DOES RATING HELP MICROFINANCE INSTITUTIONS RAISE FUNDS?

A CROSS-COUNTRY ANALYSIS OF THE ROLE OF RATING AGENCY

ASSESSMENTS IN MICROFINANCE INDUSTRY

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DOES RATING HELP MICROFINANCE INSTITUTIONS RAISE FUNDS? A CROSS-COUNTRY ANALYSIS OF THE ROLE OF RATING AGENCY ASSESSMENTS IN MICROFINANCE INDUSTRY

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Qianfei Wang, daughter of Wei Wang and Jian Zhang, was born in January, 1979, in Shenyang, LiaoNing Province, China. She graduated from Shenyang the 20th High School in 1997. She attended Nankai University, Tianjin, China the same year, and graduated with a Bachelor of Art degree in Japanese Language in 2001 and a Master of Science degree in Management in 2004. She entered Graduate School, Auburn University, in January 2006 where she held a graduate research assistantship. She married to Zhigang Li in 2004.

THESIS ABSTRACT

DOES RATING HELP MICROFINANCE INSTITUTIONS RAISE FUNDS? A CROSS-COUNTRY ANALYSIS OF THE ROLE OF RATING AGENCY ASSESSMENTS IN MICROFINANCE INDUSTRY

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This thesis studies whether rating assessments help MFIs raise more funds, using a sample of 315 MFIs operating in 63 countries worldwide during the period of 1999-2005. The main conclusion is that there is no strong evidence that rating affects MFIs fundraising efforts, after accounting for possible endogeneity of rating by two-stage least square procedure, although rating has statistically significantly positive effects on the change of non-deposit liability and total equity of MFIs by OLS procedure. However, the evidence for endogeneity of rating is not strong, which might support the idea that rating helps impose market discipline. Difference of rating impact on raising liability between

raters is detected. Rating updates, subsidized rating and rater types do not affect fundraising and regulatory authorities' activities do not affect the values of rating.

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CHAPTER I: INTRODUCTION

Microfinance is the provision of financial services to low-income clients, traditionally exclude from the mainstream financial system. Microfinance Institutions (MFIs) are the financial institutions serving poor households and small enterprises (Hartarska, 2005). Worldwide, MFIs expand the frontier of finance by providing loans and other financial services to the under-served poor. According to Daley-Harris (2006), as of December 2005, 3,133 Microcredit Institutions reported reaching 113.3 million clients, which is 22.8 percent annual growth rate since end of 2004. Today, MFIs are not a rarity any more, but are important members of the financial systems in developing countries.

The growing relevance of MFIs has lead to the development of specialized microfinance rating agencies that perform global risk assessments and credit rating for MFIs. As the microfinance industry matures, microfinance rating services have gained increased attention from investors, practitioners, and donors. However, MFIs still find it challenging to obtain funds from prospective donors and financial markets. Rating is expected to play a key role in helping MFIs to improve performance and to help them access commercial capital.

Rating generates independent information and could improve efficient allocation of funds. Rating may be especially important in the absence of developed equity and debt

markets for microfinance and because there are few alternative mechanisms that can help donors and investors choose the most appropriate MFIs to support. On the other hand, rating may have a limited role since microfinance rating agencies have little competition and there are neither recognized standards nor a consistent rating system. It is not yet clear whether rating plays a disciplining role and, in particular, whether good rating helps MFIs raise funds.

This paper uses a database of 315 MFIs across 63 countries and studies the role of rating agency assessments of MFIs. It adopts an empirical approach used in studies on the impact of market forces on performance of financial intermediaries and accounts for possible endogeneity of rating. Consistent numerical rating grades by raters are created in this thesis, which helps capture more information of rating itself.

The main conclusion is that there is no strong evidence that MFIs with better ratings were more likely to raise funds, after accounting for possible endogeneity of rating by two-stage least square procedure, although better rated MFIs are more likely to raise funds according to the OLS procedure. However, the evidence for endogeneity of rating grade is not strong, which might support the notion that ratings possibly help impose marketing discipline. Difference of ratings impact on raising liability between raters is detected. Also, evidence is found that NGOs have lower return of rating than profit financial institutions. Rating updates, subsidized rating and the type of rater do not affect fundraising and regulatory authorities' activities do not affect the values of rating.

The rest of the paper is organized as follows. The next section of the thesis briefly surveys the literature in rating as a governance mechanism and in microfinance industry. Chapter III presents the empirical specification and discusses methodological issues.

Chapter IV describes the data used. Chapter V presents the empirical results by OLS and two-stage procedures accounting for possible endogeneity of rating. Heckman Selection Model is also presented as an extension. The conclusions of the thesis with remarks on possible future research are summarized in the final chapter VI. Some additional empirical tests and informative lists are presented in appendix section.

CHAPTER II: MOTIVATION AND RELATED LITERATURE

Cross-country empirical studies on the role of credit ratings on MFIs are rare. Hartarska&Nadolnyak (2007b) study whether microfinance rating agencies were able to impose market discipline on MFIs during the period 1998-2002. The results indicate that subsidizing rating did not help MFIs raise more funds and not all rating agencies had equal impact on MFI abilities to raise extra funds – while some helped MFIs raise funds, others did not. However, the Consultative Group to Assist the Poor (CGAP), the Interamerican Development Bank and the European Union have established and still support a Rating Fund which is a special fund that subsidizes rating of MFIs. Since 2002 microfinance raters adopted a numerical rating scales but the impact of letter grade rating has not yet been examined.

This thesis focuses on whether microfinance rating agencies were able to impose market discipline on MFIs, examining the effectiveness of rating assessments post 2001 after letter grade scales were introduced. It creates a consistent rating scale with numerical values from the diverse rating scales of all rating agencies and uses this index to study whether the rating an MFI obtained helped fundraising.

This section reviews the literature on rating as an external governance mechanism and provides an overview of microfinance rating in the context of general rating practices.

The empirical approach explores the impact of rating on MFIs' ability to raise additional funds and is based on a similar approach employed in the study of bank performance.

1. RATING AS AN EXTERNAL GOVERNANCE MECHANISM

A credit rating assesses the credit worthiness of an individual, corporation, or even a country. Credit ratings are calculated from financial history and current assets and liabilities. Typically, a credit rating tells a lender or investor the probability of the subject being able to pay back their debt. In recent years, credit ratings have also been used to adjust insurance premiums, determine employment eligibility, and establish the amount of a utility or leasing deposit.

There are three types of credit ratings: personal credit ratings, corporate credit ratings and sovereign credit ratings. Corporate credit rating had its origins in the first rail-bond ratings of John Moody, who started Moody's Investors Service in 1900. Today, a credit rating is both necessary for access to capital and a key determinant of the price of funding for many companies in developed capital markets. In most countries credit ratings have weight for regulators as well as for the capital markets, and banking supervisors often require them to determine such things as deposit insurance and minimum capital requirements (Farrington, 2005).

Loffler (2004) explores the usefulness of credit rating agencies' rating systems and their rating migration policies as tools for formulating governance rules. Such rules, which consist of buy and sell restrictions, are predicated on rating stability and are commonly used in investment management. Loffler suggests there may be many circumstances where credit ratings-based governance rules may be more effective. More

generally, he finds that many statistical measures that are currently used to assess rating quality may be insufficient to judge the economic value of rating information in a specific context. Arnoud (2006) has shown that credit ratings could play a key role as "focal points" once institutional rigidities are considered. This paper shows that credit rating can coordinate investors' beliefs and together with the implicit contract and monitoring relationship between credit rating agencies and the firm and ratings have a real impact.

Some studies focus on the difference between unsolicited ratings and solicited ratings. Roy (2006) finds evidence that unsolicited ratings tend to be lower than solicited ones, after accounting for differences in observed bank characteristics by using a sample of Asian banks rated by Fitch Ratings. This downward bias does not seem to be explained by the fact that better-quality banks self-select into the solicited group, rather, unsolicited ratings appear to be lower because they are based on public information. Poon (2001) finds evidence of a significant difference in distributions between solicited and unsolicited ratings and that the ratings of the unsolicited group tend to be lower for the overall sample and the matching sub-sample, by employing S&P's sample rating from pooled time-series cross-sectional data of 265 firms from 15 countries. The paper also indicates that the relatively lower unsolicited ratings may not be caused by downward bias in assigning ratings because this bias can be due to differences in rating standards and the scales used by rating agencies, or systematic differences in their rating procedures or by self-selection issues or other latent factors.

Ferri (2001) examines the behavior of issuer ratings in developing countries, and find that bank and corporate ratings appear to be strongly related in an asymmetric way with changes in sovereign ratings. Bongini (2002) study the power of credit ratings to

predict bank insolvency in developing countries. Morgan (2002) examines the banks opacity from the lack of consensus among main rating agencies. Morgan (2000) investigates the disciplinary role of markets using bond spreads, ratings, and bank portfolio data on over 4,100 new bonds issued between 1993 and 1998, and finds that the bond spread/rating relationship is the same for the bank issues as for non-bank issues, especially among the investment grade issues. This suggests the bond market prices incorporate publicly available measures of bank risk efficiently. Bond rating agencies focus on predicting risk and are able to predict future problem loans and bank performance (Berger et al., 2000). Equity studies also find that investors promptly incorporate relevant rating information into bank stock prices (De Young et al., 2001).

Morgan (2002) finds evidence that external rating exercises market control for both banks and non-financial institutions by providing independent information. But because financial institutions are generally regulated and supervised by the authorities, external rating usually serves to help regulators strengthen the banks.

