines the relationship microfinance and inequality by providing a cross-country empirical study of 61 developing countries. Microfinance plays an important role in the financial market in many developing countries. Although microfinance is expected to significantly affect macro variables, we lack enough empirical research on Impact Analysis at the macro level, such as the effect of microfinance on inequality. We expect microfinance to have an equalizing effect, and provide a first detailed cross-country empirical analysis in this regard. We find that microfinance can lower inequality, and poorer countries need to focus more on the equalizing effect of microfinance.

Keywords: Microfinance, Inequality, Impact Analysis at Macro Level

JEL classification number: O11

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1. Introduction

The income difference between the rich and the poor is rather significant in developing countries such as Latin America and Africa, causing serious problems in their respective societies. High income inequality in poor countries leads to crime and political instability and hampers the processes of economic development and poverty reduction. In particular, high inequality is due to an imperfect financial market in developing countries. Owing to immature financial regulations and poor administration of justice, moral hazard and adverse selection are rampant in developing countries. Moreover, poor countries are fragile to external shocks because they depend on the agriculture industry, owing to which they face higher external risk. Accordingly, credit rationing takes place since the market excludes the poor without collateral which can assure these high risks. This is one of the significant reasons for high inequality in poor countries. In order to ease inequality and develop the financial sector, it is necessary to deal with such market failure.

Financial deepening (or development of financial market) is considered a powerful tool that lowers inequality and has recently been analyzed from the theoretical and empirical perspectives. However, theoretical studies on financial deepening have not reached a uniform conclusion and have been controversial. Some argue that financial deepening leads to efficient credit allocation and reduction of risk through diversified investment and information production of financial intermediaries, which stimulates economic development and hence lowers inequality. Furthermore, it can be argued that financial depth eases the credit constraints on the poor and increases their productive assets and productivity, thus contributing to poverty reduction (World Bank, 2001;

Jalilian and Kirkpatrick, 2002).

On the other hand, others argue that financial deepening benefits only the rich, thus increasing inequality. Beck, Demirgüç-Kunt, and Levine (2004) point out that since the poor depend mainly on informal finance such as borrowing from relatives or friends, the development of the financial sector is beneficial only to wealthy people. Moreover, Financial depth lowers inequality solely during late-stage development, while financial deepening increases inequality in the early stage of development. This is because only wealthy people can access the financial market (Greenwood and Jovanovic, 1990, cited in Beck et al (2004)).

Furthermore, there are only a few empirical studies and a more detailed analysis is required, although most of the studies indicate that financial depth lowers inequality (Li et al, 1998; Beck et al, 2004).

As such, while the impact of overall financial depth on inequality seems to be obscure, we focus on the role of microfinance as a tool for financial depth endowed with the equalizing effect. Microfinance directly eases the credit constraints on the poor and is expected to lower inequality.

Microfinance is a financial service for the poor and is largely applied in developing countries as low-rate finance with its unique technique known as group lending. Group lending is a financial service that offers loans to groups of borrowers who are jointly liable for the loans. Microfinance institutions (MFIs) transfer the opportunity cost to borrowers by allowing them to carry out screening and monitoring. Group members screen each other's repayment ability, which eases adverse selection. They also monitor each other, which mitigates moral hazard. Accordingly, lenders do not need to cover the high opportunity cost, which is normally required for providing loans to the poor, and

they can also achieve a low default rate. Microfinance also has a dynamic incentive, which is a useful tool that allows their clients to pay back loans, since future loan access is available only if borrowers pay back their original loans. Using these effective mechanisms, microfinance offers loans to the poor who were initially excluded from the formal financial market because they were not creditworthy. Microfinance eases credit constraints and now plays a significant role in the financial market in developing countries.

Microfinance allows the poor to have access to financial services, make investments, and diversify their business, thus leading to an increase in their income. Moreover, microfinance offers not only financial services but also training with strong disciplines, which enables borrowers to increase their productivity. They can also cope with external shocks and achieve consumption smoothing. As such, microfinance enables the poor to increase their income, consumption, and productivity, which contributes to lowering inequality.