2. RATING IN MICROFINANCE

In microfinance, governance refers to the mechanisms through which donors, equity investors, and other providers of funds ensure themselves that their funds will be used according to the intended purposes (Hartarska, 2005). Such control mechanisms are necessary and important because MFI managers may have different objectives from the providers of funds. Hartarska (forthcoming) finds that regulatory involvement and external audit do not impact performance but that rating may hold the potential to play a disciplining role in microfinance. Credit rating agencies may serve as an external

governance mechanism because they operate as independent market entities and exercise market control by providing signals about the quality of financial firms and their debt (Barth et al., 2006).

Hypothesis 1: rated MFIs get more funds than MFIs whose performance is not rated.

Hypothesis 2: regulation, audit and rating play a role to impose market discipline as external governance mechanisms in microfinance.

Many MFIs operates as NGOs. Manne (1999) proposed that governance mechanisms are much weaker in the nonprofit sector due to the absence of shareholders and a market for corporate control. Also, however, it indicates that ratings serve as control mechanisms of NGOs.

Hypothesis 3: the impact of rating in NGOs differs from that in for-profit institutions.

There are two types of rating services that perform evaluations for MFIs: credit risk ratings and global risk assessments. Credit risk ratings are provided by both microfinance and traditional (mainstream) rating agencies. Global risk assessments, or performance evaluations, are provided mainly by agencies which are active exclusively in the microfinance field as specialized agencies. Global risk assessments provide a more comprehensive picture of an MFI's performance level. These performance evaluations, in comparison to more traditional credit risk ratings, place more weight on operational elements such as appropriateness of lending methodologies and governance issues. Ratings produced by specialized credit agencies allow an MFI to be compared with other MFIs.

The idea of creating a specialized rating agency for MFIs emerged in 1996, as a result of the pilot study for *MicroRate*. Theoretically, the goal of specialized rating was to create an enabling market mechanism that would reduce information asymmetries, help bring perceived risks in line with actual risks, and increase capital flows to the emerging microfinance sector (Farrington, 2005).

It has been shown that the total number of ratings and assessments has grown by 84% in the past four years, from 152 in 2001 to 281 in 2005 (The Rating Fund Market Survey 2005). Currently, 16 rating agencies are active in this market, suggesting that the industry has reached a certain level of maturity and that there is a need to identify if and how rating can serve as an effective mechanism of market discipline.

Market forces through the market for managers and through the market for takeovers have a limited role in microfinance because the market for MFI managers is thin and most MFIs do not have true owners. This forces donors and creditors are increasingly relying on information from audited financial statements and rating agencies (Hartarska, 2005). The main objective of such external governance mechanisms is to reduce information asymmetries between the different stakeholders and the firm (Healy&Palepu, 2001).

Empirical work has touched the factors explaining the rating of MFIs. Nieto&Cinca (2005) find a positive and significant relationship between rating and profitability, rating and size, rating and productivity, a negative and significant relationship between rating and risk, while no significant relationship between rating and social performance. These findings are consistent with theory, enhancing the value of ratings for investors.

The evidence of the impact of external governance mechanisms on MFI financial

performance is scarce (Hartarska and Holtmann, 2006). One of the seminal studies using empirical data of MFIs rating is Hartarska (2005). She finds that external governance mechanisms such as auditing, rating, and regulation, have a limited impact on outreach and sustainability of microfinance institutions in Eastern Europe and the Newly Independent States. The evidence that rating improves performance is scarce. In this study, rating is significant at the 10% level only in the outreach regression but not in the regressions on sustainability variables. It is mentioned that although these results can be idiosyncratic to the sample period when rating in the region was not widely used and usually was donor mandated, they are consistent with some developments in microfinance, with raters struggling to survive perhaps because they failed to become effective external governance mechanism. Furthermore, the author notes that more research and better data is needed to ensure that strong organizations direct scarce resources to the entrepreneurial poor.

Rating methodologies differ significantly across raters. Table 1 provides a brief description of the rating methodologies of 13 rating agencies. It reveals that different rating agencies use different methods to assess MFI financial performance.

Table 1: Introduction of rating methodology for rating agencies

Agency	Analysis
Apoyo&Asociados	It issues a report containing information about: equity performance, credit risk, funds diversification, market situation, operational and technological risks, management and ownership, and future trends.
Accion Interational	It has adapted the CAMEL rating methodology to perform global risk assessments of MFIs. The CAMEL methodology assesses 21 indicators under 5 areas: Capital adequacy, Asset quality, Management, Earnings and Liquidity management.
CRISIL	It has developed the MICROS methodology, with six indicators: Management 25%, Institutional Arrangement 15%, Capital Adequacy & Asset Quality 20%, Resources 10%, Operational Effectiveness 15%, and Scalability & Sustainability 15%.

Agency	Analysis
ClassRating	The assessment of bonds, debt, shares and financial strength (global risk assessment) of financial institutions takes 5 steps: information analysis, solvency analysis, liquidity analysis, issuer's contract analysis and final classification.
Equilibrium	It performs a quantitative analysis, focused on asset quality, capital adequacy, profitability, liquidity, balance sheet mix, funding strengths and weaknesses, cash flows, and so on. On the other hand, qualitatively, it assesses the management quality, business diversification and financial flexibility.
Feller Rate	The rating is based both in solvency classification and product's own characteristics. For debt titles assessments, Feller examines guarantees, which can lead to different repayment capacities.
FitchRating	The rating is a comprehensive qualitative and quantitative assessment of strengths and weaknesses of the institution. Quantitative aspects e.g. balance sheet integrity, or profitability and risk management are counterbalanced by qualitative considerations about strategy, management quality, environment issues and future perspectives.
JCRVIS	It uses a methodology called MIRACLES, the acronym for Management, Information Systems, Reputation, Asset quality, Capital, Liquidity, Earnings and Supervisory systems (internal and external).
MCRIL	It uses a rating tool with three categories of indicators: governance and strategy, management systems, and financial performance.
MicroRate	For this agency, there is no unique criterion applying equally to all MFIs. It tries to identify this hierarchy correctly for each analysis. But the criteria ranked most frequently are: portfolio quality, operational effectiveness, management and governance.
Microfinanza	It performs a quantitative and qualitative assessment of strengths and weaknesses of the MFI, to grade the risk on two categories: fiduciary risk (related to governance and management) and credit risk (obligations e-payment ability).
PlanetRating	The rating is a comprehensive qualitative and quantitative assessment of strengths and weaknesses of the institution. Quantitative aspects e.g. balance sheet integrity, or profitability and risk management are counterbalanced by qualitative considerations about strategy, management quality, environment issues and future perspectives.
Pacific Credit Rating	The rating exercise studies quantitative and qualitative information. Qualitative aspects are considered very important and are based on fundamental principles. Complete analytic revisions are undertaken to assess the financial health of the institution. Then, future financial results are estimated, which will allow future rating revisions.

Source: Nieto&Cinca (2007) "Factors explaining the rating of Microfinance Institutions" *Nonprofit & Voluntary Sector Quarterly.*

Among these rating agencies, *Equilibrium, FitchRating, Microfinanza, PlanetRating and Pacific Credit Rating* perform qualitative as well as quantitative analysis on MFIs. Qualitative assessments focus on MFIs strategies including weakness and strength

identification, management quality, environment issues and future perspective, which have special meaning for microfinance as a rapidly growing industry. *Apoyo&Asociados, JCRVIS, MCRIL, MicroRate, Microfinanza and PlanetRating* consider governance as a part of the evaluation in addition to assessing financial performance.

Hypothesis 4: the impact of rating differs among different raters.

MFIs are close to banks because they both collect deposits and provide loans. On the other hand, they differ from banks because a considerable part of the assets of MFIs comes from the donors, although some investors infuse funds through public capital market. Compared to regular banks, MFIs have lower level of capitalization, they rarely have publicly traded debt, and the asset base for MFIs comes from grants. Although more MFIs are transforming into commercial banks, overall, NGOs and non-bank financial institutions constitute the overwhelming majority of MFIs.

Rating of MFIs differs from rating of regular banks. First, microfinance rating should, at least in part, consider the social performance of MFIs because MFI have a mission to provide financial services to the poor and must cover their costs to maintain sustainability. Three rating agencies *MicroRate, PlanetRating* and *MCRIL* claim to study MFIs social performance (Nieto&Cinca, 2007). For example, *MicroRate* proposes that striving to balance a clear and rational relationship among the social, financial and operational considerations of sound microfinance practice deserves a good grade in rating. Moreover, as MFIs rating agencies mature along with development of microfinance industry, the assessment of social performance and the development of specific methodologies to measure MFIs social impact have become increasingly important.

Secondly, mainstream raters put more emphasis on credit risk and solvency,

benchmarking against the banking sector. Alternatively, specialized raters focus more on portfolio structure and quality and operational risk and efficiency, benchmarking against other MFIs.

Hypothesis 5: the impact of MFIs specialized rating agencies differ from that of mainstream rating agencies.

Finally, since many MFIs are regulated, regulatory involvement may affect the ability of rating agencies to discipline MFIs because implicit guarantees that an MFI can be recapitalized after bad performance might be provided by regulators, therefore, the value of the information offered by a rating agency may be diminished (Hartarska&Nadolnyak, 2007a). Moreover, donors can play the same role by deciding to recapitalize or provide grant(s) to a failing organization if it fulfils a mission important to them.

Hypothesis 6: the role of rating is diminished for regulated MFIs.