Ahlin and Jiang (2008) describe a model in which the adoption of microfinance is considered financial development and show that microfinance decreases inequality. According to them, microfinance lowers inequality by increasing the income of the poor and lowering the income of the wealthy people since the wages paid by employers increase. Green, Kirkpatrick, and Murinde (2006) argue that improvement in the financial access to the poor can directly enhance poverty reduction, since an imperfect financial market, which excludes the poor, is an important factor that affects poverty (Stiglitz, 1998).

As such, although the equalizing effect of microfinance can be explained theoretically, we lack sufficient research information on the empirical analyses in this regard. There

mainly exists Impact analysis (Imp-Act) at the household level such as analyses on the effect of microfinance on household income or consumption. There is a consensus that microfinance decreases the consumption volatility of households and leads to consumption smoothing and increased production (Cuong, Bigman, Den Berg, and Thieu, 2007; Khandker, 1998; Parker and Nagarajan, 2001; and Zaman, 2001). However, Imp-Acts such as the effect of microfinance on income or poverty reduction are controversial, provide different results for different subjects, and lack universality. For example, Pitt and Khandker (1998) show that microfinance increases household consumption, while Morduch (1999) indicates that microfinance does not have a significant impact on consumption (cited in Roodman and Morduch(2009)). Mosley and Hulme (1998) show that microfinance does not offer loans to the poorest.

However, there are only a few Imp-Acts at the macro level, and there are only a few studies on the impact of microfinance on inequality. The effect of microfinance on inequality has been examined within a particular country, and there has not been any cross-country analysis thus far. Cuong, Bigman, Den Berg, and Thieu (2007) analyzed Vietnam Bank for Social Policies and concluded that it lowers inequality, but its effect is insignificant. Mahjabeen (2008) used the general equilibrium (CGE) model to show that microfinance in Bangladesh lowers inequality. There is no sufficient empirical information on the effect of microfinance on inequality, and further analysis is required.

This paper provides a detailed empirical cross-country analysis of 61 developing countries concerning the impact of microfinance on inequality. Microfinance has grown with each passing year since the 1980s and plays an important role in the financial market in many developing countries. Although microfinance is expected to significantly affect macro variables, we lack enough empirical research on Imp-Acts at

the macro level, such as the effect of microfinance on inequality. We expect microfinance to have an equalizing effect, and provide a detailed empirical analysis in this regard.

The contribution of this paper is twofold. Firstly, our study considers microfinance as a financial system that directly affects inequality and focus the relationship between microfinance and inequality, although many previous literatures analyze whether financial depth as a whole lowers inequality. We explain the role of microfinance as a tool for financial depth endowed with equalizing effect. Secondly, our analysis provides a more universal result by using the cross-country methodology, while previous empirical studies conduct country analyses and provide different results for different subjects or different countries. Thus, considering that we can (1) show more universality of microfinance's impact, (2) indicate impact assessment at the macro level, which has hardly been analyzed, and (3) explain the role of microfinance in financial development, our study is significant.

2. Model

We use the cross-country regression methodology, following recent empirical literatures such as Milanovic (2002), in order to examine the impact of microfinance on the inequality in developing countries. Our empirical analysis is based on the cross-country data of 61 developing countries, and the empirical specifications are as follows:

Model 1:
$$y_i = \alpha + \beta M_i + \eta X_i + e_i,$$

Model 2:
$$y_i = \alpha + \beta \text{Log}M_i + \eta X_i + e_i,$$

where y_i indicates the inequality measure; M_i represents the degree of microfinance intensity; X_i is the vector of control variables; and e_i denotes random disturbance (i : country).

Model 1 is the specification that includes microfinance intensity for examining the effects of microfinance on inequality. Model 2 is the specification where the logarithm of the microfinance intensity is employed to robustly examine the equalizing effect of microfinance.

The degree of microfinance intensity is included to assess the impact of microfinance on inequality. We employ the number of MFIs and the number of borrowers in a country as the measure of microfinance intensity. We can expect that microfinance eases the credit constraints on the poor, thus decreasing inequality.