CHAPTER III: EMPIRICAL MODEL

Cross-country empirical studies on the impact of credit ratings on MFIs performance are rare. Hartarska (2005) finds rating as an external governance mechanism play a limited role on MFIs profitability and sustainability in Eastern Europe, perhaps because of unique transition environment. Hartarska&Nadolnyak (2007b) find that subsidized rating does not help MFIs raise additional funds but that the ability to raise funds is affected by who provides rating services. Therefore, it is important to examine how the rating scales used by different raters impact raising funds by MFIs.

To explore the impact of rating on MFIs ability to raise additional funds, this paper adopts an empirical approach similar to the approach employed to study bank performance (Samolyk, 1994; Barth et al., 2003 and Hartarska&Nadolnyak, 2007b). This thesis uses the model developed by Hartarska&Nadolnyak (2007b). They argue that rating will play a disciplining role if it helps the MIFs raise additional funds. The null hypothesis formed by the authors is that rated MFIs were not able to raise additional funds either equity or borrowed funds. The alternative hypothesis is that after all information on the performance of the MFI is controlled for, rating still produces new information and, therefore, affects MFIs ability to raise additional equity or debt. In particular, the empirical model is:

$$ChF_{it} = constant + \alpha' R_t + \beta' B_{it-1} + \phi' M_t + \varepsilon_{it} \quad (1)$$

where the dependent ChF_{it} is the log difference of the change in funds. Two dependent variables are used as ChF_{it} . The first one is the log difference in borrowed funds other than deposits (*LiabCh*) and it is used to study the impact of rating on the ability of MFIs to attract loans. The second is the log difference in equity (*EqCh*), which captures the ability of MFIs to raise equity.

The independent variables in B_{it-1} are MFI specific variables available from the financial statements and help isolate the direct impact of rating, captured in the R_t variable so that R_t is assumed to capture the impact of new information available only through rating but not available from other sources. The variables in B_{it-1} vector includes measures of financial performance, return on total assets (*ROA*) and operational self-sufficiency (*OSS*); a measure of outreach, number of active borrowers (*NAB*); the capital ratio as a measure of the level of leverage (*CAPITAL*); loans to total assets ration (*LOAN*) as a measure of the focus on lending; portfolio at risk (*PAR*) as a measure of risk exposure; savings to total assets (*SAVINGS*); MFI size (*MFISIZE*) in terms of logarithm of total assets and MFI's age (*AGE*). The increment of equity and non-deposit liability in the current period is influenced by the indicators of financial performance and structure one year back, so the values of t-1 period are used. Such specification avoids possible endogeneity[1]. Since MFIs can be non-profit NGOs, as well as banks and non-bank financial institutions, a dummy for non-profit type is included while the banks and nonblank financial institutions are treated as the reference group.

R_t is a vector of variables that represent rating. Several specifications are included in

[1] OLS is unbiased and consistent in applying for recursive models due to the absence of endogeneity.

this thesis. First a dummy for being rated (*RATING*) is used, and alternatively, separate dummies for each specific rater. Dummies for individual raters are included in some selected models because empirical studies have shown that credit agencies differ in their evaluation of financial intermediaries (Morgan, 2002 and Hartarska&Nadolnyak, 2007b). Secondly, a numerical index that assigns values to each letter grade (*N_GRADE*) is used. It has a scale from 1 to 10. Higher value presents better rating. Numerical values were assigned based on the scale of letter grades issued by individual raters. *N_GRADE* is created to be consistent across raters since individual raters' grading scales are very different. Thirdly, a dummy variable for a rating update (*UPGRADE*) is used. This variable is important because it has been found that 49% of MFIs worldwide have rating updates (The Rating Fund market Survey 2005, 2006). Fourthly, a dummy for rater type (*MFISPECIAL*) is used, which equals 1 if the rating agency is a specialized MFI rating agency and zero otherwise. This variable is applied to detect whether there is a different effect between specialized MFI rating agencies and regular credit rating agencies. Finally a dummy for whether the rating is subsidized by the Rating Funds (*SUBSIDIZED*) is used to examine the effectiveness of subsidized rating because previous study shows that subsidized rating has no impact on raising funds.

In their study, Hartarska&Nadolnyak (2007b) use dummy variables for being rated or not and for being rated by a particular rater because letter grades were introduced only in 2001. This thesis focuses on the role of letter grades issued by the raters. Detailed description and clarifications are presented in the next section.

M_t are macroeconomic country-specific variables, including inflation (*INFLATION*), logarithm of GDP in current US dollars, (*ECONSIZE*), logarithm of GDP per capital in

US dollars, (*GDPC*), property rights (*PR*), business freedom (*BF*), financial freedom (*FF*), the external ratings and creditor monitoring index (ERC), index of the size of informal market in a country (*INFORMAL*) and the number of MFI competitors in the country (*COMPET*).

Business freedom (*BF*) is the ability to create, operate, and close an enterprise quickly and easily. Burdensome, redundant regulatory rules are the most harmful barriers to business freedom. Microfinance serving clients include the members who are willing to start a small business by getting loans from MFIs. Therefore, it is controlling for the demand of this group of clients to MFIs. Property rights (*PR*) is an assessment of the ability of individuals to accumulate private property, secured by clear laws that are fully enforced by the state. It is controlling for the institutional structure that is expected to control the supply of funds to MFIs, from private investors or donors. Financial freedom (*FF*) is a measure of security of banking system as well as its independence from government control. It may affect funding choices of MFIs that operate as regular commercial banks.

The index of the size of the informal market (*INFORMAL*) measures the level of market economy. Higher values represent larger informal markets. This variable controls demand for loans from MFIs because many MFIs serve non-registered business operating in informal market. The sources of these indices are described in Table 2. They come from the Heritage Foundation, located in the website www.heritage.org and the first three are the components of general economic indicator, economic freedom. The number of competitors in microfinance market (*COMPET)* comes from www.microcreditsummit.org. This variable captures market impact by the competitive pressure generated by other

MFIs operating in the same the market. The external ratings and creditor monitoring index (*ERC*) is an index created by Barth et al. to measure the role of external credit monitoring of the banking system in a country. It is on a scale from zero to three and is constructed by adding one for an affirmative answer to the following question: a.) Is subordinated debt allowable or required as a part of capital? b.) Do regulations require credit ratings for commercial banks, and c.) Are the top 10 banks in the country rated by an international credit rating agency? (Barth et al., 2006)

Table 2 presents definitions of the variables used in the analysis.

Table 2: Definition of variables[2]

Variable	Definition
LiabCh	Difference of logarithm of non-deposit liability; capture the ability of MFIs to attract loans.
EqCh	Difference of logarithm of total equity; capture the ability of MFIs to raise equity.
N_GRADE	Numerical value of letter grades consistent across different rating agencies[3].
RATING	1 if the MFI is rated by a rating agency in the current year, zero otherwise; usually based on previous years financial statements.
MFISPECIAL	1 if the MFI is rated by a MFI specified rating agency in the current year, zero otherwise.
UPGRADE	1 if the MFI has at least one rating update, zero otherwise.
SUBSIDIZED	1 if the rating is subsidized, zero otherwise.
AUDIT	1 if the financial statement of the MFI is audited, zero otherwise.
REGULATED	1 if the MFI is regulated by a government regulatory agency, zero otherwise.
OSS	Operational self-sufficiency = Operating revenue / (Financial expense + Loan Loss Provision + Operating Expense). Measures how well the MFI can cover its costs through operating revenues.
NAB	Logarithm of the number of current borrowers, which is the number of individuals that currently have an outstanding loan balance with the MFI or are responsible for repaying any portion of the gross loan portfolio.
ROA	Return on total assets.
CAPITAL	Ratio of total equity to total assets.
SAVINGS	Ratio of saving to total assets.
LOAN	Ratio of loans outstanding to total assets; measures risk exposure and how much MFI focus on lending.

[2] Region dummies and rater dummies are not listed in this table. A dummy variable that indicates whether the country's legal origin is English Common Law or not has been tried but was not significant.

[3] The scale is from 1 to 10. Higher value represents better rating level. The numerical values are assigned based on the levels of grades issued by raters. For example, if the grade scale is ABCDE, then A=10, B=8, C=6, D=4 and E=2.

Variable	Definition
PAR	Portfolio at risk >30 days.
NGO	1 if the MFI is organized as a NGO, zero otherwise.
AGE	Age of the MFI, equals to number of years since inception.
MFISIZE	Logarithm of the total assets of the MFI.
INFLATION	Inflation rate, change in consumer prices, source: www.mixmarket.org
ECONSIZE	Logarithm of GDP in current US dollars.
PR	Property Rights Index, higher values mean lower protections of private rights; scales from 0 to 100; source: www.heritage.org
BF	Business Freedom Index, higher values mean more freedom; scales from 0 to 100; source: www.heritage.org
FF	Financial Freedom Index, higher values mean more freedom; scales from 0 to 100; source: www.heritage.org
EconFreedom	Economic Freedom Index, the average of ten components with the same weight, higher values mean more freedom; scales from 0 to 100; source: www.heritage.org
GDPC	GDP per capital current prices in US dollars; source: World Economic Outlook, April, 2007. www.imf.org
ERC	The External Ratings and Creditor Monitoring Index, source: World Bank Survey of Bank Regulation and supervision, versions 1999-2000 and 2003.
INFORMAL	Index of the size of the informal market; Scales from1 to 5; 1 equals market economy, 5 represents the informal market size is larger than that of the formal market; source: www.heritage.org
COMPET	The number of MFI competitors in the country; Source: www.microcreditsummit.org

SAMPLE REPRESENTATIVNESS

It is important to note that if sample selection is entirely random in the sense that we begin with a random sample and randomly drop observations, OLS estimator will be still consistent. However, there are may be some systematic reasons why MFIs not rated have chosen not to get rated and estimation of the impact of rating is based only on observations with ratings. MFIs choosing to be rated know they have achieved good financial performance and probably expect to get good ratings. Therefore the rating information is not collected randomly and the impact of rating will be overestimated if we only use the rated sample instead of the full sample. Consequently, the parameter estimates obtained are biased and inconsistent. Self-selection bias may need to be corrected for before the rating information currently available is used.