The analysis also includes control variables such as the logarithm of GDP per capita, its square term, inflation rate, democracy index, and regional dummy. We assume that a higher income level increases inequality, but its effect declines after a certain level. Kuznets' inverted-U hypothesis points out that inequality increases until the country's income reaches a certain level, and after the turning point, inequality declines. Therefore, we include the logarithm of GDP per capita and its square terms in the model as well, following previous literatures, which also include these variables in their model.

Furthermore, our analysis includes openness in order to assess the impact of openness on inequality. We employ a trade (export and import) to GDP ratio as the measure of openness, following empirical literature such as Milanovic (2002) and Wade (2004).

The neoclassical theory shows that openness results in economic development, increases employment, and lowers inequality through improved resource allocation and technology transfer. Further, the Heckscher-Ohlin-Samuelson model indicates that openness increases the demand of low-skilled labor in poor countries since developing countries export low-skilled labor-intensive products, which lowers inequality. On the other hand, various studies show that openness worsens inequality. According to them, openness increases the demand of high-skilled labor in developing countries since it requires a higher level of economic activities through outsourcing and foreign direct investment (FDI). Its empirical result has also been controversial.

We expect higher inflation to be associated with higher inequality because high inflation harms mainly the poor and it increases the number of poor people. We also assume that inequality declines as democracy intensifies, following standard political economy theories (Gradstein et al, 2001). Further, our model includes regional dummy variables, including the dummies of South Africa, Eastern Europe and Central Asia, Middle East and North Africa, and Latin America for examining the inequality/difference among the regions¹.

3. Data

This paper uses the cross-sectional data of 61 developing countries which is obtained from World Development Indicators (WDI) published by World Bank. We use the 2007 cross-sectional data for regression using the number of MFIs in a country as the measure of microfinance intensity. We also use the 2005-2007 pooled data for

¹ The base region is Asia.

regression using the number of borrowers in a country as the measure of microfinance intensity. Since World Bank publishes inequality data almost every five years and its year of publication differs among countries, the data for our analysis is the earliest available data, from 2003 to 2007. The data on the number of MFIs in the country is obtained from the Microcredit Summit Campaign² and the democracy index that we employ is Institutionalized Democracy obtained from Marshall and Jaggers (2009). The definition and summary statistics are shown in Table 1.

4. Empirical Results

Table 2 displays the results of regression using the number of MFIs as the degree of microfinance intensity. Its first column (a) is the result of Model 1, which employs the number of MFIs as the degree of microfinance intensity, and its second column (b) is the result of Model 2, which employs the logarithm of the number of MFIs as the degree of microfinance intensity. Our results show that microfinance intensity measures are significantly negative in both columns (a) and (b), indicating that microfinance lowers inequality. It can be argued that microfinance has a significant equalizing effect.

Table 3 shows the result of regression using the number of borrowers in a country as the degree of microfinance intensity. Similarly, its first column (a) is the result of Model 1, which employs the number of MFIs as the degree of microfinance intensity, and its second column (b) is the result of Model 2, which employs the logarithm of the number of MFIs as the degree of microfinance intensity. The results show that the coefficient on the number of borrowers and the coefficient on the logarithm of number of borrowers

² <http://www.microcreditsummitt.org>

are significantly negative in both the columns. It can be found that microfinance leads to a decline in inequality, indicating the robustness of the equalizing effect of microfinance.

With regard to control variables, the logarithm of GDP per capita and its square terms, the dummies of Eastern Europe, Central Asia, and Latin America are significant in both columns (a) and (b), and South Africa are significant in column (b), which is consistent with our prediction. Democracy is positively significant in column (b) and it is incompatible with our prediction, although our result is consistent with previous empirical literature (Gradstein et al, 2001). In both the columns, the logarithms of GDP per capita are significantly positive and its square terms are significantly negative. It is found that inequality worsens as the country develops, but after a certain development level, inequality declines. This supports Kuznets' inverted-U hypothesis. Moreover, the dummies of Eastern Europe and Central Asia are significantly negative, while those of Latin America and South Africa are significantly positive in both the columns. It can be argued that inequality in Eastern Europe and Central Asia is relatively lower, while that in Latin America and South Africa is relatively higher.

5. Conclusion

Most developing countries face the problem of high income inequality, which leads to crimes and political instability that hamper economic development. It can be argued that financial market failure is one of the biggest reasons for high inequality, and the development of the financial market is required in order to lower inequality. Some studies consider overall financial deepening as a tool to reduce inequality and analyze

the equalizing effect of financial depth, but their results are still controversial. On the other hand, microfinance as a particular tool for financial deepening is expected to lower inequality more by directly easing the credit constraints on the poor. However, we lack the sufficient empirical research information in this regard, and a more detailed analysis is required.

This paper provides a cross-country empirical study of 61 developing countries concerning the impact of microfinance on inequality. We show that microfinance plays an important role in creating a financial system endowed with the equalizing effect. There are only a few country analyses on the impact of microfinance on inequality, and a cross-country analysis has not been conducted thus far. To the best of our knowledge, our study is the first one to indicate the universality of the equalizing effect of microfinance, applying the cross-country methodology. Moreover, we contribute to the research accumulation of the impact assessment of microfinance at the macro level, which has hardly been analyzed.

The main results of the empirical analysis in this paper are as follows:

- (1) Microfinance has a significant equalizing effect.
- (2) Our empirical results support Kuznets' inverted-U curve.

As such, our empirical results confirm that microfinance lowers inequality, and it can be used for an effective redistribution policy. Moreover, we found that economic development lowers inequality after country income reaches a certain level, while economic growth increases inequality up to a certain level of economic development such as in developing countries. Apparently, economic growth in developing countries

does not have a significant trickle down effect or an equalizing effect, and it significantly increases inequality. Accordingly, poor countries need to focus more on the equalizing effect of microfinance.

The high inequality in developing countries is largely due to the credit constraints on the poor or the financial market failure, which besieges sorely the wealthy people. Microfinance can provide loans to the poor effectively with a high repayment rate using its unique technique and is expected to ease the credit constraints on the poor and hence lower inequality. Since microfinance is considered to be unable to finance itself and relies on external support such as subsidies, governments need to develop the microfinance market with sufficient assistants. The financial sector should not depend on the market force unconditionally, and a market intervention that creates a financial system especially for the poor in order to redistribute wealth is required. Microfinance can be an effective tool with regard to this requirement. Microfinance also allows the poor not only to obtain loans but also to increase their productivity through borrowing activity with training, which leads to development of social system in poor countries. Thus, microfinance copes with market failure in order to prompt well-balanced financial development, leading to economic growth and improvement of social welfare.

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Table1 Variables Definitions and Summary Statistics

| Variable | Definition | Mean | Standard Deviation |
|-----------------------------------|--|-------------|---------------------------|
| Inequality | Gini coefficient | 41.862 | 7.886 |
| Number of MFI | The number of MFIs(microfinance institutions) in a country | 50.565 | 119.091 |
| Number of Borrowres | The number of borrowers who borrow from MFIs in a country | 101,910 | 364,663 |
| The Logarithm of GDP per capita | The Logarithm of GDP per capita (constant 2000 US\$) | 6.906 | 1.081 |
| Trade(Export+Import) to GDP ratio | Exports of goods and services + Imports of goods and services (% of GDP) | 84.810 | 35.115 |
| Inflation rate | Inflation, GDP deflator (annual %) | 8.139 | 5.682 |
| Democracy index | Institutionalised Democracy | 5.284 | 3.454 |
| South Africa | South Africa Dummy South Africa = 1, Others = 0 | 0.318 | 0.468 |
| Eastern Europe and Central Asia | Eastern Europe and Central Asia Dummy Eastern Europe and Central Asia = 1, Others = 0 | 0.224 | 0.419 |
| Middule East and North Africa | Middule East and North Africa Dummy Middule East and North Africa = 1, Others = 0 | 0.082 | 0.277 |
| Latin America | Latin America Dummy Latin Amrica = 1, Others = 0 | 0.212 | 0.411 |

Source;

Number of MFIs in the country: Microcredit Summit Campaign (<http://www.microcreditsummitt.org>)