Sample selection bias can arise in practice for two reasons. First, self-selection is result of individuals' choices or data units' characteristics (Heckman, 1979). In microfinance, whether MFI chooses to be rated in the current year is determined by its management, the board or, in some cases, by potential donors. It is possible that the financial performance the MFI obtained in previous year affects the decision of getting the external rating in current year. For example, poorly performing MFIs may be less likely to obtain credit ratings from rating agencies because they do not have confidence in receiving good ratings or they do not want to pay for a possible speculative grade rating.

Nonrandom sample selection can also arise in panel data. In the simplest case, we have several years of data, but, due to attrition, some MFIs leave the sample. This is particularly a problem in policy analysis, where attrition may be related to the effectiveness of a program.

To correct for possible sample selection, a Heckman's sample selection model can be estimated. Assume

1. $Y_1 = \beta' X + U_1$

2. $Y_2 = \gamma' Z + U_2$

where X is a k-vector of regressors, Z is an m-vector of regressorss, possibly including 1's for the intercepts, and the error terms U_1 and U_2 are jointly normally distributed, independently of X and Z, with zero expectations.

The first model is the model we are interested in. However, the latent variable Y_1 is only observed if $Y_2 > 0$. Thus, the actual dependent variable is: $Y = Y_1$ if $Y_2 > 0$, Y is a missing value if $Y_2 \leq 0$.

Heckman model is a two-stage estimation procedure, beginning with a probit model (selection equation) that produces the inverse mills ratio that is then included in the equation of interest. In addition to the two equations, Heckman estimates rho, the correlation of the residuals in the two equations and sigma, the standard error of the residuals of the outcome equation. Lambda is the product of rho and sigma. Similar to regular two-stage least square procedure, at least one identified instrumental variable is necessary in the probit model of selection equation. Ideal instruments should strongly determine whether MFIs select to be rated, simultaneously, not correlated with what grade MFIs will receive. The instruments selection will be interpreted with details in the next section.

The major hypotheses tested with empirical models are as follows: 1) rating helps MFIs raise funds; 2) the impact of rating differs between different raters; 3) better ratings attract more funds; 4) the role of rating differs between for-profit and non-profit institutions; 5) upgrade does not improve fundraising; 6) subsidized rating does not help; 7) MFI specialized rating agencies have more impact than mainstream rating agencies; 8) the impact of rating differs among different regions; 9) audit, regulation and rating play a role to impose marketing discipline as external governance mechanisms; 10) the role of rating is diminished for regulated MFIs.

Some accessorial hypotheses will be tested as well: 1) less capitalized MFIs attract more funds; 2) smaller MFIs are more likely to get additional funds; 3) better operational self-sustainability helps MFIs raise debts but not equity.

CHAPTER IV: DATA DESCRIPTION

Data used in this study come from four sources. Individual MFI data and MFI rating data come from the database collected by MIXMARKET information platform (www.mixmarket.org). MIXMARKET is a global, web-based, microfinance information platform. It provides information to sector actors and the public at large on microfinance institutions (MFIs) worldwide, public and private funds that invest in microfinance and raters/external evaluators. At the time of data collection, it had posted MFI profiles of 954 MFIs across 89 countries, for period 1998-2006. Country-specific data mainly come from MIXMARKET, while some general economy and bank regulation indices come from Heritage Foundation, World Bank Country Variables, World Bank Banking Survey and MicrocreditSummitCampaign, with details in Table 2. After merging the three major databases, the resulting database includes 315 MFIs across 63 countries from 1999-2005, and forms 875 annual individual MFI observations.

Table 3: Sample distribution by year

		1999	2000	2001	2002	2003	2004	2005	Total
Full Sample	Observations	34	42	88	119	161	170	261	875
	% of sample	3.9	4.8	10.1	13.6	18.4	19.4	29.8	100
Rated Sample	Observations	0	0	8	10	28	33	50	129
	% of sample	0	0	6.2	7.8	21.7	25.6	38.8	100

Table 3 presents the sample distribution by year. The MFIs in the sample are

increasingly distributed across time. 3.9 percent of the annual observations are from 1999, 4.8 percent from 2000, 10.1 percent from 2001, 13.6 percent from 2002, 18.4 percent from 2003, 19.4 percent from 2004 and 29.8 percent from 2005. Over 85 percent of the ratings were completed between 2003 and 2005, while around 65 percent of the annual observations are from this period. In this study, observations of rating without grades are excluded because the analysis focuses on the impact of letter grades. There are no rating observations before 2001 because letter grades rating started in 2001. The concentration of ratings in the last three years of the study period is consistent with the industry developments as rating has become more popular since 2003.

Table 4: Distribution of sample MFIs and raters by geographic region

Region	Number of countries	OBS	% of sample	Serving raters	Rated OBS	Rated % within region
Africa	21	230	26.3	*MicroRate*	26	11.3
Asia	10	175	20	*MCRIL* *CRISIL*	20	11.4
Eastern Europe and Central Asia	11	87	9.9	*Microfinanza* *MicroRate* *Planet Rating* *MCRIL*	14	16.1
Latin America and The Caribbean	17	333	38.1	*Microfinanza* *MicroRate* *Class&Asociados S.A.* *FitchRating* *Equilibrium*	59	17.7
Middle East and North Africa	4	50	5.7	*Planet Rating* *MicroRate* *Microfinanza*	10	20
Total	63	875	100		129	

Table 4 presents the distribution of sample MFIs and raters by geographic region. The highest numbers of MFIs in the sample are in Africa, Asia and Latin America and The Caribbean (LAC) three regions. They account for over 80 percent of the whole sample. Rated MFIs as a percentage of a region's MFIs represented in the sample are

relatively evenly distributed. The percentage rated MFIs ranges from 11.3 percent for African MFIs to 20 percent for MFIs from the Middle East and North Africa (MENA) region.

Table 5 is a brief description of MFI rating agencies included in this study and reveals the rated sub-sample distribution by rating agencies. *MicroRate* and *PlanetRating* rated over 55 percent of the sample, followed by *Microfinanza* and *MCRIL* with 17.8% and 13.2% respectively. The other agencies, *CRISIL*, *Class&Asociados S.A.*, *Equilibrium*, and *FitchRating* accounts for around 13% totally. *MicroRate*, *PlanetRating* and *Microfinanza* are founded in 1997, 1999, and 2000 respectively but they have been very active in the market for rating service for microfinance. Development of microfinance industry has increased the demand of rating service, consequently boosts the growth and maturity of rating service industry.

Table 5: Brief description of MFI rating agencies and sample distribution

Agency	Type	Found Year	Serving Region	Rated OBS	% Rating	Grades Scale
CRISIL	Mainstream	1987	Southeast Asia	2	1.6	mfR1; mfR2; mfR3; mfR4; mfR5; mfR6; mfR7; mfR8
ClassRating	Mainstream	1995	LAC	3	2.3	ABCDE
Equilibrium	Mainstream	1910	LAC	7	5.4	A; B+; B; C+; C; D+; D; E+; E
FitchRating	Mainstream	1913	LAC	6	4.7	AAA;AA;A BBB;BB;B CCC;CC;C; DDD;DD;D
MCRIL	MFI specialized	1983	Asia; CEE/NIS	17	13.2	α+++; α++; α+; α; α–; β+; β; β–; γ+; γ
MicroRate	MFI specialized	1997	LAC; MENA; CEE/NIS	37	28.7	α++; α+; α; α–; β+; β; β–; γ+; γ; γ–
Microfinanza	MFI specialized	2000	MENA; CEE/NIS; LAC	23	17.8	AAA;AA;A BBB;BB;B CCC;CC;C; DDD;DD;D

Agency	Type	Found Year	Serving Region	Rated OBS	% Rating	Grades Scale
PlanetRating	MFI specialized	1999	LAC; MENA CEE/NIS;	34	26.4	A+;A;A-;B+;B B-;C+;C;C-;D;E G5*; G5; G4*; G4; G3*; G3; G2*; G2 G1*; G1
Total				129	100.0%	

Table 5 also shows that microfinance raters do not have a consistent letter grade system and that grade scales vary by rater. For example, *CRISIL* has 8 levels, in terms of mfR1-mfR8 (mfR1 represents best rating), while *Microfinanza* uses 12 levels from AAA to D (AAA represents best rating). In this study a single consistent numerical scale is created using the individual grade scales of each rater. The scale used in this analysis varies from 1 to 10. Higher value represents better rating. For example, if the grade scale is ABCDE by *Equilibrium*, then A=10, B=8, C=6, D=4 and E=2. During the study period, of the 315 MFIs, 97 were rated at least once and 27 were rated at least twice. In total, the database contains 129 ratings.

Principle components analysis is one method for economists to create economic indices, such as economic freedom index. An alternative way is converting qualitative indicators to quantitative ones, which helps detect the impact of qualitative levels. In this thesis, equal margin is applied to each pair of border categories within individual raters, and is used here. The shortcoming of this approach may be that marginal effect might be different due to different point locations in the array but it is assumed that this is not the case here because each rating grade should have equal impact.

Table 6: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
LiabCh	832	0.412	1.637	-10.646	11.263
EqCh	875	0.222	1.498	-7.994	8.094
N_GRADE	129	7.116	1.809	1.9	10
REGULATED	875	0.578	0.494	0	1
L_AUDIT	875	0.392	0.488	0	1
*L_OSS**	875	1.165	0.411	0.107	3.769
L_NAB	875	9.200	1.759	2.639	15.124
L_ROA	875	0.078	0.113	0	1.359
L_CAPITAL	875	0.424	0.280	0.0003	1
L_LOAN	875	0.721	0.176	0.055	1.089
L_SAVINGS	875	0.167	0.265	0	1.120
L_MFISIZE	875	15.309	1.754	9.454	22.151
AGE	875	12.395	10.407	2	111
NGO	875	0.454	0.498	0	1
INFLATION	875	0.063	0.069	0.0003	0.961
PR	875	37.817	10.999	10	90
BF	875	33.726	11.129	10	70
FF	875	51.349	16.994	10	90
EconFreedom	875	56.890	6.315	37	79
GDPC	875	6.861	0.925	4.755	8.980
ERC	379	1.525	0.679	1	3
INFORMAL	828	4.089	0.712	2	5
COMPET	842	73.524	143.904	1	666

* L stands for one period lag.

Table 6 presents summary statistics of the variables used in the empirical analysis for the full sample. Table 7-1 presents summary statistics of the key variables used in the empirical analysis for years when the MFI were not rated versus years when the MFIs were rated. Rated MFIs differ from non-rated MFIs in terms of several indicators. In the year preceding rating, rated MFIs have higher and statistically significant *OSS* (1.252 versus 1.149). *OSS* measures how well the MFI can cover its costs through operating revenues. Similarly, there were differences in terms of the outreach measure of rated and non-rated MFIs. Outreach is measured as the logarithm of the number of active borrowers

(*NAB*), which is the number of individuals that currently have an outstanding loan balance with the MFI. In the year preceding rating, rated MFIs had better outreach indicators than MFIs that did not get rated (9.719 versus 9.110)[4]. Other indicators statistically different for the two groups include loan to total assets ratio (*LOAN)* (0.768 versus 0.712), and risk profile (*PAR*) (0.039 versus 0.055). Change in non-deposit liability (*LiabCh*) and in equity (*EqCh*) do not show difference between non-rated MFIs and the full sample MFIs, however, two-sample t test only considers sample means with degree of freedom respectively, but no other compound variables controlling MFI-specific and macroeconomic-specific characteristics are not considered.

Table 7-2 summarizes the statistics for *N_GRADE* by raters. In the sample we studies, *FitchRating* has the highest average of *N_GRADE* 9.87 while *MicroRate* has the lowest one 6.19. However, since the sample includes limited observations by rater, these results should not be interpreted as representatives.

Table 7-1: Summary statistics for non-rated group and rated group

Variable	Non-rated	Rated
LiabCh	0.395	0.509
	(0.060)	(0.164)
EqCh	0.205	0.320
	(0.054)	(0.138)
L_OSS	1.149	1.252***
	(0.015)	(0.032)
L_NAB	9.110	9.719***
	(0.066)	(0.116)
L_ROA	0.080	0.062**
	(0.004)	(0.006)
L_CAPITAL	0.430	0.390
	(0.010)	(0.024)
L_SAVINGS	0.170	0.147
	(0.010)	(0.009)
L_LOAN	0.712	0.768***
	(0.006)	(0.015)

[4] Another industry standard outreach indicator is "depth of outreach", which is calculated as the ratio of average outstanding loan size divided by GDP per capita. However, depth of outreach has much less observations in our database, so if it was used as an independent variable, the sample becomes very small.

Variable	Non-rated	Rated
L_PAR	0.055	0.039***
	(0.003)	(0.004)
L_MFISIZE	15.206	15.907
	(0.066)	(0.117)
AGE	12.539	11.566
	(0.403)	(0.503)

Standard errors are in the parenthesis
* difference in means between rated and non-rated statistically significant at the 10% level
** difference in means between rated and non-rated statistically significant at the 5% level
*** difference in means between rated and non-rated statistically significant at the 1% level

Table 7-2: Summary statistics for N_GRADE by raters

	MCRIL	*MicroRate*	*Microfinza*	*PlanetRating*
N_GRADE (Mean)	7.71	6.19	8.04	6.36
OBS	17	37	23	34
	ClassRating	*Equilibrium*	*CRICIL*	*FitchRating*
N_GRADE (Mean)	6.67	8	8.75	9.87
OBS	3	7	2	6

Table 8: Mean comparison of selected indicators between rated group and MBB[5]

Variables	2004		2005	
	Sample	MBB	Sample	MBB
CAPITAL	33.9	34.0	33.5	29.5
LOAN	75.8	78.4	80.8	80.1
NAB	44,250	14,426	55,480	16,755
ROA	6.4	2.1	6.0	2.1
PAR	3.5	1.9	3.7	1.8
Total Assets	25,900,000	7,432,540	36,300,000	12,230,758

Table 8 presents comparison of the means of selected indicators between the rated group and benchmarks posted by Micrbanking Bulletin, issue No. 14, Spring, 2007. The benchmarks provided by the bulletin are the most widely used benchmarks in the industry. *CAPITAL* and *LOAN* have close means to the benchmarks, without significant difference

[5] The MicroBanking Bulletin (MBB) is the premier benchmarking source for the microfinance industry, reaching back as far as 1997. It is a primary output of the Microfinance Information Exchange, Inc. (MIX). The MicroBanking Bulletin's industry commentary, analysis and benchmarks are widely used by investors, donors and other service providers to facilitate greater standardization and a better understanding of developments in the microfinance sector.

between the sample and the proposed population. However, *NAB, ROA, PAR* and *MFISIZE* (in terms of total assets) have higher averages than the benchmarks. Therefore, presumably, larger MFIs with better social performance and more sustainable operations will be more likely to choose to be rated. Comparison between the risk level of the rated MFIs and that of the Microbanking Bulletin benchmarks shows that the risk measure PAR is higher for rated than for the benchmarks. This may be related to the fact that larger number of borrowers (higher *NAB*) unavoidably leads to higher risk exposure.

CHAPTER V: RESULTS

Table 9 presents the results of the impact of rating, on change in non-deposit liability and equity, for the full sample, without considering possible sample selection issues. The results show that rating sends signals that help MFIs obtain loans but not equity. Specifically, according to results of Model 5, Table 9, MFIs will increase their non-deposit liability by 58.8 % if they were rated. Individual RATER dummies are jointly significant in *LiabCh* model, which is consistent with previous research that raters have different impacts on raising funds. *ClassRating*, *FitchRating* and *CRISIL* have statistically significant positive impact [6] while *Equilibrium, MCRIL Microfinanza Microrate* and *PlanetRating* do not. However, individual raters do not affect change of equity. This might be because donors, who are the main providers of equity, do not pay as much attention to rating as creditors because donors may care more about the mission of the MFI, while creditors want to ensure themselves that their loans will be repaid.

Auditing turns out to be effective as an external governance mechanism because MFIs that have their financial statements audited are more likely to raise funds. Regulated MFIs are not more likely to get additional equity and liability. External governance mechanisms play an important role in MFIs fundraising activities because *RATING, AUDIT* and *REGULATED* are jointly significant in change in equity and in

[6] In model 5, the coefficients of *ClassRating* and *FitchRating* are 2.765 and 0.710, significant at 0.01 and 0.10, respectively. The constant term is 3.456, significant at 0.01, which indicates that *CRISIL* has significant impact as the reference group.

change in liability. The results are consistent with Barth (2006), which strongly supports the view that more stringent external audits and greater external rating and credit monitoring, individually and collectively, enhance bank profitability in countries around the world. Equity to total assets ratio (*L_CAPITAL*) affects ability to raise funds, which means that capital leverage help MFIs get well capitalization in microfinance industry.

Table 9: The impact of rating on change in non-deposit liability and equity

	(1) *LiabCh*	(2) *EqCh*	(3) *LiabCh*	(4) *EqCh*	(5) *LiabCh*	(6) *EqCh*
RATING	0.544*	0.507	0.404	0.232	0.588**	0.283
	(1.77)	(1.64)	(0.89)	(0.91)	(2.01)	(1.63)
RATER DUMMIES	YES	NO	YES		YES	
SUBSIDIZED	-0.183	-0.153	0.038	-0.161	-0.101	-0.126
	(0.82)	(0.61)	(0.12)	(0.50)	(0.46)	(0.54)
REGULATED	0.168	0.190*	0.236	0.288*	0.141	0.155
	(1.49)	(1.75)	(1.23)	(1.67)	(1.33)	(1.56)
L_AUDIT	0.250**	0.196**	0.454**	0.195	0.250**	0.206**
	(2.11)	(1.97)	(2.29)	(1.20)	(2.20)	(2.13)
UPGRADE	-0.687*	-0.077	-0.916*	0.046	-0.681*	-0.065
	(1.84)	(0.39)	(1.90)	(0.18)	(1.82)	(0.33)
L_OSS	0.505***	0.320**	0.547	0.004	0.488***	0.320**
	(2.75)	(2.27)	(1.11)	(0.01)	(2.70)	(2.36)
L_ROA	0.631	0.152	1.970	0.536	0.715	0.186
	(1.05)	(0.38)	(1.20)	(0.83)	(1.15)	(0.47)
L_NAB	-0.049	0.081	-0.013	0.143	-0.062	0.079
	(0.88)	(1.55)	(0.12)	(1.55)	(1.12)	(1.53)
L_CAPITAL	1.203***	-1.405***	0.662	-1.440***	1.084***	-1.570***
	(4.30)	(6.24)	(1.40)	(3.59)	(3.98)	(7.05)
L_LOAN	0.534	0.280	0.279	0.244	0.746**	0.206
	(1.43)	(0.92)	(0.57)	(0.48)	(2.13)	(0.72)
L_SAVINGS	0.872***	-0.429	0.467	-0.810*	0.892***	-0.546**
	(2.62)	(1.55)	(1.05)	(1.96)	(2.78)	(2.08)
L_MFISIZE	-0.386***	-0.518***	-0.341***	-0.499***	-0.367***	-0.518***
	(5.77)	(8.22)	(3.05)	(4.78)	(5.73)	(8.31)
L_PAR	0.240	-0.029	-0.963	0.129	0.049	-0.174
	(0.30)	(0.04)	(1.24)	(0.12)	(0.06)	(0.27)
NGO	-0.187	-0.154	-0.181	-0.430**	-0.159	-0.204*
	(1.31)	(1.29)	(0.76)	(2.28)	(1.16)	(1.82)
AGE	0.014*	0.021***	-0.004	0.011	0.013	0.021***
	(1.72)	(3.25)	(0.44)	(1.11)	(1.57)	(3.32)
ECONSIZE	0.036	-0.044	0.043	-0.186**	0.075	-0.072*
	(0.57)	(0.97)	(0.46)	(2.50)	(1.59)	(1.89)
PR	-0.008	0.000				
	(1.41)	(0.04)				