Number of Borrowers in the country: Trend Lines 2005 - 2007 MFI Benchmarks (Microfinance Information eXchange)

<http://www.themix.org/publications/trend-lines-2005-2007-mfi-benchmarks>

Democracy index; Marshall and Jagers(2009)

Others: World Development Indicators(WDI)

Table2

(a)

| | |
|---------------|--------|
| Number of obs | 61 |
| F(10, 50) | 17.49 |
| Prob > F | 0 |
| R-squared | 0.7777 |
| Adj R-squared | 0.7332 |
| Root MSE | 4.2464 |

(b)

| | |
|---------------|--------|
| Number of obs | 59 |
| F(10, 48) | 16.540 |
| Prob > F | 0.000 |
| R-squared | 0.775 |
| Adj R-squared | 0.728 |
| Root MSE | 4.319 |

| | <i>coefficient</i> | <i>p-value</i> | |
|--|--------------------|----------------|-----|
| Number of MFI | -0.0098 | 0.055 | * |
| Logarithm of number of MFI | | | |
| Logarithm of GDP per capita | 18.8718 | 0.028 | ** |
| Square of logarithm of GDP per capita Square | -1.3799 | 0.020 | ** |
| Trade to GDP ratio | -0.0043 | 0.820 | |
| Inflation rate | -0.0753 | 0.557 | |
| Democracy | 0.3258 | 0.144 | |
| South Africa | 2.2492 | 0.343 | |
| Eastern Europe and Central Asia | -6.8877 | 0.004 | *** |
| Middle East and North Africa | -2.9863 | 0.338 | |
| Latin America | 11.7369 | 0.000 | *** |
| _cons | -23.0968 | 0.453 | |

| | <i>coefficient</i> | <i>p-value</i> | |
|--|--------------------|----------------|-----|
| | | | |
| | -1.0998 | 0.094 | * |
| | 21.6184 | 0.020 | ** |
| | -1.5796 | 0.015 | ** |
| | -0.0085 | 0.675 | |
| | -0.0821 | 0.544 | |
| | 0.2917 | 0.198 | |
| | 2.9279 | 0.209 | |
| | -8.1182 | 0.005 | *** |
| | -3.1997 | 0.322 | |
| | 12.3188 | 0.000 | *** |
| | -29.1001 | 0.370 | |

Table3

| (a) | | (b) | |
|---------------|--------|---------------|--------|
| Number of obs | 120 | Number of obs | 120 |
| F(10, 109) | 45.570 | F(10, 109) | 44.240 |
| Prob > F | 0.000 | Prob > F | 0.000 |
| R-squared | 0.807 | R-squared | 0.802 |
| Adj R-squared | 0.789 | Adj R-squared | 0.784 |
| Root MSE | 4.024 | Root MSE | 4.072 |

| | <i>coefficient</i> | <i>p-value</i> | | <i>coefficient</i> | <i>p-value</i> | |
|--|--------------------|----------------|-----|--------------------|----------------|-----|
| Number of borrowers | -0.0000034 | 0.004 | *** | | | |
| Logarithm of number of borrowers | | | | -0.7974 | 0.018 | ** |
| Logarithm of GDP per capita | 16.5793 | 0.013 | ** | 14.6090 | 0.031 | ** |
| Square of logarithm of GDP per capita Square | -1.2671 | 0.007 | *** | -1.1567 | 0.014 | ** |
| Trade to GDP ratio | -0.0052 | 0.699 | | -0.0098 | 0.479 | |
| Inflation rate | -0.1257 | 0.183 | | -0.1605 | 0.101 | |
| Democracy | 0.2761 | 0.189 | | 0.4304 | 0.033 | ** |
| South Africa | 2.5396 | 0.104 | | 2.7347 | 0.083 | * |
| Eastern Europe and Central Asia | -4.5746 | 0.001 | *** | -4.2704 | 0.003 | *** |
| Middle East and North Africa | -0.8992 | 0.715 | | 1.0717 | 0.651 | |
| Latin America | 14.0992 | 0.000 | *** | 14.7733 | 0.000 | *** |
| cons | -14.1037 | 0.544 | | 1.2118 | 0.961 | |