	(1) *LiabCh*	(2) *EqCh*	(3) *LiabCh*	(4) *EqCh*	(5) *LiabCh*	(6) *EqCh*
BF	0.004	-0.002				
	(0.71)	(0.33)				
FF	0.006	0.007**				
	(1.54)	(2.07)				
INFLATION	-1.245	-1.658**	-1.394	-1.722	-1.068	-1.752**
	(1.61)	(2.16)	(1.19)	(1.45)	(1.33)	(2.47)
GDPC	-0.048	0.103	-0.112	0.305	-0.108	0.162*
	(0.42)	(1.09)	(0.62)	(1.60)	(1.13)	(1.93)
INFORMAL	-0.013	-0.011				
	(0.17)	(0.16)				
COMPET	0.001	0.000				
	(1.30)	(0.11)				
EconFreedom			0.014	-0.005	0.011	0.007
			(0.76)	(0.30)	(1.16)	(0.84)
ERC			-0.089	-0.125		
			(0.72)	(0.90)		
Constant	4.418***	6.971***	3.732	8.476***	3.456***	7.112***
	(3.90)	(7.71)	(1.56)	(4.32)	(3.19)	(8.12)
Observations	785	824	355	379	832	875
R-squared	0.23	0.24	0.25	0.23	0.22	0.24
F-Statistics	7.10	4.50	11.00	2.95	10.11	6.92

Robust t statistics in the parentheses.
significant at 10%; ** significant at 5%; *** significant at 1%

No positive impact of rating update is found in all the specification. This result should be interpreted with caution because in the sample only 27 MFIs out of 94 in total have rating updates while The Rating Funds Survey 2005 shows that overall 49% of MFIs have. Equity to total assets ratio has negative effects on the change in equity, and positive on change in liability which suggests that MFIs may target an optimal capital structure. The smaller an MFI's size is, the more funds it gets, which is consistent with the notion that MFIs strive to obtain economies of scale.

In Models (3)-(6) *EconFreedom* is used as the general economic freedom index, instead of *BF, FF* and *PR*, because these three components are not jointly statistically significant. The *ERC* index, created based on banking regulations and supervisions, is not statistically significant in model (3) and model (4) and is not used further in the analysis because it is not available for all countries in the sample and including it in the sample of

rated MFIs significantly reduces the sample. It is also possible that microfinance industry might differ significantly from the regular bank industry. Additionally, another policy study also shows that any approach to regulation and supervision of MFIs needs to recognize their heterogeneity and accommodate the flexibility and scope for development that MFIs need (Hardy, 2003).

Some studies argue that rating has more effects during a longer period of time (Jorion et al., 2005). In this thesis, rating with one period lag, together with all other variables derived from *RATING* with one lag period was estimated with several model specifications. However, there was no evidence to support the notion that rating has an impact for a period longer than one year.

Table 10: The impact of rating on change in non-deposit liability and equity by raters and regions

	(1) *LiabCh*	(2) *EqCh*	(3) *LiabCh*	(4) *EqCh*
N_GRADE	-2.170	0.032	0.185**	0.246**
	(1.49)	(0.05)	(2.54)	(2.23)
SUBSIDIZED	-0.124	-0.150	-0.179	-0.043
	(0.10)	(0.13)	(0.63)	(0.19)
*N_GRADE*SUBSIDIZED*	-0.082	-0.001		
	(0.49)	(0.01)		
REGULATED	-0.621	1.698	0.317	0.788***
	(0.35)	(1.12)	(0.99)	(3.01)
*N_GRADE*REGULATED*	0.113	-0.150		
	(0.47)	(0.70)		
UPGRADE	1.460	-1.393	-0.675	0.061
	(0.60)	(0.52)	(1.21)	(0.15)
*N_GRADE*UPGRADE*	-0.337	0.193		
	(1.00)	(0.54)		
MFISPECIAL	-25.294	-6.860	-0.238	0.069
	(1.63)	(0.87)	(0.38)	(0.18)
L_AUDIT	0.708*	-0.056	0.735*	0.128
	(1.69)	(0.19)	(1.84)	(0.54)
L_OSS	1.456**	-0.011	1.060**	0.077
	(2.14)	(0.02)	(2.07)	(0.18)
L_ROA	10.120**	4.028	4.984	2.028

	(1) *LiabCh*	(2) *EqCh*	(3) *LiabCh*	(4) *EqCh*
	(2.00)	(1.39)	(1.37)	(0.87)
L_NAB	0.005	-0.032	-0.089	0.037
	(0.03)	(0.18)	(0.55)	(0.26)
L_CAPITAL	-0.846	-3.254***	-0.381	-2.930***
	(1.01)	(3.32)	(0.64)	(4.79)
L_LOAN	-1.141	0.953	-1.095	0.249
	(1.01)	(0.86)	(1.61)	(0.32)
L_SAVINGS	0.115	-1.419	0.820	-1.115
	(0.08)	(1.15)	(0.87)	(1.47)
L_MFISIZE	-0.823***	-0.663***	-0.746***	-0.647***
	(3.28)	(3.41)	(4.36)	(3.92)
L_PAR	2.240	2.945	-0.363	3.176
	(0.61)	(0.77)	(0.15)	(1.12)
NGO	1.114	2.951**	-0.055	0.699
	(0.69)	(2.32)	(0.15)	(0.67)
*N_GRADE*NGO*	-0.274	-0.454**		-0.091
	(1.11)	(2.60)		(0.64)
AGE	0.015	0.052*	0.036	0.051**
	(0.48)	(1.77)	(1.61)	(2.28)
ECONSIZE	0.373	0.065	0.099	-0.169
	(1.13)	(0.24)	(1.05)	(1.63)
PR	0.004	-0.002		
	(0.15)	(0.08)		
BF	0.026	-0.019		
	(1.02)	(0.74)		
FF	-0.007	0.007		
	(0.30)	(0.41)		
INFLATION	-7.398	2.037	-3.717	0.986
	(1.06)	(0.38)	(0.94)	(0.25)
GDPC	-0.309	0.335	-0.035	0.363
	(0.44)	(0.52)	(0.13)	(1.60)
REGION DUMMIES	NO	NO		
RATER DUMMIES	NO	NO		
*RATERS*N_GRADE*	NO	NO		
INFORMAL	0.694*	0.200		
	(1.94)	(0.75)		
COMPET	-0.005	-0.002		
	(1.21)	(0.53)		
EconFreedom			0.029	-0.025
			(0.99)	(1.02)
Constant	23.976*	6.707	7.660**	9.793***
	(1.78)	(0.92)	(2.18)	(3.01)
Observations	119	123	125	129
R-squared	0.58	0.55	0.43	0.44
F-Statistics	-	-	2.41	2.82

Robust t statistics in the parentheses.
significant at 10%; ** significant at 5%; *** significant at 1%

Table 10 presents the results of the impact of rating, measured with a numerical grade, on change in non-deposit liability and equity, for the sample or rated MFIs, with rater dummies, region dummies and interactions. Model (3) and (4) where for some variables and interactions left out are the preferred models after applying some tests for joint significance.

N_GRADE has positive impacts in both model (3) and (4). This suggests that rating plays a disciplining role because better ratings help MFIs raise funds. Subsidized rating does not help MFIs raise additional funds considering both main effect and interaction effect, which is consistent with the result of Hartarska and Nadolnyak (2007b). Within the sample of rated MFIs *REGULATED* also has a positive impact on raising equity but not debt suggesting that creditor prefer regulated MFIs, while donors are indifferent to regulation.

Neither *UPGRADE* nor *MFISPECIAL* have statistically significant impact. There is no well developed rating system for microfinance entities and even specialized raters have no consistent rating grades and rating standards. This suggests that the type of rating agencies an MFI chooses does not matter. In addition, most MFIs receive upgrades either because the rating is subsidized or they were satisfied with the rating grade they obtained in previous year. Therefore, updates of rating do not differ from first-time rating.

Operational self-sustainability affects the ability to raise funds because this is one of the missions MFIs strive to achieve and funding providers might care about this criterion. *N_GRADE*NGO* has statistically significant negative sign, which means that rating grades have lower return on NGOs than for for-profit financial institutions. This is interpreted to mean that for for-profit financial institutions aim at “profit” and rating

might help them attract funds while NGOs concentrates on meeting a mission. *REGION DUMMIES*, *RATER DUMMIES* and *RATER*N_GRADE* are not jointly significant in models (1) and (2). It may be because *N_GRADE* accounts for difference between raters and was assigned with consistent numerical grades.

The results from OLS regressions may suffer from endogeneity since the MFIs who have chosen to be rated probably knew they had better financial performance and expected better letter grades and thus more funds than the ones who did not chose to be rated by external raters. Also, the cost of rating assessment activities is another factor which prevents MFIs with relative poor performance from getting rating. Therefore, the estimates based on the sample of MFIs with full rating information may be biased. It is necessary to consider sample selection problems.

HAUSMAN TEST FOR ENDOGENEITY AND TWO-STAGE PROCEDURE

Since *N_GRADE* may suffer from endogeneity, a Hausman test to check for that is performed. In the second stage, P-values of residuals saved from the first stage of Hausman, which regresses *N_GRADE* on all the other exogenous variables in the clean models, are 0.01 and 0.03 respectively, which indicates endogeneity. Two-stage least square procedure is applied to correct for this problem. *REGULATED* might be appropriate for an instrumental variable for *LiabCh* equation in two-stage procedure, using the preferred models. There are two reasons. First, if MFIs get regulated, they need to meet some financial standards otherwise the regulators will impose sanctions. Therefore, it is supposed to be positive correlated with *N_GRADE*. Second, *REGULATED* might not be correlated with additional funds (liability) from creditors

because donors do not care much about whether MFIs are regulated due to the distortion of regulation in microfinance.

L_OSS might be appropriate for an instrumental variable for *EqCh* equation in two-stage procedure, using cleaned models. *OSS* captures how well MFIs make themselves operational self-sustainable. It goes into the evaluation of rating, thus, it is correlated with *N_GRADE.* On the other hand, investors care more about return on total equity, instead of *OSS*; therefore, it is not correlated with the extra equity MFIs receive.

Table 11: The impact of rating on change in non-deposit liability and equity

by two-stage least square procedure

	(1) *LiabCh*	(2) *EqCh*
N_GRADE	1.189	0.350
	(0.82)	(0.47)
SUBSIDIZED	-0.232	-0.070
	(0.53)	(0.30)
UPGRADE	-1.206	-0.015
	(1.36)	(0.03)
MFISPECIAL	1.671	0.254
	(0.59)	(0.18)
L_AUDIT	0.854*	0.105
	(1.73)	(0.43)
L_OSS	0.432	
	(0.33)	
L_ROA	7.385	2.304
	(1.20)	(1.09)
L_NAB	-0.433	-0.015
	(0.80)	(0.05)
L_CAPITAL	-1.993	-3.173**
	(0.77)	(2.11)
L_LOAN	-1.612	0.172
	(1.09)	(0.16)
L_SAVINGS	0.597	-1.049
	(0.47)	(1.35)
L_MFISIZE	-0.728***	-0.658***
	(2.90)	(3.88)
L_PAR	-1.983	2.609
	(0.37)	(0.79)
NGO	0.006	0.090
	(0.01)	(0.34)

	(1) *LiabCh*	(2) *EqCh*
AGE	0.027	0.050**
	(0.62)	(2.11)
ECONSIZE	0.195	-0.153
	(0.89)	(1.18)
INFLATION	-6.264	0.116
	(0.93)	(0.03)
GDPC	-0.407	0.305
	(0.67)	(0.91)
EconFreedom	0.101	-0.016
	(0.80)	(0.27)
REGULATED		0.729**
		(2.03)
Constant	0.923	9.534*
	(0.07)	(1.74)
Observations	125	129
R-squared	-	0.42
F-Statistics	1.25	2.80

Robust t statistics in the parentheses.
significant at 10%; ** significant at 5%; *** significant at 1%

Table 11 presents the results of two-stage procedure, using the preferred models from the OLS specifications. The results show that the coefficients on *N_GRADE* are not statistically significant in either of the models. Although it is not exactly clear what goes into rating, in general, rating agencies exist, and thus, they must provide additional independent information. In microfinance, rating matters more for commercial funds providers; however, commercial funds have not been distinguished from other funds sources, such as donation and grants in this study. There is evidence to show that *AUDIT* and *REGULATED* help MFIs raise liability and equity, respectively. The impacts of *MFISIZE* are consistent with all the other analysis and this result is very robust in different models.

However, the evidence for endogeneity of *N_GRADE* is not strong. The instruments selected may suffer from the problem of weak instruments. Therefore, it is possible that

rating helps impose market discipline in microfinance as an effective external governance mechanism.

HECKMAN EXTENSION

Self-selection bias can also be corrected by Heckman Selection Model as well as two-stage procedure. *L_AUDIT* might be an appropriate instrument identified in the Heckman Selection Model. First, MFIs are likely to choose to both get financial statements audited and rated. In our sample, the correlation between *RATING* and *AUDIT* is 0.16 at 0.0000 significant levels. Second, *AUDIT* is not correlated with *N_GRADE* because rating system does not account whether MFIs get their financial statements audited. In our sample, the correlation between *N_GRADE* and *AUDIT* is 0.04 with p-value 0.63. *AGE* is another instrument in Heckman Selection Model for the similar reasons.

Table 12: Heckman Selection Model to predict numerical grades[7]

Heckman selection model -- two-step estimates (regression model with sample selection)
Number of obs=875
Censored obs=746
Uncensored obs=129

Wald chi2(16) = 48.99
Prob > chi2 = 0.0000

	Outcome equation *N_GRADE*	Selection equation *RATING*
L_CAPITAL	1.742***	-0.196
	(2.59)	(0.80)
L_NAB	0.180	0.014
	(1.17)	(0.27)
L_PAR	3.951	-1.002
	(0.97)	(0.94)
L_OSS	0.588	0.178
	(1.19)	(1.13)

[7] Heckman estimates rho, the correlation of the residuals in the two equations and sigma. In this regression, rho is 0.134, significant at 10% level, which confirms that self-selection problem exists in this case.

	Outcome equation *N_GRADE*	Selection equation *RATING*
L_SAVINGS	0.354	-0.387
	(0.49)	(1.47)
L_LOAN	1.167	0.625*
	(1.06)	(1.75)
L_ROA	-1.794	-0.753
	(0.69)	(0.96)
L_MFISIZE	0.297	0.129**
	(1.51)	(2.19)
L_AUDIT		0.364***
		(3.30)
AGE		-0.017**
		(2.08)
Constant	-1.623	-3.592***
	(0.41)	(4.99)
Observations	129	875

Robust z statistics in the parentheses.
significant at 10%; ** significant at 5%; *** significant at 1%.

Table 12 presents the results obtained by Heckman Selection Model. By using Heckman Selection Model, we can get a vector of the predicted values of *N_GRADE,* which is denoted as *PHECKMAN*.

Table 13 reports the comparison of actually observed *N_GRADE* and the predicted *PHECKMAN*. Paired two-sample t-test shows that the predicted result is as robust as the original values, which is the preliminary step and the precondition for using *PHECKMAN* as independent variable, instead of *N_GRADE* in the following regression specifications.

Table 13: Summary statistics for *PHECKMAN* and actual *N_GRADE*[8]

Variable	Obs	Mean	Std. Dev.	Min	Max
N_GRADE	129	7.116	1.809	1.9	10
PHECKMAN	129	6.975	0.961	1.93	9.98

However, the relative small number of uncensored group will affect the power and the efficiency of the prediction, in our case, the difference of observation numbers

[8] Paired t-test for equal mean shows the predicted result is robust with P-value 0.03. The null hypotheses of equal mean is failed to be rejected at 1% significance level.

between full sample and uncensored group might be too large. It is not safe enough to use *PHECKMAN* instead of actual *N_GRADE* in the models. Therefore, Heckman extension ends up by this step.

TESTS FOR IDENTIFIED MODELS

Table 10: Model (3) and (4) are identified as cleaned models.

Firstly, heteroskedasticity has been examined in the specifications by using Breusch-Pagan tests. Robust errors are reported in parentheses because heteroskedasticity exits in all specifications.

Secondly, multicollinearity was assessed in the specifications using the variance inflation factor (VIF). The means of VIFs confirm that multicollinearity is not a problem in the clean models but it is a problem in the extended models of all the regressions. (See Appendix5.)

Lastly, specification error and omitted variables bias was tested for using the Ramsey RESET test in all models. The null hypothesis states that the model does not have specification error and the alternative is that the model does have specification error. The F-statistics for the Ramsey RESET of specification (3) and (4) were calculated to be 2.39 and 3.30; consequently, p-values are 0.001 and 0.02 respectively. The results might be acceptable since the p-values reported from Ramsey RESET are usually low and the significance level can be set lower than the regular t-tests in regression procedures. For the RESET test, the lower the F-statistic is, the more certain it can be concluded that specification error or omitted variables test is not a problem. For these two models used in this thesis, it is not highly certain that these problems cannot be proven to exist in the

model. It is possible that there are still some other factors which have effects on the change of non-deposit liability and total equity of MFIs, such as outreach depth indicator, and the factor whether the country has deposit insurance schemes. Since the database available does not provide the information mentioned above, they cannot be included in the analysis. The limitations of this thesis come from the limited data sample, as well as the excessive missing values within unbalanced panel data, thus further improvement is hard to be performed. Better database is necessarily to help future work refine the model.

CHAPTER VI: CONCLUSIONS

This thesis studies whether rating assessments help MFIs raise more funds, using a sample of 315 MFIs operating in 63 countries in the world during the period of 1999-2005. The main conclusion is that there is no strong evidence that rating affects MFIs fundraising efforts, after accounting for possible endogeneity of rating by two-stage least square procedure, although rating has statistically significantly positive effects on the change of non-deposit liability and total equity of MFIs by OLS procedure. However, the evidence for endogeneity of rating is not strong, which might support the idea that rating helps impose market discipline. Difference of rating impact on raising liability between raters is detected. Rating updates, subsidized rating and rater types do not affect fundraising and regulatory authorities' activities do not affect the values of rating.

The results on the role of rating should be interpreted with caution due to the specific sample. The results need to be viewed with the limitation of data and the unbalanced nature of the panel data. Also, whether the rating is requested from potential donors or current boards may affect the effectiveness of rating itself. However, date associated with above issues is not available. Moreover, more information can be drawn from full the version rating reports, like sub-rating for separate aspects can be examined

in other regression specifications once data is available. The role of rating is very important for policy purposes and, since the results in this thesis are only valid for a specific time period and regions, the role of rating needs to be addressed further with better data.

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APPENDIX

Appendix1. Methods of creating the numerical rating grades by raters.

Agency	Grades Scale	Numerical Values assignments (1-10)
CRISIL	mfR1; mfR2; mfR3;	mfR1=10; mfR2=8.8; mfR3=7.6;
	mfR4; mfR5; mfR6;	mfR4=6.4; mfR5=5.2; mfR6=4;
	mfR7; mfR8	mfR7=2.8; mfR8=1.6
ClassRating	ABCDE	A=10; B=8; C=6; D=4; E=2;
Equilibrium	A; B+; B; C+; C	A=10; B+=9; B=8; C+=7; C=6;
	D+; D; E+; E	D+=5; D=4; E+=3; E=2
FitchRating	AAA;AA;A	AAA=10; AA=9.2; A=8.4
	BBB;BB;B	BBB=7.6; BB=6.8; B=6.0
	CCC;CC;C;	CCC=5.2; CC=4.4; C=3.6
	DDD;DD;D	DDD=2.8; DD=2.0; D=1.2
MCRIL	α+++; α++; α+;	
	α; α–; β+; β; β–;	α+++/α++ =10
	γ+; γ	α+=9; α=8; α–=7
		β+=6; β=5; β–=4
MicroRate	α++; α+; α; α–;	γ+=3; γ=2; γ–=1
	β+; β; β–;	
	γ+; γ; γ–	
Microfinanza	AAA;AA;A	AAA=10; AA=9.2; A=8.4
	BBB;BB;B	BBB=7.6; BB=6.8; B=6.0
	CCC;CC;C;	CCC=5.2; CC=4.4; C=3.6
	DDD;DD;D	DDD=2.8; DD=2.0; D=1.2
PlanetRating	A+;A;A-;B+;B	A+=10; A=9.1; A-=8.2; B+=7.3; B=6.4; B-=5.5;
	B-;C+;C;C-;D;E	C+=4.6; C=3.7; C-=2.8; D=1.9; E=1
	G5*; G5; G4*; G4;	G5*=10; G5=9; G4*=8; G4=7;
	G3*; G3; G2*; G2	G3*=6; G3=5; G2*=4; G2=3
	G1*; G1	G1*=2; G1=1

Appendix2. Rated sample distribution by country and year

Country	2001	2002	2003	2004	2005	Total
Argentina	0	0	0	0	1	1
Armenia	0	1	1	0	0	2
Azerbaijan	0	0	0	0	2	2
Bangladesh	0	0	2	0	0	2
Benin	0	0	3	2	1	6
Bolivia	1	1	1	4	5	12
Brazil	0	0	1	0	0	1
Burkina Faso	0	0	0	0	1	1
Cambodia	1	0	2	1	3	7
Colombia	0	0	1	2	2	5
Dominican Republic	0	0	0	0	1	1
Ecuador	0	0	1	3	2	6
Egypt	0	0	0	2	0	2
El Salvador	0	0	0	0	1	1
Ethiopia	0	0	0	0	1	1
Georgia	0	0	0	0	2	2
Honduras	0	0	0	0	2	2
India	2	2	1	1	1	7
Jordan	1	0	0	0	0	1
Kazakhstan	0	1	1	0	0	2
Kenya	1	1	1	0	1	4
Kyrgyzstan	0	1	1	0	2	4
Madagascar	0	0	0	1	0	1
Mali	0	0	1	0	0	1
Morocco	1	2	2	0	1	6
Nicaragua	0	0	2	0	5	7
Pakistan	0	0	0	1	0	1
Paraguay	0	0	0	0	1	1
Peru	1	0	4	8	9	22
Philippines	0	1	0	1	1	3
Russia	0	0	1	0	1	2
Senegal	0	0	1	1	2	4
Tanzania	0	0	0	1	0	1
Togo	0	0	0	1	1	2
Tunisia	0	0	0	1	0	1

Country	2001	2002	2003	2004	2005	Total
Uganda	0	0	1	3	1	5
Total	8	10	28	33	50	129

Appendix3. List of MFIs included in the rated group

ABA	Caritas	KAFC
ACEP	DBACD	KLF
ACODEP	EBS	KRep
ACSI	ECLOF PHL	KWFT
ADOPEM	EDPYME Alternativa	Kafo
AMC de R.L.	EDPYME Confianza	MDFKamurj
AMRET	EDPYME Crear Arequipa	MFW
AMSSF/MC	EDPYME Crear Tacna	ODEF
AREGAK	EDPYME Crear Trujillo	Otiv Sambava
ASA	EDPYME EDYFICAR	PADME
Al Amana	EDPYME PROEMPRESA	PAMECAS
BANTRA	Emprender	PAPME
BASIX	Enda	PRASAC
BTFF	FDL	PRESTANIC
BURO	FIE	PRISMA
Banco Los Andes ProCredit	FIE Gran Poder	PRODESA
BancoSol	FIELCO	ProEmpresa
Bandhan	FINADEV	ProMujer
CEAPE/MA	FINCA TZA	ProMujer Nicaragua
CEB	FINCA Uganda	ProMujer Peru
CMAC Arequipa	FMFB Pakistan	RCPB
CMAC Maynas	FMM Bucaramanga	SHARE
CMAC Tacna	FMM Popay	SPANDANA
CMAC Trujillo	FOCCAS	TSKI
CMF	FORA	TSPI
CMS	FUNBODEM	UM PAMECAS
COAC Jardin Azuayo	FinDev	UTrust / UWFT
COAC Maquita Cushunchic	Fundacion Espoir	VF
CODESARROLLO	Fundacion Leon 2000	VMCA
CRECER	GK	WAGES
CREDIT	HKL	WWB Medell
CREDO	HdH	Zakoura
CRYSTAL FUND		

Appendix4. Country list without rated MFIs

Albania	Malawi	Sierra Leone
Cameroon	Mexico	South Africa
Chad	Moldova	Sri Lanka
Chile	Mongolia	Tajikistan
Colombia	Mozambique	Thailand
Costa Rica	Nepal	Togo
Ghana	Nigeria	Venezuela
Guatemala	Poland	Zambia
Haiti	Romania	Zimbabwe
Indonesia	Rwanda	

Appendix5. Results of the VIFs (variance inflation factor) for the test of multicollinearity

As a rule of thumb, the variables whose VIF values are greater than 10 may merit further investigation. Some variables in the specifications show rather high VIF but the means VIFs are less than 10 for all the specifications, indicating that multicollinearity is not a problem of the models.

VIF (Model 3)

Variable	VIF	1/VIF
L_MFISIZE	3.23	0.309442
L_NAB	2.74	0.364687
GDPC	2.19	0.456419
ECONSIZE	2.14	0.468078
L_CAPITAL	1.95	0.513539
NGO	1.76	0.567981
L_SAVINGS	1.74	0.573416
MFISPECIAL	1.65	0.606373
L_OSS	1.65	0.606751
L_ROA	1.63	0.615173
EconFreedom	1.63	0.615193
L_LOAN	1.57	0.636492
REGULATED	1.47	0.680684

Variable	VIF	1/VIF
N_GRADE	1.46	0.685660
L_PAR	1.41	0.706788
INFLATION	1.27	0.788425
AGE	1.27	0.789055
UPGRADE	1.25	0.798007
SUBSIDIZED	1.20	0.832319
L_AUDIT	1.15	0.873276
Mean VIF	1.72	

VIF (Model 4)

Variable	VIF	1/VIF
*N_GRADE*NGO*	22.24	0.044964
NGO	21.16	0.047259
L_MFISIZE	3.35	0.298507
N_GRADE	3.16	0.316456
L_NAB	2.78	0.359712
GDPC	2.26	0.442478
ECONSIZE	2.16	0.462963
L_CAPITAL	1.96	0.510204
MFISPECIAL	1.94	0.515464
L_SAVINGS	1.78	0.561798
L_OSS	1.65	0.606061
EconFreedom	1.64	0.609756
L_ROA	1.62	0.617284
L_LOAN	1.53	0.653595
REGULATED	1.45	0.689655
L_PAR	1.39	0.719424
INFLATION	1.31	0.763359
AGE	1.28	0.78125
UPGRADE	1.24	0.806452
SUBSIDIZED	1.21	0.826446
L_AUDIT	1.17	0.854701
Mean VIF	3.73	